

Wastren Advantage Inc.
Environmental Surveillance, Education, and Research Program
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Idaho National Laboratory Site Offsite Environmental Surveillance Program Report: First Quarter 2017

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EXECUTIVE SUMMARY

None of the radionuclides detected in samples collected during the first quarter of 2017 could be directly linked with INL Site activities. Levels of detected radionuclides were no different than values measured at other locations across the western United States. All detected radionuclide concentrations were well below standards set by the U.S. Department of Energy (DOE) and regulatory standards established by the U.S. Environmental Protection Agency (EPA) for protection of the public.

This report for the first quarter of 2017 contains results from the Environmental Surveillance, Education, and Research (ESER) Program's monitoring of the Department of Energy's Idaho National Laboratory (INL) Site's offsite environment, January 1 through March 31, 2017. All sample types (media) and the sampling schedule followed during 2017 are listed in Appendix A. This report contains results for the following sample types:

- Air, including particulate air filters, charcoal cartridges, and atmospheric moisture
- Precipitation
- Milk

Table E-1. Summary of results for the First Quarter of 2017.

Media	Sample Type	Analysis	Results
Air	Filters	Gross alpha, gross beta	There were some statistical differences in monthly or quarterly gross alpha or gross beta concentrations measured at Distant, Boundary, and INL Site sampling locations, but these appeared to be normal variations in the data. A few differences were also noted in weekly results but no pattern was discernible. No result exceeded the DCS for gross alpha or gross beta activity in air.
	Quarterly Composite	Gamma-emitting radionuclides, ⁹⁰ Sr, actinides (americium and plutonium)	No human-made gamma-emitting radionuclides, ⁹⁰ Sr, or ^{239/240} Pu were detected above 3s uncertainty in any of the first quarter composites. Plutonium-238 was detected in one composite and ²⁴¹ Am was detected in two composites just above the 3s uncertainty level. The results were 0.0045, 0.0046 and 0.0039 percent of the applicable DCSs, respectively.
	Charcoal Cartridge	Iodine-131	Iodine-131 was not detected in any of the 26 batches counted during the quarter.
Atmospheric Moisture	Liquid	Tritium	Seven of the eight sample results showed tritium concentrations greater than the 3s uncertainty during the quarter. No sample result exceeded the DCS for tritium in air.
Precipitation	Liquid	Tritium	Fifteen samples were collected. Ten of the results were greater than the 3s uncertainty. All results were within the range previously measured and were consistent with those reported across the region by the Environmental Protection Agency.
Milk	Liquid	Iodine-131, other gamma-emitting	Milk was collected at seven locations. No Iodine-131 or

Media	Sample Type	Analysis	Results
		radionuclides	other human-made gamma emitting radionuclides were detected.
Large game animals	Tissue	Gamma-emitting radionuclides	No large game animals were sampled in the first quarter.

LIST OF ABBREVIATIONS

AEC	Atomic Energy Commission
CFA	Central Facilities Area
DCS	Derived Concentration Standard
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
ICP	Idaho Cleanup Project
INL	Idaho National Laboratory
INEL	Idaho National Engineering Laboratory
INEEL	Idaho National Engineering and Environmental Laboratory
ISU	Idaho State University
MDC	minimum detectable concentration
NRTS	National Reactor Testing Station
ORAU	Oak Ridge Associated Universities
WAI	Wastren Advantage, Inc.

LIST OF UNITS

Bq	becquerel
Ci	curie
g	gram
L	liter
μ Ci	microcurie
mL	milliliter
mrem	millirem
mR	milliRoentgen
pCi	picocurie

1. ESER PROGRAM DESCRIPTION

Operations at the Idaho National Laboratory (INL) Site 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 Safe Drinking Water Act). The requirements imposed by DOE are specified in DOE Orders. These requirements include those to monitor the effects of DOE activities both inside and outside the boundaries of DOE facilities (DOE 2011a, DOE 2015a). During calendar year 2017, environmental monitoring within the INL Site boundaries was primarily the responsibility of the INL and Idaho Cleanup Project (ICP) contractors. At the beginning of the second quarter of 2016, ESER Program responsibilities were assumed by Wastren Advantage, Inc. (WAI), in conjunction with team members Idaho State University and Oak Ridge Associated Universities (ORAU).

This report contains monitoring results from the ESER Program for samples collected during the first quarter of 2017 (January 1- March 31, 2017).

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 INL Site
- Assess the potential radiation dose to members of the public from INL Site effluents
- 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 different media at a number of potential exposure points within the various exposure pathways, including air, water, agricultural products, wildlife, and soil that could possibly contribute to the radiation dose received by the public.

Environmental samples collected include:

- air at 16 locations on and around the INL Site
- moisture in air at four locations around the INL Site
- precipitation from three locations on and around the INL Site
- drinking water from eight locations and surface water from three locations around the INL Site
- agricultural products, including milk at seven dairies around the INL Site, potatoes from at least six local producers, alfalfa from a local producer, grain (wheat and barley) from approximately 10 local producers, and lettuce from approximately nine home-owned and portable gardens on and around the INL
- soil from 13 locations around the INL Site biennially
- environmental dosimeters from 17 locations semi-annually
- various numbers of wildlife including big game (pronghorn, mule deer, and elk) and waterfowl sampled on and near the INL Site.

Table A-1 in Appendix A lists samples, sampling locations, and collection frequency for the ESER Program.

The ESER Program used two laboratories to perform analyses on routine environmental samples collected during the quarter reported here. The ISU Environmental Assessment Laboratory (EAL) performed routine gross alpha, gross beta, tritium, and gamma spectrometry analyses. Analyses requiring radiochemistry including strontium-90 (^{90}Sr), plutonium-238 (^{238}Pu), plutonium-239/240 ($^{239/240}\text{Pu}$), and americium-241 (^{241}Am) were performed by Oak Ridge Associated Universities (ORAU).

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. Any data found to be outside historical norms in the ESER Program is thoroughly investigated to determine if an INL Site origin is likely. Investigation may include re-sampling and/or re-analysis of prior samples.

In the event of any suspected worldwide nuclear incidents, like the 1986 Chernobyl accident or the 2011 Fukushima accident, the EPA may request additional sampling be performed through RadNet [previously known as the Environmental Radiation Ambient Monitoring System (ERAMS) network] (EPA 2017). 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 was renamed RadNet in 2005 to reflect a new mission. RadNet is comprised of a nationwide network of sampling stations that provide air, precipitation, drinking water, and milk samples. The ESER Program currently operates a high-volume air sampler and collects precipitation and drinking water in Idaho Falls for this national program and routinely sends samples to EPA's Eastern Environmental Radiation Facility for analyses. The RadNet data collected at Idaho Falls are not reported by the ESER Program but are available through the EPA RadNet website (<https://www.epa.gov/radnet>).

Once samples have been collected and analyzed, the ESER Program has the responsibility for quality control of the data and for preparing quarterly reports on results from the environmental surveillance program. The quarterly reports are then consolidated into the INL Site Environmental Report for each calendar year. These annual reports also include data collected by other INL Site contractors.

The results reported in the quarterly and annual reports are assessed in terms of data quality and statistical significance with respect to laboratory analytical uncertainties, sample locations, reported INL Site releases, meteorological data, and worldwide events that might conceivably have an effect on the INL Site environment. First, field collection and laboratory information are reviewed to determine identifiable errors that would invalidate or limit use of the data. Examples of such limitations include insufficient sample volume, torn filters, evidence of laboratory cross-contamination or quality control issues. Data that pass initial screening are further evaluated using statistical methods. Statistical tools are necessary for data evaluation particularly since environmental measurements typically involve the determination of minute concentrations, which are difficult to detect and even more difficult to distinguish from other measurements.

Results are presented in this report with an analytical uncertainty term, s , where " s " is the estimated sample standard deviation (σ), assuming a Gaussian or normal distribution. All results are reported in this document, even those that do not necessarily represent detections. The term "detected", as used for the discussion of results in this report, does not imply any degree of risk to the public or environment, but rather indicates that the radionuclide was measured at a concentration sufficient for the analytical instrument to record a value that is statistically different from background. Laboratory measurements involve the analysis of a target sample and the analysis of a prepared laboratory blank (i.e., a sample which is identical to the

sample collected in the environment, except that the radionuclide of interest is absent). In order to conclude that a radionuclide has been detected, it is essential to consider two fundamental aspects of the problem of detection: (1) the instrument signal for the sample must be greater than that observed for the blank before the decision can be made that the radionuclide has been detected; and (2) an estimate must be made of the minimum radionuclide concentration that will yield a sufficiently large observed signal before the correct decision can be made for detection or non-detection. ESER currently defines a detection of radioactivity in an individual sample if the result exceeds the minimum detectable concentration (MDC) calculated by the laboratory after the analysis of a background sample (i.e., the *a posteriori* measurement) based on calculations derived by Curie (1968). The MDC is defined as the concentration at which there is a 95 percent confidence that an analyte signal will be distinguishable from an analyte-free sample.

In addition ESER uses a three standard deviation criterion to identify a potentially false positive result. A false positive result is indicated when the range encompassing the result, plus or minus the total uncertainty at three standard deviations, includes zero (e.g., 2.5 +/- 1.0; range of -0.5 to 3.5). Statistically, the probability that a result can exceed the absolute value of its total uncertainty at three standard deviations by chance alone is less than 1 percent. A result that is greater than three times the total uncertainty of the measurement represents a statistically positive detection with over 99 percent confidence (DOE 2015b). The ESER reports measured radionuclide concentrations greater than or equal to their respective 3s uncertainties as being *detected with confidence*.

Concentrations between 2s and 3s are reported as *questionably detected*. That is, the radionuclide may be present in the sample; however, the probability that a result can exceed the absolute value of its total uncertainty at two standard deviations by chance alone may be as high as 5 percent. Measurements made between 2s and 3s are examined further to determine if they are a part of a pattern (temporal or spatial) that might warrant further investigation or recounting. For example, if a particular radionuclide is routinely detected at > 3s at a specific location, a sample result between 2s and 3s might be considered detected.

If a result is less than or equal to 2s there is even less statistical confidence that the radionuclide is present in the sample. Analytical results in this report are presented as the result value \pm one standard deviation (1s) for reporting consistency with the annual report. To obtain the 2s or 3s values simply multiply the uncertainty term by 2 or 3.

For more information concerning the ESER Program, contact WAI at (208) 525-8250, or visit the Program's web page (<http://www.idaho eser.com>).

2. THE INL SITE

The INL Site is a nuclear energy and homeland security 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 890 mi² (2,300 km²) of the upper Snake River Plain in Southeastern Idaho (Figure 1). The history of the INL Site 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 retooled guns were tested on the nearby, uninhabited plain, known as the Naval Proving Ground. In the years following 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 amounts of electricity. Over time the site has operated 52 various types of 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. With renewed interest in nuclear power the DOE announced in 2003 that Argonne National Laboratory and the INEEL would be the lead laboratories for development of the next generation of power reactors. On February 1, 2005 the INEEL and Argonne National Laboratory-West became the INL. The INL is committed to providing international nuclear leadership for the 21st Century, developing and demonstrating compelling national security technologies, and delivering excellence in science and technology as one of the Department of Energy's multiprogram national laboratories.

The Idaho Cleanup Project (ICP) is now a separately managed effort. The ICP is charged with safely and cost-effectively completing the majority of cleanup work from past laboratory missions in an ongoing process.

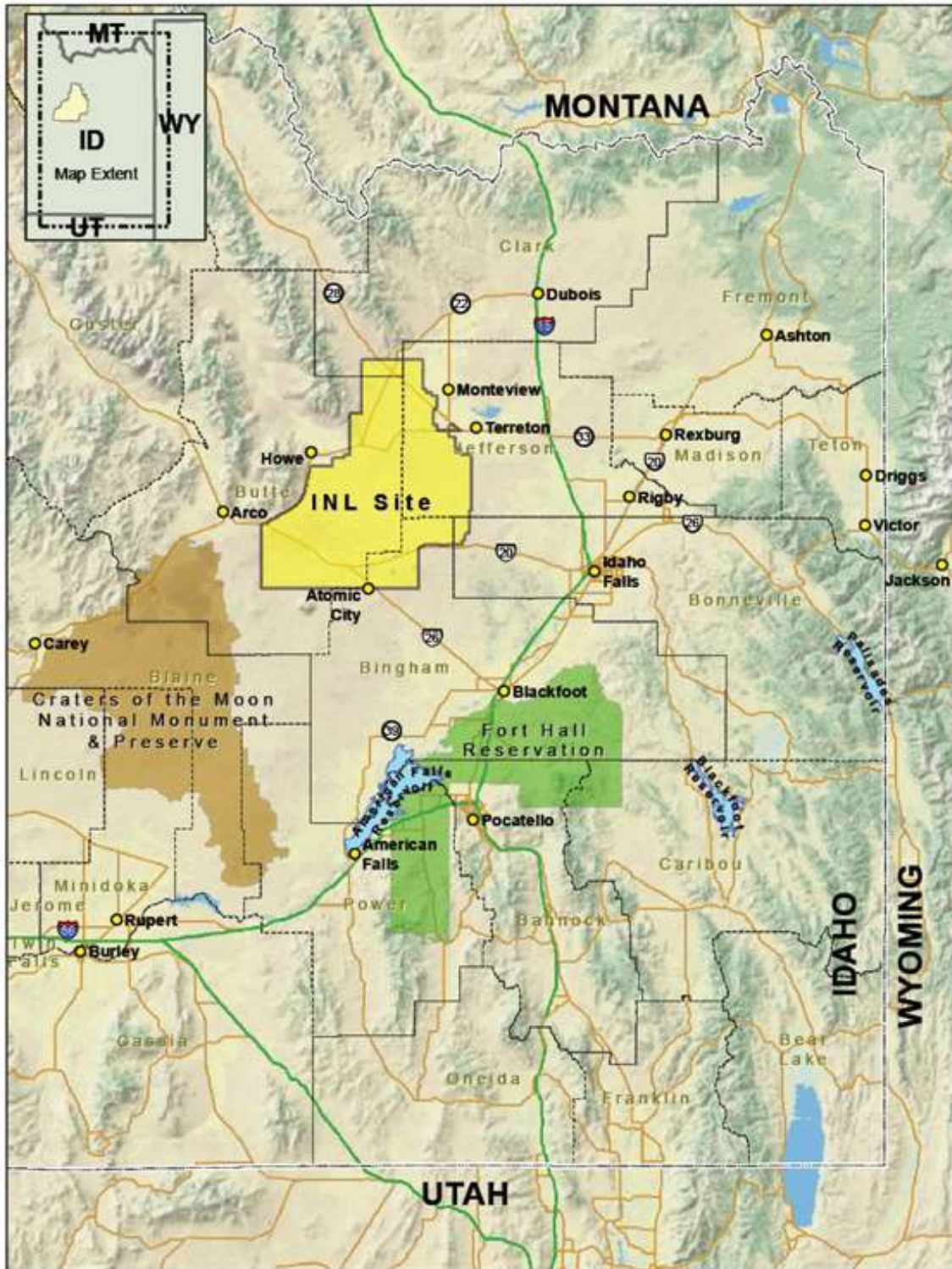


Figure 1. Location of the Idaho National Laboratory Site.

3. AIR SAMPLING

The primary pathway by which radionuclides can move off the INL Site is through the air and for this reason the air pathway is the primary focus of monitoring on and around the INL Site. Samples for particulates and iodine-131 (^{131}I) gas in air were collected weekly for the duration of the quarter at 16 locations using low-volume air samplers. The sampler in Jackson resumed operation at the end of 2016 following completion of the construction at a new sampling location. Moisture in the atmosphere was sampled at four locations around the INL Site and analyzed for tritium. Air sampling activities and results for the first quarter of 2017 are discussed below. A summary of approximate minimum detectable concentrations (MDCs) for radiological analyses and DOE Derived Concentration Standard (DCS) (DOE 2011b) values is provided in Appendix B.

LOW-VOLUME AIR SAMPLING

Radioactivity associated with airborne particulates was monitored continuously by 18 low-volume air samplers (two of which are used as replicate samplers) at 16 locations during the first quarter of 2017 (Figure 2). Three of these samplers are located on the INL Site, seven are situated off the INL Site near the boundary, and eight have been placed at locations distant to the INL Site. Samplers are divided into INL Site, Boundary, and Distant groups to determine if there is a gradient of radionuclide concentrations, increasing towards the INL Site. Each replicate sampler is relocated every other year to a new location. At the start of 2016, one replicate sampler was moved to Sugar City (a Distant location) and one was moved to Blackfoot (also a Distant location). An average of 19,251 ft³ (545 m³) of air was sampled at each location, each week, at an average flow rate of 1.91 ft³/min (0.05 m³/min). Particulates in air were collected on membrane particulate filters (1.2- μm pore size). Gases passing through the filter were collected with an activated charcoal cartridge.

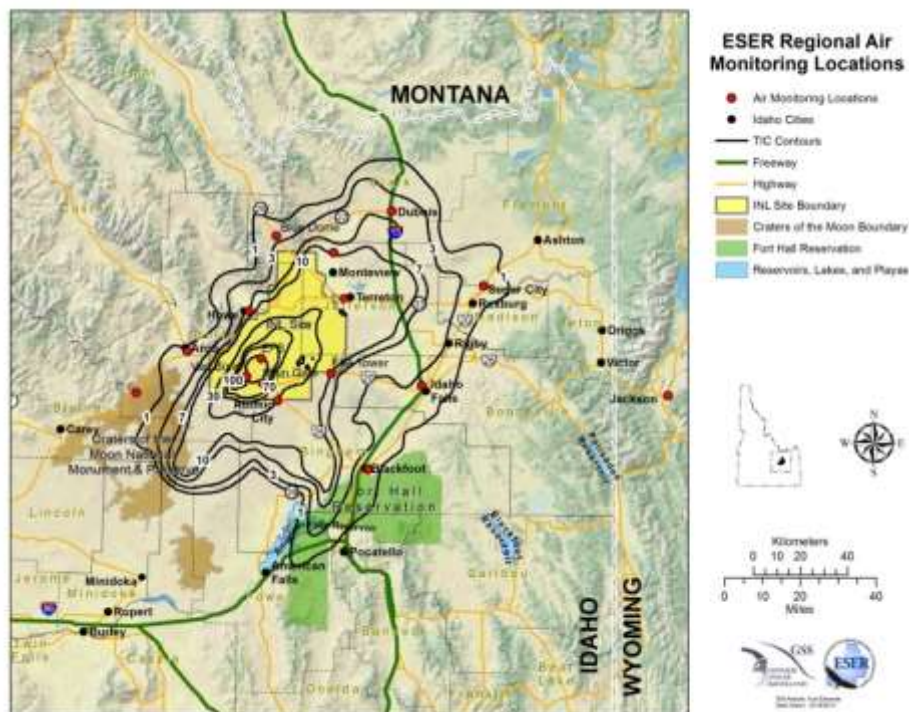


Figure 2. Low-volume air sampler locations.

Filters and charcoal cartridges were changed weekly at each station during the quarter. Each particulate filter was analyzed 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.

The weekly particulate filters collected during the quarter for each location were composited and analyzed for gamma-emitting radionuclides. Selected composites were also analyzed by location for ^{90}Sr , ^{238}Pu , $^{239/240}\text{Pu}$, and ^{241}Am as determined by a rotating quarterly schedule.

Charcoal cartridges were analyzed for gamma-emitting radionuclides, specifically for iodine-131 (^{131}I). Iodine-131 is of particular 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 that any elevated level of ^{131}I in the environment could be from a recent release of fission products.

Gross alpha results are reported in Table C-1 and shown in Figures 3 through 6. Gross alpha data are tested for normality prior to statistical analyses, and generally show no consistent discernible distribution. Because there is no discernible distribution of the data, the nonparametric Kruskal-Wallis test of multiple independent groups was used to test for statistical differences between INL Site, Boundary, and Distant locations. The use of nonparametric tests, such as Kruskal-Wallis, gives less weight to outlier and extreme values thus allowing a more appropriate comparison of data groups. A statistically significant difference exists between data groups if the (p) value is less than 0.05. Values greater than 0.05 translate into a 95 percent confidence that the medians are statistically the same. Comparisons of gross alpha concentrations were made for the quarter and for each month of the quarter using this methodology. The p-value for each comparison is shown in Table D-1. In the first quarter, there was a statistical difference for the quarter as a whole and for the month of March. In both cases, the Boundary group showed the highest concentration, followed by the Distant group. The INL Site group was actually the group with the lowest gross alpha concentrations. The differences between the groups was very small, however, as shown in Figure 3.

As an additional check, comparisons between gross alpha concentrations measured at Boundary and Distant locations were made on a weekly basis. 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. INL Site sample results were not included in this analysis because the onsite data, collected at only three locations, are not representative of the entire INL Site and would not aid in determining offsite impacts. There were two weeks where a statistical difference existed between the two sample groups (Table D-2). These were the weeks of January 11 and February 1. Nothing unusual was noted in the data when individual locations were compared, with Sugar City being somewhat low on January 11 and Arco on the higher end on February 1.

Gross beta results are presented in Table C-1 and displayed in Figures 7 through 10. The data are tested quarterly and generally are found to be neither normally nor log-normally 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. A statistical difference was noted in the quarterly data and during January (Table D-1). As with the gross alpha data, the difference between groups was fairly small. During the winter months, gross beta concentrations tend to be more variable than during other seasons. This is due to variations in weather conditions between individual sampling locations, such as when inversion conditions are persistent at some locations.

Weekly comparisons were also made using the same method as for the gross alpha data and statistical differences were found during two weeks of the quarter (Table D-2). These were the first two weeks of the quarter (January 4 and January 11). In both cases, the Boundary locations were higher than the Distant locations. No particular pattern was found when looking at individual location concentrations.

Iodine-131 was not detected in any of the 26 sets of charcoal cartridges measured during the first quarter. Weekly ^{131}I results for each location are listed in Table C-2 of Appendix C.

No ^{137}Cs or other human-made gamma-emitting radionuclides were found in quarterly composites. No ^{90}Sr or $^{239/240}\text{Pu}$ were found either. Plutonium-238 was detected just above the 3s uncertainty level in the composite from the duplicate sampler at Blackfoot (but not in the composite from the regular sampler in Blackfoot). In comparison to the Derived Concentration Standard, the $^{239/240}\text{Pu}$ result was 0.004 percent of the DCS. Americium-241 was also reported in composites from Idaho Falls and Jackson, also just above the detection limit. The higher of these two values was 0.005 percent of the DCS. A lower detection limit achieved by the current laboratory performing these analyses has resulted in a few results near the detection limit in 2016 and 2017. Results for these analyses are found in Table C-3 of Appendix C.

ATMOSPHERIC MOISTURE SAMPLING

Atmospheric moisture is collected by pulling air through a column of absorbent material (molecular sieve material) to absorb water vapor. The water is then extracted from the absorbent material by heat distillation. The resulting water samples are then analyzed for tritium using liquid scintillation.

Results were available for eight atmospheric moisture samples collected during the first quarter of 2017. Seven of the eight results exceeded the 3s uncertainty level for tritium, with similar results to those reported previously. Results also remain similar between the four sampling locations. All samples were significantly below the DOE DCS for tritium in air of $1.4 \times 10^{-8} \mu\text{Ci}/\text{mL}_{\text{air}}$ with a maximum reported value of $6.77 \times 10^{-13} \mu\text{Ci}/\text{mL}_{\text{air}}$ at Sugar City. Results are shown in Table C-4, Appendix C.

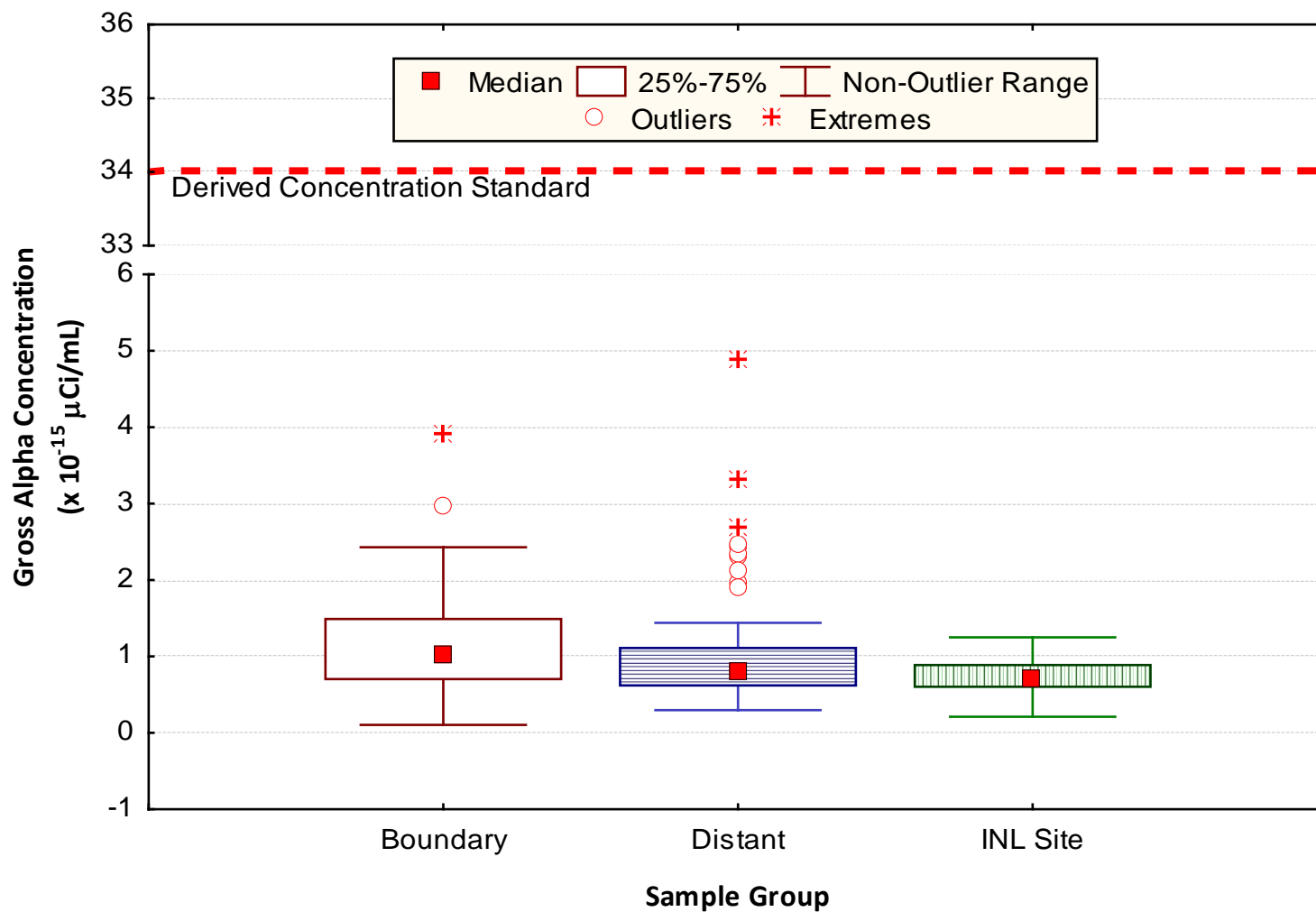


Figure 3. Gross alpha concentrations in air at ESER INL Site, Boundary, and Distant locations for the first quarter of 2017.

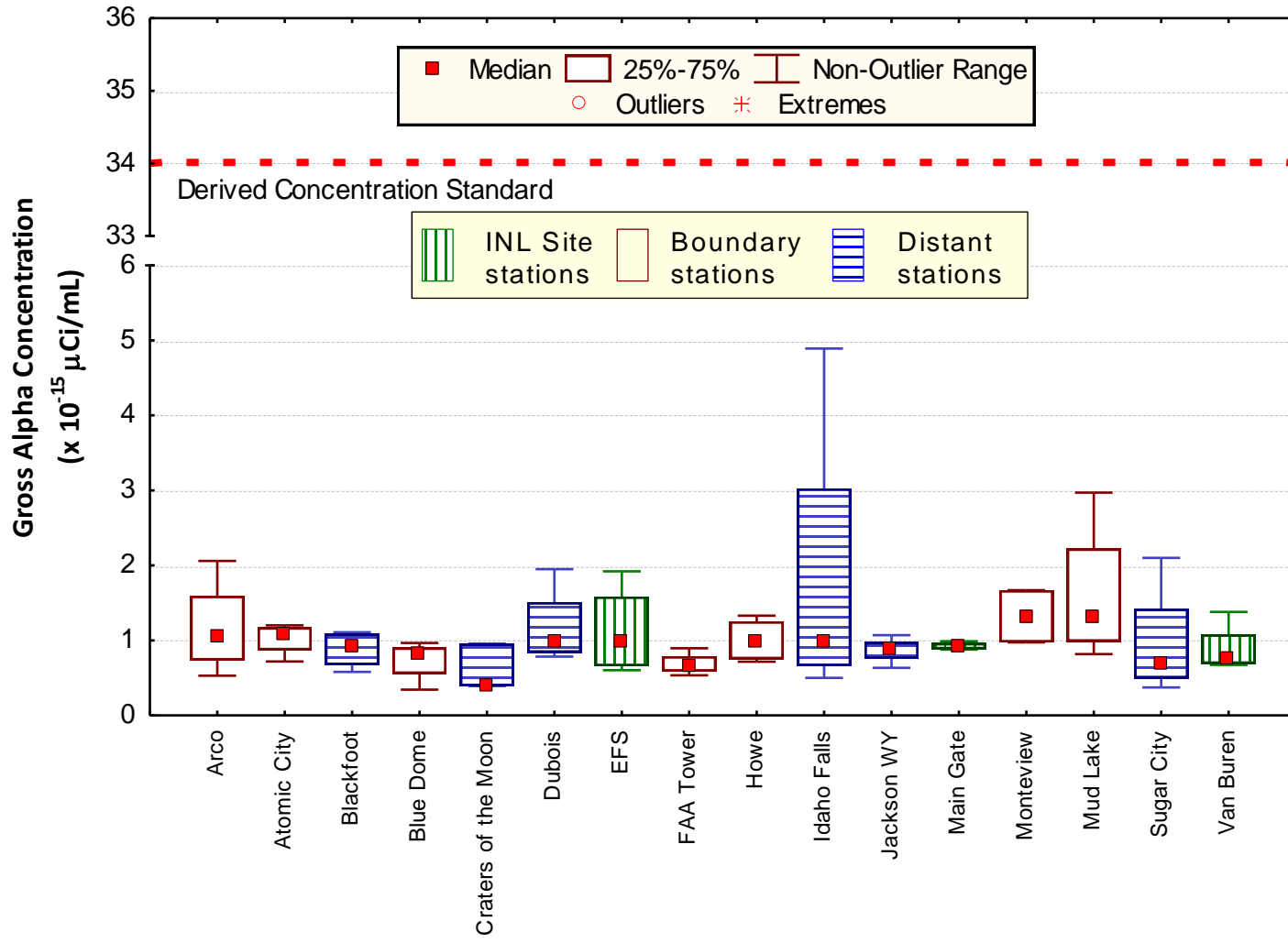


Figure 4. January gross alpha concentrations in air at ESER INL Site, Boundary, and Distant locations. Number of samples (N) = 4 at each location, except Craters of the Moon (N = 3) and Monteview (N = 2).

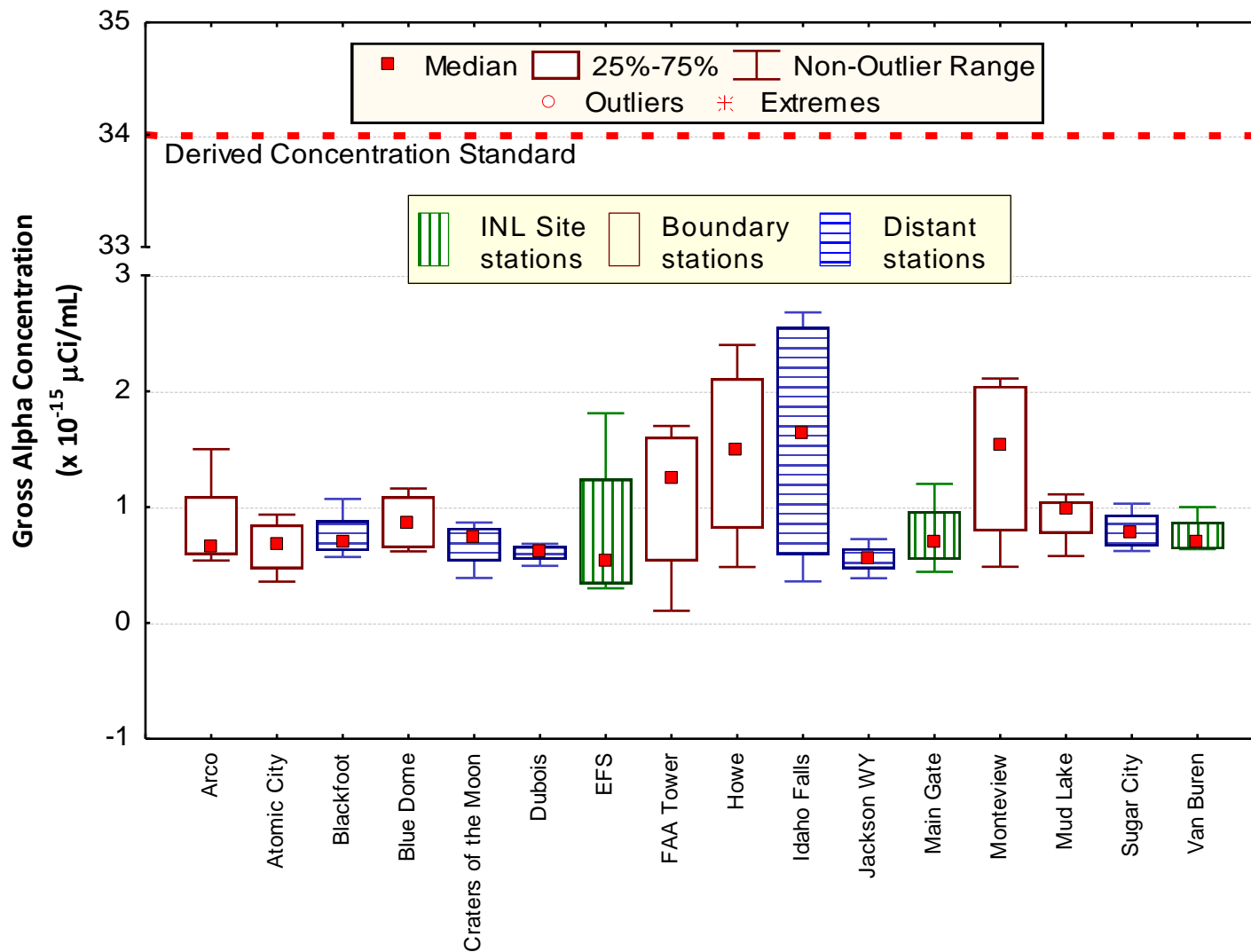


Figure 5. February gross alpha concentrations in air at ESER INL Site, Boundary, and Distant locations. Number of samples (N) = 4 at each location.

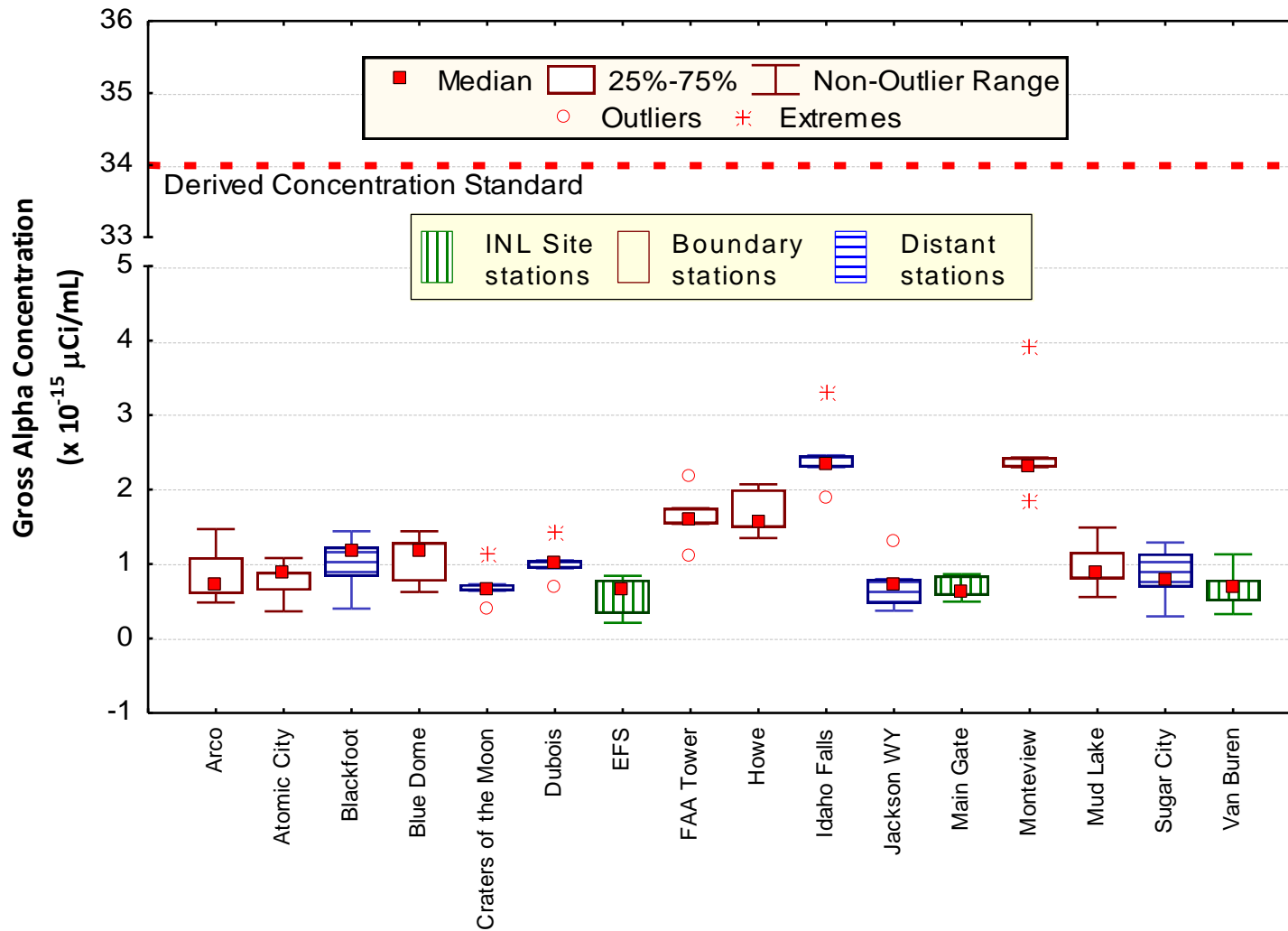


Figure 6. March gross alpha concentrations in air at ESER INL Site, Boundary, and Distant locations.
 Number of samples (N) = 5 at each location.

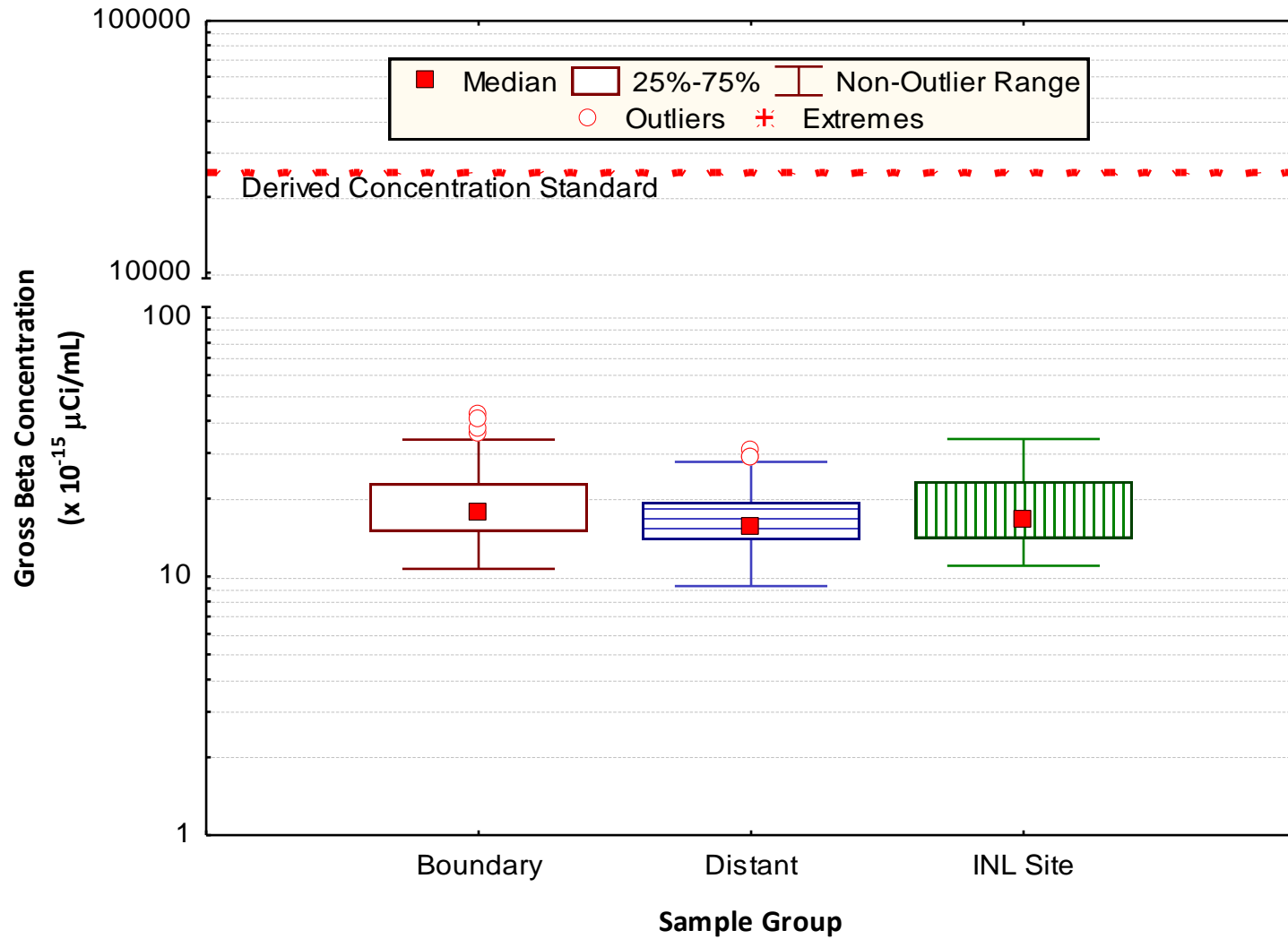


Figure 7. Gross beta concentrations in air at ESER INL Site, Boundary, and Distant locations for the first quarter of 2017.

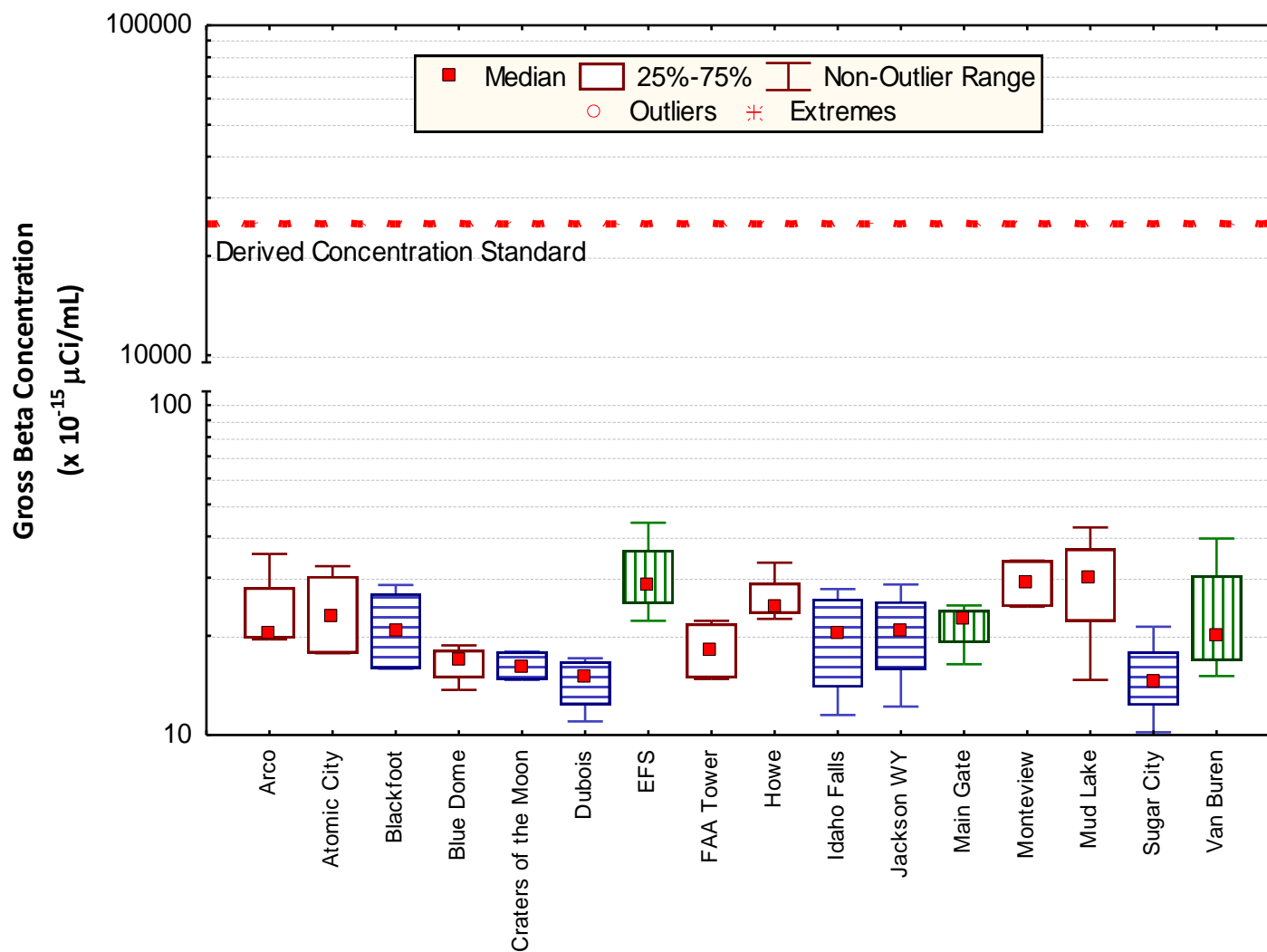


Figure 8. January gross beta concentrations in air at ESER INL Site, Boundary, and Distant locations.

Number of samples (N) = 4 at each location, except Craters of the Moon (N = 3) and Monteview (N = 2). The main highway to Craters of the Moon was closed on January 11 due to snow and so the sample collected on January 18 represents two weeks of collection. Valid air samples were not collected at Monteview on January 11 and 18 due to malfunctioning air pumps.

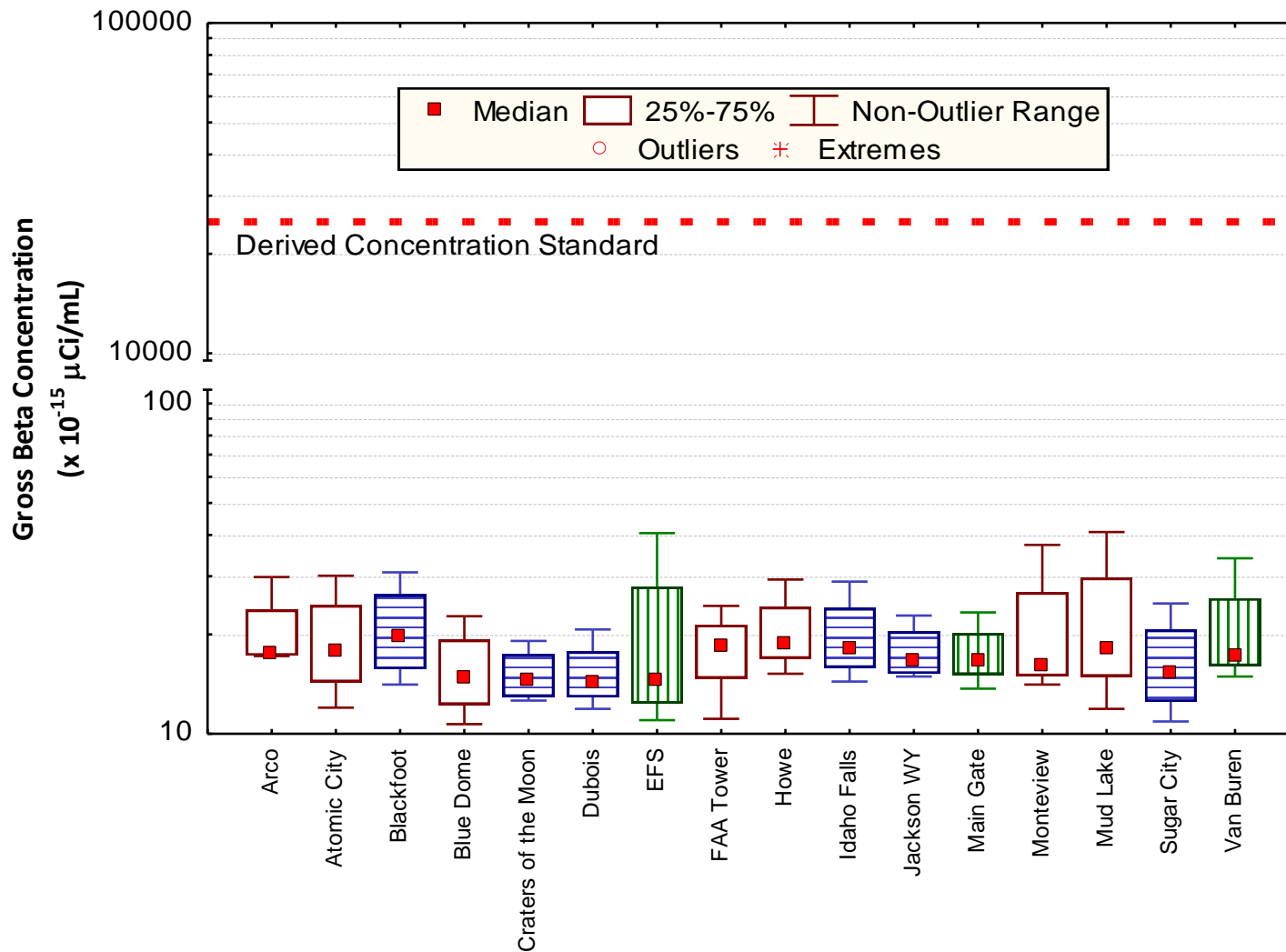


Figure 9. February gross beta concentrations in air at ESER INL Site, Boundary, and Distant locations. Number of samples (N) = 4 at each location.

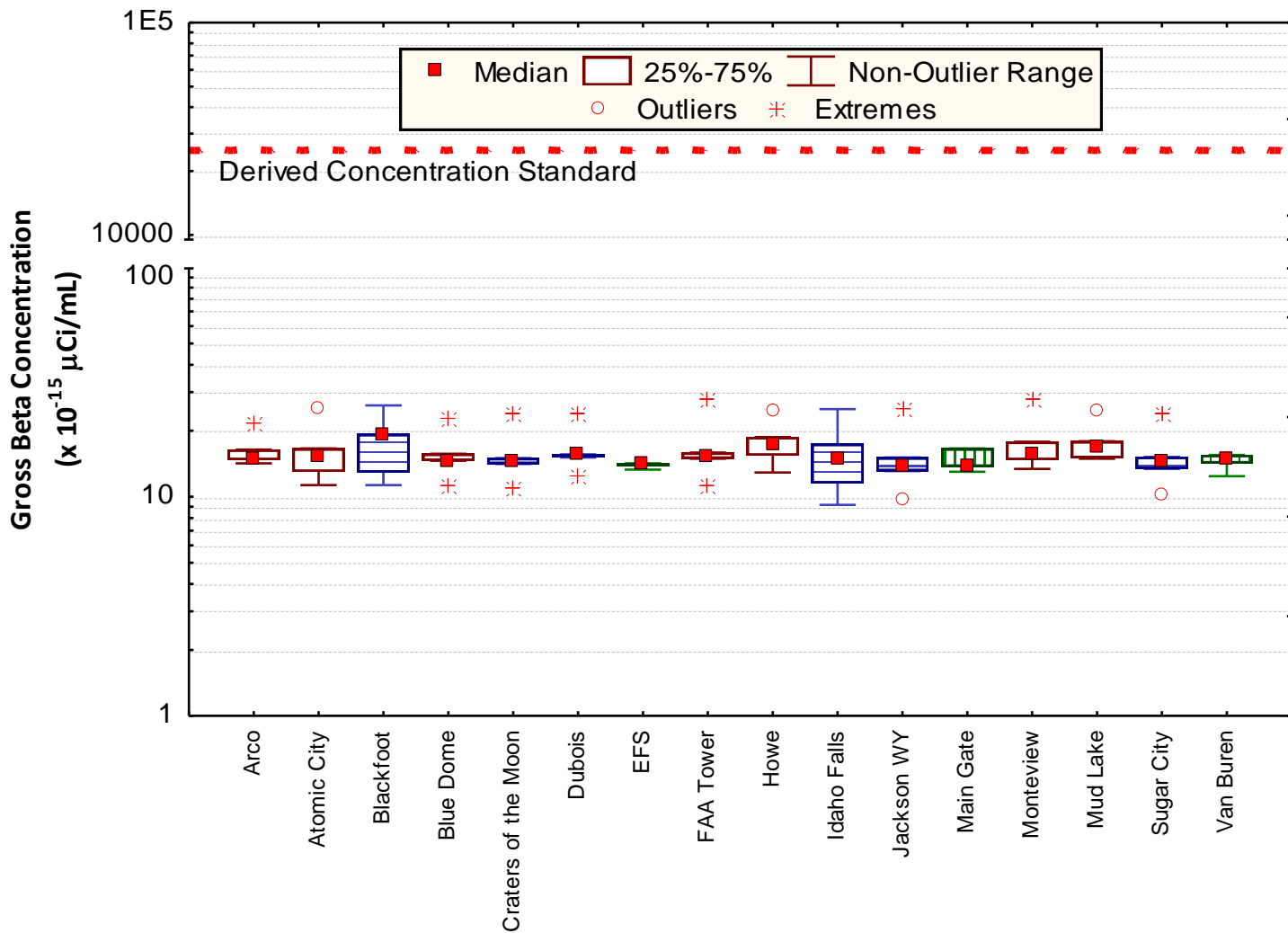


Figure 10. March gross beta concentrations in air at ESER INL Site, Boundary, and Distant locations. Number of samples (N) = 5 at each location.

4. PRECIPITATION AND WATER SAMPLING

PRECIPITATION SAMPLING

Precipitation samples are gathered when sufficient precipitation occurs to allow for the collection of the minimum sample volume of approximately 50 mL. Samples are taken of monthly composites from Idaho Falls and CFA, and weekly from the EFS. Precipitation samples are analyzed for tritium. Storm events in the first quarter of 2017 produced sufficient precipitation to yield 15 samples.

Tritium was measured above the 3s values in 10 of the 15 samples. These results are listed in Table C-5 (Appendix C). Low levels of tritium exist in the environment at all times as a result of cosmic ray reactions with water molecules in the upper atmosphere and the remnants of fallout from nuclear weapons testing. When detected, tritium values have remained well within the historical range and the range measured across the country by the EPA Radnet program (EPA 2017). Most samples have values up to about 150 pCi/L, with occasional values ranging up to about 300-400 pCi/L. The maximum value in the first quarter was 192 pCi/L in a January CFA sample. The overall average for most sets of tritium data in almost all media is usually about 100 pCi/L, and for the first quarter precipitation it was right in line at 94 pCi/L.



5. AGRICULTURAL PRODUCT, WILDLIFE, AND SOIL SAMPLING

Another potential pathway for contaminants to reach humans is through the food chain. The ESER Program samples multiple agricultural products and game animals from around the INL Site and Southeast Idaho. Specifically, milk, alfalfa, grain, potatoes, lettuce, large game animals, and waterfowl are sampled. Milk is sampled throughout the year and large game animals are sampled whenever large game animals are killed onsite from vehicle collisions. Alfalfa is collected during the second quarter, lettuce and grain are sampled during the third quarter, while potatoes are collected during the third and fourth quarters. Waterfowl are collected in either the third or fourth quarter. See Table A-1, Appendix A, for more details on agricultural product and wildlife sampling. This section discusses results from milk and agricultural products samples available during the first quarter of 2017.

MILK SAMPLING

Milk samples were collected weekly in Idaho Falls. Monthly samples were collected at five other locations around the INL Site (Figure 11) during the first quarter of 2017. The Fort Hall dairy was not in operation during the quarter. In addition to the local locations, commercially-available organic milk (from Colorado) was purchased as a control sample each month. All samples were analyzed for gamma emitting radionuclides, with particular emphasis on Iodine-131.

Iodine-131 was not detected in any weekly or monthly samples during the first quarter. No other human-made gamma-emitting radionuclides were found either. Data for ^{131}I and ^{137}Cs in milk samples are listed in Appendix C, Table C-6.

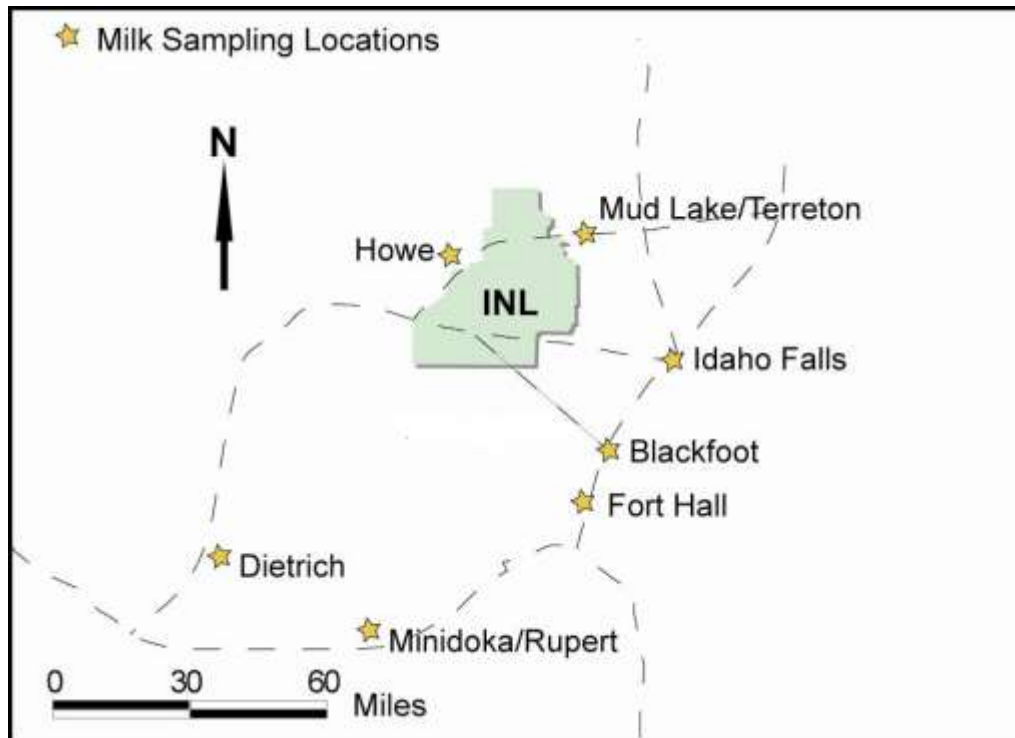


Figure 11. ESER milk sampling locations.

LARGE GAME ANIMAL SAMPLING

No game animal samples were collected in the first quarter.

6. QUALITY ASSURANCE

The ESER Quality Assurance Program consists of five ongoing tasks which measure:

1. method uncertainty
2. data completeness
3. data accuracy, using spike, performance evaluation and laboratory control samples
4. data precision, using split samples, duplicate samples and recounts
5. presence of contamination in samples, using blanks.

Sample results are compared to criteria described in the Quality Assurance Project Plan for the INL Site Offsite Environmental Surveillance Program (WAI 2016). Criteria established by DOE for Quality Assurance activities include:

- Quality assurance program
- Personnel training and qualification
- Quality improvement process
- Documents and records
- Established work processes
- Established standards for design and verification
- Established procurement requirements
- Inspection and acceptance testing
- Management assessment
- Independent assessment

Assessments of ESER data quality are achieved through analysis of spike, performance evaluation, and duplicate samples; through sample recounts; through analysis of blank samples; and through comparison of sample results to established method quality objectives. These assessments are documented in the ESER Quality Assurance for the First Quarter of 2017 (WAI 2017).

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APPENDIX A
SUMMARY OF SAMPLING SCHEDULE

Table A-1. Summary of the ESER Program's Sampling Schedule

Sample Type Analysis	Collection Frequency	LOCATIONS		
		Distant	Boundary	INL Site
AIR SAMPLING				
<i>LOW-VOLUME AIR</i>				
Gross Alpha, Gross Beta, ¹³¹ I	weekly	Blackfoot, Craters of the Moon, Dubois, Idaho Falls, Jackson WY, Sugar City	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Blue Dome	Main Gate, EFS, Van Buren
Gamma Spec	quarterly	Blackfoot, Craters of the Moon, Dubois, Idaho Falls, Jackson WY, Sugar City	Arco, Atomic City, FAA Tower, Howe, Monteview, Mud Lake, Blue Dome	Main Gate, EFS, Van Buren
⁹⁰ Sr, Transuranics	quarterly	Rotating schedule	Rotating schedule	Rotating schedule
<i>ATMOSPHERIC MOISTURE</i>				
Tritium	2 to 13 weeks	Blackfoot, Idaho Falls, Sugar City	Atomic City	None
<i>PRECIPITATION</i>				
Tritium	monthly	Idaho Falls	None	CFA
Tritium	weekly	None	None	EFS
<i>DRINKING WATER</i>				
Gross Alpha, Gross Beta, Tritium	Semiannually	Craters of the Moon, Idaho Falls, Minidoka, Shoshone	Atomic City, Howe, Mud Lake, Rest Area	None
<i>SURFACE WATER</i>				
Gross Alpha, Gross Beta, Tritium	Semiannually	Buhl, Hagerman, Twin Falls	None	Big Lost River (when flowing)
ENVIRONMENTAL RADIATION SAMPLING				
<i>TLDs/OSLDs</i>				
Gamma Radiation	semiannual	Aberdeen, Blackfoot (2), Craters of the Moon, Dubois, Idaho Falls, Jackson WY, Minidoka, Sugar City, Roberts	Arco, Atomic City, Birch Creek, Blue Dome, Howe, Monteview, Mud Lake	None
SOIL SAMPLING				
<i>SOIL</i>				
Gamma Spec, ⁹⁰ Sr, Transuranics	biennially	Carey, Blackfoot, St. Anthony	Butte City, Monteview, Atomic City, FAA Tower, Howe, Mud Lake (2), Birch Creek, Frenchman's Cabin	None

Table A-1. Summary of the ESER Program's Sampling Schedule (continued)

Sample Type Analysis	Collection Frequency	LOCATIONS		
		Distant	Boundary	INL Site
FOODSTUFF SAMPLING				
<i>MILK</i>				
Gamma Spec (¹³¹ I)	weekly	Idaho Falls	None	None
Gamma Spec (¹³¹ I)	monthly	Blackfoot, Dietrich, Fort Hall, Idaho Falls, Minidoka	Howe, Terreton	None
Tritium, ⁹⁰ Sr	Semi-annually	Blackfoot, Dietrich, Fort Hall, Idaho Falls, Minidoka	Howe, Terreton	None
<i>POTATOES</i>				
Gamma Spec, ⁹⁰ Sr	annually	Varies among Blackfoot, Idaho Falls, Rupert, Shelley, Hamer, Driggs, occasional samples across the U.S.	Varies among Arco, Monteview, Mud Lake, Terreton	None
<i>ALFALFA</i>				
Gamma Spec, ⁹⁰ Sr	annually	None	Mud Lake	None
<i>GRAIN</i>				
Gamma Spec, ⁹⁰ Sr	annually	Varies among American Falls, Blackfoot, Carey, Idaho Falls, Rupert/Minidoka, Roberts	Varies among Arco, Monteview, Mud Lake, Taber, Terreton	None
<i>LETTUCE</i>				
Gamma Spec, ⁹⁰ Sr	annually	Varies among Blackfoot, Carey, Idaho Falls, Rigby, Sugar City	Varies among Arco, Atomic City, FAA Tower, Howe, Monteview	EFS
<i>BIG GAME</i>				
Gamma Spec	varies	Occasional samples across the U.S.	Public Highways	INL Site roads
<i>WATERFOWL</i>				
Gamma Spec, ⁹⁰ Sr, Transuranics	annually	Varies among: Heise, Firth, Fort Hall, Mud Lake, Market Lake, and American Falls	None	INL Site wastewater disposal ponds

APPENDIX B
SUMMARY OF MDCs AND DCSs

Table B-1. Summary of Approximate Minimum Detectable Concentrations for Radiological Analyses Performed during First Quarter 2017

Sample Type	Analysis	Approximate Minimum Detectable Concentration ^a (MDC)	Derived Concentration Standard ^b (DCS)
Air (particulate filter) ^e	Gross alpha ^c	4.11×10^{-16} $\mu\text{Ci/mL}$	3.4×10^{-14} $\mu\text{Ci/mL}$
	Gross beta ^d	9.38×10^{-16} $\mu\text{Ci/mL}$	2.5×10^{-11} $\mu\text{Ci/mL}$
	¹³⁷ Cs	8.34×10^{-17} $\mu\text{Ci/mL}$	9.8×10^{-11} $\mu\text{Ci/mL}$
	⁹⁰ Sr	2.24×10^{-17} $\mu\text{Ci/mL}$	2.5×10^{-11} $\mu\text{Ci/mL}$
	²⁴¹ Am	6.51×10^{-19} $\mu\text{Ci/mL}$	4.1×10^{-14} $\mu\text{Ci/mL}$
	²³⁸ Pu	4.37×10^{-19} $\mu\text{Ci/mL}$	3.7×10^{-14} $\mu\text{Ci/mL}$
	^{239/240} Pu	8.48×10^{-19} $\mu\text{Ci/mL}$	3.4×10^{-14} $\mu\text{Ci/mL}$
Air (charcoal cartridge) ^e	¹³¹ I	4.80×10^{-16} $\mu\text{Ci/mL}$	2.3×10^{-19} $\mu\text{Ci/mL}$
Air (atmospheric moisture)	³ H	84.4 pCi/L _{water}	2.1×10^{-7} $\mu\text{Ci/mL}_{\text{air}}$
Air (precipitation)	³ H	97.0 pCi/L	1.9×10^{-3} $\mu\text{Ci/mL}$
Milk	¹³¹ I	0.27 pCi/L	--
	¹³⁷ Cs	0.85 pCi/L	--

a The MDC is an estimate of the concentration of radioactivity in a given sample type that can be identified with a 95 percent level of confidence. MDCs are calculated and reported by the laboratories based on actual ESER sample results following analysis.
 b DCSs, 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 Based on the most restrictive human-made alpha emitter (²³⁹Pu).
 d Based on the most restrictive human-made beta emitter (⁹⁰Sr).
 e The approximate MDC is based on an average filtered air volume (pressure corrected) of 445 m³/week.

APPENDIX C
SAMPLE ANALYSIS RESULTS

TABLE C-1. Weekly Gross Alpha and Gross Beta Concentrations in Air

Sampling Group and Location	Sampling Date	GROSS ALPHA						GROSS BETA							
		Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)			Result > 3s	Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)			Result > 3s
BOUNDARY	1/4/2017	2.06	±	0.30	7.62	±	1.10	Yes	35.40	±	0.85	130.98	±	3.16	Yes
	1/11/2017	1.13	±	0.23	4.18	±	0.84	Yes	20.60	±	0.63	76.22	±	2.32	Yes
	1/18/2017	0.94	±	0.18	3.47	±	0.66	Yes	19.50	±	0.51	72.15	±	1.87	Yes
	1/25/2017	0.53	±	0.20	1.96	±	0.72	No	19.80	±	0.58	73.26	±	2.15	Yes
	2/1/2017	1.50	±	0.22	5.55	±	0.81	Yes	29.80	±	0.65	110.26	±	2.39	Yes
	2/8/2017	0.54	±	0.19	1.99	±	0.71	No	17.30	±	0.55	64.01	±	2.03	Yes
	2/15/2017	0.64	±	0.14	2.36	±	0.52	Yes	17.20	±	0.56	63.64	±	2.06	Yes
	2/22/2017	0.68	±	0.18	2.53	±	0.65	Yes	17.70	±	0.60	65.49	±	2.23	Yes
	3/1/2017	0.48	±	0.15	1.79	±	0.54	Yes	14.70	±	0.53	54.39	±	1.95	Yes
	3/8/2017	0.70	±	0.16	2.60	±	0.58	Yes	16.40	±	0.54	60.68	±	2.01	Yes
	3/15/2017	0.60	±	0.15	2.22	±	0.54	Yes	14.80	±	0.55	54.76	±	2.02	Yes
	3/22/2017	1.47	±	0.20	5.44	±	0.75	Yes	21.80	±	0.62	80.66	±	2.30	Yes
	3/29/2017	1.09	±	0.16	4.03	±	0.61	Yes	14.20	±	0.51	52.54	±	1.89	Yes
ATOMIC CITY	1/4/2017	1.20	±	0.21	4.44	±	0.78	Yes	28.10	±	0.66	103.97	±	2.44	Yes
	1/11/2017	1.15	±	0.23	4.26	±	0.85	Yes	17.70	±	0.60	65.49	±	2.21	Yes
	1/18/2017	1.02	±	0.23	3.77	±	0.84	Yes	32.50	±	0.74	120.25	±	2.72	Yes
	1/25/2017	0.72	±	0.19	2.66	±	0.68	Yes	17.70	±	0.52	65.49	±	1.92	Yes
	2/1/2017	0.94	±	0.18	3.46	±	0.65	Yes	30.10	±	0.60	111.37	±	2.20	Yes
	2/8/2017	0.36	±	0.17	1.32	±	0.63	No	12.00	±	0.46	44.40	±	1.70	Yes
	2/15/2017	0.76	±	0.14	2.80	±	0.52	Yes	18.90	±	0.55	69.93	±	2.02	Yes
	2/22/2017	0.58	±	0.15	2.14	±	0.57	Yes	16.70	±	0.55	61.79	±	2.02	Yes
	3/1/2017	0.37	±	0.13	1.35	±	0.47	No	11.30	±	0.46	41.81	±	1.69	Yes
	3/8/2017	0.65	±	0.15	2.39	±	0.55	Yes	16.60	±	0.53	61.42	±	1.96	Yes
	3/15/2017	0.87	±	0.15	3.21	±	0.56	Yes	15.20	±	0.52	56.24	±	1.91	Yes
	3/22/2017	1.08	±	0.19	4.00	±	0.69	Yes	24.90	±	0.65	92.13	±	2.39	Yes
	3/29/2017	0.89	±	0.15	3.29	±	0.54	Yes	13.00	±	0.47	48.10	±	1.74	Yes
BLUE DOME	1/4/2017	0.76	±	0.19	2.82	±	0.70	Yes	17.50	±	0.55	64.75	±	2.05	Yes
	1/11/2017	0.85	±	0.22	3.13	±	0.82	Yes	13.70	±	0.56	50.69	±	2.09	Yes
	1/18/2017	0.97	±	0.19	3.57	±	0.72	Yes	18.70	±	0.53	69.19	±	1.97	Yes
	1/25/2017	0.34	±	0.18	1.27	±	0.66	No	16.10	±	0.53	59.57	±	1.94	Yes
	2/1/2017	0.62	±	0.18	2.28	±	0.65	Yes	22.70	±	0.57	83.99	±	2.10	Yes
	2/8/2017	0.68	±	0.19	2.52	±	0.71	Yes	10.70	±	0.46	39.59	±	1.69	Yes
	2/15/2017	1.02	±	0.16	3.77	±	0.58	Yes	15.80	±	0.53	58.46	±	1.94	Yes
	2/22/2017	1.16	±	0.19	4.29	±	0.69	Yes	13.80	±	0.53	51.06	±	1.96	Yes
	3/1/2017	0.63	±	0.15	2.31	±	0.54	Yes	11.20	±	0.47	41.44	±	1.72	Yes
	3/8/2017	0.77	±	0.16	2.83	±	0.58	Yes	14.60	±	0.52	54.02	±	1.91	Yes
	3/15/2017	1.29	±	0.18	4.77	±	0.66	Yes	15.70	±	0.55	58.09	±	2.03	Yes
	3/22/2017	1.44	±	0.20	5.33	±	0.75	Yes	22.90	±	0.63	84.73	±	2.34	Yes
	3/29/2017	1.16	±	0.16	4.29	±	0.60	Yes	14.60	±	0.50	54.02	±	1.85	Yes
FAA TOWER	1/4/2017	0.90	±	0.20	3.31	±	0.73	Yes	22.20	±	0.61	82.14	±	2.24	Yes
	1/11/2017	0.69	±	0.22	2.53	±	0.81	Yes	14.80	±	0.59	54.76	±	2.18	Yes
	1/18/2017	0.64	±	0.19	2.36	±	0.71	Yes	21.30	±	0.59	78.81	±	2.17	Yes
	1/25/2017	0.53	±	0.19	1.98	±	0.69	No	15.00	±	0.51	55.50	±	1.90	Yes
	2/1/2017	0.96	±	0.20	3.56	±	0.72	Yes	24.40	±	0.59	90.28	±	2.19	Yes
	2/8/2017	0.10	±	0.16	0.38	±	0.61	No	11.10	±	0.47	41.07	±	1.73	Yes
	2/15/2017	1.51	±	0.19	5.59	±	0.69	Yes	18.30	±	0.57	67.71	±	2.12	Yes
	2/22/2017	1.70	±	0.22	6.29	±	0.80	Yes	18.30	±	0.60	67.71	±	2.23	Yes

TABLE C-1. Weekly Gross Alpha and Gross Beta Concentrations in Air

Sampling Group and Location	Sampling Date	GROSS ALPHA			GROSS BETA						
		Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)		Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s		Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)		Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)	
	3/1/2017	1.12	± 0.17	4.14	± 0.64	Yes	11.20	± 0.48	41.44	± 1.77	Yes
	3/8/2017	1.59	± 0.20	5.88	± 0.74	Yes	15.90	± 0.55	58.83	± 2.03	Yes
	3/15/2017	1.75	± 0.20	6.48	± 0.74	Yes	15.30	± 0.55	56.61	± 2.03	Yes
	3/22/2017	2.17	± 0.24	8.03	± 0.88	Yes	27.60	± 0.70	102.12	± 2.58	Yes
	3/29/2017	1.54	± 0.18	5.70	± 0.68	Yes	14.90	± 0.51	55.13	± 1.90	Yes
HOWE	1/4/2017	0.79	± 0.19	2.91	± 0.68	Yes	24.20	± 0.61	89.54	± 2.25	Yes
	1/11/2017	1.33	± 0.31	4.92	± 1.16	Yes	22.50	± 0.82	83.25	± 3.03	Yes
	1/18/2017	1.18	± 0.23	4.37	± 0.84	Yes	33.30	± 0.73	123.21	± 2.68	Yes
	1/25/2017	0.72	± 0.22	2.65	± 0.81	Yes	24.50	± 0.66	90.65	± 2.44	Yes
	2/1/2017	1.15	± 0.22	4.26	± 0.81	Yes	29.30	± 0.68	108.41	± 2.50	Yes
	2/8/2017	0.48	± 0.16	1.79	± 0.60	No	15.20	± 0.47	56.24	± 1.74	Yes
	2/15/2017	1.82	± 0.20	6.73	± 0.73	Yes	19.10	± 0.57	70.67	± 2.12	Yes
	2/22/2017	2.40	± 0.24	8.88	± 0.87	Yes	18.60	± 0.59	68.82	± 2.17	Yes
	3/1/2017	1.35	± 0.19	5.00	± 0.69	Yes	15.40	± 0.53	56.98	± 1.97	Yes
	3/8/2017	1.55	± 0.20	5.74	± 0.73	Yes	18.70	± 0.57	69.19	± 2.12	Yes
	3/15/2017	2.00	± 0.21	7.40	± 0.78	Yes	17.40	± 0.58	64.38	± 2.13	Yes
	3/22/2017	2.07	± 0.23	7.66	± 0.85	Yes	24.30	± 0.66	89.91	± 2.45	Yes
	3/29/2017	1.49	± 0.19	5.51	± 0.70	Yes	12.90	± 0.51	47.73	± 1.88	Yes
MONTEVIEW	1/4/2017	1.67	± 0.25	6.18	± 0.93	Yes	33.80	± 0.77	125.06	± 2.84	Yes
a	1/11/2017		±		±	No		±		±	No
a	1/18/2017		±		±	No		±		±	No
	1/25/2017	0.97	± 0.20	3.60	± 0.75	Yes	24.50	± 0.60	90.65	± 2.21	Yes
	2/1/2017	1.10	± 0.19	4.07	± 0.70	Yes	37.30	± 0.67	138.01	± 2.46	Yes
	2/8/2017	0.49	± 0.18	1.79	± 0.68	No	14.10	± 0.50	52.17	± 1.86	Yes
	2/15/2017	1.98	± 0.20	7.33	± 0.75	Yes	15.80	± 0.54	58.46	± 1.99	Yes
	2/22/2017	2.11	± 0.23	7.81	± 0.87	Yes	16.30	± 0.59	60.31	± 2.16	Yes
	3/1/2017	1.84	± 0.21	6.81	± 0.78	Yes	13.40	± 0.52	49.58	± 1.94	Yes
	3/8/2017	2.32	± 0.24	8.58	± 0.87	Yes	15.70	± 0.57	58.09	± 2.10	Yes
	3/15/2017	2.30	± 0.23	8.51	± 0.86	Yes	17.80	± 0.61	65.86	± 2.24	Yes
	3/22/2017	3.91	± 0.29	14.47	± 1.09	Yes	27.70	± 0.70	102.49	± 2.60	Yes
	3/29/2017	2.43	± 0.23	8.99	± 0.83	Yes	14.70	± 0.53	54.39	± 1.96	Yes
MUD LAKE	1/4/2017	1.15	± 0.20	4.26	± 0.75	Yes	30.70	± 0.66	113.59	± 2.45	Yes
	1/11/2017	0.82	± 0.19	3.02	± 0.71	Yes	14.70	± 0.51	54.39	± 1.89	Yes
	1/18/2017	2.97	± 0.31	10.99	± 1.14	Yes	42.60	± 0.83	157.62	± 3.09	Yes
	1/25/2017	1.48	± 0.26	5.48	± 0.94	Yes	29.50	± 0.72	109.15	± 2.65	Yes
	2/1/2017	0.98	± 0.21	3.64	± 0.79	Yes	40.80	± 0.77	150.96	± 2.84	Yes
	2/8/2017	0.58	± 0.20	2.14	± 0.72	No	11.90	± 0.49	44.03	± 1.81	Yes
	2/15/2017	1.11	± 0.16	4.11	± 0.61	Yes	18.50	± 0.57	68.45	± 2.09	Yes
	2/22/2017	0.97	± 0.18	3.58	± 0.66	Yes	17.90	± 0.57	66.23	± 2.12	Yes
	3/1/2017	0.56	± 0.15	2.06	± 0.55	Yes	14.90	± 0.53	55.13	± 1.95	Yes
	3/8/2017	0.80	± 0.16	2.97	± 0.60	Yes	16.80	± 0.55	62.16	± 2.04	Yes
	3/15/2017	1.16	± 0.18	4.29	± 0.65	Yes	17.90	± 0.58	66.23	± 2.15	Yes
	3/22/2017	1.49	± 0.21	5.51	± 0.77	Yes	24.70	± 0.66	91.39	± 2.43	Yes
	3/29/2017	0.87	± 0.15	3.22	± 0.57	Yes	15.00	± 0.52	55.50	± 1.94	Yes
DISTANT											
BLACKFOOT	1/4/2017	1.07	± 0.20	3.96	± 0.73	Yes	25.20	± 0.62	93.24	± 2.29	Yes
	1/11/2017	0.76	± 0.20	2.82	± 0.75	Yes	15.90	± 0.56	58.83	± 2.07	Yes
	1/18/2017	1.11	± 0.22	4.11	± 0.81	Yes	28.50	± 0.67	105.45	± 2.47	Yes

TABLE C-1. Weekly Gross Alpha and Gross Beta Concentrations in Air

Sampling Group and Location	Sampling Date	GROSS ALPHA					GROSS BETA				
		Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)		Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s	Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)		Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s
	1/25/2017	0.58 ± 0.21	2.15 ± 0.77	No	15.90 ± 0.56	58.83 ± 2.07	Yes				
	2/1/2017	0.57 ± 0.19	2.11 ± 0.69	Yes	30.80 ± 0.67	113.96 ± 2.47	Yes				
	2/8/2017	0.70 ± 0.20	2.58 ± 0.74	Yes	14.10 ± 0.51	52.17 ± 1.90	Yes				
	2/15/2017	1.07 ± 0.17	3.96 ± 0.64	Yes	22.00 ± 0.63	81.40 ± 2.33	Yes				
	2/22/2017	0.68 ± 0.17	2.50 ± 0.62	Yes	17.30 ± 0.58	64.01 ± 2.14	Yes				
	3/1/2017	0.40 ± 0.14	1.48 ± 0.53	No	11.30 ± 0.50	41.81 ± 1.85	Yes				
	3/8/2017	1.23 ± 0.19	4.55 ± 0.69	Yes	19.30 ± 0.59	71.41 ± 2.17	Yes				
	3/15/2017	1.18 ± 0.17	4.37 ± 0.64	Yes	19.30 ± 0.58	71.41 ± 2.15	Yes				
	3/22/2017	1.44 ± 0.19	5.33 ± 0.72	Yes	26.10 ± 0.64	96.57 ± 2.36	Yes				
	3/29/2017	0.83 ± 0.14	3.08 ± 0.53	Yes	12.90 ± 0.47	47.73 ± 1.73	Yes				
QA-1 (BLACKFOOT)	1/4/2017	1.11 ± 0.20	4.11 ± 0.75	Yes	25.00 ± 0.63	92.50 ± 2.32	Yes				
	1/11/2017	0.91 ± 0.21	3.36 ± 0.77	Yes	16.50 ± 0.56	61.05 ± 2.06	Yes				
	1/18/2017	0.63 ± 0.19	2.32 ± 0.70	Yes	25.20 ± 0.62	93.24 ± 2.28	Yes				
	1/25/2017	0.70 ± 0.20	2.58 ± 0.74	Yes	15.10 ± 0.52	55.87 ± 1.93	Yes				
	2/1/2017	1.02 ± 0.20	3.77 ± 0.72	Yes	29.20 ± 0.63	108.04 ± 2.32	Yes				
	2/8/2017	0.61 ± 0.19	2.26 ± 0.68	Yes	13.60 ± 0.49	50.32 ± 1.80	Yes				
	2/15/2017	0.90 ± 0.15	3.32 ± 0.57	Yes	18.90 ± 0.57	69.93 ± 2.09	Yes				
	2/22/2017	0.57 ± 0.15	2.09 ± 0.57	Yes	15.70 ± 0.54	58.09 ± 1.99	Yes				
	3/1/2017	0.09 ± 0.11	0.31 ± 0.40	No	10.80 ± 0.44	39.96 ± 1.64	Yes				
	3/8/2017	0.86 ± 0.17	3.20 ± 0.64	Yes	16.50 ± 0.58	61.05 ± 2.13	Yes				
3/15/2017	0.92 ± 0.17	3.42 ± 0.61	Yes	16.90 ± 0.57	62.53 ± 2.11	Yes					
3/22/2017	1.02 ± 0.18	3.77 ± 0.67	Yes	23.60 ± 0.62	87.32 ± 2.31	Yes					
3/29/2017	0.50 ± 0.12	1.84 ± 0.45	Yes	12.30 ± 0.46	45.51 ± 1.69	Yes					
CRATERS OF THE MOON	1/4/2017	0.96 ± 0.19	3.54 ± 0.69	Yes	17.90 ± 0.53	66.23 ± 1.97	Yes				
	1/11/2017	±	±	No	±	±	No				
	1/18/2017	0.40 ± 0.10	1.47 ± 0.35	Yes	14.70 ± 0.32	54.39 ± 1.18	Yes				
	1/25/2017	0.39 ± 0.18	1.45 ± 0.68	No	16.10 ± 0.53	59.57 ± 1.96	Yes				
	2/1/2017	0.78 ± 0.19	2.87 ± 0.68	Yes	19.10 ± 0.54	70.67 ± 1.99	Yes				
	2/8/2017	0.68 ± 0.19	2.51 ± 0.72	Yes	13.30 ± 0.49	49.21 ± 1.83	Yes				
	2/15/2017	0.87 ± 0.15	3.20 ± 0.56	Yes	15.80 ± 0.53	58.46 ± 1.98	Yes				
	2/22/2017	0.39 ± 0.15	1.44 ± 0.55	No	12.60 ± 0.52	46.62 ± 1.92	Yes				
	3/1/2017	0.39 ± 0.14	1.42 ± 0.50	No	11.10 ± 0.48	41.07 ± 1.76	Yes				
	3/8/2017	0.64 ± 0.16	2.37 ± 0.58	Yes	14.30 ± 0.53	52.91 ± 1.96	Yes				
3/15/2017	0.73 ± 0.15	2.69 ± 0.56	Yes	14.10 ± 0.53	52.17 ± 1.97	Yes					
3/22/2017	1.13 ± 0.19	4.18 ± 0.71	Yes	24.20 ± 0.66	89.54 ± 2.43	Yes					
3/29/2017	0.67 ± 0.14	2.46 ± 0.53	Yes	15.00 ± 0.52	55.50 ± 1.94	Yes					
DUBOIS	1/4/2017	1.07 ± 0.19	3.96 ± 0.72	Yes	17.10 ± 0.53	63.27 ± 1.96	Yes				
	1/11/2017	0.79 ± 0.19	2.90 ± 0.69	Yes	11.00 ± 0.46	40.70 ± 1.70	Yes				
	1/18/2017	1.95 ± 0.21	7.22 ± 0.78	Yes	16.30 ± 0.47	60.31 ± 1.73	Yes				
	1/25/2017	0.89 ± 0.20	3.29 ± 0.73	Yes	13.70 ± 0.48	50.69 ± 1.79	Yes				
	2/1/2017	0.49 ± 0.18	1.82 ± 0.67	No	20.70 ± 0.58	76.59 ± 2.13	Yes				
	2/8/2017	0.60 ± 0.19	2.22 ± 0.70	Yes	11.90 ± 0.48	44.03 ± 1.76	Yes				
	2/15/2017	0.68 ± 0.14	2.53 ± 0.51	Yes	14.80 ± 0.52	54.76 ± 1.91	Yes				
	2/22/2017	0.64 ± 0.15	2.36 ± 0.57	Yes	13.90 ± 0.51	51.43 ± 1.87	Yes				
	3/1/2017	0.68 ± 0.15	2.51 ± 0.57	Yes	12.50 ± 0.50	46.25 ± 1.85	Yes				
	3/8/2017	0.94 ± 0.16	3.49 ± 0.61	Yes	15.60 ± 0.52	57.72 ± 1.93	Yes				
3/15/2017	1.02 ± 0.17	3.77 ± 0.63	Yes	15.50 ± 0.56	57.35 ± 2.05	Yes					
3/22/2017	1.43 ± 0.20	5.29 ± 0.74	Yes	24.00 ± 0.64	88.80 ± 2.35	Yes					

TABLE C-1. Weekly Gross Alpha and Gross Beta Concentrations in Air

Sampling Group and Location	Sampling Date	GROSS ALPHA					GROSS BETA								
		Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s	Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s		
IDAHO FALLS	3/29/2017	1.05	±	0.16	3.89	±	0.59	Yes	15.10	±	0.52	55.87	±	1.91	Yes
	1/4/2017	1.16	±	0.20	4.29	±	0.75	Yes	24.00	±	0.61	88.80	±	2.27	Yes
	1/11/2017	0.82	±	0.20	3.02	±	0.75	Yes	11.50	±	0.50	42.55	±	1.84	Yes
	1/18/2017	4.89	±	0.32	18.09	±	1.18	Yes	27.70	±	0.62	102.49	±	2.31	Yes
	1/25/2017	0.50	±	0.19	1.85	±	0.70	No	16.40	±	0.54	60.68	±	1.99	Yes
	2/1/2017	0.82	±	0.19	3.03	±	0.71	Yes	28.90	±	0.64	106.93	±	2.37	Yes
	2/8/2017	0.36	±	0.18	1.32	±	0.66	No	14.40	±	0.51	53.28	±	1.88	Yes
	2/15/2017	2.43	±	0.23	8.99	±	0.83	Yes	19.10	±	0.59	70.67	±	2.19	Yes
	2/22/2017	2.68	±	0.26	9.92	±	0.95	Yes	17.30	±	0.60	64.01	±	2.22	Yes
	3/1/2017	2.30	±	0.23	8.51	±	0.84	Yes	11.50	±	0.50	42.55	±	1.86	Yes
	3/8/2017	1.88	±	0.22	6.96	±	0.81	Yes	9.18	±	0.48	33.97	±	1.79	Yes
	3/15/2017	2.34	±	0.23	8.66	±	0.84	Yes	17.40	±	0.58	64.38	±	2.15	Yes
	3/22/2017	3.30	±	0.27	12.21	±	1.01	Yes	25.10	±	0.67	92.87	±	2.49	Yes
3/29/2017	2.46	±	0.22	9.10	±	0.81	Yes	14.90	±	0.51	55.13	±	1.89	Yes	
JACKSON	1/4/2017	0.89	±	0.19	3.29	±	0.71	Yes	19.40	±	0.57	71.78	±	2.11	Yes
	1/11/2017	0.63	±	0.19	2.35	±	0.72	Yes	12.20	±	0.51	45.14	±	1.88	Yes
	1/18/2017	1.07	±	0.23	3.96	±	0.83	Yes	28.60	±	0.69	105.82	±	2.55	Yes
	1/25/2017	0.88	±	0.20	3.24	±	0.75	Yes	22.20	±	0.59	82.14	±	2.18	Yes
	2/1/2017	0.72	±	0.18	2.68	±	0.67	Yes	22.80	±	0.57	84.36	±	2.10	Yes
	2/8/2017	0.55	±	0.18	2.03	±	0.66	Yes	14.90	±	0.50	55.13	±	1.83	Yes
	2/15/2017	0.56	±	0.13	2.08	±	0.49	Yes	18.00	±	0.55	66.60	±	2.04	Yes
	2/22/2017	0.39	±	0.13	1.43	±	0.48	No	15.50	±	0.49	57.35	±	1.81	Yes
	3/1/2017	0.37	±	0.12	1.38	±	0.44	Yes	9.75	±	0.41	36.08	±	1.53	Yes
	3/8/2017	0.47	±	0.13	1.72	±	0.47	Yes	15.10	±	0.48	55.87	±	1.76	Yes
	3/15/2017	0.71	±	0.13	2.62	±	0.49	Yes	13.80	±	0.47	51.06	±	1.72	Yes
	3/22/2017	1.30	±	0.18	4.81	±	0.66	Yes	25.30	±	0.60	93.61	±	2.22	Yes
	3/29/2017	0.80	±	0.13	2.95	±	0.48	Yes	13.10	±	0.44	48.47	±	1.61	Yes
SUGAR CITY	1/4/2017	0.62	±	0.17	2.29	±	0.63	Yes	14.40	±	0.49	53.28	±	1.81	Yes
	1/11/2017	0.37	±	0.17	1.38	±	0.63	No	10.20	±	0.46	37.74	±	1.71	Yes
	1/18/2017	2.10	±	0.25	7.77	±	0.92	Yes	21.30	±	0.58	78.81	±	2.16	Yes
	1/25/2017	0.74	±	0.21	2.74	±	0.78	Yes	14.50	±	0.54	53.65	±	1.99	Yes
	2/1/2017	1.03	±	0.20	3.81	±	0.74	Yes	24.80	±	0.60	91.76	±	2.23	Yes
	2/8/2017	0.70	±	0.20	2.59	±	0.74	Yes	10.90	±	0.48	40.33	±	1.76	Yes
	2/15/2017	0.84	±	0.15	3.09	±	0.55	Yes	16.50	±	0.54	61.05	±	2.00	Yes
	2/22/2017	0.62	±	0.16	2.30	±	0.59	Yes	14.10	±	0.53	52.17	±	1.96	Yes
	3/1/2017	0.30	±	0.13	1.10	±	0.48	No	10.10	±	0.46	37.37	±	1.69	Yes
	3/8/2017	0.69	±	0.16	2.55	±	0.58	Yes	14.30	±	0.53	52.91	±	1.95	Yes
	3/15/2017	1.29	±	0.18	4.77	±	0.65	Yes	15.20	±	0.54	56.24	±	1.98	Yes
	3/22/2017	1.14	±	0.19	4.22	±	0.70	Yes	24.10	±	0.65	89.17	±	2.39	Yes
	3/29/2017	0.77	±	0.14	2.84	±	0.53	Yes	13.40	±	0.49	49.58	±	1.81	Yes
QA-2 (SUGAR CITY)	1/4/2017	0.60	±	0.17	2.23	±	0.61	Yes	16.90	±	0.51	62.53	±	1.89	Yes
	1/11/2017	0.97	±	0.28	3.60	±	1.04	Yes	16.00	±	0.71	59.20	±	2.61	Yes
	1/18/2017	3.46	±	0.32	12.80	±	1.17	Yes	26.60	±	0.69	98.42	±	2.53	Yes
	1/25/2017	0.72	±	0.21	2.68	±	0.77	Yes	16.00	±	0.55	59.20	±	2.03	Yes
	2/1/2017	0.79	±	0.18	2.92	±	0.68	Yes	25.60	±	0.59	94.72	±	2.20	Yes
	2/8/2017	0.35	±	0.18	1.31	±	0.66	No	11.80	±	0.48	43.66	±	1.76	Yes
	2/15/2017	0.82	±	0.15	3.04	±	0.54	Yes	16.10	±	0.53	59.57	±	1.96	Yes
	2/22/2017	0.59	±	0.16	2.19	±	0.60	Yes	15.20	±	0.55	56.24	±	2.04	Yes

TABLE C-1. Weekly Gross Alpha and Gross Beta Concentrations in Air

Sampling Group and Location	Sampling Date	GROSS ALPHA					GROSS BETA								
		Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s	Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)		Result > 3s		
	3/1/2017	0.62	±	0.15	2.29	±	0.55	Yes	11.00	±	0.47	40.70	±	1.75	Yes
	3/8/2017	0.69	±	0.16	2.55	±	0.59	Yes	16.60	±	0.56	61.42	±	2.07	Yes
	3/15/2017	1.28	±	0.17	4.74	±	0.64	Yes	15.30	±	0.53	56.61	±	1.96	Yes
	3/22/2017	1.11	±	0.19	4.11	±	0.70	Yes	27.00	±	0.67	99.90	±	2.48	Yes
	3/29/2017	1.16	±	0.16	4.29	±	0.60	Yes	13.70	±	0.49	50.69	±	1.79	Yes
INL SITE															
EFS	1/4/2017	1.92	±	0.32	7.10	±	1.17	Yes	44.00	±	1.00	162.80	±	3.69	Yes
	1/11/2017	1.25	±	0.35	4.63	±	1.30	Yes	28.70	±	0.99	106.19	±	3.64	Yes
	1/18/2017	0.60	±	0.20	2.23	±	0.75	No	27.80	±	0.68	102.86	±	2.50	Yes
	1/25/2017	0.71	±	0.21	2.63	±	0.77	Yes	22.20	±	0.62	82.14	±	2.28	Yes
	2/1/2017	1.81	±	0.27	6.70	±	0.98	Yes	40.50	±	0.82	149.85	±	3.02	Yes
	2/8/2017	0.67	±	0.17	2.49	±	0.64	Yes	11.00	±	0.42	40.70	±	1.57	Yes
	2/15/2017	0.30	±	0.09	1.11	±	0.33	Yes	13.70	±	0.41	50.69	±	1.50	Yes
	2/22/2017	0.37	±	0.15	1.38	±	0.57	No	15.20	±	0.56	56.24	±	2.08	Yes
	3/1/2017	0.34	±	0.14	1.24	±	0.53	No	13.30	±	0.53	49.21	±	1.97	Yes
	3/8/2017	0.21	±	0.13	0.78	±	0.49	No	13.80	±	0.53	51.06	±	1.96	Yes
	3/15/2017	0.65	±	0.15	2.41	±	0.55	Yes	14.00	±	0.53	51.80	±	1.97	Yes
	3/22/2017	0.84	±	0.18	3.12	±	0.67	Yes	21.10	±	0.63	78.07	±	2.34	Yes
	3/29/2017	0.79	±	0.15	2.92	±	0.56	Yes	14.20	±	0.52	52.54	±	1.92	Yes
MAIN GATE	1/4/2017	0.88	±	0.16	3.25	±	0.59	Yes	23.10	±	0.52	85.47	±	1.93	Yes
	1/11/2017	0.94	±	0.23	3.48	±	0.86	Yes	16.40	±	0.61	60.68	±	2.26	Yes
	1/18/2017	0.89	±	0.23	3.28	±	0.86	Yes	24.70	±	0.69	91.39	±	2.55	Yes
	1/25/2017	0.99	±	0.22	3.66	±	0.82	Yes	21.70	±	0.61	80.29	±	2.27	Yes
	2/1/2017	1.20	±	0.21	4.44	±	0.78	Yes	23.30	±	0.60	86.21	±	2.20	Yes
	2/8/2017	0.44	±	0.19	1.63	±	0.71	No	13.70	±	0.52	50.69	±	1.94	Yes
	2/15/2017	0.72	±	0.14	2.68	±	0.52	Yes	16.50	±	0.53	61.05	±	1.98	Yes
	2/22/2017	0.65	±	0.17	2.42	±	0.62	Yes	17.00	±	0.58	62.90	±	2.14	Yes
	3/1/2017	0.58	±	0.15	2.14	±	0.56	Yes	13.70	±	0.52	50.69	±	1.91	Yes
	3/8/2017	0.61	±	0.16	2.25	±	0.57	Yes	16.60	±	0.56	61.42	±	2.05	Yes
	3/15/2017	0.50	±	0.14	1.83	±	0.51	Yes	13.70	±	0.53	50.69	±	1.94	Yes
	3/22/2017	0.87	±	0.18	3.20	±	0.67	Yes	24.90	±	0.66	92.13	±	2.44	Yes
	3/29/2017	0.84	±	0.15	3.12	±	0.55	Yes	13.00	±	0.49	48.10	±	1.80	Yes
VAN BUREN GATE	1/4/2017	1.38	±	0.28	5.11	±	1.03	Yes	39.40	±	0.92	145.78	±	3.39	Yes
	1/11/2017	0.78	±	0.18	2.89	±	0.67	Yes	15.10	±	0.49	55.87	±	1.83	Yes
	1/18/2017	0.70	±	0.18	2.60	±	0.67	Yes	18.50	±	0.53	68.45	±	1.95	Yes
	1/25/2017	0.67	±	0.17	2.49	±	0.64	Yes	21.50	±	0.53	79.55	±	1.97	Yes
	2/1/2017	1.00	±	0.20	3.70	±	0.73	Yes	34.00	±	0.67	125.80	±	2.48	Yes
	2/8/2017	0.64	±	0.18	2.36	±	0.67	Yes	14.90	±	0.49	55.13	±	1.82	Yes
	2/15/2017	0.74	±	0.14	2.74	±	0.51	Yes	17.40	±	0.53	64.38	±	1.97	Yes
	2/22/2017	0.64	±	0.16	2.36	±	0.57	Yes	17.20	±	0.55	63.64	±	2.02	Yes
	3/1/2017	0.33	±	0.13	1.21	±	0.48	No	12.40	±	0.49	45.88	±	1.79	Yes
	3/8/2017	0.67	±	0.15	2.48	±	0.54	Yes	15.50	±	0.51	57.35	±	1.89	Yes
	3/15/2017	0.50	±	0.14	1.86	±	0.50	Yes	15.00	±	0.53	55.50	±	1.95	Yes
	3/22/2017	1.13	±	0.19	4.18	±	0.70	Yes	26.30	±	0.67	97.31	±	2.46	Yes
	3/29/2017	0.79	±	0.15	2.92	±	0.54	Yes	14.20	±	0.51	52.54	±	1.87	Yes

a. Invalid sample result shown in red

TABLE C-2. Weekly Iodine-131 Activity in Air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty (x 10 ⁻¹⁵ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹¹ Bq/mL)			Result > 3s
BOUNDARY								
ARCO	01/04/2017	-1.28	±	1.35	-4.74	±	5.00	No
	01/11/2017	1.49	±	1.15	5.51	±	4.26	No
	01/18/2017	-1.01	±	0.95	-3.74	±	3.52	No
	01/25/2017	0.26	±	1.02	0.94	±	3.77	No
	02/01/2017	0.39	±	0.97	1.44	±	3.59	No
	02/08/2017	-0.98	±	0.99	-3.61	±	3.67	No
	02/15/2017	0.03	±	0.99	0.12	±	3.66	No
	02/22/2017	-0.83	±	1.03	-3.07	±	3.81	No
	03/01/2017	1.99	±	1.01	7.36	±	3.74	No
	03/08/2017	1.37	±	0.98	5.07	±	3.61	No
	03/15/2017	0.03	±	0.97	0.13	±	3.60	No
	03/22/2017	0.24	±	0.95	0.87	±	3.50	No
	03/29/2017	-1.93	±	1.00	-7.14	±	3.69	No
ATOMIC CITY	01/04/2017	-0.97	±	1.03	-3.60	±	3.81	No
	01/11/2017	1.51	±	1.16	5.59	±	4.29	No
	01/18/2017	-1.34	±	1.26	-4.96	±	4.66	No
	01/25/2017	0.23	±	0.91	0.84	±	3.36	No
	02/01/2017	0.33	±	0.83	1.23	±	3.08	No
	02/08/2017	-0.91	±	0.93	-3.37	±	3.43	No
	02/15/2017	0.03	±	0.90	0.11	±	3.34	No
	02/22/2017	-0.74	±	0.91	-2.73	±	3.38	No
	03/01/2017	1.84	±	0.93	6.81	±	3.44	No
	03/08/2017	1.31	±	0.93	4.85	±	3.44	No
	03/15/2017	0.03	±	0.87	0.11	±	3.23	No
	03/22/2017	0.23	±	0.93	0.86	±	3.45	No
	03/29/2017	-1.77	±	0.92	-6.55	±	3.39	No
BLUE DOME	01/04/2017	0.72	±	0.98	2.68	±	3.62	No
	01/11/2017	-1.68	±	1.10	-6.22	±	4.07	No
	01/18/2017	2.33	±	1.12	8.62	±	4.14	No
	01/25/2017	1.10	±	1.32	4.07	±	4.88	No
	02/01/2017	-0.45	±	0.90	-1.68	±	3.32	No
	02/08/2017	0.92	±	0.91	3.41	±	3.38	No
	02/15/2017	0.46	±	0.88	1.70	±	3.26	No
	02/22/2017	-1.47	±	0.91	-5.44	±	3.36	No
	03/01/2017	0.17	±	0.81	0.64	±	3.01	No
	03/08/2017	1.05	±	0.86	3.89	±	3.17	No
	03/15/2017	0.85	±	0.90	3.14	±	3.34	No
	03/22/2017	1.33	±	0.93	4.92	±	3.43	No
	03/29/2017	0.54	±	0.85	1.99	±	3.14	No
FAA TOWER	01/04/2017	0.72	±	0.97	2.66	±	3.60	No
	01/11/2017	-1.72	±	1.13	-6.36	±	4.18	No
	01/18/2017	2.51	±	1.21	9.29	±	4.48	No
	01/25/2017	1.10	±	1.32	4.07	±	4.88	No
	02/01/2017	-0.46	±	0.91	-1.70	±	3.37	No
	02/08/2017	0.94	±	0.93	3.47	±	3.44	No
	02/15/2017	0.02	±	0.69	0.08	±	2.53	No
	02/22/2017	-1.55	±	0.95	-5.74	±	3.53	No
	03/01/2017	0.18	±	0.85	0.66	±	3.14	No
	03/08/2017	1.10	±	0.90	4.07	±	3.32	No
03/15/2017	0.86	±	0.91	3.16	±	3.37	No	

TABLE C-2. Weekly Iodine-131 Activity in Air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty		Result ± 1s Uncertainty			Result > 3s
		(x 10 ⁻¹⁵ µCi/mL)		(x 10 ⁻¹¹ Bq/mL)			
HOWE	03/22/2017	1.38	± 0.96	5.11	± 3.56	No	
	03/29/2017	0.55	± 0.87	2.04	± 3.23	No	
	01/04/2017	0.69	± 0.93	2.53	± 3.43	No	
	01/11/2017	-2.29	± 1.50	-8.47	± 5.55	No	
	01/18/2017	2.63	± 1.27	9.73	± 4.70	No	
	01/25/2017	1.22	± 1.47	4.51	± 5.44	No	
	02/01/2017	-0.51	± 1.00	-1.88	± 3.70	No	
	02/08/2017	0.80	± 0.79	2.95	± 2.93	No	
	02/15/2017	0.47	± 0.91	1.75	± 3.36	No	
	02/22/2017	-1.46	± 0.90	-5.40	± 3.32	No	
	03/01/2017	0.18	± 0.85	0.66	± 3.13	No	
	03/08/2017	1.08	± 0.88	4.00	± 3.24	No	
	03/15/2017	0.86	± 0.92	3.18	± 3.39	No	
	03/22/2017	1.37	± 0.96	5.07	± 3.54	No	
	03/29/2017	0.59	± 0.94	2.20	± 3.47	No	
MONTEVIEW	01/04/2017	0.80	± 1.09	2.97	± 4.03	No	
a	01/11/2017		±		±	No	
a	01/18/2017		±		±	No	
	01/25/2017	1.04	± 1.25	3.85	± 4.63	No	
	02/01/2017	-0.41	± 0.82	-1.52	± 3.02	No	
	02/08/2017	0.92	± 0.92	3.42	± 3.39	No	
	02/15/2017	0.48	± 0.91	1.76	± 3.37	No	
	02/22/2017	-1.57	± 0.96	-5.81	± 3.57	No	
	03/01/2017	0.19	± 0.88	0.69	± 3.27	No	
	03/08/2017	1.16	± 0.95	4.29	± 3.50	No	
	03/15/2017	0.92	± 0.98	3.39	± 3.61	No	
	03/22/2017	1.39	± 0.97	5.14	± 3.59	No	
	03/29/2017	0.58	± 0.92	2.14	± 3.39	No	
MUD LAKE	01/04/2017	0.67	± 0.91	2.49	± 3.37	No	
	01/11/2017	-1.40	± 0.92	-5.18	± 3.39	No	
	01/18/2017	2.78	± 1.34	10.29	± 4.96	No	
	01/25/2017	1.24	± 1.49	4.59	± 5.51	No	
	02/01/2017	-0.50	± 0.98	-1.83	± 3.63	No	
	02/08/2017	0.97	± 0.96	3.60	± 3.56	No	
	02/15/2017	0.47	± 0.91	1.74	± 3.35	No	
	02/22/2017	-1.46	± 0.90	-5.40	± 3.32	No	
	03/01/2017	0.18	± 0.85	0.67	± 3.16	No	
	03/08/2017	1.08	± 0.88	4.00	± 3.26	No	
	03/15/2017	0.86	± 0.92	3.19	± 3.40	No	
	03/22/2017	1.34	± 0.94	4.96	± 3.48	No	
	03/29/2017	0.57	± 0.91	2.12	± 3.35	No	
DISTANT							
BLACKFOOT	01/04/2017	-0.94	± 0.99	-3.48	± 3.67	No	
	01/11/2017	1.45	± 1.11	5.37	± 4.11	No	
	01/18/2017	-1.25	± 1.17	-4.63	± 4.33	No	
	01/25/2017	0.27	± 1.09	1.01	± 4.03	No	
	02/01/2017	0.40	± 1.00	1.48	± 3.70	No	
	02/08/2017	-0.99	± 1.01	-3.67	± 3.74	No	
	02/15/2017	0.03	± 1.04	0.13	± 3.85	No	
	02/22/2017	-0.79	± 0.98	-2.91	± 3.61	No	
	03/01/2017	2.10	± 1.06	7.77	± 3.92	No	

TABLE C-2. Weekly Iodine-131 Activity in Air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty		Result ± 1s Uncertainty			Result > 3s
		(x 10 ⁻¹⁵ µCi/mL)		(x 10 ⁻¹¹ Bq/mL)			
	03/08/2017	1.41	± 1.00	5.22	± 3.70	No	
	03/15/2017	0.03	± 0.92	0.12	± 3.39	No	
	03/22/2017	0.22	± 0.88	0.81	± 3.26	No	
	03/29/2017	-1.78	± 0.92	-6.59	± 3.40	No	
QA-1 (BLACKFOOT)	01/04/2017	-0.97	± 1.02	-3.59	± 3.77	No	
	01/11/2017	1.41	± 1.08	5.22	± 4.00	No	
	01/18/2017	-1.19	± 1.12	-4.40	± 4.14	No	
	01/25/2017	0.25	± 1.01	0.93	± 3.74	No	
	02/01/2017	0.37	± 0.93	1.38	± 3.44	No	
	02/08/2017	-0.93	± 0.94	-3.43	± 3.49	No	
	02/15/2017	0.03	± 0.96	0.12	± 3.55	No	
	02/22/2017	-0.75	± 0.92	-2.76	± 3.42	No	
	03/01/2017	1.80	± 0.91	6.66	± 3.38	No	
	03/08/2017	1.49	± 1.06	5.51	± 3.92	No	
	03/15/2017	0.03	± 0.97	0.12	± 3.57	No	
	03/22/2017	0.19	± 0.76	0.71	± 2.82	No	
03/29/2017	-1.76	± 0.91	-6.51	± 3.37	No		
CRATERS a	01/04/2017	-0.92	± 0.97	-3.40	± 3.59	No	
	01/11/2017		±		±	No	
	01/18/2017	-0.57	± 0.53	-2.10	± 1.97	No	
	01/25/2017	0.25	± 1.00	0.93	± 3.70	No	
	02/01/2017	0.39	± 0.97	1.44	± 3.59	No	
	02/08/2017	-0.96	± 0.98	-3.56	± 3.62	No	
	02/15/2017	0.03	± 0.97	0.12	± 3.60	No	
	02/22/2017	-0.79	± 0.97	-2.91	± 3.60	No	
	03/01/2017	1.96	± 0.99	7.25	± 3.67	No	
	03/08/2017	1.42	± 1.01	5.25	± 3.74	No	
	03/15/2017	0.03	± 0.96	0.12	± 3.54	No	
	03/22/2017	0.24	± 0.97	0.90	± 3.60	No	
	03/29/2017	-1.94	± 1.00	-7.18	± 3.70	No	
	DUBOIS	01/04/2017	0.68	± 0.92	2.51	± 3.40	No
01/11/2017		-1.37	± 0.90	-5.07	± 3.33	No	
01/18/2017		2.02	± 0.97	7.47	± 3.60	No	
01/25/2017		1.05	± 1.26	3.89	± 4.66	No	
02/01/2017		-0.49	± 0.97	-1.82	± 3.60	No	
02/08/2017		0.93	± 0.92	3.43	± 3.40	No	
02/15/2017		0.46	± 0.89	1.72	± 3.30	No	
02/22/2017		-1.38	± 0.85	-5.11	± 3.13	No	
03/01/2017		0.18	± 0.85	0.67	± 3.16	No	
03/08/2017		1.04	± 0.85	3.85	± 3.13	No	
03/15/2017		0.87	± 0.93	3.22	± 3.43	No	
03/22/2017		1.29	± 0.90	4.77	± 3.34	No	
03/29/2017		0.56	± 0.88	2.06	± 3.25	No	
IDAHO FALLS	01/04/2017	0.70	± 0.94	2.58	± 3.49	No	
	01/11/2017	-1.52	± 1.00	-5.62	± 3.69	No	
	01/18/2017	2.27	± 1.09	8.40	± 4.03	No	
	01/25/2017	1.12	± 1.36	4.14	± 5.03	No	
	02/01/2017	-0.47	± 0.93	-1.73	± 3.43	No	
	02/08/2017	0.93	± 0.92	3.43	± 3.40	No	
	02/15/2017	0.49	± 0.95	1.82	± 3.50	No	
	02/22/2017	-1.57	± 0.97	-5.81	± 3.58	No	

TABLE C-2. Weekly Iodine-131 Activity in Air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty		Result ± 1s Uncertainty			Result > 3s
		(x 10 ⁻¹⁵ µCi/mL)		(x 10 ⁻¹¹ Bq/mL)			
	03/01/2017	0.19	± 0.89	0.70	± 3.30		No
	03/08/2017	1.18	± 0.96	4.37	± 3.56		No
	03/15/2017	0.87	± 0.93	3.23	± 3.44		No
	03/22/2017	1.37	± 0.96	5.07	± 3.54		No
	03/29/2017	0.54	± 0.86	2.01	± 3.18		No
JACKSON	01/04/2017	-0.98	± 1.03	-3.61	± 3.81		No
	01/11/2017	1.43	± 1.10	5.29	± 4.07		No
	01/18/2017	-1.31	± 1.23	-4.85	± 4.55		No
	01/25/2017	0.24	± 0.97	0.90	± 3.59		No
	02/01/2017	0.38	± 0.94	1.39	± 3.48		No
	02/08/2017	0.97	± 0.92	3.60	± 3.42		No
	02/15/2017	-0.78	± 0.95	-2.87	± 3.50		No
	02/22/2017	-0.64	± 0.80	-2.38	± 2.95		No
	03/01/2017	1.70	± 0.86	6.29	± 3.19		No
	03/08/2017	1.17	± 0.83	4.33	± 3.07		No
	03/15/2017	0.03	± 0.78	0.10	± 2.90		No
	03/22/2017	0.20	± 0.81	0.75	± 3.01		No
	03/29/2017	-1.57	± 0.81	-5.81	± 3.00		No
SUGAR CITY	01/04/2017	0.67	± 0.90	2.46	± 3.34		No
	01/11/2017	-1.44	± 0.94	-5.33	± 3.49		No
	01/18/2017	2.47	± 1.19	9.14	± 4.40		No
	01/25/2017	1.20	± 1.45	4.44	± 5.37		No
	02/01/2017	-0.47	± 0.93	-1.73	± 3.43		No
	02/08/2017	0.97	± 0.96	3.59	± 3.56		No
	02/15/2017	0.47	± 0.90	1.74	± 3.34		No
	02/22/2017	-1.46	± 0.90	-5.40	± 3.33		No
	03/01/2017	0.18	± 0.84	0.65	± 3.11		No
	03/08/2017	1.11	± 0.90	4.11	± 3.34		No
	03/15/2017	0.83	± 0.88	3.07	± 3.27		No
	03/22/2017	1.33	± 0.93	4.92	± 3.44		No
	03/29/2017	0.55	± 0.87	2.04	± 3.23		No
QA-2 (SUGAR CITY)	01/04/2017	0.65	± 0.88	2.39	± 3.24		No
	01/11/2017	-2.17	± 1.42	-8.03	± 5.25		No
	01/18/2017	2.76	± 1.33	10.21	± 4.92		No
	01/25/2017	1.17	± 1.42	4.33	± 5.25		No
	02/01/2017	-0.45	± 0.89	-1.65	± 3.28		No
	02/08/2017	0.94	± 0.93	3.46	± 3.43		No
	02/15/2017	0.46	± 0.89	1.71	± 3.28		No
	02/22/2017	-1.49	± 0.92	-5.51	± 3.39		No
	03/01/2017	0.18	± 0.84	0.66	± 3.12		No
	03/08/2017	1.12	± 0.91	4.14	± 3.37		No
	03/15/2017	0.82	± 0.87	3.02	± 3.21		No
	03/22/2017	1.31	± 0.91	4.85	± 3.38		No
	03/29/2017	0.53	± 0.84	1.98	± 3.12		No
INL SITE							
EFS	01/04/2017	-1.44	± 1.52	-5.33	± 5.62		No
	01/11/2017	2.52	± 1.93	9.32	± 7.14		No
	01/18/2017	-1.30	± 1.22	-4.81	± 4.51		No
	01/25/2017	0.26	± 1.04	0.96	± 3.85		No
	02/01/2017	0.46	± 1.15	1.71	± 4.26		No
	02/08/2017	-0.84	± 0.85	-3.09	± 3.15		No

TABLE C-2. Weekly Iodine-131 Activity in Air.

Sampling Group and Location	Sampling Date	Result ± 1s Uncertainty			Result ± 1s Uncertainty			Result > 3s
		(x 10 ⁻¹⁵ µCi/mL)			(x 10 ⁻¹¹ Bq/mL)			
	02/15/2017	0.02	±	0.68	0.08	±	2.53	No
	02/22/2017	-0.81	±	1.00	-2.98	±	3.70	No
	03/01/2017	2.13	±	1.08	7.88	±	4.00	No
	03/08/2017	1.45	±	1.03	5.37	±	3.81	No
	03/15/2017	0.03	±	0.96	0.12	±	3.56	No
	03/22/2017	0.25	±	1.00	0.92	±	3.70	No
	03/29/2017	-1.97	±	1.02	-7.29	±	3.77	No
MAIN GATE	01/04/2017	-0.75	±	0.79	-2.77	±	2.93	No
	01/11/2017	1.63	±	1.25	6.03	±	4.63	No
	01/18/2017	-1.45	±	1.36	-5.37	±	5.03	No
	01/25/2017	0.26	±	1.05	0.97	±	3.89	No
	02/01/2017	0.40	±	1.00	1.48	±	3.70	No
	02/08/2017	-1.03	±	1.05	-3.81	±	3.89	No
	02/15/2017	0.03	±	0.95	0.12	±	3.52	No
	02/22/2017	-0.80	±	0.99	-2.95	±	3.65	No
	03/01/2017	2.00	±	1.01	7.40	±	3.74	No
	03/08/2017	1.41	±	1.00	5.22	±	3.70	No
	03/15/2017	0.03	±	0.95	0.12	±	3.52	No
	03/22/2017	0.24	±	0.97	0.89	±	3.57	No
	03/29/2017	-1.89	±	0.98	-6.99	±	3.61	No
VAN BUREN GATE	01/04/2017	-1.35	±	1.43	-5.00	±	5.29	No
	01/11/2017	1.23	±	0.94	4.55	±	3.48	No
	01/18/2017	-1.11	±	1.05	-4.11	±	3.89	No
	01/25/2017	0.21	±	0.84	0.78	±	3.10	No
	02/01/2017	0.38	±	0.94	1.39	±	3.47	No
	02/08/2017	-0.89	±	0.91	-3.30	±	3.36	No
	02/15/2017	0.03	±	0.91	0.11	±	3.38	No
	02/22/2017	-0.72	±	0.90	-2.68	±	3.32	No
	03/01/2017	1.91	±	0.97	7.07	±	3.59	No
	03/08/2017	1.28	±	0.91	4.74	±	3.37	No
	03/15/2017	0.03	±	0.91	0.12	±	3.38	No
	03/22/2017	0.24	±	0.94	0.87	±	3.49	No
	03/29/2017	-1.90	±	0.98	-7.03	±	3.63	No

a. Invalid sample result shown in red.

TABLE C-3. Quarterly Cesium-137, Strontium-90, and Actinide Concentrations in Composite Air Filters.

Sampling Group and Location	Sampling Date	Analyte	Result ± 1s Uncertainty (x 10 ⁻¹⁸ µCi/mL)			Result ± 1s Uncertainty (x 10 ⁻¹⁴ Bq/mL)			Result > 3s
BOUNDARY									
ARCO	3/29/2017	CESIUM-137	169.00	±	137.00	625.30	±	506.90	No
ATOMIC CITY	3/29/2017	CESIUM-137	-25.00	±	70.80	-92.50	±	261.96	No
		STRONTIUM-90	-3.07	±	6.22	-11.35	±	23.03	No
BLUE DOME	3/29/2017	CESIUM-137	70.10	±	85.50	259.37	±	316.35	No
FAA TOWER	3/29/2017	CESIUM-137	18.20	±	136.00	67.34	±	503.20	No
HOWE	3/29/2017	CESIUM-137	335.00	±	137.00	1239.50	±	506.90	No
		STRONTIUM-90	-7.55	±	6.56	-27.94	±	24.27	No
MONTEVIEW	3/29/2017	CESIUM-137	68.90	±	158.00	254.93	±	584.60	No
		STRONTIUM-90	-11.66	±	7.44	-43.16	±	27.54	No
MUD LAKE	3/29/2017	AMERICIUM-241	1.35	±	0.46	5.01	±	1.71	No
		CESIUM-137	212.00	±	137.00	784.40	±	506.90	No
		PLUTONIUM-238	0.89	±	0.36	3.28	±	1.34	No
		PLUTONIUM-239/240	0.59	±	0.30	2.18	±	1.09	No
DISTANT									
BLACKFOOT	3/29/2017	AMERICIUM-241	1.08	±	0.39	4.01	±	1.45	No
		CESIUM-137	83.40	±	123.00	308.58	±	455.10	No
		PLUTONIUM-238	0.88	±	0.36	3.25	±	1.33	No
		PLUTONIUM-239/240	1.03	±	0.39	3.80	±	1.44	No
QA-1 (BLACKFOOT)	3/29/2017	AMERICIUM-241	0.79	±	0.33	2.94	±	1.22	No
		CESIUM-137	-196.00	±	142.00	-725.20	±	525.40	No
		PLUTONIUM-238	1.66	±	0.48	6.14	±	1.79	Yes
		PLUTONIUM-239/240	0.83	±	0.34	3.07	±	1.26	No
CRATERS	3/29/2017	CESIUM-137	-134.00	±	89.00	-495.80	±	329.30	No
DUBOIS	3/29/2017	CESIUM-137	-238.00	±	125.00	-880.60	±	462.50	No
IDAHO FALLS	3/29/2017	AMERICIUM-241	1.87	±	0.58	6.92	±	2.14	Yes
		CESIUM-137	-55.20	±	88.10	-204.24	±	325.97	No
		PLUTONIUM-238	1.05	±	0.43	3.87	±	1.58	No
		PLUTONIUM-239/240	1.39	±	0.50	5.16	±	1.83	No
JACKSON	3/29/2017	AMERICIUM-241	1.60	±	0.48	5.91	±	1.76	Yes
		CESIUM-137	74.00	±	73.50	273.80	±	271.95	No
		PLUTONIUM-238	1.13	±	0.40	4.18	±	1.48	No
		PLUTONIUM-239/240	0.71	±	0.47	2.61	±	1.73	No

TABLE C-3. Quarterly Cesium-137, Strontium-90, and Actinide Concentrations in Composite Air Filters.

SUGAR CITY	3/29/2017	CESIUM-137	-91.60	±	91.90	-338.92	±	340.03	No
		STRONTIUM-90	-12.39	±	6.22	-45.83	±	23.01	No
QA-2 (SUGAR CITY)	3/29/2017	CESIUM-137	-18.90	±	77.30	-69.93	±	286.01	No
		STRONTIUM-90	-18.52	±	5.98	-68.52	±	22.14	No
INL SITE									
EFS	3/29/2017	CESIUM-137	-45.90	±	83.60	-169.83	±	309.32	No
		STRONTIUM-90	-10.66	±	6.58	-39.43	±	24.34	No
MAIN GATE	3/29/2017	AMERICIUM-241	0.00	±	0.15	0.00	±	0.54	No
		CESIUM-137	96.50	±	87.90	357.05	±	325.23	No
		PLUTONIUM-238	0.74	±	0.33	2.72	±	1.22	No
		PLUTONIUM-239/240	0.29	±	0.42	1.09	±	1.54	No
VAN BUREN GATE	3/29/2017	CESIUM-137	128.00	±	121.00	473.60	±	447.70	No
		STRONTIUM-90	-7.85	±	6.01	-29.04	±	22.23	No

TABLE C-4. Tritium Concentrations in Atmospheric Moisture

Sampling Group and Location	Start Date	Sampling Date	Result \pm 1s Uncertainty			Result \pm 1s Uncertainty			Result > 3s
			(x 10 ⁻¹³ μ Ci/mL _{air})			(x 10 ⁻⁹ Bq/mL _{air})			
BOUNDARY									
ATOMIC CITY	12/28/16	02/22/17	3.92	\pm	0.73	14.50	\pm	2.69	Yes
DISTANT									
BLACKFOOT	12/21/16	02/22/17	4.86	\pm	0.93	17.98	\pm	3.45	Yes
BLACKFOOT	02/22/17	03/22/17	3.99	\pm	0.97	14.76	\pm	3.59	Yes
IDAHO FALLS	12/07/16	01/25/17	3.47	\pm	0.68	12.84	\pm	2.53	Yes
IDAHO FALLS	01/25/17	03/01/17	2.40	\pm	0.92	8.88	\pm	3.40	No
IDAHO FALLS	03/01/17	03/29/17	6.13	\pm	1.21	22.68	\pm	4.48	Yes
SUGAR CITY	12/14/16	02/22/17	2.61	\pm	0.67	9.66	\pm	2.46	Yes
SUGAR CITY	02/22/17	03/22/17	6.77	\pm	0.90	25.05	\pm	3.31	Yes

TABLE C-5. Monthly and Weekly Tritium Concentrations in Precipitation

Location	Start Date	End Date	Result ± 1s Uncertainty			Result ± 1s Uncertainty			Result > 3s
			(pCi/L)			(Bq/L)			
IDAHO FALLS	12/31/16	01/31/17	124.00	±	25.20	4.59	±	0.93	Yes
	01/31/17	02/28/17	86.80	±	22.70	3.21	±	0.84	Yes
	02/28/17	03/31/17	126.00	±	23.30	4.66	±	0.86	Yes
CFA	12/01/16	01/03/17	192.00	±	26.70	7.10	±	0.99	Yes
	01/03/17	02/01/17	50.70	±	24.30	1.88	±	0.90	No
	02/01/17	02/27/17	117.00	±	23.10	4.33	±	0.85	Yes
	02/27/17	03/27/17	128.00	±	23.60	4.74	±	0.87	Yes
EFS	12/28/16	01/04/17	37.50	±	25.40	1.39	±	0.94	No
	01/11/17	01/18/17	88.40	±	24.70	3.27	±	0.91	Yes
	01/18/17	01/25/17	66.60	±	24.30	2.46	±	0.90	No
	01/25/17	02/01/17	60.00	±	24.20	2.22	±	0.90	No
	02/01/17	02/08/17	44.00	±	24.00	1.63	±	0.89	No
	02/15/17	02/22/17	80.50	±	22.60	2.98	±	0.84	Yes
	02/22/17	03/01/17	115.00	±	23.40	4.26	±	0.87	Yes
	03/01/17	03/08/17	91.80	±	23.10	3.40	±	0.85	Yes

Table C-6. Weekly and Monthly Iodine-131 and Cesium-137 Concentrations in Milk

Location	Sampling Date	Iodine-131						Cesium-137							
		Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)			Result ± 1s Uncertainty (pCi/L)			Result ± 1s Uncertainty (Bq/L)				
		Result	± 1s	Uncertainty	Result	± 1s	Uncertainty	Result	± 1s	Uncertainty	Result	± 1s	Uncertainty	Result > 3s	
BLACKFOOT	01/08/17	0.03	±	1.87	0.001	±	0.069	No	-1.00	±	1.40	-0.037	±	0.052	No
	02/06/17	-1.21	±	1.86	-0.045	±	0.069	No	-0.52	±	1.38	-0.019	±	0.051	No
	03/05/17	0.40	±	1.78	0.015	±	0.066	No	0.36	±	1.44	0.013	±	0.053	No
CONTROL	01/03/17	-2.81	±	2.05	-0.104	±	0.076	No	0.14	±	0.87	0.005	±	0.032	No
	02/07/17	1.29	±	2.19	0.048	±	0.081	No	1.85	±	1.42	0.069	±	0.053	No
	03/06/17	-4.78	±	1.98	-0.177	±	0.073	No	1.84	±	0.91	0.068	±	0.034	No
DIETRICH	01/03/17	-1.68	±	1.70	-0.062	±	0.063	No	-0.47	±	1.37	-0.018	±	0.051	No
	02/06/17	-1.92	±	1.77	-0.071	±	0.066	No	0.83	±	1.44	0.031	±	0.053	No
	03/07/17	-2.86	±	1.98	-0.106	±	0.073	No	-0.90	±	1.31	-0.033	±	0.049	No
HOWE	01/03/17	2.36	±	1.88	0.087	±	0.070	No	0.76	±	1.34	0.028	±	0.050	No
	02/07/17	-0.85	±	1.82	-0.031	±	0.067	No	0.47	±	0.85	0.017	±	0.031	No
	03/06/17	-3.47	±	1.78	-0.129	±	0.066	No	-0.28	±	0.85	-0.010	±	0.031	No
IDAHO FALLS	01/03/17	-0.38	±	1.53	-0.014	±	0.057	No	2.40	±	1.45	0.089	±	0.054	No
	01/10/17	-0.42	±	1.56	-0.015	±	0.058	No	2.67	±	1.52	0.099	±	0.056	No
	01/17/17	0.55	±	1.57	0.020	±	0.058	No	-0.12	±	1.46	-0.004	±	0.054	No
	01/24/17	0.53	±	1.58	0.020	±	0.059	No	1.18	±	1.47	0.044	±	0.054	No
	01/31/17	1.15	±	1.52	0.043	±	0.056	No	0.38	±	1.57	0.014	±	0.058	No
	02/07/17	-0.81	±	1.66	-0.030	±	0.061	No	-0.33	±	1.44	-0.012	±	0.053	No
	Duplicate 02/07/17	3.98	±	1.85	0.147	±	0.069	No	1.77	±	1.44	0.066	±	0.053	No
	02/14/17	0.38	±	1.54	0.014	±	0.057	No	2.90	±	1.47	0.107	±	0.054	No
	02/21/17	-0.97	±	1.60	-0.036	±	0.059	No	2.61	±	1.49	0.097	±	0.055	No
	02/28/17	-0.51	±	1.53	-0.019	±	0.057	No	2.16	±	1.48	0.080	±	0.055	No
	03/07/17	1.49	±	1.86	0.055	±	0.069	No	1.42	±	1.41	0.053	±	0.052	No
	03/14/17	-0.99	±	1.58	-0.037	±	0.059	No	0.89	±	1.48	0.033	±	0.055	No
	03/21/17	1.39	±	1.52	0.051	±	0.056	No	-0.21	±	1.41	-0.008	±	0.052	No
	03/28/17	-0.83	±	1.61	-0.031	±	0.060	No	1.58	±	1.47	0.059	±	0.054	No
MINIDOKA	01/03/17	0.18	±	1.64	0.007	±	0.061	No	2.22	±	1.45	0.082	±	0.054	No
	Duplicate 01/03/17	-2.72	±	1.76	-0.101	±	0.065	No	0.26	±	0.88	0.009	±	0.032	No
	02/06/17	4.96	±	2.10	0.184	±	0.078	No	-0.77	±	0.90	-0.028	±	0.033	No
	03/07/17	-1.97	±	1.73	-0.073	±	0.064	No	-1.40	±	1.53	-0.052	±	0.057	No
TERRETON	01/03/17	-1.40	±	1.86	-0.052	±	0.069	No	0.19	±	0.88	0.007	±	0.032	No
	02/07/17	-2.36	±	1.96	-0.087	±	0.073	No	-0.52	±	1.34	-0.019	±	0.050	No
	03/06/17	0.92	±	1.80	0.034	±	0.067	No	0.62	±	1.52	0.023	±	0.056	No

APPENDIX D
STATISTICAL ANALYSIS RESULTS

Table D-1. Results of the Kruskal-Wallis statistical test between INL Site, Boundary, and Distant sample groups by month.

Parameter	P ^a
Gross Alpha	
Quarter	0.00
January	0.60
February	0.19
March	0.00
Gross Beta	
Quarter	0.03
January	0.01
February	0.60
March	0.29

a. A 'p' value greater than 0.05 signifies no statistical difference between data groups. Any values below 0.05 are indicated in red.

Table D-2. Statistical difference in weekly gross alpha and gross beta concentrations measured at Boundary and Distant locations.

Parameter	Mann-Whitney U test	
	Week	P ^a
Gross Alpha		
	January 4	0.39
	January 11	0.03
	January 18	0.34
	January 25	0.89
	February 1	0.05
	February 8	0.09
	February 15	0.39
	February 22	0.12
	March 1	0.32
	March 8	0.39
	March 15	0.62
	March 22	0.17
	March 29	0.09
Gross Beta		
	January 4	0.05
	January 11	0.03
	January 18	0.30
	January 25	0.07
	February 1	0.12
	February 8	0.89
	February 15	0.83
	February 22	0.09
	March 1	0.07
	March 8	0.09
	March 15	0.48
	March 22	1.00
	March 29	0.72

a. A 'p' value greater than 0.05 signifies no statistical difference between data groups (i.e., Boundary and Distant locations). Any values below 0.05 are indicated in red.