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Individual Radiation Protection Monitoring in the Marshall Islands: Enewetak Island Resettlement Support (May-December 2001).

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The following document has been prepared as a hardcopy supplement to the U.S. Department of Energy web site, http://tis.eh.doe.gov/health/rwd/. This report has been prepared in partial fulfillment of LLNL program level goals and actions supporting Enewetak Atoll resettlement as formally outlined under a Memorandum of Understanding (MOU) between the U.S. Department of Energy, the Republic of the Marshall Islands, and the Enewetak/Ujelang Local Atoll Government.

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DISCLAIMER

This work was performed under the auspices of the U. S. Department of Energy by the University of California, Lawrence Livermore National Laboratory under Contract No. W-7405-Eng-48.

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INTRODUCTION

The United States (U.S.) Department of Energy (DOE) has recently implemented a series of strategic initiatives to address long-term radiological surveillance needs at former U.S. test sites in the Marshall Islands. The plan is to engage local atoll communities in developing shared responsibilities for implementing radiation protection programs for resettled and resettling populations. Using pooled resources of the U.S. Department of Energy and local atoll governments, individual radiation protection programs have been developed in whole-body counting and plutonium urinalysis to assess potential intakes of radionuclides from residual fallout contamination. The whole-body counting systems are operated and maintained by Marshallese technicians (Figure 1). Samples of urine are collected from resettlement workers and island residents under controlled conditions and analyzed for plutonium isotopes at the Lawrence Livermore National Laboratory using advanced accelerator based measurement technologies. This web site provides an overview of the methodologies, a full disclosure of the measurement data, and a yearly assessment of estimated radiation doses to resettlement workers and island residents.

Figure I. Picture of the newly constructed Enewetak Radiological Laboratory. View related publication, UCRL-JC-147325 (Bell et al., 2002).

BRIEF HISTORY OF NUCLEAR TESTING IN THE MARSHALL ISLANDS

Introduction

Immediately after WWII, the United States created a Joint Task Force to develop a nuclear weapons testing program. Planners examined a number of possible locations in the Atlantic, the Caribbean, and the Pacific but decided that coral atolls in the northern Marshall Islands offered the best advantages of stable weather conditions, fewest inhabitants to relocate, and isolation with hundreds of miles of open ocean to the west where trade winds were likely to disperse radioactive fallout. During the period between 1945 and 1958, there were a total of 67 nuclear tests conducted on Bikini and Enewetak Atoll in the Marshall Islands.

The most significant contaminating event was the Castle Bravo test conducted on 1 March 1954. Bravo was an experimental thermonuclear device with an estimated explosive yield of 15 MT that led to widespread fallout contamination over the inhabited islands of Rongelap and Utirik Atolls as well as other areas to the east of Bikini (Figure 2). Today, the Department of Energy, through the Office of Health Studies, continues to provide environmental monitoring, healthcare, and medical services on affected atolls.

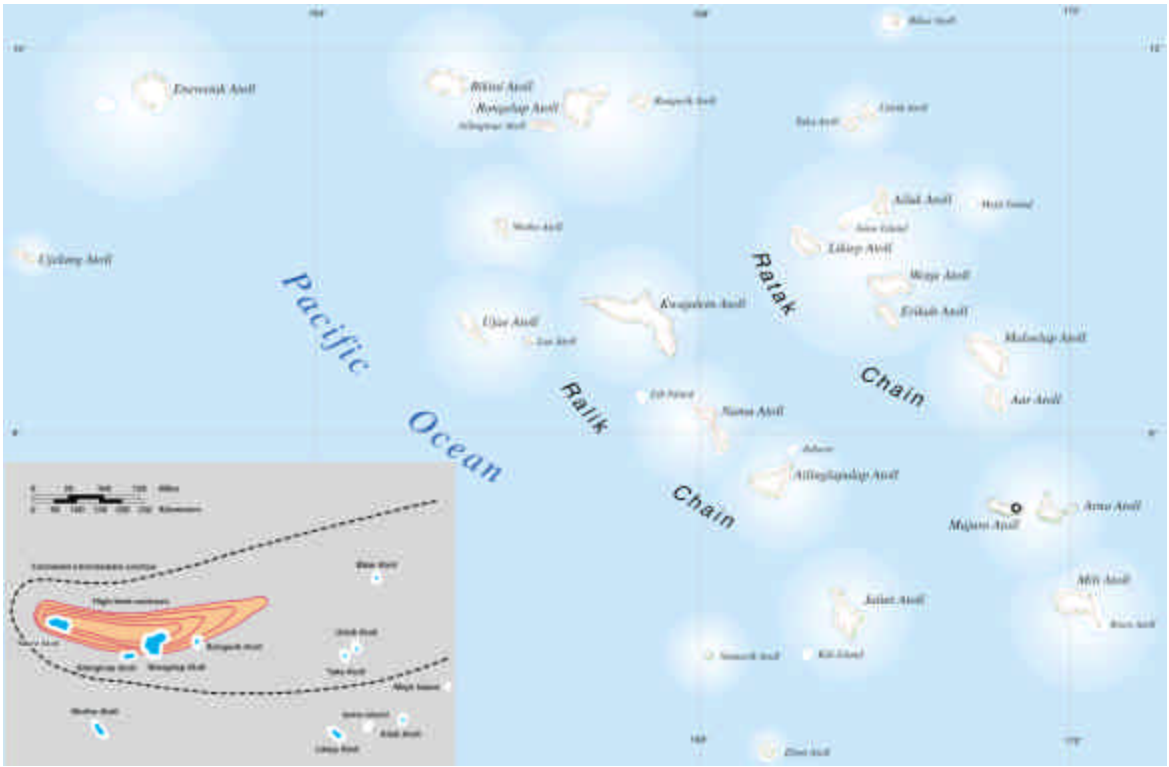

Figure 2. Map of the Republic of Marshall Islands showing the fallout pattern from the Bravo test conducted on 1 March 1954.

Enewetak Atoll

People and Events on Enewetak Atoll

After an initial series of nuclear tests on Bikini Atoll in 1946, local inhabitants of Enewetak were relocated to a new home on Ujelang Atoll in December 1947 in preparation for the scheduled first series of nuclear tests on Enewetak.

Operation Sandstone commenced in April 1948 and included 3 tests atop 200-foot high steel towers located separately on the islands of Enjebi, Aomen, and Runit. An additional 4 near surface tests were conducted on steel towers as part of Operation Greenhouse during 1951. Operation Ivy, in 1952, set the stage for the first test of a large thermonuclear device. The Mike thermonuclear blast of 31 October 1952 had an explosive yield of 10.4 MT and vaporized the island of Elugelab, leaving behind a one-half mile deep crater. Early analysis of Mike fallout debris showed the presence of two new isotopes of plutonium, ^{244}Pu and ^{246}Pu, and lead to the discovery of the new heavy elements, Einsteinum and Fermium (Seaborg and Loveland, 1990). Operation Castle involved a single test on Enewetak in 1954 and five high-yield tests on Bikini. A total of 11 nuclear tests were conducted on Enewetak in 1956 as part of Operation Redwing, including an air burst from a balloon located over water. The United States anticipated the acceptance of a call for suspension of atmospheric nuclear testing and assembled a large number of devices for testing before the moratorium started. From April through August 1958, 22 near-surface nuclear denotations were carried out on Enewetak either on platforms, barges, or underwater (10 tests at Bikini, 2 tests near Johnson Atoll, and a high altitude test about 60 miles west of Bikini). Most of the nuclear tests on Enewetak Atoll were conducted in the northern reaches of the atoll and produced highly localized fallout contamination because large quantities of soil, water and lagoon sediment were incorporated into the ensuing fireball and fallout cloud. As a consequence, the northern islands on Enewetak received significant amounts of local fallout deposition containing a range of fission products, activation products, and unfissioned nuclear fuel. By the time the test moratorium came into effect on 31 October 1958, the United States had conducted 42 tests on Enewetak Atoll.

Post Testing Era and Initial Cleanup Activities

Enewetak Atoll continued to be used for defense programs until the start of a cleanup and rehabilitation program in 1977. Over 4,000 U.S. servicemen assisted in the cleanup operations with 6 lives lost in accidents in what became known as the Enewetak Radiological Support Project (U.S. DOE, 1982). Over 100,000 cubic yards of soil from the surface of six islands were removed and deposited in Cactus crater on Runit Island. The Nevada Operations Office of the Department of Energy was responsible for certification of radiological conditions of each island upon completion of the project. The Operations Office also developed several large databases to document radiological conditions before and after the cleanup operations and to provide data to update available dose estimates. The Enewetak cleanup was largely focused on the removal and containment of plutonium along with other heavy radioactive elements. Even during this early period of cleanup and rehabilitation, the adequacy of cleanup of the northern islands on Enewetak was brought into question because predictive assessments showed that ingestion of cesium-137 and other fission products from consumption of locally grown foods was the most significant exposure pathway.

The people of Enewetak remained on Ujelang Atoll until resettlement of Enewetak Island began in 1980. Between 1980-1997, the resettled population was periodically monitored for internally deposited radionuclides by scientists from the Brookhaven National Laboratory using whole-body counting and plutonium urinalysis techniques (Sun et al., 1997a, 1997b).

More recently, the Department of Energy agreed to design and construct a radiological laboratory on Enewetak Island and help develop the necessary local resources to maintain and operate the facility. This cooperative effort was formalized in August 2000 between the U.S. Department of Energy, the Republic of the Marshall Islands, and the Enewetak/Ujelang Local Atoll Government (MOU, 2000).

The laboratory facility was completed in May 2001. The laboratory incorporates both a permanent whole-body counting system to assess internal exposures to cesium-137 and clean living space for people providing 24-hour urine samples. Scientists from the Health and Ecological Assessment Division of the Lawrence Livermore National Laboratory now direct the whole-body counting and plutonium urinalysis radiation protection monitoring programs in the Marshall Islands.

WHOLE-BODY COUNTING

What Is Whole-Body Counting?

The whole-body counting systems installed in the Marshall Islands contain large volume sodium iodide radiation detectors that measure gamma rays coming from radionuclides deposited in the body. The system is modeled after the "Masse-Bolton Chair" design (Figure 3). It can be used to detect high-energy gamma-emitting radionuclides such as cesium-137, cobalt-60 and potassium-40, in most of the body and all of the internal organs. Using internationally accepted methods, the total amount of a radionuclide measured by whole-body counting is converted into a dose estimate using specially designed computer software (Canberra, 1998a, 1998b.).

The whole-body counting systems in the Marshall Islands are calibrated using a human surrogate **calibration** source, called a Bottle Manakin Absorption (BOMAB) phantom, filled with a known amount of a mixed gamma-emiting standard **traceable** to the U.S. National Institute of Standards and Technology. Background and other quality control check counts are performed on a daily basis to ensure that the system conforms to applicable quality requirements.

Local Marshallese technicians are responsible for all daily operations in the whole-body counting facilities. Each technician receives an initial six weeks of intensive training and periodic retraining at the Lawrence Livermore National Laboratory and is employed to run the facility for up to 40 hours per week. Scientists from the Lawrence Livermore National Laboratory provide on-going technical assistance, advanced training, and perform a more detailed data quality assurance appraisal before the data is released or posted to this web site.

What Will the Whole-body Counting Show?

The main pathway for exposure to residual fallout contamination in the northern Marshall Islands is through ingestion of cesium-137 contained in locally grown foods, such as coconut, *Pandanus* fruit, and breadfruit. The whole-body counting program in the Marshall Islands will offer island residents an unprecedented level of protection until it is clearly demonstrated that radiation surveillance measures can be relaxed. The value of this type of radiation protection monitoring program lies in the fact that the whole-body count data provides a direct measure of the full range of radionuclide intakes in the local populations. Information about individual intakes and potential '**high-end**' health risks can be assessed from the measurement data rather than relying on assumptions based on a range of assumed intake scenarios. In combination with environmental monitoring data, residents who receive a whole-body count showing the presence of cesium-137 can make an informed decision about their eating habits and/or lifestyle based on what is considered a 'safe' or acceptable health risk. The Marshall Islands Government has adopted a very stringent cleanup dose standard of 15 mrem per year (0.15 millisievert per year) as an acceptable level of exposure. As communities return to their native islands, whole-body counting will provide a level of reassurance that radiation related health risks remain at or below these established standards.

Estimating Doses from Cesium-137 Using Whole-body Counting

People living in the Marshall Islands may be exposed to cesium-137 taken up from the soils into locally grown foods. Whole-body counting provides a direct measure of the amount of cesium-137 inside the body of people. The biokinectic behavior of cesium-137 in the human body is well known and allows information from the whole-body counter to be converted to a radiation dose. The **radiation dose** is the quantity used by health physicists to estimate radiation induced health risks. Dose estimates provided on this web site are expressed as an annual or projected lifetime 70-year dose, assuming a chronic exposure to cesium-137 and/or plutonium-239

Internal Doses from Cesium-137 on Enewetak

The whole-body counting data are shown in Table 1 of Appendix A.

Figure 3. The whole-body counter with a volunteer seated in the chair.

The annual internal **effective dose** estimates from cesium-137 in the resident population on Enewetak Atoll during 2001 are presented in graphical form on the frequency distribution bar chart (Figure 4).

The vast majority of people living on Enewetak Island received an annual internal dose from cesium-137 of less than 1 mrem. The average individual doses to adults (358 individuals), teenagers (41 individuals) and children (6 individuals) were 0.4 ± 0.4, 0.2 ± 0.2, and <0.1 mrem per year, respectively. The average dose for adult males of 0.4 mrem per year was slightly higher than that observed in adult females (around 0.3 mrem per year). Annual dose estimates compare with a natural background dose of 140 mrem per year in the Marshall Islands and 300 mrem per year in the United States. The annual doses observed on Enewetak Island are well below the recommended dose limit for members of the public in the United States of 100 mrem per year. Under present living conditions, the observed doses indicate island residents are receiving adequate radiation protection from residual fallout contamination.

PLUTONIUM URINALYSIS MONITORING

What Is Plutonium Urinalysis Monitoring?

Plutonium urinalysis is a very sensitive measurement technique used to determine the amount of plutonium in human urine as a means of estimating human exposure to plutonium. Plutonium urinalysis tests are performed by collecting urine from individuals over a 24-hour period. The test turns a urine sample into a powder, which scientists then analyze by counting the number of plutonium atoms in the sample, using mass spectrometry. Everybody has a small amount of plutonium in their bodies from

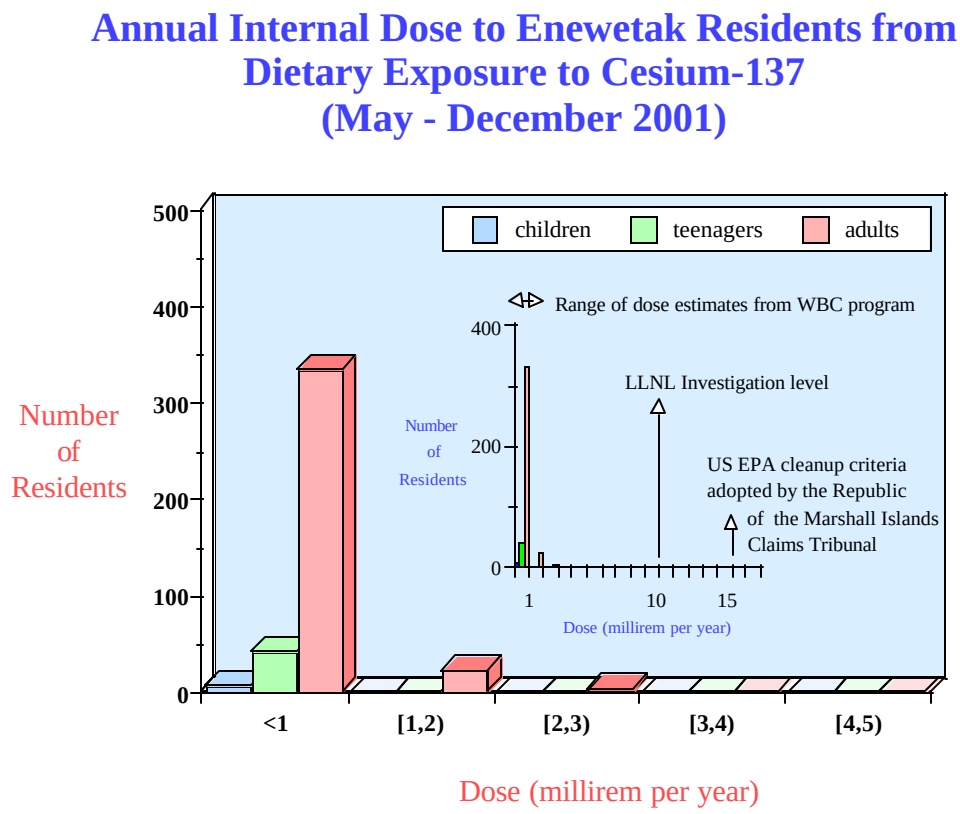

Figure 4. An assessment of Cesium-137 exposure in the resident population on Enewetak Island (May-December 2001) by whole-body counting.

exposure to worldwide fallout contamination. The amount of plutonium detected in the Marshall Islands can be compared with **baseline** excretion rates to assess likely intakes associated with resettlement.

The Marshall Islands urinalysis program uses a state-of-the-art measurement technology available at the Center for Accelerator Mass Spectrometry (CAMS) at the Lawrence Livermore National Laboratory. Accelerator mass spectrometry is about 100 times more sensitive than monitoring techniques commonly employed in occupational monitoring programs used throughout the United States.

Potential Exposures to Plutonium in the Environment

Plutonium is an important radioactive element produced in nuclear explosions. Plutonium emits **alpha particles** (or alpha-rays). Alpha particles are heavy, slow moving, charged particles that travel only one or two inches in air, and can be stopped by a piece of paper or the dead, outside layers of our skin. Therefore, any possible health effects from plutonium come from internal exposure.

Persistent and measurable quantities of residual fallout plutonium contamination have been observed in soils from test sites in the northern Marshall Islands. However, plutonium is not readily transferred from soils to plants (for example, the concentration of plutonium in vegetation is about 100,000 times less than in associated soil) nor is there significant gastrointestinal adsorption of plutonium through the gut of animals and/or marine organisms.

The main potential exposure pathway for plutonium is from inhalation of contaminated dust particles in the air that people breath. Inhaled or ingested plutonium may eventually end up in various tissues—especially the lungs, liver and bone—resulting in continuous exposure of these tissues to alpha particle radiation. Plutonium remains in the body for a long time, but the systemic uptake and associated dose contribution from plutonium in people living on Enewetak and Rongelap Islands are

still expected to be low (Harrison et al., 1989; ICRP, 1986, 1990, 1993, 1994).

Potential radionuclide inhalation exposure rates due to resuspension of contaminated soil can be estimated from the product of the soil concentration, resuspension enhancement factors, and inhalation dose factors for the various radionuclides. These estimates show that the projected dose contribution from residual plutonium on Enewetak and Rongelap Islands will be less that 5% of the total man-made dose over a lifetime. Dose estimates from environmental data are also consistent with results from previous urinalysis studies conducted in the Marshall Islands by the Brookhaven National Laboratory.

What Is the Purpose of Plutonium Urinalysis in the Marshall Islands?

Plutonium urinalysis is a measurement technique that ultimately provides information to individuals on the amount of plutonium they have in their bodies. Although plutonium is expected to be a minor contributor to the total man-made dose, it is a concern to people living in the northern Marshall Islands who are potentially exposed to elevated concentrations of plutonium in the environment. Consequently, the U.S. Department of Energy agreed to monitor resettlement workers and perform a limited number of urinalysis tests on island residents, using advanced measurement technologies available at the Lawrence Livermore National Laboratory.

The Marshall Islands plutonium urinalysis monitoring program was designed to address the following issues:

1) To provide more reliable and accurate data to assess **baseline** and significant incremental intakes of plutonium in the resettled and resettling populations using advanced accelerator based mass spectrometric measurement technologies.

2) To monitor the levels of plutonium exposure in critical populations groups, such as workers engaged in soil remediation or agriculture.

3) To demonstrate and document that occupational and/or public exposures to plutonium are below levels that will impact human health.

4) To participate in analytical proficiency testing programs to ensure that the accuracy and reliability of the measurements meet all applicable quality requirements.

5) To document and test the reliability of using environmental data to assess plutonium exposures to people living on coral atolls.

Methods for Detection of Plutonium in Urine

The decision to support a Marshall Islands plutonium urinalysis monitoring program at the Lawrence Livermore National Laboratory was originally made in 1998. Urine samples were initially sent to the University of Utah for analysis of plutonium, using **fission track analysis**. Fission is a process where heavy nuclei, such as plutonium and uranium, break up into two large fragments. Fission may occur spontaneously or be induced by collisions with neutrons.

During fission track analysis, samples are exposed to a source of neutrons in a reactor, in contact with a quartz or plastic slide. Any resulting fission fragments leave behind tracks on the slide that can be counted under an optical microscope to determine the amount of plutonium present. Historically, fission track analysis has been plagued with a number of deficiencies including the use of less than reliable and tedious preparative methods, low chemical yields, contamination issues, and inaccurate quantification. The University of Utah and the Brookhaven National Laboratory improved on the fission track process methodology and adopted a more rigorous approach to data reduction and quality assurance.

More recently, scientists from the Lawrence Livermore National Laboratory have developed an ultra low-level detection technique for determination of plutonium isotopes in urine using accelerator mass spectrometry. Accelerator mass spectrometry has a detection sensitivity around 1 to 3 µBq of plutonium and avoids many of the disadvantages of using either conventional atom counting techniques, such as alpha spectrometry and/or other competing new technologies.

There are two main isotopes of plutonium in the environment–plutonium-239 and plutonium-240. The isotopic composition of plutonium (i.e., the relative amounts of plutonium-239 and plutonium-240) vary significantly, depending on the origin of the plutonium. For example, the plutonium-240 content of local fallout produced in high yield nuclear tests in the Marshall Islands is significantly higher ($^{240}Pu/^{239}Pu$~0.25-0.35) than that contained in global fallout ($^{240}Pu/^{239}Pu$~0.18) or in unfissioned nuclear

fuel ($^{240}Pu/^{239}Pu$~0.05). Consequently, it may be possible to use urinalysis and plutonium isotope measurements as an investigative tool to assess exposures to Bravo or other specific test events.

The higher level of plutonium-240 in nuclear fallout also needs to be considered in dose estimates. It should also be noted that alpha spectrometry is a much less sensitive measurement technique and, along with fission track analysis, cannot distinguish between plutonium-239 and plutonium-240.

Method Validation

Method **validation** is the process used to monitor and document the quality of measurement data. The Lawrence Livermore National Laboratory has recently demonstrated the viability of using accelerator mass spectrometry for ultra-trace plutonium isotope detection and measurement. Method validation has included the successful participation of LLNL in an interlaboratory exercise organized by the U.S. National Institute of Standards and Technology (NIST). The results of this exercise clearly show that accelerator mass spectrometric technologies are well suited for detection of µBq concentrations of plutonium-239 and plutonium-240 in urine (Figure 5).

View full report, UCRL-ID-147972 (Marchetti et al, 2001).

Plutonium Urinalysis Monitoring on Enewetak

The urinalysis data are shown in Table 2 of Appendix A.

Accelerator Mass Spectrometry enables monitoring of plutonium excretion down to 1 to 3 µBq per 24 hours. The improved sensitivity and reliability of this measurement technique was required in order to more ably assess potential low-level chronic or incremental exposures to plutonium in excess of baseline excretion resulting from previous exposures to general worldwide environmental contamination. However, the urinary excretion of plutonium by Enewetak residents and agricultural workers during the July-August 2001 collection was still far below a level where the measurements could be performed with an acceptable level of uncertainty. Moreover, the majority of the results fall below the **critical level** of the measurements. This would normally negate the need to report a dose value at all; rather, we would assume the dose from plutonium was zero. For completeness, we have included dose estimates in our reporting.

The projected 70-year lifetime doses are presented in graphical form on a frequency distribution bar chart (Figure 6). The projected 70-year lifetime dose from internally deposited plutonium in the Enewetak resident population is less than 10 mrem (or 0.1 mSv), well below applicable cleanup standards (Figure 6).

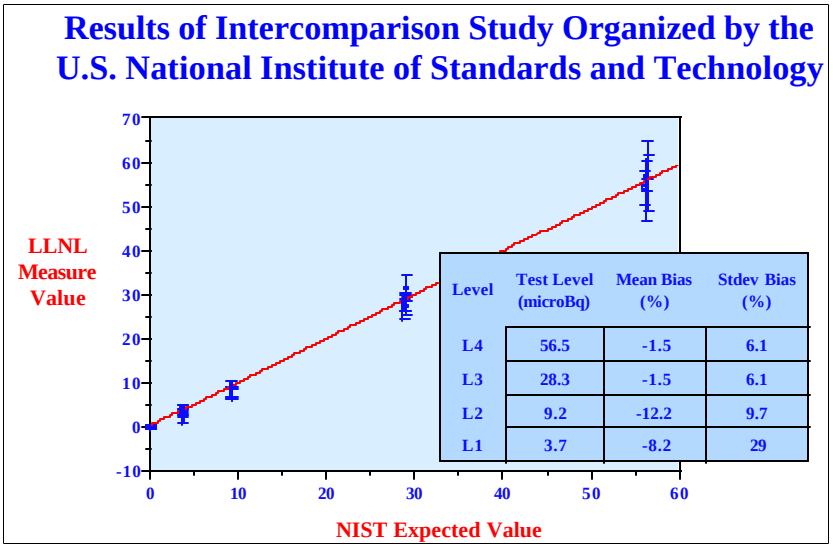

Figure 5. Results of a NIST interlaboratory exercise on low-level plutonium-239 determination in synthetic urine (microBecquerel, µBq)

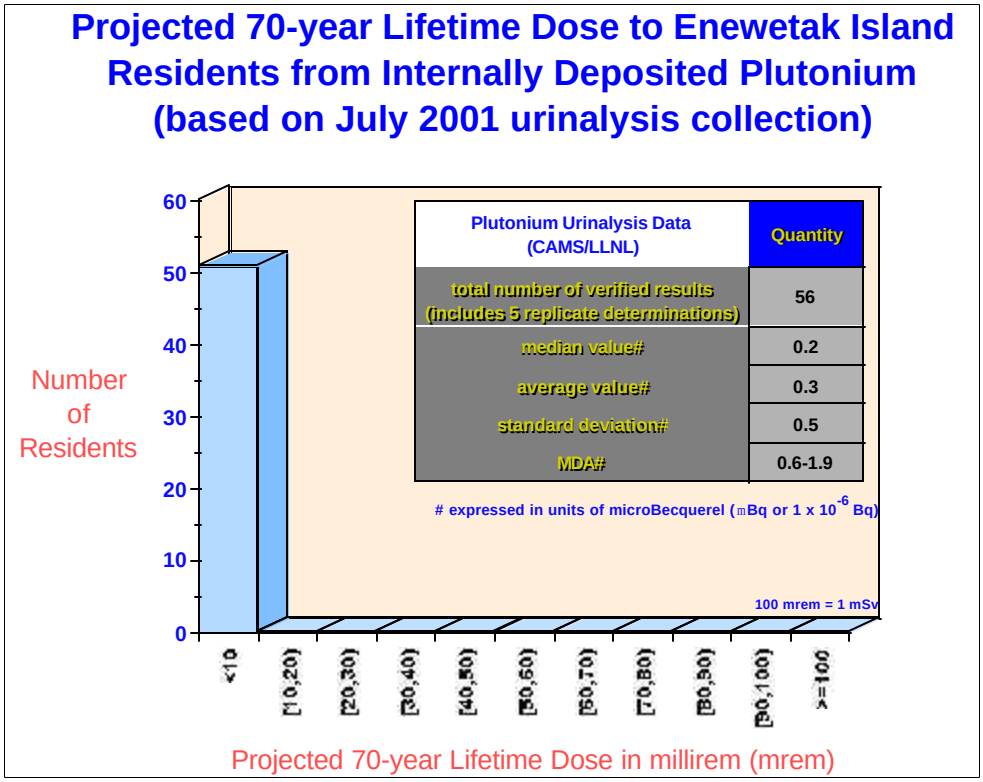

Figure 6. An assessment of the projected 70-year lifetime dose from plutonium deposition in residents on Enewetak Island (July 2001 collection)

Urinary excretion of plutonium by Enewetak Atoll agricultural workers and island residents will consist of a **baseline,** long-term excretion from residual systemic burdens acquired from all previous exposures and a potential prompt-excretion component from any intake associated with resettlement. Dose estimates shown here assume that the intake of plutonium is equivalent to the daily excretion rate, i.e., that the total body burden of plutonium will remain at the present level. This is a very conservative (i.e., dose maximizing) assumption. There is no evidence of significant incremental intakes of plutonium because urinary excretion of plutonium by Enewetak residents is within the range of what might be expected from residual systematic burdens acquired from previous exposures to worldwide fallout contamination. Previous estimates of the background urinary excretion of plutonium in adults from the northern Marshall Islands range from 1-2 µBq per 24-hour urine sample (NRC, 1994).

PROVIDING FOLLOW UP ON RESULTS

All program volunteers receive a preliminary copy of their dose report immediately after they receive a whole-body count. Scientists from the Lawrence Livermore National Laboratory verify the measurements, and if required, a revised dose report is generated and returned to the individuals concerned. Annual doses of 10 mrem or above evoke a predetermined action or investigation. These actions may include follow-up measurements, a dietary evaluation, and/or a work history review. Below this level, we assume that **default assumptions** for assigning doses are valid and need not be considered for investigation of intake. This action level is one-tenth of the investigation level used throughout the Department of Energy and is well below the 15 mrem cleanup standard adopted by the Marshall Islands. In addition, at the end of each calendar year, all program volunteers receive a final written report containing all available verified individual whole-body counts and plutonium urinalysis measurement data along with their estimated annual or committed lifetime doses.

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GLOSSARY OF TERMS

Absorbed Dose

The **absorbed dose** is the energy deposited in an organ or tissue per unit mass of irradiated material. The common unit for absorbed dose is the rad, which is equivalent to 100 egs per gram of material.

The international scientific community has adopted the use of a different term for rad called a gray (Gy). One Gy is the same as 100 rad.

Activity

The transition rate or number of radioactive decays per unit time of a given radioactive source expressed in units of **Becquerel**, **curie** or other acceptable units.

Alpha Particles

Alpha particles are one of the primary types of radiation associated with radioactivity. Alpha rays are heavy, slow moving, charged particles that travel only one or two inches in air and can be stopped by a piece of paper or the dead, outside layers of skin. Because of the very short range of the emitted alpha radiation, the main concern in radiation protection is from the potential health effects of internally deposited alpha-emitting radionuclides.

Background Radiation

The average person in the United States receives about 360 mrem of ionizing radiation every year. About 300 mrem per year comes from **natural background radiation** from outer space, soil and air that people breath, and about 60 mrem from **man-made sources** such as medical exposures to diagnostic rays and consumer products (e.g., from smoking tobacco). The general worldwide contribution from radioactive fallout contamination is <0.3% of the average total dose. Exposures to natural background radiation vary depending on the geographic area, diet, and factors such as the composition of materials used in the construction of homes. The natural background radiation dose in the Marshall Islands is around 140 mrem per year and is significantly less than what most people receive around the world.

Baseline

We have all been exposed to some level of worldwide fallout contamination. In the United States, it is estimated that the population receives up to 1.5 millirem (0.3% of the average total annual dose) from worldwide fallout and about 0.5 millirem (or 0.1% of the average total annual dose) from operations related to nuclear power generation. Similarly, people living in the Marshall Islands will have very small quantities of internally deposited plutonium and cesium-137 in their bodies from worldwide environmental contamination of food, air, water and soil. The residual system burden acquired from previous exposures provides a **baseline** for assessing the significance of any intake associated with resettlement.

Our measurements show that the baseline urinary excretion of plutonium by resettlement workers on Rongelap and the resident population on Enewetak is at or below the sensitivity of our measurements by accelerator mass spectrometry.

Whole-body counting will also be used to establish the cesium-137 baseline for the Rongelap population as resettlement begins. The aim of the Marshall Islands radiation protection monitoring program is to monitor internally deposited radionuclide that fall above the existing baseline and may potentially be associated with resettlement.

For the purposes of this discussion, the urinary excretion of plutonium must increase by about 3 µBq per day to register a positive detection at a reasonable level of uncertainty. Therefore, the minimal detectable dose for the plutonium urinalysis program is around 0.02 mrem per year.

Similarly, the **Minimum Detectable Amount (MDA)** for the whole-body counting systems on Rongelap and Enewetak range from ~ 0.04–0.2 kBq. This translates into a detectable annual effective dose of around 0.2 to 0.7 mrem.

Becquerel (Bq)

A **Becquerel** (abbreviated as **Bq**) is the International System (SI) unit for the activity of radioactive material. One **Bq** of radioactive material is that amount of material in which one atom is transformed or undergoes one disintegration every second. The common units used in this report for

reporting whole-body counting and plutonium urinalysis data are the **kBq** (kiloBq) and **mBq** (microBq).

Biokinectic

The word 'biokinectic' is used here to describe the adsorption (uptake), distribution and retention of elements in humans.

Calibration

The process of adjusting, determining the response, or reading an instrument to a standard.

Committed Dose Equivalent

The time integral of a dose-equivalent rate in an organ or tissue that will be received by an individual following an intake of radioactive material into the body. When the time integral is not specified, it will be taken as 50 years for adults and to age 70 years for intakes by children. Committed dose equivalent is normally expressed in units of rem.

The international scientific community has adopted the use of a different term for rem called a seivert (Sv). One Sv is the same as 100 rem.

Committed Effective Dose Equivalent

The committed dose equivalents to various tissues or organ in the body each multiplied by an appropriate tissue-weighing factor and then summed. Committed effective dose equivalence (CEDE) is normally expressed in units of rem.

The international scientific community has adopted the use of a different term for rem called a sievert (Sv). One Sv is the same as 100 rem.

Critical Level

The amount of a count (L_c) or final measurement of a quantity of an analyte at or above which a decision is made that the analyte is definitely present ($L_c \approx$ **MDA**/2)

Default Assumptions

The largest contribution to the radiation dose attributable to residual nuclear fallout in the Marshall Islands results from either internal exposure from intake of radionuclides through ingestion, inhalation and/or absorption through the skin, and external exposure from radionuclides distributed in the soil. External exposure rates can be measured directly using instrument surveys of the radiation field. The assignment of dose to internally deposited radionuclides is much more complicated. Biokinectic and dosimetric models developed by the International Commission on Radiological Protection (ICRP) are used to convert whole-body burdens (from whole-body counting or from in vitro bioassay tests, such as urinalysis) into dose. In the case of a chronic exposure, organ and body burdens continue to build up over time until a steady state is reached where losses due to decay and excretion are balanced by intake and absorption. Cesium-137 has an effective half-life in an adult of about 110 days and, under chronic exposure conditions, reaches a maximal dose rate after about 2 years. By contrast, plutonium absorbed from the gastrointestinal or respiratory tract enters the blood stream and deposits in liver and bone with an effective half-life of 20-50 years. Only a small fraction of plutonium entering the blood stream is excreted in urine with the long-term excretion rate approaching 2×10^{-5} of the systemic body burden per day. Knowledge of excretion rates and time of exposure are important when interpreting urinalysis data.

Direct bioassay

The measurements of radioactive material in the human body, utilizing instrumentation that detects radiation emitted from radioactive material in the body (synonymous with in vivo measurements)

Dose Assessment

The scientific process used to determine radiation dose and uncertainty in the dose.

Dose Equivalent

The **dose equivalent** is the adsorbed dose multiplied by a biological effectiveness factor for the radiation to cause biological damage. Dose equivalents are typically expressed in rem. A dose of 100 rem to an adult normally produces some clinical signs of radiation sickness and requires hospitalization.

The international scientific community has adopted the use of a different term for rem called a sievert (Sv). One Sv is the same as 100 rem.

Effective Dose Equivalent

The **effective dose equivalent** for the whole-body is the sum of dose-equivalents for various organs in the body weighted to account for different sensitivities of the organs to radiation. It includes the dose from radiation sources internal and/or external to the body. The effective dose equivalent is usually expressed in units of millirem (mrem).

The international scientific community has adopted the use of a different term for millirem called a millisievert (mSv). One mSv is the same as 100 mrem.

External Dose or Exposure

That portion of the dose equivalent received from radiation sources outside the human body.

Fission Track Analysis

During neutron irradiation, heavy nuclei, such as uranium and plutonium, undergo nuclear fission with release of large fission fragments. This property have led to the development of a number of measurement techniques such as delayed neutron activation analysis and **fission track analysis**. Fission track analysis is a measurement technique commonly employed in plutonium urinalysis (bioassay) monitoring programs. Urine samples are chemically treated to remove plutonium. The plutonium is then mounted in contact with a special plastic or quartz slide known as solid state nuclear track detector (SSNTD). The slide, along with the sample, is then irradiated in a reactor where neutron-induced fission of plutonium-239 (or uranium-235) causes emission of energetic fission fragments. Some of the fragments penetrate into the SSNTD damaging the integrity of the material before coming to rest. The SSNTD is separated from the sample and chemically etched to expose the damaged areas (known as fission tracks) on the detector surface. The fission tracks are then counted under an optical microscope. The amount of plutonium (and/or uranium) present in the sample is a function of the total number of tracks and the neutron flux.

Gamma-rays

Gamma-rays are electromagnetic waves produced by spontaneous decay of radioactive elements. Sunlight also consists of electromagnetic waves, but gamma-rays have a shorter wavelength and much higher energy. High energy gamma-rays, such as those produced by decay of cesium-137, may penetrate deeply into the body and affect cells. Gamma-rays from a cobalt-60 source are often used for cancer radiotherapy.

High-End Health Risk

Relates to the maximally exposed individuals in a population.

In Vitro

In vitro measurements are synonymous with indirect bioassay techniques, such an urinalysis.

In Vivo

In vivo measurements are synonymous with direct bioassay techniques, such whole-body counting.

Indirect bioassay

Measurements to determine the presence of or estimate the amount of a radioactive material in the excreta, urine, or in other biological materials removed from the body (synonymous with in vitro measurements)

Individual

Any human being.

Internal Dose or Exposure

That portion of the dose equivalent received from radiation sources inside the human body.

Isotope

Atoms with the same number of protons but different numbers of neutrons are called isotopes of a specific element. We identify different isotopes by appending the total number of nucleons (the total number of proton plus neutrons in the nucleus of an atom) to the name of the element, e.g., cesium-137. Isotopes are usually written in an abbreviated form using the chemical symbol of the element. Two examples include ^{137}Cs for cesium-137, ^{239}Pu for plutonium-239, and ^{40}K for potassium –40.

Minimum Detectable Amount (MDA)

The smallest activity or mass of an analyte in a sample or person that can be detected with an acceptable level of uncertainty.

Monitoring

The measurement of radiation levels or individual doses and the use of the results to assess radiological hazards or potential and actual doses resulting from exposures to ionizing radiation.

Quality Assurance

All those planned and systematic actions necessary to provide adequate confidence that an analyses, measurement, or surveillance program will perform satisfactorily.

Quality Control

Those actions that control the attributes of analytical process, system or facility according to predetermined quality requirements.

Radiation Dose (or mrem)

A generic term to describe the amount of radiation a person receives. Dose is measured in units of thousands of a **roentgen equivalent man (rem)** (called the millirem). The millirem is normally abbreviated as **mrem**. Dose is a general term used to assist in the management of individual exposure to radiation.

The international scientific community has adopted the use of a different term for millirem called a millisievert (mSv). One mSv is the same as 100 mrem.

Radioactivity

A natural and spontaneous process by which unstable atoms of an element emit energy and/or particles from their nuclei and, thus, change (or decay) to atoms of a different element or a different state of the same element.

Validation

Defining the process of the method capability and determining whether it can be properly applied as intended.

Whole-body

For the purposes of external exposure includes the head, trunk, the arms above and including the elbow, and legs above and including the knee.

Appendix A: INDIVIDUAL MEASUREMENT DATA

The following data tables provide full disclosure of all verified measurement data collected to 31 December 2001.

Table 1. Whole-body Count data for agricultural workers and Enewetak Island residents (May-Dec. 2001).

Table 2. Plutonium urinalysis data for agricultural workers and Enewetak Island residents (CAMS/LLNL, July 2001 collection)

Table 1. Whole-body count data for agricultural workers and Enewetak Island residents (May–Dec 2001).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	^{40}K (kBq) Upper	^{40}K (kBq) Lower	^{40}K (kBq) MDA	^{137}Cs (kBq) Value	^{137}Cs (kBq) Upper	^{137}Cs (kBq) Lower	^{137}Cs (kBq) MDA	Method Code
EN00002	Adult	Male	5/19/2001	4.0	4.3	3.8	0.7	0.17	0.18	0.15	0.089	NaI_WBC
EN00002	Adult	Male	8/8/2001	4.2	4.4	3.9	0.8	0.24	0.25	0.22	0.10	NaI_WBC
EN00003	Adult	Male	5/19/2001	4.0	4.3	3.7	0.6	0.00	0.00	0.00	0.065	NaI_WBC
EN00003	Adult	Male	8/8/2001	4.3	4.5	4.0	0.8	0.14	0.15	0.12	0.098	NaI_WBC
EN00004	Adult	Male	5/21/2001	3.3	3.5	3.1	0.7	0.00	0.00	0.00	0.065	NaI_WBC
EN00004	Adult	Male	6/28/2001	3.7	3.9	3.4	0.7	0.00	0.00	0.00	0.063	NaI_WBC
EN00004	Adult	Male	12/6/2001	3.0	3.2	2.8	0.7	0.034	0.043	0.024	0.095	NaI_WBC
EN00005	Adult	Male	5/21/2001	4.1	4.3	3.8	0.6	0.27	0.29	0.25	0.10	NaI_WBC
EN00005	Adult	Male	7/11/2001	4.5	4.8	4.2	0.8	0.18	0.20	0.16	0.097	NaI_WBC
EN00005	Adult	Male	9/4/2001	4.8	5.1	4.5	0.8	0.20	0.22	0.19	0.092	NaI_WBC
EN00005	Adult	Male	10/3/2001	4.9	5.2	4.6	0.7	0.16	0.17	0.14	0.089	NaI_WBC
EN00005	Adult	Male	11/7/2001	4.4	4.6	4.1	0.7	0.18	0.20	0.17	0.093	NaI_WBC
EN00005	Adult	Male	12/5/2001	4.2	4.4	3.9	0.8	0.18	0.19	0.16	0.097	NaI_WBC
EN00006	Adult	Male	5/21/2001	3.4	3.6	3.2	0.6	0.18	0.20	0.17	0.092	NaI_WBC
EN00006	Adult	Male	6/28/2001	4.5	4.8	4.2	0.8	0.17	0.18	0.16	0.096	NaI_WBC
EN00006	Adult	Male	9/4/2001	4.3	4.6	4.1	0.7	0.19	0.21	0.17	0.10	NaI_WBC
EN00006	Adult	Male	10/3/2001	4.5	4.8	4.2	0.8	0.24	0.26	0.23	0.10	NaI_WBC
EN00006	Adult	Male	11/5/2001	3.7	3.9	3.4	0.8	0.17	0.18	0.15	0.091	NaI_WBC
EN00006	Adult	Male	12/5/2001	4.4	4.6	4.1	0.7	0.18	0.20	0.17	0.094	NaI_WBC
EN00007	Adult	Male	5/21/2001	3.5	3.7	3.2	0.6	0.23	0.25	0.21	0.097	NaI_WBC
EN00007	Adult	Male	6/28/2001	4.1	4.3	3.8	0.8	0.16	0.17	0.14	0.096	NaI_WBC
EN00007	Adult	Male	9/4/2001	4.4	4.6	4.1	0.7	0.24	0.25	0.22	0.10	NaI_WBC
EN00007	Adult	Male	10/3/2001	4.2	4.5	4.0	0.7	0.23	0.25	0.21	0.099	NaI_WBC
EN00007	Adult	Male	11/5/2001	3.7	3.9	3.5	0.7	0.18	0.19	0.16	0.094	NaI_WBC
EN00008	Adult	Male	5/21/2001	3.3	3.6	3.1	0.6	0.088	0.099	0.077	0.085	NaI_WBC
EN00008	Adult	Male	9/4/2001	4.0	4.3	3.8	0.8	0.21	0.23	0.19	0.077	NaI_WBC
EN00008	Adult	Male	10/3/2001	4.0	4.3	3.8	0.8	0.14	0.15	0.13	0.092	NaI_WBC
EN00008	Adult	Male	11/5/2001	3.7	4.0	3.5	0.8	0.12	0.13	0.11	0.093	NaI_WBC
EN00008	Adult	Male	12/14/2001	4.1	4.4	3.9	0.8	0.15	0.17	0.14	0.095	NaI_WBC
EN00009	Adult	Male	5/21/2001	2.6	2.8	2.4	0.6	0.10	0.11	0.086	0.073	NaI_WBC
EN00009	Adult	Male	6/28/2001	3.4	3.7	3.2	0.8	0.083	0.095	0.071	0.084	NaI_WBC
EN00009	Adult	Male	9/4/2001	3.6	3.8	3.3	0.8	0.055	0.066	0.044	0.086	NaI_WBC
EN00009	Adult	Male	10/3/2001	3.6	3.9	3.4	0.8	0.050	0.060	0.040	0.082	NaI_WBC
EN00009	Adult	Male	11/6/2001	3.4	3.6	3.2	0.7	0.00	0.00	0.00	0.064	NaI_WBC
EN00009	Adult	Male	12/5/2001	3.2	3.4	3.0	0.7	0.098	0.11	0.087	0.074	NaI_WBC
EN00010	Adult	Male	5/21/2001	4.0	4.3	3.7	0.7	0.12	0.13	0.11	0.092	NaI_WBC
EN00010	Adult	Male	6/28/2001	4.7	5.0	4.4	0.8	0.095	0.11	0.084	0.087	NaI_WBC
EN00010	Adult	Male	9/4/2001	4.9	5.2	4.6	0.8	0.18	0.20	0.16	0.099	NaI_WBC
EN00010	Adult	Male	10/3/2001	5.3	5.6	5.0	0.8	0.20	0.22	0.18	0.10	NaI_WBC
EN00010	Adult	Male	11/5/2001	4.7	5.0	4.4	0.8	0.10	0.12	0.091	0.088	NaI_WBC
EN00010	Adult	Male	12/5/2001	4.7	5.0	4.5	0.8	0.097	0.11	0.084	0.087	NaI_WBC
EN00011	Adult	Male	5/21/2001	3.2	3.4	3.0	0.6	0.20	0.22	0.18	0.098	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq)				^{137}Cs (kBq)				Method Code
				Value	Upper	Lower	MDA	Value	Upper	Lower	MDA	
EN00011	Adult	Male	6/28/2001	4.5	4.8	4.2	0.8	0.20	0.22	0.19	0.10	NaI_WBC
EN00011	Adult	Male	9/5/2001	4.5	4.8	4.2	0.8	0.20	0.22	0.18	0.095	NaI_WBC
EN00011	Adult	Male	10/3/2001	4.3	4.6	4.1	0.7	0.15	0.16	0.14	0.099	NaI_WBC
EN00011	Adult	Male	11/6/2001	3.9	4.2	3.7	0.8	0.16	0.18	0.15	0.091	NaI_WBC
EN00011	Adult	Male	12/6/2001	3.5	3.7	3.3	0.8	0.19	0.21	0.18	0.075	NaI_WBC
EN00012	Adult	Male	5/21/2001	3.1	3.3	2.9	0.7	0.063	0.073	0.053	0.081	NaI_WBC
EN00012	Adult	Male	6/28/2001	4.2	4.5	3.9	0.8	0.062	0.072	0.052	0.098	NaI_WBC
EN00012	Adult	Male	10/5/2001	4.8	5.1	4.5	0.7	0.12	0.13	0.11	0.077	NaI_WBC
EN00012	Adult	Male	11/5/2001	3.6	3.8	3.3	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00012	Adult	Male	12/5/2001	3.8	4.0	3.5	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00013	Adult	Male	5/21/2001	3.8	4.1	3.6	0.6	0.00	0.00	0.00	0.062	NaI_WBC
EN00013	Adult	Male	6/28/2001	4.8	5.1	4.5	0.8	0.00	0.00	0.00	0.064	NaI_WBC
EN00013	Adult	Male	9/5/2001	4.7	4.9	4.4	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00013	Adult	Male	10/4/2001	4.6	4.9	4.4	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00013	Adult	Male	11/6/2001	4.1	4.4	3.8	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00013	Adult	Male	12/14/2001	4.3	4.5	4.0	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00014	Adult	Male	5/21/2001	3.5	3.7	3.2	0.7	0.00	0.00	0.00	0.065	NaI_WBC
EN00015	Adult	Male	5/21/2001	3.0	3.3	2.8	0.7	0.091	0.10	0.079	0.084	NaI_WBC
EN00015	Adult	Male	9/4/2001	3.7	4.0	3.5	0.8	0.13	0.14	0.11	0.076	NaI_WBC
EN00015	Adult	Male	10/4/2001	4.3	4.5	4.0	0.8	0.095	0.11	0.083	0.087	NaI_WBC
EN00015	Adult	Male	11/5/2001	3.4	3.6	3.2	0.8	0.11	0.12	0.097	0.074	NaI_WBC
EN00016	Adult	Male	5/21/2001	3.9	4.2	3.7	0.7	0.11	0.12	0.093	0.088	NaI_WBC
EN00016	Adult	Male	8/8/2001	4.2	4.4	3.9	0.7	0.089	0.10	0.077	0.074	NaI_WBC
EN00016	Adult	Male	12/19/2001	4.7	5.0	4.4	0.8	0.12	0.13	0.11	0.076	NaI_WBC
EN00017	Adult	Male	5/21/2001	4.4	4.7	4.1	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00018	Adult	Male	7/10/2001	4.9	5.2	4.6	0.7	0.13	0.14	0.12	0.085	NaI_WBC
EN00018	Adult	Male	9/5/2001	4.9	5.2	4.6	0.7	0.21	0.22	0.19	0.095	NaI_WBC
EN00018	Adult	Male	10/3/2001	4.5	4.7	4.2	0.8	0.19	0.21	0.17	0.098	NaI_WBC
EN00018	Adult	Male	11/6/2001	4.6	4.9	4.3	0.7	0.14	0.16	0.13	0.086	NaI_WBC
EN00018	Adult	Male	12/6/2001	4.0	4.3	3.8	0.8	0.13	0.15	0.12	0.086	NaI_WBC
EN00019	Adult	Male	5/22/2001	3.5	3.8	3.3	0.7	0.12	0.13	0.11	0.086	NaI_WBC
EN00019	Adult	Male	6/28/2001	4.8	5.1	4.5	0.8	0.17	0.19	0.16	0.089	NaI_WBC
EN00019	Adult	Male	9/4/2001	3.9	4.2	3.7	0.8	0.18	0.20	0.17	0.087	NaI_WBC
EN00019	Adult	Male	10/3/2001	4.3	4.6	4.0	0.8	0.25	0.27	0.23	0.10	NaI_WBC
EN00019	Adult	Male	11/5/2001	4.0	4.3	3.8	0.7	0.18	0.19	0.16	0.090	NaI_WBC
EN00019	Adult	Male	12/5/2001	3.7	3.9	3.4	0.7	0.11	0.12	0.094	0.086	NaI_WBC
EN00020	Adult	Male	5/22/2001	3.6	3.8	3.3	0.7	0.14	0.15	0.12	0.088	NaI_WBC
EN00020	Adult	Male	9/5/2001	4.5	4.8	4.3	0.8	0.18	0.19	0.16	0.089	NaI_WBC
EN00020	Adult	Male	10/3/2001	4.5	4.7	4.2	0.7	0.21	0.22	0.19	0.10	NaI_WBC
EN00020	Adult	Male	11/5/2001	4.2	4.4	3.9	0.8	0.22	0.23	0.20	0.10	NaI_WBC
EN00020	Adult	Male	12/6/2001	4.0	4.2	3.7	0.8	0.22	0.24	0.20	0.10	NaI_WBC
EN00021	Adult	Male	5/22/2001	4.4	4.7	4.1	0.7	0.21	0.23	0.20	0.093	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq)				^{137}Cs (kBq)				Method Code
				Value	Upper	Lower	MDA	Value	Upper	Lower	MDA	
EN00021	Adult	Male	9/5/2001	4.9	5.1	4.6	0.8	0.15	0.17	0.14	0.093	NaI_WBC
EN00021	Adult	Male	10/3/2001	4.9	5.2	4.6	0.8	0.17	0.19	0.16	0.10	NaI_WBC
EN00021	Adult	Male	11/5/2001	4.2	4.4	3.9	0.8	0.092	0.10	0.081	0.086	NaI_WBC
EN00021	Adult	Male	12/5/2001	4.5	4.7	4.2	0.7	0.11	0.13	0.10	0.087	NaI_WBC
EN00022	Adult	Male	5/22/2001	3.9	4.1	3.6	0.6	0.15	0.17	0.14	0.089	NaI_WBC
EN00022	Adult	Male	6/29/2001	4.2	4.5	4.0	0.8	0.14	0.15	0.12	0.083	NaI_WBC
EN00022	Adult	Male	9/5/2001	4.5	4.8	4.3	0.8	0.18	0.20	0.17	0.10	NaI_WBC
EN00022	Adult	Male	10/3/2001	4.8	5.1	4.5	0.8	0.13	0.15	0.12	0.091	NaI_WBC
EN00022	Adult	Male	11/7/2001	4.4	4.6	4.1	0.8	0.12	0.14	0.11	0.086	NaI_WBC
EN00022	Adult	Male	12/12/2001	4.6	4.9	4.3	0.8	0.11	0.12	0.098	0.087	NaI_WBC
EN00023	Teenager	Male	5/22/2001	3.6	3.8	3.4	0.6	0.18	0.20	0.17	0.090	NaI_WBC
EN00023	Adult	Male	9/5/2001	4.6	4.9	4.4	0.8	0.11	0.12	0.095	0.087	NaI_WBC
EN00023	Adult	Male	10/4/2001	4.6	4.9	4.4	0.8	0.075	0.086	0.064	0.085	NaI_WBC
EN00023	Adult	Male	11/5/2001	4.2	4.5	3.9	0.7	0.077	0.089	0.065	0.098	NaI_WBC
EN00023	Adult	Male	12/12/2001	4.5	4.7	4.2	0.7	0.11	0.13	0.10	0.089	NaI_WBC
EN00024	Adult	Male	5/22/2001	3.7	4.0	3.5	0.7	0.43	0.45	0.40	0.10	NaI_WBC
EN00024	Adult	Male	9/5/2001	4.5	4.8	4.2	0.8	0.34	0.36	0.31	0.10	NaI_WBC
EN00024	Adult	Male	10/4/2001	4.7	4.9	4.4	0.8	0.28	0.30	0.26	0.097	NaI_WBC
EN00024	Adult	Male	11/5/2001	4.0	4.2	3.7	0.8	0.24	0.25	0.22	0.10	NaI_WBC
EN00025	Adult	Male	5/22/2001	3.7	3.9	3.4	0.7	0.14	0.16	0.13	0.087	NaI_WBC
EN00025	Adult	Male	7/9/2001	4.9	5.2	4.6	0.8	0.14	0.16	0.13	0.079	NaI_WBC
EN00025	Adult	Male	9/5/2001	4.6	4.9	4.3	0.8	0.14	0.15	0.13	0.094	NaI_WBC
EN00025	Adult	Male	10/4/2001	4.9	5.2	4.6	0.7	0.14	0.16	0.13	0.088	NaI_WBC
EN00025	Adult	Male	11/6/2001	4.1	4.4	3.8	0.8	0.10	0.11	0.089	0.085	NaI_WBC
EN00026	Adult	Male	5/22/2001	4.0	4.2	3.7	0.6	0.083	0.094	0.072	0.098	NaI_WBC
EN00026	Adult	Male	7/2/2001	4.8	5.1	4.5	0.8	0.00	0.00	0.00	0.069	NaI_WBC
EN00027	Adult	Male	5/22/2001	3.5	3.8	3.3	0.6	0.049	0.058	0.040	0.092	NaI_WBC
EN00027	Adult	Male	6/29/2001	4.3	4.6	4.0	0.8	0.00	0.00	0.00	0.064	NaI_WBC
EN00027	Adult	Male	9/5/2001	4.1	4.4	3.9	0.8	0.060	0.070	0.049	0.083	NaI_WBC
EN00027	Adult	Male	10/4/2001	4.3	4.6	4.0	0.7	0.045	0.055	0.035	0.089	NaI_WBC
EN00027	Adult	Male	11/6/2001	4.6	4.9	4.3	0.7	0.00	0.00	0.00	0.064	NaI_WBC
EN00028	Adult	Male	5/22/2001	4.2	4.4	3.9	0.6	0.16	0.18	0.15	0.097	NaI_WBC
EN00028	Adult	Male	6/29/2001	4.5	4.8	4.2	0.8	0.10	0.11	0.09	0.091	NaI_WBC
EN00028	Adult	Male	9/5/2001	4.6	4.9	4.4	0.8	0.11	0.13	0.10	0.097	NaI_WBC
EN00028	Adult	Male	10/4/2001	4.7	4.9	4.4	0.8	0.073	0.083	0.062	0.087	NaI_WBC
EN00028	Adult	Male	11/6/2001	4.3	4.5	4.0	0.8	0.12	0.13	0.10	0.086	NaI_WBC
EN00029	Adult	Male	5/22/2001	3.7	4.0	3.5	0.7	0.10	0.12	0.092	0.084	NaI_WBC
EN00029	Adult	Male	7/2/2001	4.5	4.8	4.2	0.8	0.099	0.11	0.087	0.086	NaI_WBC
EN00029	Adult	Male	9/5/2001	4.7	5.0	4.4	0.8	0.17	0.19	0.16	0.087	NaI_WBC
EN00029	Adult	Male	10/4/2001	4.7	5.0	4.5	0.8	0.12	0.14	0.11	0.090	NaI_WBC
EN00029	Adult	Male	11/6/2001	4.3	4.5	4.0	0.8	0.13	0.15	0.12	0.092	NaI_WBC
EN00029	Adult	Male	12/12/2001	4.7	4.9	4.4	0.7	0.12	0.13	0.10	0.086	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	^{40}K (kBq) Upper	^{40}K (kBq) Lower	^{40}K (kBq) MDA	^{137}Cs (kBq) Value	^{137}Cs (kBq) Upper	^{137}Cs (kBq) Lower	^{137}Cs (kBq) MDA	Method Code
EN00030	Adult	Male	5/22/2001	3.3	3.6	3.1	0.6	0.076	0.087	0.065	0.091	NaI_WBC
EN00031	Adult	Male	5/22/2001	3.2	3.5	3.0	0.6	0.070	0.081	0.060	0.087	NaI_WBC
EN00032	Adult	Male	5/23/2001	3.7	3.9	3.4	0.7	0.14	0.16	0.13	0.094	NaI_WBC
EN00032	Adult	Male	6/29/2001	4.7	5.0	4.4	0.8	0.15	0.16	0.14	0.090	NaI_WBC
EN00032	Adult	Male	9/6/2001	4.5	4.8	4.2	0.7	0.11	0.12	0.098	0.086	NaI_WBC
EN00032	Adult	Male	10/4/2001	4.3	4.6	4.1	0.8	0.15	0.17	0.14	0.094	NaI_WBC
EN00032	Adult	Male	11/6/2001	4.1	4.3	3.8	0.8	0.094	0.11	0.082	0.080	NaI_WBC
EN00032	Adult	Male	12/13/2001	4.4	4.7	4.1	0.8	0.12	0.13	0.10	0.088	NaI_WBC
EN00033	Adult	Male	5/23/2001	3.5	3.7	3.3	0.7	0.086	0.097	0.075	0.088	NaI_WBC
EN00033	Adult	Male	6/29/2001	3.6	3.9	3.4	0.8	0.088	0.10	0.077	0.084	NaI_WBC
EN00033	Adult	Male	10/9/2001	4.1	4.3	3.8	0.7	0.13	0.15	0.12	0.090	NaI_WBC
EN00033	Adult	Male	11/6/2001	3.5	3.7	3.2	0.8	0.14	0.15	0.12	0.084	NaI_WBC
EN00034	Adult	Male	5/23/2001	3.5	3.7	3.2	0.6	0.20	0.21	0.18	0.093	NaI_WBC
EN00034	Adult	Male	9/6/2001	4.3	4.6	4.1	0.8	0.22	0.24	0.21	0.10	NaI_WBC
EN00034	Adult	Male	10/5/2001	4.3	4.6	4.0	0.8	0.24	0.26	0.22	0.10	NaI_WBC
EN00034	Adult	Male	11/7/2001	3.9	4.2	3.7	0.8	0.20	0.21	0.18	0.092	NaI_WBC
EN00034	Adult	Male	12/6/2001	3.7	3.9	3.5	0.8	0.17	0.18	0.15	0.10	NaI_WBC
EN00035	Adult	Male	5/23/2001	3.5	3.8	3.3	0.7	0.14	0.16	0.13	0.070	NaI_WBC
EN00035	Adult	Male	6/29/2001	4.5	4.8	4.2	0.8	0.098	0.11	0.085	0.088	NaI_WBC
EN00035	Adult	Male	10/5/2001	4.5	4.8	4.3	0.8	0.093	0.11	0.081	0.085	NaI_WBC
EN00035	Adult	Male	11/7/2001	3.6	3.8	3.3	0.8	0.061	0.072	0.050	0.093	NaI_WBC
EN00035	Adult	Male	12/13/2001	4.1	4.4	3.9	0.8	0.11	0.12	0.10	0.075	NaI_WBC
EN00036	Adult	Male	5/23/2001	3.8	4.1	3.6	0.7	0.24	0.26	0.22	0.092	NaI_WBC
EN00037	Adult	Male	5/23/2001	4.1	4.4	3.9	0.7	0.13	0.14	0.11	0.092	NaI_WBC
EN00038	Adult	Male	5/24/2001	4.1	4.3	3.8	0.8	0.25	0.27	0.23	0.11	NaI_WBC
EN00038	Adult	Male	6/29/2001	4.2	4.5	4.0	0.8	0.27	0.29	0.25	0.096	NaI_WBC
EN00038	Adult	Male	9/6/2001	4.6	4.8	4.3	0.8	0.28	0.30	0.26	0.10	NaI_WBC
EN00038	Adult	Male	10/5/2001	4.7	5.0	4.4	0.8	0.22	0.23	0.20	0.094	NaI_WBC
EN00038	Adult	Male	11/6/2001	4.2	4.5	3.9	0.8	0.14	0.15	0.12	0.087	NaI_WBC
EN00038	Adult	Male	12/14/2001	5.1	5.4	4.8	0.7	0.17	0.19	0.16	0.093	NaI_WBC
EN00039	Adult	Male	5/24/2001	4.4	4.7	4.1	0.8	0.31	0.33	0.29	0.079	NaI_WBC
EN00039	Adult	Male	7/10/2001	4.5	4.8	4.2	0.8	0.20	0.22	0.19	0.10	NaI_WBC
EN00039	Adult	Male	9/6/2001	4.2	4.5	4.0	0.8	0.27	0.29	0.25	0.10	NaI_WBC
EN00039	Adult	Male	10/5/2001	4.8	5.1	4.5	0.8	0.29	0.31	0.27	0.10	NaI_WBC
EN00039	Adult	Male	11/6/2001	4.1	4.4	3.9	0.8	0.23	0.25	0.21	0.10	NaI_WBC
EN00039	Adult	Male	12/5/2001	4.3	4.5	4.0	0.8	0.23	0.25	0.21	0.095	NaI_WBC
EN00040	Adult	Male	5/24/2001	4.4	4.7	4.1	0.8	0.032	0.042	0.023	0.086	NaI_WBC
EN00041	Adult	Male	5/24/2001	4.3	4.6	4.1	0.8	0.094	0.11	0.082	0.088	NaI_WBC
EN00042	Adult	Male	5/24/2001	4.6	4.9	4.3	0.8	0.19	0.21	0.18	0.098	NaI_WBC
EN00042	Adult	Male	9/6/2001	5.1	5.4	4.8	0.8	0.12	0.14	0.11	0.095	NaI_WBC
EN00042	Adult	Male	10/5/2001	5.3	5.6	5.0	0.8	0.11	0.12	0.098	0.088	NaI_WBC
EN00042	Adult	Male	11/7/2001	4.7	5.0	4.4	0.8	0.20	0.22	0.19	0.077	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	^{40}K (kBq) Upper	^{40}K (kBq) Lower	^{40}K (kBq) MDA	^{137}Cs (kBq) Value	^{137}Cs (kBq) Upper	^{137}Cs (kBq) Lower	^{137}Cs (kBq) MDA	Method Code
EN00042	Adult	Male	12/13/2001	5.3	5.6	4.9	0.8	0.16	0.18	0.15	0.090	NaI_WBC
EN00043	Adult	Male	5/24/2001	4.6	4.9	4.3	0.8	0.092	0.10	0.080	0.093	NaI_WBC
EN00043	Adult	Male	7/11/2001	4.8	5.1	4.5	0.8	0.050	0.061	0.040	0.088	NaI_WBC
EN00043	Adult	Male	9/6/2001	4.5	4.8	4.2	0.8	0.046	0.054	0.037	0.087	NaI_WBC
EN00043	Adult	Male	10/12/2001	4.3	4.5	4.0	0.7	0.077	0.088	0.066	0.082	NaI_WBC
EN00043	Adult	Male	11/6/2001	4.3	4.6	4.0	0.7	0.034	0.040	0.027	0.086	NaI_WBC
EN00043	Adult	Male	12/6/2001	4.3	4.6	4.0	0.8	0.077	0.089	0.066	0.085	NaI_WBC
EN00044	Adult	Male	5/25/2001	4.3	4.5	4.0	0.8	0.27	0.29	0.26	0.10	NaI_WBC
EN00045	Adult	Male	5/25/2001	4.1	4.4	3.8	1.1	0.34	0.36	0.31	0.15	NaI_WBC
EN00046	Adult	Male	5/25/2001	4.4	4.7	4.1	0.8	0.23	0.25	0.21	0.092	NaI_WBC
EN00047	Adult	Male	5/25/2001	4.3	4.6	4.0	0.8	0.17	0.18	0.15	0.096	NaI_WBC
EN00047	Adult	Male	6/29/2001	4.2	4.5	3.9	0.8	0.13	0.15	0.12	0.093	NaI_WBC
EN00047	Adult	Male	9/6/2001	4.1	4.3	3.8	0.7	0.17	0.18	0.15	0.088	NaI_WBC
EN00047	Adult	Male	10/5/2001	4.5	4.8	4.2	0.8	0.17	0.19	0.16	0.095	NaI_WBC
EN00047	Adult	Male	11/7/2001	3.6	3.9	3.4	0.8	0.14	0.15	0.12	0.089	NaI_WBC
EN00048	Adult	Male	5/25/2001	4.0	4.2	3.7	0.8	0.042	0.052	0.033	0.084	NaI_WBC
EN00049	Adult	Male	5/25/2001	4.0	4.2	3.7	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00050	Adult	Male	5/25/2001	4.5	4.8	4.2	0.8	0.094	0.11	0.082	0.087	NaI_WBC
EN00051	Adult	Male	5/25/2001	3.6	3.8	3.3	0.8	0.16	0.17	0.14	0.076	NaI_WBC
EN00052	Teenager	Male	5/25/2001	3.9	4.2	3.7	0.8	0.040	0.054	0.025	0.10	NaI_WBC
EN00053	Adult	Male	5/25/2001	4.3	4.5	4.0	0.7	0.17	0.18	0.15	0.077	NaI_WBC
EN00054	Adult	Male	5/25/2001	4.4	4.7	4.1	0.9	0.19	0.21	0.17	0.12	NaI_WBC
EN00055	Adult	Male	5/25/2001	4.3	4.6	4.0	0.8	0.16	0.18	0.15	0.10	NaI_WBC
EN00056	Adult	Male	5/28/2001	2.6	2.8	2.4	0.8	0.00	0.00	0.00	0.064	NaI_WBC
EN00057	Adult	Male	5/28/2001	4.3	4.6	4.0	0.8	0.26	0.28	0.24	0.10	NaI_WBC
EN00058	Adult	Male	5/28/2001	4.4	4.7	4.1	0.8	0.076	0.087	0.065	0.087	NaI_WBC
EN00059	Adult	Male	5/28/2001	3.8	4.0	3.5	0.8	0.23	0.24	0.21	0.10	NaI_WBC
EN00060	Adult	Male	5/28/2001	4.1	4.4	3.8	0.8	0.12	0.13	0.10	0.093	NaI_WBC
EN00061	Adult	Female	5/28/2001	2.4	2.6	2.2	0.8	0.00	0.00	0.00	0.064	NaI_WBC
EN00062	Adult	Female	5/28/2001	2.9	3.1	2.7	0.8	0.048	0.057	0.039	0.095	NaI_WBC
EN00063	Teenager	Female	5/28/2001	2.3	2.5	2.2	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00064	Adult	Male	5/28/2001	3.5	3.8	3.3	0.8	0.15	0.16	0.13	0.074	NaI_WBC
EN00065	Teenager	Male	5/28/2001	3.1	3.3	2.8	0.8	0.12	0.14	0.11	0.088	NaI_WBC
EN00066	Adult	Female	5/29/2001	3.1	3.3	2.9	0.7	0.27	0.29	0.25	0.10	NaI_WBC
EN00067	Adult	Male	5/29/2001	2.4	2.6	2.2	0.8	0.10	0.11	0.088	0.097	NaI_WBC
EN00068	Adult	Male	5/29/2001	4.4	4.7	4.1	0.8	0.14	0.16	0.13	0.094	NaI_WBC
EN00069	Adult	Male	5/30/2001	4.0	4.2	3.7	0.8	0.21	0.23	0.19	0.096	NaI_WBC
EN00070	Teenager	Male	5/30/2001	4.1	4.3	3.8	0.8	0.20	0.21	0.18	0.074	NaI_WBC
EN00071	Adult	Male	5/30/2001	4.9	5.2	4.6	0.8	0.19	0.20	0.17	0.078	NaI_WBC
EN00072	Adult	Female	5/30/2001	2.8	3.0	2.6	0.7	0.081	0.092	0.070	0.087	NaI_WBC
EN00073	Adult	Female	5/30/2001	2.5	2.7	2.3	0.8	0.086	0.097	0.076	0.072	NaI_WBC
EN00074	Adult	Female	5/30/2001	2.9	3.2	2.7	0.8	0.13	0.15	0.12	0.091	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	^{40}K (kBq) Upper	^{40}K (kBq) Lower	^{40}K (kBq) MDA	^{137}Cs (kBq) Value	^{137}Cs (kBq) Upper	^{137}Cs (kBq) Lower	^{137}Cs (kBq) MDA	Method Code
EN00075	Teenager	Male	5/30/2001	3.3	3.5	3.1	0.8	0.063	0.074	0.052	0.091	NaI_WBC
EN00076	Teenager	Male	5/30/2001	2.7	3.0	2.5	0.8	0.077	0.088	0.067	0.079	NaI_WBC
EN00077	Adult	Female	5/30/2001	2.4	2.6	2.2	0.8	0.056	0.067	0.045	0.087	NaI_WBC
EN00078	Adult	Female	5/30/2001	3.8	4.0	3.5	0.8	0.11	0.12	0.095	0.093	NaI_WBC
EN00079	Adult	Female	5/30/2001	2.8	3.0	2.6	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00080	Adult	Male	5/30/2001	3.3	3.5	3.1	0.8	0.083	0.095	0.071	0.085	NaI_WBC
EN00081	Adult	Male	5/30/2001	3.4	3.6	3.1	0.8	0.19	0.21	0.18	0.086	NaI_WBC
EN00082	Teenager	Male	5/30/2001	3.8	4.0	3.5	0.8	0.11	0.12	0.096	0.084	NaI_WBC
EN00083	Teenager	Male	5/30/2001	3.9	4.1	3.6	0.7	0.11	0.12	0.098	0.10	NaI_WBC
EN00084	Adult	Male	5/30/2001	4.6	4.9	4.3	0.8	0.12	0.13	0.11	0.095	NaI_WBC
EN00084	Adult	Male	6/29/2001	4.5	4.8	4.2	0.8	0.13	0.15	0.12	0.089	NaI_WBC
EN00084	Adult	Male	9/6/2001	4.7	5.0	4.4	0.8	0.10	0.12	0.091	0.090	NaI_WBC
EN00084	Adult	Male	10/5/2001	5.2	5.5	4.9	0.8	0.15	0.16	0.13	0.090	NaI_WBC
EN00084	Adult	Male	11/7/2001	4.7	4.9	4.4	0.8	0.18	0.20	0.17	0.10	NaI_WBC
EN00084	Adult	Male	12/12/2001	4.2	4.5	3.9	0.8	0.13	0.15	0.12	0.084	NaI_WBC
EN00085	Adult	Male	5/30/2001	4.3	4.6	4.1	0.8	0.19	0.20	0.17	0.10	NaI_WBC
EN00086	Adult	Male	5/31/2001	3.5	3.8	3.3	0.8	0.26	0.28	0.24	0.078	NaI_WBC
EN00087	Adult	Male	5/31/2001	4.2	4.4	3.9	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00088	Adult	Male	5/31/2001	4.5	4.8	4.2	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00089	Teenager	Male	5/31/2001	4.0	4.3	3.8	0.8	0.086	0.097	0.075	0.080	NaI_WBC
EN00090	Adult	Male	5/31/2001	3.8	4.1	3.6	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00091	Adult	Male	5/31/2001	3.9	4.1	3.6	0.8	0.06	0.074	0.052	0.095	NaI_WBC
EN00092	Adult	Male	6/2/2001	4.5	4.8	4.3	0.7	0.069	0.081	0.058	0.10	NaI_WBC
EN00093	Adult	Male	6/2/2001	3.9	4.2	3.7	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00094	Adult	Male	6/2/2001	4.6	4.9	4.3	0.7	0.30	0.32	0.28	0.106	NaI_WBC
EN00095	Adult	Male	6/2/2001	4.3	4.6	4.1	0.8	0.13	0.14	0.11	0.078	NaI_WBC
EN00096	Adult	Male	6/2/2001	4.0	4.2	3.7	0.7	0.053	0.064	0.042	0.086	NaI_WBC
EN00097	Adult	Male	6/2/2001	4.1	4.3	3.8	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00098	Adult	Male	6/2/2001	4.7	4.9	4.4	0.8	0.19	0.20	0.17	0.078	NaI_WBC
EN00099	Adult	Male	6/2/2001	5.1	5.4	4.8	0.8	0.097	0.11	0.084	0.10	NaI_WBC
EN00100	Adult	Male	6/4/2001	3.6	3.9	3.4	0.8	0.21	0.22	0.19	0.098	NaI_WBC
EN00101	Adult	Male	6/4/2001	5.0	5.3	4.7	0.8	0.087	0.098	0.076	0.079	NaI_WBC
EN00102	Adult	Male	6/4/2001	4.2	4.5	3.9	0.8	0.075	0.084	0.065	0.068	NaI_WBC
EN00103	Adult	Male	6/4/2001	4.3	4.6	4.0	0.8	0.079	0.090	0.068	0.093	NaI_WBC
EN00104	Adult	Male	6/4/2001	4.6	4.9	4.3	0.8	0.19	0.21	0.17	0.10	NaI_WBC
EN00105	Adult	Male	6/4/2001	4.3	4.6	4.0	0.8	0.14	0.15	0.12	0.085	NaI_WBC
EN00106	Adult	Male	6/4/2001	3.6	3.8	3.4	0.7	0.11	0.12	0.098	0.082	NaI_WBC
EN00107	Adult	Male	6/4/2001	4.4	4.6	4.1	0.8	0.15	0.16	0.14	0.091	NaI_WBC
EN00108	Adult	Male	6/4/2001	4.0	4.3	3.7	0.8	0.33	0.35	0.30	0.10	NaI_WBC
EN00109	Adult	Male	6/4/2001	4.5	4.8	4.2	0.8	0.12	0.13	0.10	0.074	NaI_WBC
EN00110	Adult	Male	6/4/2001	3.7	3.9	3.5	0.8	0.15	0.17	0.14	0.076	NaI_WBC
EN00111	Adult	Male	6/4/2001	4.9	5.2	4.6	0.8	0.099	0.11	0.087	0.086	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq)				^{137}Cs (kBq)				Method Code
				Value	Upper	Lower	MDA	Value	Upper	Lower	MDA	
EN00112	Teenager	Male	6/6/2001	2.7	2.9	2.5	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00113	Teenager	Male	6/6/2001	3.1	3.3	2.9	0.7	0.00	0.00	0.00	0.059	NaI_WBC
EN00114	Adult	Male	6/6/2001	4.1	4.3	3.8	0.8	0.46	0.49	0.44	0.10	NaI_WBC
EN00115	Adult	Male	6/6/2001	3.5	3.8	3.3	0.8	0.055	0.066	0.044	0.080	NaI_WBC
EN00116	Adult	Male	6/6/2001	4.2	4.4	3.9	0.8	0.75	0.79	0.71	0.11	NaI_WBC
EN00116	Adult	Male	9/14/2001	4.7	4.9	4.4	0.8	0.69	0.73	0.66	0.11	NaI_WBC
EN00116	Adult	Male	10/5/2001	4.9	5.2	4.6	0.7	0.65	0.69	0.61	0.11	NaI_WBC
EN00116	Adult	Male	11/7/2001	4.3	4.5	4.0	0.8	0.46	0.49	0.44	0.11	NaI_WBC
EN00116	Adult	Male	12/14/2001	4.7	4.9	4.4	0.8	0.47	0.50	0.44	0.11	NaI_WBC
EN00117	Adult	Male	6/6/2001	3.7	3.9	3.4	0.8	0.22	0.24	0.21	0.10	NaI_WBC
EN00118	Adult	Male	6/6/2001	4.5	4.7	4.2	0.8	0.056	0.066	0.046	0.075	NaI_WBC
EN00119	Teenager	Male	6/6/2001	3.4	3.6	3.1	0.8	0.095	0.11	0.083	0.091	NaI_WBC
EN00120	Adult	Male	6/6/2001	4.2	4.4	3.9	0.8	0.00	0.00	0.00	0.064	NaI_WBC
EN00121	Teenager	Male	6/6/2001	3.9	4.1	3.6	0.7	0.15	0.16	0.13	0.077	NaI_WBC
EN00122	Adult	Male	6/6/2001	3.6	3.8	3.3	0.8	0.047	0.058	0.036	0.084	NaI_WBC
EN00123	Adult	Male	6/6/2001	4.0	4.2	3.7	0.8	0.11	0.12	0.10	0.090	NaI_WBC
EN00124	Adult	Male	6/7/2001	4.1	4.3	3.8	0.8	0.093	0.10	0.082	0.076	NaI_WBC
EN00125	Adult	Male	6/7/2001	3.7	4.0	3.5	0.8	0.078	0.089	0.066	0.083	NaI_WBC
EN00126	Adult	Male	6/7/2001	3.5	3.7	3.3	0.8	0.20	0.22	0.18	0.11	NaI_WBC
EN00127	Adult	Male	6/7/2001	4.5	4.8	4.2	0.8	0.29	0.31	0.27	0.10	NaI_WBC
EN00128	Adult	Male	6/7/2001	3.5	3.7	3.3	0.8	0.041	0.051	0.030	0.090	NaI_WBC
EN00129	Adult	Male	6/7/2001	3.8	4.1	3.6	0.8	0.15	0.16	0.13	0.080	NaI_WBC
EN00130	Adult	Male	6/7/2001	4.5	4.8	4.3	0.7	0.00	0.00	0.00	0.063	NaI_WBC
EN00131	Adult	Male	6/7/2001	4.5	4.8	4.2	0.8	0.17	0.19	0.16	0.078	NaI_WBC
EN00132	Adult	Male	6/8/2001	4.3	4.6	4.1	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00133	Adult	Male	6/8/2001	4.7	5.0	4.4	0.8	0.13	0.14	0.12	0.093	NaI_WBC
EN00134	Adult	Male	6/8/2001	4.2	4.5	3.8	1.4	0.00	0.00	0.00	0.11	NaI_WBC
EN00135	Adult	Male	6/8/2001	3.4	3.6	3.1	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00136	Teenager	Male	6/8/2001	3.3	3.6	3.1	0.8	0.00	0.00	0.00	0.059	NaI_WBC
EN00137	Adult	Male	6/8/2001	4.3	4.6	4.0	0.8	0.17	0.19	0.16	0.10	NaI_WBC
EN00138	Adult	Male	6/8/2001	4.8	5.1	4.5	0.8	0.13	0.14	0.12	0.091	NaI_WBC
EN00139	Teenager	Male	6/8/2001	3.6	3.8	3.4	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00140	Teenager	Male	6/8/2001	4.1	4.3	3.8	0.8	0.040	0.053	0.028	0.10	NaI_WBC
EN00141	Adult	Male	6/11/2001	3.6	3.9	3.4	0.8	0.38	0.40	0.35	0.10	NaI_WBC
EN00142	Adult	Male	6/11/2001	4.1	4.4	3.9	0.8	0.33	0.35	0.30	0.10	NaI_WBC
EN00143	Adult	Male	6/11/2001	4.0	4.3	3.7	0.8	0.11	0.12	0.096	0.089	NaI_WBC
EN00144	Adult	Male	6/11/2001	4.6	4.9	4.3	0.8	0.16	0.18	0.15	0.095	NaI_WBC
EN00145	Adult	Male	6/11/2001	4.1	4.3	3.8	0.8	0.18	0.19	0.16	0.093	NaI_WBC
EN00146	Adult	Male	6/11/2001	2.9	3.1	2.7	0.8	0.18	0.20	0.17	0.087	NaI_WBC
EN00147	Adult	Male	6/11/2001	3.9	4.2	3.7	0.7	0.15	0.17	0.14	0.093	NaI_WBC
EN00148	Adult	Male	6/11/2001	3.6	3.9	3.4	0.8	0.22	0.23	0.20	0.097	NaI_WBC
EN00149	Adult	Male	6/11/2001	2.9	3.1	2.7	0.8	0.13	0.14	0.11	0.086	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq)				^{137}Cs (kBq)				Method Code
				Value	Upper	Lower	MDA	Value	Upper	Lower	MDA	
EN00150	Adult	Male	6/12/2001	3.7	4.0	3.5	0.8	0.093	0.11	0.082	0.091	NaI_WBC
EN00151	Adult	Male	6/12/2001	3.9	4.1	3.6	0.8	0.70	0.74	0.66	0.11	NaI_WBC
EN00151	Adult	Male	8/13/2001	4.2	4.5	3.9	0.8	0.78	0.82	0.74	0.11	NaI_WBC
EN00151	Adult	Male	9/6/2001	4.5	4.7	4.2	0.8	0.76	0.80	0.71	0.11	NaI_WBC
EN00151	Adult	Male	10/5/2001	4.5	4.7	4.2	0.8	0.74	0.78	0.70	0.11	NaI_WBC
EN00151	Adult	Male	11/7/2001	3.8	4.1	3.6	0.8	0.60	0.64	0.57	0.10	NaI_WBC
EN00151	Adult	Male	12/13/2001	4.3	4.6	4.1	0.8	0.52	0.55	0.49	0.11	NaI_WBC
EN00152	Adult	Male	6/12/2001	2.9	3.2	2.7	0.8	0.26	0.28	0.24	0.093	NaI_WBC
EN00153	Adult	Male	6/12/2001	3.4	3.6	3.2	0.8	0.17	0.18	0.15	0.092	NaI_WBC
EN00154	Adult	Male	6/12/2001	4.2	4.5	4.0	0.7	0.15	0.16	0.13	0.076	NaI_WBC
EN00155	Adult	Male	6/12/2001	3.5	3.8	3.3	0.8	0.11	0.12	0.097	0.086	NaI_WBC
EN00156	Teenager	Male	6/12/2001	4.0	4.2	3.7	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00157	Teenager	Male	6/12/2001	4.8	5.1	4.5	0.7	0.00	0.00	0.00	0.063	NaI_WBC
EN00158	Teenager	Male	6/13/2001	2.8	3.0	2.6	0.8	0.061	0.072	0.051	0.097	NaI_WBC
EN00159	Adult	Male	6/13/2001	3.4	3.7	3.2	0.7	0.054	0.063	0.045	0.093	NaI_WBC
EN00160	Adult	Male	6/14/2001	4.3	4.6	4.0	0.7	0.33	0.35	0.30	0.11	NaI_WBC
EN00161	Teenager	Male	6/14/2001	3.7	4.0	3.5	0.8	0.00	0.00	0.00	0.059	NaI_WBC
EN00162	Adult	Male	6/14/2001	3.7	3.9	3.4	0.8	0.12	0.13	0.11	0.086	NaI_WBC
EN00163	Adult	Male	6/14/2001	4.2	4.5	4.0	0.8	0.15	0.16	0.13	0.074	NaI_WBC
EN00164	Adult	Male	6/15/2001	3.7	3.9	3.5	0.8	0.40	0.43	0.38	0.11	NaI_WBC
EN00165	Adult	Male	6/15/2001	4.3	4.5	4.0	0.8	0.14	0.15	0.12	0.089	NaI_WBC
EN00166	Teenager	Male	6/15/2001	3.2	3.4	3.0	0.7	0.19	0.21	0.18	0.098	NaI_WBC
EN00167	Adult	Male	6/15/2001	3.9	4.2	3.7	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00168	Adult	Male	6/15/2001	4.8	5.1	4.5	0.8	0.00	0.00	0.00	0.065	NaI_WBC
EN00169	Adult	Male	6/19/2001	2.7	2.9	2.5	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00170	Adult	Male	6/19/2001	4.4	4.7	4.1	0.8	0.17	0.19	0.16	0.096	NaI_WBC
EN00171	Adult	Male	6/20/2001	3.4	3.7	3.2	0.7	0.00	0.00	0.00	0.064	NaI_WBC
EN00172	Adult	Male	6/20/2001	4.6	4.9	4.3	0.8	0.13	0.14	0.11	0.095	NaI_WBC
EN00173	Adult	Male	6/22/2001	4.1	4.3	3.8	0.8	0.18	0.20	0.17	0.099	NaI_WBC
EN00174	Adult	Male	6/22/2001	4.9	5.2	4.6	0.8	0.00	0.00	0.00	0.066	NaI_WBC
EN00175	Adult	Male	6/22/2001	4.7	5.0	4.4	0.8	0.095	0.11	0.084	0.089	NaI_WBC
EN00176	Adult	Male	6/25/2001	4.3	4.6	4.0	0.7	0.39	0.41	0.37	0.10	NaI_WBC
EN00177	Adult	Male	6/28/2001	4.9	5.2	4.6	0.7	0.13	0.14	0.12	0.088	NaI_WBC
EN00178	Adult	Male	7/2/2001	4.4	4.7	4.1	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00179	Adult	Female	7/9/2001	2.9	3.1	2.7	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00180	Child	Male	7/9/2001	2.5	2.7	2.3	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00181	Teenager	Male	7/9/2001	3.6	3.9	3.4	0.7	0.043	0.054	0.033	0.087	NaI_WBC
EN00182	Teenager	Male	7/9/2001	2.5	2.7	2.3	0.8	0.00	0.00	0.00	0.059	NaI_WBC
EN00183	Adult	Male	7/10/2001	4.3	4.5	4.0	0.8	0.21	0.23	0.19	0.10	NaI_WBC
EN00184	Adult	Male	7/10/2001	4.0	4.3	3.8	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00185	Adult	Male	7/10/2001	4.6	4.8	4.3	0.8	0.29	0.31	0.27	0.11	NaI_WBC
EN00186	Adult	Male	7/10/2001	4.2	4.4	3.9	0.7	0.12	0.13	0.11	0.074	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	^{40}K (kBq) Upper	^{40}K (kBq) Lower	^{40}K (kBq) MDA	^{137}Cs (kBq) Value	^{137}Cs (kBq) Upper	^{137}Cs (kBq) Lower	^{137}Cs (kBq) MDA	Method Code
EN00187	Adult	Male	7/10/2001	4.3	4.6	4.1	0.8	0.093	0.10	0.082	0.073	NaI_WBC
EN00188	Adult	Male	7/10/2001	5.0	5.3	4.7	0.8	0.00	0.00	0.00	0.059	NaI_WBC
EN00189	Adult	Male	7/10/2001	3.9	4.1	3.6	0.8	0.081	0.092	0.070	0.10	NaI_WBC
EN00190	Adult	Male	7/10/2001	5.0	5.3	4.7	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00191	Adult	Male	7/10/2001	4.6	4.9	4.3	0.7	0.00	0.00	0.00	0.063	NaI_WBC
EN00192	Adult	Male	7/10/2001	3.6	3.9	3.4	0.8	0.00	0.00	0.00	0.059	NaI_WBC
EN00193	Adult	Female	7/10/2001	3.2	3.4	2.9	0.7	0.00	0.00	0.00	0.064	NaI_WBC
EN00194	Adult	Male	7/11/2001	5.4	5.7	5.1	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00195	Adult	Male	7/11/2001	3.8	4.1	3.6	0.8	0.052	0.061	0.043	0.089	NaI_WBC
EN00196	Adult	Female	7/11/2001	2.9	3.1	2.7	0.7	0.056	0.068	0.044	0.10	NaI_WBC
EN00197	Adult	Female	7/11/2001	2.7	2.9	2.5	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00198	Teenager	Female	7/11/2001	2.8	3.0	2.6	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00200	Adult	Male	7/12/2001	3.7	3.9	3.4	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00201	Adult	Female	7/12/2001	2.3	2.5	2.1	0.8	0.22	0.24	0.21	0.099	NaI_WBC
EN00202	Adult	Female	7/12/2001	2.4	2.6	2.2	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00203	Adult	Female	7/12/2001	3.2	3.4	2.9	0.7	0.13	0.14	0.11	0.086	NaI_WBC
EN00204	Adult	Female	7/12/2001	3.0	3.3	2.8	0.7	0.11	0.13	0.10	0.090	NaI_WBC
EN00205	Adult	Female	7/12/2001	3.1	3.3	2.9	0.7	0.20	0.22	0.18	0.097	NaI_WBC
EN00206	Adult	Male	7/12/2001	4.5	4.8	4.3	0.7	0.10	0.11	0.090	0.086	NaI_WBC
EN00207	Adult	Female	7/13/2001	2.8	3.0	2.6	0.7	0.062	0.072	0.051	0.093	NaI_WBC
EN00208	Adult	Female	7/13/2001	3.1	3.4	2.9	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00209	Adult	Female	7/13/2001	3.1	3.3	2.8	0.7	0.11	0.12	0.096	0.072	NaI_WBC
EN00210	Adult	Female	7/13/2001	2.5	2.7	2.3	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00211	Adult	Female	7/13/2001	3.1	3.3	2.9	0.7	0.22	0.24	0.20	0.10	NaI_WBC
EN00212	Adult	Female	7/13/2001	2.3	2.5	2.1	0.7	0.00	0.00	0.00	0.063	NaI_WBC
EN00213	Adult	Female	7/13/2001	3.6	3.8	3.3	0.7	0.18	0.20	0.17	0.10	NaI_WBC
EN00214	Adult	Female	7/13/2001	2.9	3.1	2.7	0.8	0.056	0.070	0.042	0.10	NaI_WBC
EN00215	Adult	Female	7/13/2001	3.3	3.5	3.1	0.7	0.074	0.085	0.064	0.072	NaI_WBC
EN00216	Teenager	Female	7/13/2001	2.5	2.7	2.3	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00217	Child	Female	7/13/2001	2.4	2.6	2.2	0.8	0.00	0.00	0.00	0.058	NaI_WBC
EN00218	Adult	Female	7/13/2001	2.6	2.8	2.4	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00219	Teenager	Female	7/13/2001	3.0	3.2	2.7	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00220	Adult	Female	7/13/2001	2.8	3.0	2.6	0.7	0.11	0.12	0.095	0.082	NaI_WBC
EN00221	Adult	Female	7/13/2001	3.4	3.6	3.2	0.7	0.089	0.10	0.078	0.073	NaI_WBC
EN00222	Adult	Female	7/13/2001	2.8	3.0	2.6	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00223	Teenager	Male	7/24/2001	2.7	2.9	2.5	0.8	0.084	0.095	0.073	0.087	NaI_WBC
EN00224	Teenager	Male	7/24/2001	3.9	4.1	3.6	0.8	0.067	0.077	0.058	0.070	NaI_WBC
EN00225	Teenager	Male	7/24/2001	2.2	2.4	2.0	0.8	0.067	0.077	0.057	0.088	NaI_WBC
EN00226	Teenager	Male	7/24/2001	4.4	4.6	4.1	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00227	Adult	Male	7/24/2001	4.5	4.8	4.2	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00228	Adult	Male	7/24/2001	4.1	4.4	3.9	0.8	0.068	0.078	0.057	0.086	NaI_WBC
EN00229	Teenager	Male	7/26/2001	3.7	4.0	3.5	0.8	0.035	0.045	0.025	0.085	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	^{40}K (kBq) Upper	^{40}K (kBq) Lower	^{40}K (kBq) MDA	^{137}Cs (kBq) Value	^{137}Cs (kBq) Upper	^{137}Cs (kBq) Lower	^{137}Cs (kBq) MDA	Method Code
EN00230	Adult	Male	7/31/2001	3.4	3.7	3.2	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00231	Child	Female	8/9/2001	2.1	2.3	1.9	0.7	0.00	0.00	0.00	0.056	NaI_WBC
EN00232	Child	Female	8/9/2001	2.4	2.6	2.2	0.7	0.00	0.00	0.00	0.059	NaI_WBC
EN00233	Child	Female	8/9/2001	2.6	2.7	2.4	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00234	Child	Female	8/9/2001	2.2	2.3	2.0	0.8	0.00	0.00	0.00	0.058	NaI_WBC
EN00235	Adult	Male	8/10/2001	3.7	4.0	3.5	0.8	0.21	0.23	0.19	0.093	NaI_WBC
EN00236	Adult	Female	8/10/2001	2.8	3.0	2.6	0.7	0.046	0.056	0.036	0.085	NaI_WBC
EN00237	Adult	Female	8/10/2001	2.4	2.6	2.2	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00238	Adult	Male	8/10/2001	3.9	4.2	3.7	0.8	0.00	0.00	0.00	0.065	NaI_WBC
EN00239	Adult	Female	8/10/2001	2.5	2.7	2.3	0.8	0.21	0.22	0.19	0.090	NaI_WBC
EN00240	Adult	Female	8/10/2001	2.6	2.8	2.5	0.8	0.042	0.051	0.033	0.084	NaI_WBC
EN00241	Adult	Female	8/10/2001	2.4	2.6	2.2	0.8	0.083	0.095	0.071	0.098	NaI_WBC
EN00242	Adult	Female	8/13/2001	2.7	2.9	2.5	0.7	0.066	0.076	0.057	0.072	NaI_WBC
EN00243	Adult	Male	8/13/2001	4.2	4.5	3.9	0.7	0.041	0.052	0.031	0.095	NaI_WBC
EN00244	Adult	Male	8/13/2001	4.6	4.9	4.3	0.8	0.29	0.31	0.27	0.11	NaI_WBC
EN00245	Adult	Female	8/13/2001	2.9	3.1	2.7	0.8	0.066	0.076	0.055	0.083	NaI_WBC
EN00246	Adult	Female	8/13/2001	2.7	2.9	2.5	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00247	Adult	Female	8/13/2001	2.8	3.0	2.6	0.7	0.073	0.084	0.062	0.091	NaI_WBC
EN00248	Adult	Female	8/13/2001	3.3	3.6	3.1	0.7	0.036	0.044	0.028	0.082	NaI_WBC
EN00249	Adult	Female	8/13/2001	3.1	3.3	2.9	0.8	0.072	0.084	0.061	0.085	NaI_WBC
EN00250	Adult	Female	8/14/2001	3.1	3.3	2.9	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00251	Adult	Female	8/14/2001	3.1	3.4	2.9	0.7	0.22	0.24	0.21	0.10	NaI_WBC
EN00252	Adult	Female	8/14/2001	2.8	3.0	2.6	0.7	0.34	0.36	0.31	0.099	NaI_WBC
EN00253	Adult	Female	8/14/2001	3.1	3.3	2.8	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00254	Adult	Female	8/14/2001	2.9	3.1	2.7	0.8	0.082	0.093	0.070	0.088	NaI_WBC
EN00255	Adult	Male	8/14/2001	4.9	5.2	4.6	0.9	0.15	0.17	0.14	0.10	NaI_WBC
EN00256	Adult	Female	8/14/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00257	Adult	Female	8/14/2001	3.4	3.6	3.2	0.8	0.00	0.00	0.00	0.064	NaI_WBC
EN00258	Adult	Female	8/14/2001	3.1	3.3	2.9	0.8	0.034	0.042	0.026	0.088	NaI_WBC
EN00259	Adult	Female	8/14/2001	2.9	3.1	2.7	0.8	0.078	0.090	0.067	0.083	NaI_WBC
EN00260	Adult	Female	8/14/2001	3.3	3.5	3.0	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00261	Adult	Female	8/14/2001	2.7	2.9	2.6	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00262	Adult	Female	8/15/2001	3.4	3.6	3.2	0.8	0.19	0.21	0.18	0.094	NaI_WBC
EN00263	Adult	Female	8/15/2001	2.8	3.0	2.6	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00264	Adult	Female	8/15/2001	3.0	3.2	2.8	0.7	0.11	0.12	0.099	0.088	NaI_WBC
EN00265	Adult	Female	8/15/2001	2.7	2.9	2.6	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00266	Adult	Female	8/15/2001	3.4	3.6	3.2	0.8	0.14	0.16	0.13	0.076	NaI_WBC
EN00267	Adult	Female	8/15/2001	3.1	3.3	2.9	0.7	0.11	0.12	0.097	0.078	NaI_WBC
EN00268	Adult	Female	8/15/2001	2.6	2.8	2.4	0.7	0.052	0.063	0.041	0.093	NaI_WBC
EN00269	Adult	Female	8/15/2001	2.7	2.9	2.5	0.7	0.38	0.40	0.35	0.10	NaI_WBC
EN00270	Adult	Female	8/15/2001	2.9	3.1	2.7	0.7	0.20	0.21	0.18	0.092	NaI_WBC
EN00271	Adult	Female	8/15/2001	2.7	2.9	2.5	0.7	0.16	0.18	0.15	0.093	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	Upper	Lower	MDA	^{137}Cs (kBq) Value	Upper	Lower	MDA	Method Code
EN00272	Teenager	Female	8/15/2001	2.8	3.0	2.6	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00273	Adult	Female	8/15/2001	3.0	3.2	2.8	0.8	0.35	0.38	0.33	0.10	NaI_WBC
EN00274	Adult	Female	8/16/2001	3.0	3.2	2.8	0.7	0.29	0.31	0.27	0.098	NaI_WBC
EN00275	Adult	Female	8/16/2001	2.6	2.8	2.4	0.8	0.11	0.13	0.10	0.090	NaI_WBC
EN00276	Adult	Female	8/16/2001	3.4	3.6	3.2	0.8	0.11	0.13	0.10	0.086	NaI_WBC
EN00277	Adult	Female	8/16/2001	2.7	2.9	2.5	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00278	Adult	Female	8/16/2001	2.8	3.0	2.6	0.8	0.18	0.19	0.16	0.086	NaI_WBC
EN00279	Adult	Female	8/16/2001	2.4	2.5	2.2	0.8	0.059	0.069	0.049	0.076	NaI_WBC
EN00280	Adult	Female	8/16/2001	2.6	2.7	2.4	0.8	0.10	0.11	0.090	0.073	NaI_WBC
EN00281	Adult	Female	8/16/2001	2.6	2.8	2.4	0.8	0.071	0.081	0.061	0.068	NaI_WBC
EN00282	Adult	Female	8/16/2001	3.1	3.3	2.9	0.8	0.10	0.11	0.088	0.089	NaI_WBC
EN00283	Adult	Female	8/16/2001	2.9	3.1	2.7	0.7	0.00	0.00	0.00	0.059	NaI_WBC
EN00284	Adult	Female	8/16/2001	2.8	3.0	2.6	0.8	0.12	0.14	0.11	0.076	NaI_WBC
EN00285	Adult	Female	8/17/2001	2.5	2.7	2.3	0.7	0.078	0.088	0.067	0.073	NaI_WBC
EN00286	Adult	Female	8/17/2001	2.7	2.9	2.5	0.8	0.19	0.20	0.17	0.10	NaI_WBC
EN00287	Adult	Female	8/17/2001	2.4	2.6	2.2	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00288	Teenager	Female	8/17/2001	2.7	2.9	2.5	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00289	Adult	Male	8/17/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.057	NaI_WBC
EN00290	Adult	Female	8/17/2001	2.9	3.1	2.7	0.7	0.11	0.12	0.095	0.072	NaI_WBC
EN00291	Adult	Female	8/17/2001	2.7	2.9	2.6	0.7	0.20	0.22	0.18	0.078	NaI_WBC
EN00292	Adult	Female	8/17/2001	2.8	3.0	2.6	0.8	0.073	0.084	0.062	0.091	NaI_WBC
EN00293	Adult	Female	8/17/2001	2.6	2.8	2.4	0.7	0.052	0.061	0.043	0.097	NaI_WBC
EN00294	Adult	Female	8/17/2001	2.5	2.7	2.4	0.7	0.050	0.060	0.040	0.082	NaI_WBC
EN00295	Adult	Female	8/17/2001	3.0	3.2	2.8	0.8	0.036	0.046	0.026	0.084	NaI_WBC
EN00295	Adult	Female	8/17/2001	2.8	3.3	2.3	2.4	0.00	0.00	0.00	0.22	NaI_WBC
EN00295	Adult	Female	9/28/2001	2.8	3.0	2.6	0.7	0.028	0.037	0.019	0.075	NaI_WBC
EN00296	Adult	Female	8/20/2001	3.1	3.4	2.9	0.8	0.26	0.28	0.24	0.10	NaI_WBC
EN00297	Adult	Female	8/20/2001	2.9	3.1	2.7	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00298	Adult	Female	8/20/2001	2.4	2.6	2.3	0.8	0.093	0.10	0.082	0.085	NaI_WBC
EN00299	Teenager	Female	8/20/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00300	Adult	Female	8/20/2001	2.6	2.8	2.4	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00301	Teenager	Female	8/20/2001	2.7	2.9	2.5	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00302	Adult	Female	8/20/2001	2.5	2.7	2.3	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00303	Adult	Female	8/20/2001	2.2	2.4	2.0	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00304	Teenager	Female	8/20/2001	3.1	3.3	2.9	0.8	0.11	0.12	0.097	0.075	NaI_WBC
EN00305	Adult	Female	8/21/2001	3.5	3.7	3.2	0.7	0.069	0.081	0.058	0.086	NaI_WBC
EN00306	Adult	Female	8/21/2001	3.1	3.3	2.9	0.7	0.053	0.062	0.045	0.10	NaI_WBC
EN00307	Adult	Female	8/21/2001	2.8	3.0	2.6	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00308	Adult	Female	8/21/2001	3.2	3.4	3.0	0.8	0.00	0.00	0.00	0.058	NaI_WBC
EN00309	Teenager	Female	8/21/2001	3.1	3.3	2.9	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00310	Adult	Male	8/27/2001	4.6	4.9	4.3	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00311	Adult	Female	8/27/2001	2.2	2.4	2.0	0.8	0.00	0.00	0.00	0.058	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq)				^{137}Cs (kBq)				Method Code
				Value	Upper	Lower	MDA	Value	Upper	Lower	MDA	
EN00312	Teenager	Female	8/27/2001	2.7	2.9	2.5	0.8	0.00	0.00	0.00	0.059	NaI_WBC
EN00313	Teenager	Female	8/27/2001	2.6	2.8	2.4	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00314	Adult	Female	8/27/2001	3.0	3.2	2.8	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00315	Adult	Female	8/27/2001	2.7	2.9	2.5	0.8	0.00	0.00	0.00	0.057	NaI_WBC
EN00316	Adult	Female	8/27/2001	2.6	2.7	2.4	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00317	Adult	Female	8/27/2001	2.5	2.7	2.3	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00318	Adult	Female	8/28/2001	2.6	2.8	2.5	0.8	0.043	0.054	0.033	0.091	NaI_WBC
EN00319	Adult	Female	8/28/2001	2.9	3.1	2.7	0.8	0.11	0.13	0.10	0.077	NaI_WBC
EN00320	Adult	Female	8/28/2001	2.9	3.2	2.7	0.8	0.00	0.00	0.00	0.057	NaI_WBC
EN00321	Adult	Male	8/28/2001	4.3	4.6	4.0	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00322	Adult	Female	8/28/2001	3.1	3.3	2.9	0.7	0.089	0.10	0.078	0.074	NaI_WBC
EN00323	Adult	Female	8/28/2001	2.5	2.7	2.3	0.8	0.073	0.085	0.060	0.10	NaI_WBC
EN00324	Adult	Female	9/3/2001	2.6	2.8	2.5	0.8	0.076	0.087	0.065	0.082	NaI_WBC
EN00325	Adult	Female	9/3/2001	2.8	3.0	2.6	0.7	0.078	0.090	0.067	0.10	NaI_WBC
EN00326	Adult	Female	9/3/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00327	Adult	Male	9/5/2001	5.0	5.3	4.8	0.8	0.049	0.059	0.038	0.085	NaI_WBC
EN00328	Adult	Male	9/10/2001	4.6	4.9	4.3	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00329	Adult	Female	9/11/2001	3.5	3.8	3.3	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00330	Adult	Female	9/11/2001	3.2	3.4	2.9	0.7	0.11	0.12	0.093	0.079	NaI_WBC
EN00331	Adult	Female	9/11/2001	3.0	3.2	2.8	0.7	0.18	0.20	0.17	0.076	NaI_WBC
EN00332	Adult	Female	9/11/2001	3.2	3.5	3.0	0.8	0.098	0.11	0.086	0.087	NaI_WBC
EN00333	Adult	Female	9/11/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.059	NaI_WBC
EN00334	Adult	Female	9/11/2001	3.1	3.4	2.9	0.8	0.11	0.12	0.096	0.091	NaI_WBC
EN00335	Adult	Female	9/13/2001	3.6	3.8	3.4	0.7	0.00	0.00	0.00	0.063	NaI_WBC
EN00336	Adult	Female	9/13/2001	3.4	3.6	3.2	0.7	0.092	0.10	0.080	0.083	NaI_WBC
EN00337	Adult	Female	9/13/2001	2.9	3.1	2.7	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00338	Adult	Female	9/13/2001	3.2	3.4	3.0	0.8	0.086	0.097	0.075	0.075	NaI_WBC
EN00339	Adult	Female	9/13/2001	3.3	3.6	3.1	0.8	0.10	0.12	0.090	0.10	NaI_WBC
EN00340	Adult	Female	9/13/2001	3.3	3.5	3.1	0.8	0.077	0.088	0.067	0.074	NaI_WBC
EN00341	Adult	Male	9/19/2001	4.5	4.8	4.2	0.7	0.069	0.080	0.059	0.090	NaI_WBC
EN00342	Adult	Male	9/19/2001	4.8	5.1	4.5	0.8	0.00	0.00	0.00	0.058	NaI_WBC
EN00343	Adult	Female	9/21/2001	2.6	2.7	2.4	0.7	0.00	0.00	0.00	0.056	NaI_WBC
EN00344	Adult	Male	9/21/2001	5.0	5.3	4.7	0.8	0.00	0.00	0.00	0.065	NaI_WBC
EN00345	Adult	Female	9/21/2001	2.7	2.9	2.5	0.7	0.050	0.060	0.040	0.10	NaI_WBC
EN00346	Adult	Female	9/21/2001	3.2	3.5	3.0	0.8	0.10	0.12	0.092	0.083	NaI_WBC
EN00347	Teenager	Female	9/21/2001	3.6	3.8	3.4	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00348	Adult	Female	9/21/2001	3.3	3.5	3.0	1.0	0.00	0.00	0.00	0.091	NaI_WBC
EN00348	Adult	Female	9/21/2001	3.5	3.7	3.2	0.8	0.078	0.090	0.067	0.085	NaI_WBC
EN00349	Adult	Female	9/27/2001	3.2	3.4	3.0	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00350	Adult	Female	9/27/2001	3.0	3.2	2.8	0.8	0.041	0.050	0.032	0.081	NaI_WBC
EN00351	Adult	Male	9/27/2001	4.4	4.7	4.2	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00352	Teenager	Female	9/28/2001	3.1	3.3	2.9	0.7	0.00	0.00	0.00	0.059	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq) Value	Upper	Lower	MDA	^{137}Cs (kBq) Value	Upper	Lower	MDA	Method Code
EN00353	Adult	Male	9/28/2001	4.2	4.4	3.9	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00354	Adult	Male	10/8/2001	4.2	4.5	3.9	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00355	Adult	Male	10/8/2001	4.1	4.4	3.9	0.8	0.00	0.00	0.00	0.058	NaI_WBC
EN00356	Adult	Male	10/8/2001	3.1	3.3	2.9	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00357	Adult	Male	10/9/2001	2.5	2.7	2.3	0.7	0.00	0.00	0.00	0.057	NaI_WBC
EN00358	Adult	Female	10/9/2001	2.3	2.5	2.2	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00359	Adult	Male	10/9/2001	3.7	3.9	3.5	0.7	0.00	0.00	0.00	0.057	NaI_WBC
EN00360	Adult	Female	10/9/2001	2.8	3.0	2.6	0.9	0.00	0.00	0.00	0.078	NaI_WBC
EN00361	Adult	Male	10/10/2001	4.3	4.6	4.0	0.7	0.11	0.12	0.095	0.088	NaI_WBC
EN00362	Adult	Female	10/10/2001	2.5	2.7	2.3	0.7	0.046	0.054	0.037	0.083	NaI_WBC
EN00363	Adult	Female	10/10/2001	2.8	3.0	2.6	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00364	Adult	Male	10/11/2001	4.2	4.4	3.9	0.8	0.21	0.22	0.19	0.098	NaI_WBC
EN00365	Adult	Female	10/12/2001	2.3	2.5	2.1	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00366	Adult	Male	10/12/2001	2.9	3.1	2.7	0.8	0.051	0.060	0.042	0.095	NaI_WBC
EN00367	Adult	Female	10/12/2001	2.2	2.4	2.0	0.8	0.050	0.060	0.040	0.083	NaI_WBC
EN00368	Adult	Female	10/12/2001	2.8	3.0	2.6	0.8	0.14	0.15	0.12	0.099	NaI_WBC
EN00369	Adult	Female	10/12/2001	2.3	2.5	2.1	0.7	0.00	0.00	0.00	0.058	NaI_WBC
EN00370	Adult	Male	10/12/2001	3.6	3.8	3.3	0.8	0.00	0.00	0.00	0.058	NaI_WBC
EN00371	Adult	Male	10/17/2001	4.2	4.5	4.0	0.8	0.049	0.060	0.039	0.079	NaI_WBC
EN00372	Adult	Female	10/18/2001	2.8	3.0	2.6	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00373	Adult	Female	10/19/2001	2.9	3.1	2.7	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00374	Adult	Female	10/19/2001	2.5	2.7	2.3	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00375	Adult	Male	10/19/2001	4.2	4.4	3.9	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00376	Teenager	Male	10/19/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.059	NaI_WBC
EN00377	Adult	Female	10/19/2001	2.6	2.8	2.5	0.7	0.00	0.00	0.00	0.056	NaI_WBC
EN00377	Adult	Female	10/25/2001	2.7	2.9	2.5	0.8	0.00	0.00	0.00	0.057	NaI_WBC
EN00378	Adult	Male	10/19/2001	4.3	4.6	4.0	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00378	Adult	Male	10/25/2001	4.1	4.4	3.9	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00379	Adult	Male	10/19/2001	3.6	3.8	3.3	0.8	0.064	0.075	0.053	0.087	NaI_WBC
EN00379	Adult	Male	10/19/2001	3.5	3.8	3.3	0.7	0.078	0.089	0.067	0.10	NaI_WBC
EN00379	Adult	Male	10/19/2001	4.0	4.3	3.6	1.5	0.00	0.00	0.00	0.13	NaI_WBC
EN00379	Adult	Male	10/19/2001	3.6	3.8	3.4	0.8	0.14	0.15	0.13	0.072	NaI_WBC
EN00379	Adult	Male	10/25/2001	3.3	3.5	3.1	0.8	0.050	0.06	0.04	0.089	NaI_WBC
EN00380	Teenager	Male	10/25/2001	3.9	4.1	3.6	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00381	Adult	Male	10/26/2001	4.2	4.5	4.0	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00382	Adult	Male	10/29/2001	3.7	3.9	3.4	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00383	Adult	Male	10/29/2001	3.0	3.2	2.8	0.8	0.00	0.00	0.00	0.057	NaI_WBC
EN00384	Adult	Male	10/29/2001	4.4	4.7	4.1	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00385	Adult	Female	10/29/2001	2.7	2.9	2.5	0.7	0.072	0.082	0.062	0.071	NaI_WBC
EN00386	Adult	Female	10/29/2001	2.8	3.0	2.6	0.7	0.00	0.00	0.00	0.060	NaI_WBC
EN00387	Adult	Female	10/30/2001	2.6	2.8	2.4	0.8	0.25	0.27	0.24	0.10	NaI_WBC
EN00388	Teenager	Male	10/30/2001	2.9	3.1	2.7	0.8	0.00	0.00	0.00	0.059	NaI_WBC

Table 1. (Continued).

ID #	Age Type	Gender	Count Date	^{40}K (kBq)				^{137}Cs (kBq)				Method Code
				Value	Upper	Lower	MDA	Value	Upper	Lower	MDA	
EN00389	Adult	Male	11/2/2001	4.2	4.4	3.9	0.8	0.00	0.00	0.00	0.063	NaI_WBC
EN00390	Adult	Female	11/2/2001	2.6	2.7	2.4	0.7	0.00	0.00	0.00	0.062	NaI_WBC
EN00391	Adult	Male	11/2/2001	4.0	4.2	3.7	0.7	0.16	0.18	0.15	0.096	NaI_WBC
EN00392	Adult	Female	11/2/2001	2.7	2.9	2.5	0.8	0.089	0.10	0.077	0.084	NaI_WBC
EN00393	Adult	Male	11/2/2001	4.6	4.9	4.4	0.8	0.12	0.14	0.11	0.088	NaI_WBC
EN00394	Teenager	Male	11/8/2001	4.2	4.5	4.0	0.8	0.070	0.080	0.060	0.073	NaI_WBC
EN00395	Adult	Male	11/9/2001	3.3	3.5	3.1	0.8	0.15	0.16	0.13	0.093	NaI_WBC
EN00396	Adult	Female	11/9/2001	2.8	3.0	2.6	0.8	0.11	0.13	0.10	0.087	NaI_WBC
EN00397	Adult	Female	11/9/2001	3.0	3.3	2.8	0.7	0.084	0.096	0.073	0.081	NaI_WBC
EN00398	Adult	Male	11/9/2001	3.5	3.7	3.3	0.8	0.13	0.14	0.12	0.072	NaI_WBC
EN00399	Adult	Female	11/9/2001	2.3	2.5	2.1	0.7	0.059	0.069	0.048	0.082	NaI_WBC
EN00400	Adult	Female	11/9/2001	2.5	2.7	2.3	0.7	0.00	0.00	0.00	0.061	NaI_WBC
EN00401	Adult	Female	11/13/2001	3.0	3.2	2.8	0.7	0.00	0.00	0.00	0.059	NaI_WBC
EN00402	Adult	Male	11/13/2001	2.7	2.9	2.5	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00403	Adult	Male	11/14/2001	4.1	4.4	3.9	0.8	0.17	0.18	0.15	0.094	NaI_WBC
EN00404	Adult	Female	11/14/2001	2.7	2.9	2.5	0.7	0.040	0.050	0.031	0.084	NaI_WBC
EN00405	Teenager	Female	11/14/2001	2.5	2.7	2.3	0.7	0.16	0.17	0.14	0.076	NaI_WBC
EN00405	Teenager	Female	11/14/2001	2.7	2.9	2.5	0.7	0.16	0.17	0.14	0.076	NaI_WBC
EN00407	Adult	Female	11/19/2001	2.6	2.7	2.4	0.8	0.15	0.16	0.13	0.075	NaI_WBC
EN00408	Adult	Female	11/19/2001	2.7	2.9	2.5	0.8	0.00	0.00	0.00	0.060	NaI_WBC
EN00409	Adult	Female	11/20/2001	2.3	2.5	2.1	0.8	0.063	0.073	0.053	0.093	NaI_WBC
EN00410	Adult	Female	11/20/2001	2.6	2.8	2.4	0.7	0.00	0.00	0.00	0.057	NaI_WBC
EN00411	Adult	Male	11/21/2001	4.3	4.6	4.0	0.8	0.00	0.00	0.00	0.062	NaI_WBC
EN00412	Teenager	Male	11/23/2001	3.4	3.6	3.2	0.8	0.063	0.073	0.053	0.085	NaI_WBC
EN00413	Adult	Male	11/26/2001	3.4	3.6	3.2	0.8	0.00	0.00	0.00	0.061	NaI_WBC
EN00414	Teenager	Male	11/28/2001	2.8	3.0	2.6	0.7	0.062	0.072	0.053	0.071	NaI_WBC
EN00415	Teenager	Male	11/28/2001	3.1	3.4	2.9	0.8	0.080	0.092	0.068	0.087	NaI_WBC
EN00416	Teenager	Male	11/28/2001	2.9	3.1	2.7	0.7	0.00	0.00	0.00	0.057	NaI_WBC
EN00417	Teenager	Male	11/28/2001	3.3	3.5	3.1	0.7	0.12	0.13	0.11	0.076	NaI_WBC
EN00418	Teenager	Male	11/28/2001	2.7	2.9	2.5	0.8	0.056	0.066	0.046	0.083	NaI_WBC
EN00420	Adult	Male	12/12/2001	4.0	4.3	3.8	0.8	0.083	0.094	0.072	0.082	NaI_WBC

Table 2. Plutonium urinalysis data for agricultural workers and Enewetak Island residents (CAMS/LLNL, July 2001 collection).[a]

				^{239}Pu (μBq)				^{240}Pu (μBq)				
ID#	Age Type	Gender	Collection Date	Value	Upper Level	Lower Level	MDA	Value	Upper Level	Lower Level	MDA	Notes
EN00005	Adult	Male	7/30/2001	-0.2	0.4	-0.8	1.5	0.0	0.6	-0.7	4.3	
EN00006	Adult	Male	7/30/2001	0.2	0.8	-0.4	1.5	0.0	0.7	-0.7	4.3	
EN00007	Adult	Male	8/1/2001	0.1	0.7	-0.4	1.5	0.0	0.6	-0.7	4.3	
EN00008	Adult	Male	7/26/2001	-0.2	0.6	-0.9	1.5	0.0	0.8	-0.8	4.3	
EN00010	Adult	Male	8/1/2001	0.5	1.1	-0.2	1.5	0.0	0.6	-0.7	4.3	
EN00010	Adult	Male	8/6/2001	-0.2	0.4	-0.8	1.5	0.0	0.6	-0.7	4.3	
EN00011	Adult	Male	8/1/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
EN00015	Adult	Male	7/30/2001	-0.2	0.5	-0.8	1.5	0.0	0.7	-0.8	4.3	
EN00018	Adult	Male	7/31/2001	-0.2	0.5	-0.9	1.5	0.0	0.8	-0.8	4.3	
EN00020	Adult	Male	7/30/2001	0.1	0.6	-0.5	1.5	0.0	0.6	-0.6	4.3	
EN00022	Adult	Male	7/30/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
EN00023	Teenager	Male	7/26/2001	1.6	2.7	0.6	1.5	0.0	0.7	-0.8	4.3	
EN00025	Adult	Male	7/30/2001	1.4	2.3	0.5	1.5	0.0	0.7	-0.7	4.3	
EN00029	Adult	Male	8/2/2001	0.5	1.2	-0.2	1.5	0.0	0.6	-0.7	4.3	
EN00029	Adult	Male	8/6/2001	0.2	0.5	0.0	0.6	0.6	1.5	-0.3	2.4	
EN00034	Adult	Male	8/2/2001	0.3	0.8	-0.3	1.5	0.0	0.5	-0.6	4.3	
EN00035	Adult	Male	8/3/2001	0.1	0.6	-0.5	1.5	0.0	0.6	-0.6	4.3	
EN00038	Adult	Male	7/30/2001	2.2	3.4	1.0	1.5	0.0	0.8	-0.8	4.3	
EN00041	Adult	Male	8/2/2001	0.5	1.2	-0.1	1.5	0.0	0.6	-0.7	4.3	
EN00043	Adult	Male	8/1/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
EN00047	Adult	Male	8/1/2001	-0.2	0.4	-0.8	1.5	0.0	0.7	-0.7	4.3	
EN00053	Adult	Male	7/27/2001	0.5	1.2	-0.2	1.5	0.0	0.6	-0.7	4.3	
EN00053	Adult	Male	8/6/2001	0.9	1.7	0.1	1.5	0.0	0.7	-0.7	4.3	
EN00065	Teenager	Male	7/25/2001	-0.2	0.5	-0.8	1.5	0.0	0.8	-0.8	4.3	
EN00080	Adult	Male	7/26/2001	0.5	1.2	-0.2	1.5	0.0	0.6	-0.7	4.3	
EN00082	Teenager	Male	7/26/2001	-0.2	0.5	-0.8	1.5	0.0	0.7	-0.8	4.3	
EN00084	Adult	Male	8/1/2001	0.4	1.0	-0.2	1.5	1.0	1.7	0.3	4.3	
EN00088	Adult	Male	8/2/2001	-0.2	0.6	-0.9	1.5	0.0	0.8	-0.9	4.3	
EN00093	Adult	Male	7/26/2001	0.7	1.5	-0.1	1.5	0.0	0.7	-0.8	4.3	
EN00094	Adult	Male	7/31/2001	0.3	0.9	-0.4	1.5	1.6	2.6	0.6	4.3	
EN00103	Adult	Male	8/1/2001	0.1	0.7	-0.4	1.5	0.0	0.6	-0.7	4.3	
EN00114	Adult	Male	7/31/2001	0.1	0.3	-0.1	0.6	0	0.8	-0.8	2.4	
EN00114	Adult	Male	8/6/2001	0.05	0.2	-0.1	0.6	0	0.5	-0.5	2.4	
EN00119	Teenager	Male	7/25/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
EN00125	Adult	Male	7/27/2001	0.6	1.3	-0.1	1.5	1.2	2.0	0.5	4.3	
EN00125	Adult	Male	8/6/2001	0.3	0.5	0.0	0.6	0	0.6	-0.6	2.4	
EN00126	Adult	Male	7/31/2001	0.2	0.8	-0.4	1.5	0.0	0.7	-0.7	4.3	
EN00135	Adult	Male	7/26/2001	0.0	0.5	-0.5	1.5	0.0	0.6	-0.6	4.3	
EN00141	Adult	Male	7/27/2001	0.3	0.4	0.1	0.6	0.3	0.6	0.0	2.4	
EN00142	Adult	Male	7/27/2001	-0.2	1.8	-2.2	1.5	0.0	2.0	-2.1	4.3	
EN00148	Adult	Male	8/6/2001	0.5	0.8	0.2	0.6	0	0.5	-0.5	2.4	
EN00149	Adult	Male	8/2/2001	0.7	1.4	0.0	1.5	0.0	0.6	-0.7	4.3	
EN00153	Adult	Male	7/27/2001	6.5	11.2	1.8	0.6	0	12.0	-12.0	2.4	Note A
EN00161	Adult	Male	7/26/2001	1.3	1.9	0.7	0.6	0	1.0	-1.0	2.4	

Table 2. Continued.

ID#	Age Type	Gender	Collection Date	^{239}Pu (µBq) Value	Upper Level	Lower Level	MDA	^{240}Pu (µBq) Value	Upper Level	Lower Level	MDA	Notes
EN00162	Adult	Male	7/27/2001	0.4	0.8	0.1	0.6	1.1	2.5	-0.4	2.4	
EN00165	Adult	Male	7/31/2001	0.2	0.9	-0.4	1.5	3.0	4.5	1.4	4.3	
EN00171	Adult	Male	7/31/2001	1.2	2.3	0.1	1.5	0.0	0.9	-0.9	4.3	
EN00176	Adult	Male	8/3/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
EN00183	Adult	Male	7/27/2001	0.6	1.3	-0.1	1.5	0.0	0.7	-0.7	4.3	
EN00223	Teenager	Male	7/25/2001	0.2	0.7	-0.4	1.5	0.0	0.6	-0.6	4.3	
EN00224	Teenager	Male	7/25/2001	0.1	0.7	-0.4	1.5	0.0	0.6	-0.7	4.3	
EN00225	Teenager	Male	7/25/2001	0.5	1.1	-0.2	1.5	0.0	0.6	-0.7	4.3	
EN00226	Teenager	Male	7/25/2001	0.4	1.1	-0.4	1.5	0.0	0.8	-0.9	4.3	
EN00227	Adult	Male	8/3/2001	1.0	1.7	0.3	1.5	1.7	2.4	1.0	4.3	
EN00228	Adult	Male	8/3/2001	0.8	1.1	0.4	0.6	0.5	1.1	-0.1	2.4	
EN00229	Teenager	Male	8/2/2001	0.5	1.2	-0.2	1.5	0.0	0.6	-0.7	4.3	
EN00230	Adult	Male	8/3/2001	-0.1	0.1	-0.3	0.6	0	0.7	-0.7	2.4	
Control	Adult	Male	8/3/2001	2.1	3.2	0.9	1.5	0.0	0.7	-0.7	4.3	
Field Blank 1			7/25/2001	0.3	0.9	-0.4	1.5	0.0	0.7	-0.8	4.3	
Field Blank 2			7/26/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
Field Blank 3			7/27/2001	0.3	1.0	-0.4	1.5	0.0	0.7	-0.8	4.3	
Field Blank 4			7/30/2001	0.2	0.9	-0.4	1.5	0.0	0.7	-0.8	4.3	
Field Blank 5			7/31/2001	0.8	1.7	0.0	1.5	0.0	0.8	-0.8	4.3	
Field Blank 6			8/1/2001	0.6	1.3	-0.1	1.5	0.0	0.7	-0.7	4.3	
Field Blank 7			8/2/2001	-0.2	0.4	-0.7	1.5	0.0	0.6	-0.7	4.3	
Field Blank 8			8/3/2001	-0.2	0.3	-0.7	1.5	0.0	0.5	-0.6	4.3	
Field Blank 9			8/6/2001	-0.2	0.3	-0.7	1.5	0.0	0.6	-0.6	4.3	

[a] Verified urinalysis data as of 12/31/2001.

Note A: Low recovery; failed Q.C. criteria for dose reporting.

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