

Bikini Atoll inhabitants were moved first to Rongerik Atoll and then finally to Kili Island. In 1968 President Johnson declared Bikini Island safe for resettlement.

Rehabilitation efforts of Bikini Atoll began in 1969. These activities required persons to reside on Bikini Island. By April 1978, the population numbered 143 persons and consisted of caretakers and agriculturalists employed by the Trust Territory plus a few Bikini land owners and their families who found their way back via Trust Territory trade ships. This population remained on Bikini Island until they were relocated in August 1978 to Kili Island in the southern Marshalls and to Ejit Island, Majuro Atoll.

During the rehabilitation and repopulation years, the medical services already provided by Robert Conard, M.D. and the Brookhaven Medical Team on other atolls of the Marshall Islands were expanded to include sick call and body burden measurements on Bikini Islands. This team made body burden measurements in 1974 (CO 75) and in 1977 (CO 77). In August 1977, the responsibility for providing body burden measurements was transferred from the Medical Department to the Safety and Environmental Protection Division (SEP) at Brookhaven National Laboratory. The 1978, 1979 and 1980 body burden measurements of the Bikini population were conducted by the SEP organization.

This report summarizes all personnel monitoring activities which were conducted on the Bikini Atoll residents from 1970 through 1980. Using the body burden data along with the reported residence interval, individual dose equivalents have been calculated and are also reviewed.

A. Body Burden Measurements - Radiochemical Analysis of Urine

Prior to the assumption of responsibility for the total personnel monitoring program by the SEP Division in 1977, analysis of urine samples for

fission products and transuranic elements was conducted under contracts to Battelle Pacific Northwest Laboratories (BNWL) and Environmental Measurements Laboratory (EML). Analytical procedures for processing and analysis are similar and can be found in OL 81.

Urine data collected after 1977 were processed by the SEP Division. Sample collection and analysis procedures used by this division are outlined below.

1. Urine Collection Protocol

Twenty-four hour and five day urine samples were collected from Bikini Atoll residents. Twenty-four hour samples were used to define fission product body burdens while the five day urine samples were used both to determine fission products and transuranic body burdens. The normal procedure was to distribute the urine collection bottles just after the individual received a whole-body count. Individuals were informed to collect all urine excreta in the bottle for the specified collection period. Sample containers were collected after the selected sample period had elapsed.

Once collected, acidification procedures were followed to inhibit biological degradation of the sample. From 1977 to 1978, urine bottles were pretreated with 15 ml of a 10% thymol-alcohol solution. After urine collection, 10 ml of HNO_3 was added. This procedure was halted because of skin discomfort caused by thymol contamination during urine collection. In 1979 and 1980, 15g of boric acid was added to each one liter urine bottle after sample collection. Both acidification techniques minimize sample degradation. After acidification, samples were packaged and shipped to BNL for analysis.

Twenty-four hour urine samples are analyzed for gamma emitting nuclides and ^{90}Sr . Samples are first placed in an ultrasonic cleaner to loosen

and disperse solids. Total volume is measured and a 300 ml aliquot is then drawn for gamma analysis. Gamma spectroscopy is performed with a 125 cc active volume, 26% relative efficiency Ge(Li) detector which is connected to a computer based multi-channel analyzer. Samples were counted from 4000 to 10000 seconds depending on the activity in the sample. When gamma analysis was completed, the aliquot was returned to the initial sample and the total volume was analyzed for ^{90}Sr - ^{90}Y .

The sample is acidified to a pH of 1, stable strontium and yttrium carrier along with ^{85}Sr tracer are added to the sample. The sample is chemically processed according to the procedure reported in Appendix A. The final processing step results in a ^{90}Y precipitate which is used to determine the ^{90}Sr urine activity concentration. Sample results are corrected for chemical yield and radiological decay of ^{90}Y post separation from ^{90}Sr . Because of the duration between sample collection and sample analysis (in excess of two months) ^{90}Y and ^{90}Sr are in secular equilibrium at time of sample analysis.

^{137}Cs and ^{90}Sr urine activity concentrations for all pooled samples are reported in Table 1. ^{137}Cs and ^{90}Sr urine activity concentrations and the ^{90}Sr body burden at time of removal are reported in Tables 2 through 5 for Bikini Atoll residents sampled between 1973 and 1980. The ^{90}Sr data were used to calculate the bone marrow dose-equivalent commitment.

Five day urine samples were also collected from 1974 to 1978. These samples were analyzed by Battelle Northwest Laboratory (BNWL), Environmental Monitoring Laboratory (EML) and Los Alamos Scientific Laboratory (LASL) for fission products and transuranic nuclides. The results are presented in Table 6. All transuranic analyses were carried out by alpha spectroscopy. The minimum detectable limit was 3.7×10^{-5} Bq for all analysis systems.

Five samples were obtained sequentially from 16 persons during the January 1979 field trip to determine the variability inherent in the 24 hour urine sample program. The results of this study are listed in Table 7. For ^{137}Cs , the mean biological and counting variability (one standard deviation) associated with a single urine sample is 32%. For ^{90}Sr , most of the results were less than the minimum detection limits of the system or the average of the 5 urine sample results had an associated standard deviation which was larger than the result. Consequently, only 6 sample results were used to determine the biological and counting variability of the ^{90}Sr urine data. The mean standard deviation associated with this result is 65%. The counting error contributes 15% of the variability while other sources of variation account for 50%. These other sources are most likely related to the day to day metabolic changes normally exhibited by an individual.

B. Whole-Body Counting

Whole-body counting measurements on the Bikini population that were conducted in 1974, 1977, 1978, 1979 and 1980 are presented. The body burden measurements were performed by two different organizations; consequently, the experimental design included a mechanism to ensure that previous and current results are directly comparable. Key detection components were duplicated and the systems were calibrated in the same manner (CO 63). The operational procedures and counting geometries were basically similar, and an intercomparison study was conducted using Marshallese and Brookhaven personnel to ensure system comparability.

1. Instrumentation

The detector chosen for field use by both Brookhaven organizations is a 28 cm diameter, 10 cm thick, sodium iodide thallium activated scintillation

crystal. It is optically coupled to seven, 7.6 cm diameter low background magnetically shielded, photomultiplier tubes. The signal output from each photomultiplier tube is connected in parallel and the combined output routed to a preamplifier/amplifier and then to a microprocessor-based computer/pulse height analyzer (PHA). The PHA data is stored on a magnetic discette, and the results may be analyzed either in the field or at BNL using a matrix reduction, minimization of the sum of squares technique (TS 76).

2. Calibration

Analysis of spectra by the matrix reduction technique requires that the computer library contain individual standards for each radionuclide that is expected in the field measurements and that the field measurements and standards be the same geometry.

To accomplish this, a review of the previous whole body counting data (CO 75, CO 77) indicated the need to calibrate for ^{40}K , ^{60}Co and ^{137}Cs . The present system was calibrated in 1978 using an Anderson REMCAL phantom (CO 63) and in 1979 using a BOMAB bottle phantom. Each radionuclide was introduced into the phantom's organs in an amount equivalent to the fraction in organ of reference of that in total body as defined by the ICRP in Publication 2 (ICRP 59). Under conditions of continuous exposure where equilibrium has been reached these fractions are correct. This is achieved for the nuclide ^{40}K . The nuclides ^{60}Co and ^{137}Cs are in non-equilibrium throughout the exposure and post exposure intervals. Cesium is taken up principally in cells with 80% to muscle and 8% to bone (SP 68) where the mean residence times are both 160 days. This implies a nearly uniform distribution of the nuclide throughout the whole body. Thus, with 88% of the uptake spread throughout the body with a long halftime and with the remaining 12% of the uptake in the extracellular fluid, which retains

cesium with a short halftime (1.0 day), the source geometry will not be significantly affected with respect to an ingestion/excretion equilibrium of cesium within the body. ^{60}Co is not distributed uniformly throughout the body with 20% of an oral intake being retained in the liver with a very long biological halftime and about 80% being cleared from the extracellular fluid to out of the body with a biological halftime of one day or less. Thus source geometry will be significantly effected with respect to ingestion/excretion equilibrium of cobalt within the body.

To verify the activity in the phantom prior to use as a standard, an aliquot of the phantom solution was counted on a lithium drifted germanium detector which was calibrated with NBS standard sources. The phantom was then counted in a shadow shield whole body counter (WBC) (PA65). The whole body counting system consists of a stationary crystal and stationary bed. The counter detects radioactive material located principally in the thorax, so positioning of the phantom and the in vivo counting subjects must be as similar as possible. To facilitate reproducible counting geometries, each subject and the standard phantom was positioned such that the central axis of the crystal intersected the central axis of the body about 25 cm below the sternal notch. The distance between the surface of the bed and the bottom of the detector is 32.4 cm. The total system efficiencies for ^{40}K , ^{60}Co and ^{137}Cs are listed in Table 8 as are typical minimum detection limits for these nuclides.

In 1979, a shadow shield chair geometry replaced the shadow shield bed configuration. The chair whole-body counter used the same electronics as in the past. The system was calibrated using a 30mab bottle phantom. Uniformly distributed activity concentrations of ^{40}K , ^{60}Co and ^{137}Cs were used for system calibration. Verification of phantom activity was accomplished as previously

described. The chair geometry detects radioactive material located between the neck and the knee. The total system efficiencies are the same for the chair and bed geometries.

3. Quality Control

The quality control (QC) program consisted of a cross comparison of the radionuclide amounts estimated to be in the phantom volume versus NBS calibration standards. Agreement between the two activity concentrations is within plus or minus 5% for all radionuclides. Other quality control mechanisms employed were repetitive counting of secondary point source standards, multiple counts of Brookhaven personnel, repetitive counting of the Marshallese (blind duplicates) and an intercomparison study.

Two point sources were used in the QC program. Initially ^{137}Cs source, which has been used by the BNL medical surveys in previous years, was used to monitor potential changes in system resolution and efficiency as function of time. In subsequent years, a $^{137}\text{Cs} + ^{60}\text{Co}$ point source, was used for zero, gain, resolution and efficiency determination.

Replicate counting of Marshallese was conducted on 5% of the subjects. Results indicate that the data obtained from the field whole body counting system is reproducible to within plus or minus 6%. Almost all of this error is due to variable subject position. When subjects remain stationary, the difference between sequential results is plus or minus 1%.

An intercomparison of whole body counting systems was conducted between the field system and the whole body counter operated by S. Cohn for the Brookhaven Medical Department. Persons used in the study included 13 Marshallese with measurable ^{137}Cs body burdens plus several Brookhaven employees with current whole body counting records at the Medical Department. The results

of the study indicate that ^{137}Cs and ^{40}K body burdens which exceed the minimum sensitivity of both systems are in agreement to within plus or minus 5%.

RESULTS

Persons listed in Tables 9 through 12 have been identified as medically registered residents. This terminology means these individuals reported to BNL doctors for sick call during the April 1978 field survey and were assigned a registration number. For continuity, these numbers were retained by SEP for radiochemical analysis of urine identification. Individuals who donated urine for analysis of ^{90}Sr and ^{137}Cs in 1979 and did not report for sick call during the April 1978 survey at Bikini Atoll have been termed non-medically registered. Persons who had not resided at Bikini Atoll for more than three years as of January 1979 or had never resided at Bikini Atoll are labeled as comparisons.

Tables 9 and 10 present a list of adult individuals who were counted in 1974 (CO 75), 1977 (CO 77), 1978, 1979 and 1980. There is a general increase in body burdens of adult males from 1974 to 1977 by a factor of 13.3, and from 1977 to 1978 by a factor of 1.8. The general increase for adult females from 1977 to 1978 was slightly higher than that for males over the same period. In most cases, the January 1979 data are significantly lower than the 1978 with an averaged reduction in the ^{137}Cs body burden by a factor of 2.9. The May 1979 and August 1980 data follow the expected decreasing trend.

Tables 11 and 12 summarize the ^{137}Cs body burden data collected for adolescents and children. It must be noted that data reported here are uncorrected for height and weight differences between subjects and the standard, up to 15% deviations have been reported for adult data (MI 76). Body burdens of adoles-

cents and children reported in Tables 11, 12 and 13 were computed using efficiencies obtained from standard adolescent and juvenile Bomab phantoms.

Table 13 summarizes the ^{137}Cs data that are presently available. It shows the mean standard deviation from the mean, and range of values reported for the sampled population segregated by sex and age, as it has changed from 1974 to 1980.

Table 14 compares the observed reduction in ^{137}Cs body burdens from April 1978 to January 1979 with the reduction in ^{137}Cs body burden that was expected as a result of relocating the Bikini population in late August 1978. Values for the biological removal rate constants were obtained from NCRP Report 52 (NCRP 77) and ICRP Publication 10A (ICRP 71).

Table 15 presents the long term biological removal rate constants for individuals in the Bikini population as determined from sequential measurements in 1979 and 1980. Table 16 presents population subgroup mean values for the ^{137}Cs long term biological removal rate constant. The data are in good agreement with ICRP publication 10A (ICRP 71) and NCRP report 52 (NCRP 77).

In addition to the followup whole body counts performed on persons who were initially counted in April 1978 on Bikini Atoll, persons who had resided at Bikini Atoll and were concerned about their current body burdens were counted. Dependents of adult Bikini Atoll residents were counted regardless of their residence history. Results of this work conducted in January 1979, May 1979 and August 1980 at Majuro Atoll, Kili Island and Jaluit Atoll are presented for adult males, adult females, adolescents and juveniles in Tables 17 through 20 respectively. Most of the ^{137}Cs body burdens are at levels which are consistent with world fallout contamination. Some individuals have higher than anticipated ^{137}Cs body burdens. Interviews with these subjects revealed that they either

of sea food products from contaminated atolls or had recently visited these atolls.

Population Census and Residence Atolls

^{137}Cs body burdens from May 1979 of individuals whose residence history on Bikini was minimal and who had not recently (within 2 years of August 1978) resided at Bikini Atoll were grouped together to form a comparison population. In August 1980, a second comparison population was selected from Majuro Atoll and Kili Island residents who had never resided on Bikini Atoll. The whole-body counting data for this group is presented in Tables 21 through 24. Table 25 summarizes the ^{137}Cs data for both the May 1979 and August 1980 comparison populations. The comparison population data were used in the computation of the ^{137}Cs long term biological removal rate constants reported in Table 15.

Table 26 shows the number of April 1978 Bikini residents that were recounted on subsequent field trips. Column 2 lists the total number of people counted on each field trip. Column 3 lists the total number of persons who resided at Bikini Atoll in April 1978. Column 4 lists the number of persons who were medically registered in April 1978. The difference between column 3 and 4 reflects the presence of Rongelap or Utirik residents who had moved to Bikini Atoll between 1970 and 1978. Column 5 lists the number of persons counted that belong to the medically registered population listed in Column 3. Column 6 lists the number of persons counted who reportedly resided on Bikini Atoll at the time of relocation in August 1978. Column 7 lists the number of non-relocated former residents counted.

Table 27 presents the number of adult males, adult females, adolescents and juveniles which composed the medically registered, relocated population sampled in 1978 and 1979. Table 28 presents the same sample breakdown for the

not medically registered population and medically registered children counted only in 1979.

Table 29 summarizes the residence locations of all persons counted. Tables 30 and 31 break this data down by sex, age and registry status for the January 1979 and May 1979 field trips. Tables 32 through 39 provide individual counting dates and residence atoll or island at time of counting. Table 40 lists registry numbers, age, name, sex and last known location of individuals who have not been whole body counted since their departure from Bikini Atoll.

DOSIMETRY

The dose equivalent to Bikini Atoll residents during their residency period was the result of internal and external sources of radiation. In 1975, external exposure measurements were performed (GR 79) at Bikini Atoll. Using these data and an estimate of the Marshallese living pattern developed by Gudiksen (GU 76), an estimate of the mean yearly net exposure rate for adult males, adult females, adolescents and juveniles was developed and reported in a previous publication (GR 79). The net external dose equivalent for each individual was determined as the product of the mean net exposure rate, the residency interval and a correction factor for radiological decay and is presented in Column 5 of Table 41.

The dose equivalent commitment for bone marrow due to ^{90}Sr has been calculated for individuals from urine data reported in Tables 2 through 5. The symbols, constants and equations used are presented in Appendix B. The retrospective dose equivalent was determined using several assumptions. First, persons returning to Bikini Atoll returned with an initial ^{90}Sr body burden at baseline levels. Second, while residing on Bikini Atoll, individuals were subjected to a constant and continuous uptake of ^{90}Sr through the ingestion pathway.

Finally, once strontium is ingested and absorbed into the blood, ^{90}Sr disintegrations are evenly distributed in cortical and cancellous bone tissues. Each individual was assumed to exhibit different ^{90}Sr ingestion rates. The daily activity ingestion rate was determined from urine data. The prospective dose equivalent was determined with the assumption that ingestion of ^{90}Sr ceased when the individual departed from Bikini Atoll. Disintegrations resulting from residual strontium-90 in bone post departure were calculated for an infinite post residence interval versus a fifty year period commonly chosen for radiation workers. The dose equivalent commitment, the sum of the retrospective and prospective dose equivalents, are listed in Table 41, Column 3.

The retrospective and prospective dose equivalent resulting from the ingestion of ^{137}Cs have been calculated for members of the Bikini Atoll population. The symbols, constants and equations used are presented in Appendix C. Data used for these calculations were obtained from Tables 9 through 12 of this report. Because the ^{137}Cs body burden data dramatically increased between 1974 and 1978, constant and continuous uptake of ^{137}Cs could not be assumed. Consequently, the dose equivalent during the uptake interval was calculated using a monotonic increasing uptake regime. The total residency period, was divided into three intervals during which constant and continuous ingestion of ^{137}Cs was assumed. These periods, January 1, 1970 to December 31, 1975, January 1, 1976 to April 5, 1977 and April 6 to August 31, 1978, were determined based on the bioassay data and the maturation period for vegetation planted in the early 1970's. It was also assumed that the initial ^{137}Cs body burdens of individuals returning to Bikini Atoll were at baseline levels. The prospective dose equivalent was determined with the assumption that the ingestion of ^{137}Cs ceased after

an individual departed from Bikini Atoll. The dose equivalent commitment as determined from these calculations are listed in Table 41, Column 4.

The total body dose equivalent commitment listed in Column 6, Table 41 is the sum of Columns 4 and 5. The total bone marrow dose equivalent commitment reported in Column 7 was obtained by summing the data in Columns 3, 4 and 5.

Figures 1 through 3 illustrate the distribution of the dosimetric information obtained from Table 41. Figure 1 describes the distribution of residence interval, net external exposure, ^{90}Sr bone marrow dose equivalent commitment, ^{137}Cs total body dose equivalent commitment, the total bone marrow and total whole body dose equivalent commitments for the Bikini population sampled in April 1978. Figure 2 presents this information for males only while Figure 3 presents the female dose distribution.

Discussion of Results

^{90}Sr body burdens do not appear to be significantly different for males, females and adolescents; however, the ^{137}Cs body burden as summarized in Table 13 indicates that male versus female adult body burden means are significantly different. There was also a small difference between the body burdens of the adult females and all children. These differences suggest that dietary and living patterns change as an individual matures thus effecting the body burden.

This problem was addressed for external exposure in an earlier report (GU 77) and an estimated living pattern was developed for children, adult females and adult males. This information indicates that the adult males spend 5% more of their time in an environment which is radiologically substantially higher in activity than do the adult females. If one assumes that 5% more of the dietary uptake of radioactive materials occurs due to the longer duration of time spent in the interior section of the island, then one would expect that the mean adult

male body burden would be higher than the mean adult female body burden by a factor of 1.2. The ^{137}Cs data collected in April 1978 indicates that the mean adult male body burden is 1.5 times higher than the mean adult female body burden. Likewise, the mean child body burden for ^{137}Cs would be expected to be lower by a factor of 1.8. Our data indicates that the mean child ^{137}Cs body burden is a factor 2 less than the mean adult male body burden.

Other factors which influence the body burden include the age of the individual, the residence interval on Bikini Island and family relationships. ^{137}Cs body burden results weighted by the individual's body potassium and ordered by sex, age and residence interval were tested to determine the influence of age and residence interval on the body burden. The Bartlett test for homogeneity of variance was used to determine if the sample populations under consideration had the same variances. If the sample variances were the same then a one way analysis of variances was performed on each data set. If the sample variances were not equal, then the data was transformed by taking the log (ln or square root) of the activity and the test for homogeneity repeated. When the data passed the Bartlett test for homogeneity, the one way analysis of variance was performed. The data were grouped by sex because the mean of the adult male and adult female ^{137}Cs body burden were significantly different.

The result of the one way analysis of variance with age of the individual being the variable suspected of influencing the weighted ^{137}Cs body burden results indicates that no age or age group significantly influences the results. This implies that indigenous food products are consumed at a uniform rate by all individuals and that one age group does not have a preference for a type of food not found in the diet of other generations.

The result of the one way analysis of variance with residence time on Bikini as the variable of concern is unclear. The statistical analysis for adult males indicates that persons with residency periods greater than 6 years have higher weighted ^{137}Cs results than the rest of the male population. For adult females, the group residing on Bikini for 3-6 years have lower weighted ^{137}Cs results than the rest of the adult female population. Residency once past 1 year, was expected to have no effect on the ^{137}Cs body burden. This expectation was based on the mathematical models used by ICRP Publication 10A (ICRP 71) which indicate that equilibrium with the environment would be reached within the first 2 years of exposure to a constant uptake of ^{137}Cs .

Data for these analyses were grouped in age and residency intervals that would provide a minimum sample size of five data points per sample interval. The small sample size and large variance of the grouped data cast serious doubt as to the significance of the results generated by our statistical analysis.

The last variable considered was the impact of the social structure in the Marshallese society. This factor seems to be highly significant. Table 42 lists the ^{137}Cs body burden results ordered by family ranking. The family rank was accomplished by assigning the family placement number to the adult male's ^{137}Cs body burden. Examination of this table reveals that the family follows the pattern set by the adult male. This pattern does not follow a direct one to one relationship; however, the trend is apparent.

There are several possible reasons for this trend. First, individuals from the same family have a similar philosophy regarding the quantity of indigenous food crops that they want to consume each day. Second, the family only uses locally grown food products that are obtainable from that family's land. The family wato is also listed in Table 35. Finally, the significance of

processed food on the family diet will be a function of the first two items listed above and the willingness of the family to purchase food.

The whole-body counting data also indicates that previous estimates of the type of food and amount of various components in the Bikini diet did not adequately describe the dietary patterns that existed between 1974 and 1978. As certain local food crops, coconuts, became available in 1976, they were incorporated into the diet in the form of jekaru (the water sap of the coconut tree), jekomai (a syrup concentrate made from jekaru) and waini (drinking coconuts). The maturation time of the coconut tree is 5-7 years. Consequently, one would expect to observe a steady increase in the ^{137}Cs body burden through 1978 at which time an equilibrium body burden would be reached. Comparison of the observed reduction in the ^{137}Cs body burden from April 25, 1978 to January 24, 1979 with the expected reduction in the body burdens from September 1, 1978 to January 24, 1979 yields almost identical results for the adult male and adult female groups as shown in Tables 7 and 8. This implies that the Bikini population could have attained equilibrium and that the body burdens on September 1, 1978 were not significantly different than those measured in April 1978. The child data do not agree with the expected value; however, the difference is not beyond the range of half-times listed in NCRP Report 52 (NCRP 77). Although NCRP Report 52 lists a mean half-time for children ages 5 through 15, it does not specify the age distribution of the sample. Most of the Bikini children were in the 5-10 year category; hence, one would expect the observed reduction factor for this group to be somewhat higher than the expected value.

Although the data indicates that the ^{137}Cs body burdens may not have increased between April and September 1978, this is not assurance that the body

burdens would not have increased when new dietary items like pandanus and breadfruit became available for daily consumption.

Furthermore, while the population may have been near equilibrium with their April dietary uptake, individuals within the population may not have been. This was apparent in the adult male ^{137}Cs body burden data where two individuals show no decline in activity between the April 1978 and January 1979 whole body count. In one case, the individual was present on Bikini for only 5 months prior to the April 1978 count. This places the individual at approximately 60% of his equilibrium body burden value. In the second case, there seems to be no clear explanation for the lack of any reduction in the body burden, however

1. the individual may have lived away from Bikini prior to the April count; hence, equilibrium was not established at the time of counting, or
2. the individual changed his diet pattern between April and September.

These deviations from the norm do not alter the conclusion that equilibrium or near equilibrium may have been reached for the population as a whole for ^{137}Cs . Indeed, they illustrate variations about a mean value.

Data collected between January 1979 and August 1980 also indicate that certain individuals have been ingesting ^{137}Cs at a rate which exceeds that of the sample population. This could in large part be due to visits to Bikini or other contaminated atolls between measurement dates.

The individual dosimetric data presented here clearly illustrates that at least 19% of the Bikini residents would have received a dose equivalent in excess of 5 mSv (0.5 rem) due to the ingestion of ^{137}Cs had the April 1978 activity ingestion rate of ^{137}Cs continued. This dose equivalent level does not include the dose equivalent from external radiation or other internally deposited radioactive material. Removal of the Bikini population from Bikini Atoll

eliminated the ^{137}Cs source term from the diet and limited the dose equivalent received by this population.

The contribution of ^{90}Sr to the bone marrow dose equivalent commitment was small relative to the contribution from external exposure and ^{137}Cs . As residence intervals increased, and food products with higher ^{90}Sr concentrations became more available, then the body burdens and bone marrow dose equivalents would have correspondingly increased.

The total body and bone marrow total dose equivalent commitments have a standard deviation of 40% in the adult subgroups. For residence periods between the years 1969 and 1978, a maximally exposed person received a total dose equivalent commitment of 30 mSv (3 rem) and the population average total dose equivalent commitment was 12 mSv (1.2 rem) due to man-made radioactivity on Bikini Island.

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Appendix A

Urine Bioassay Chemistry Procedures

^{137}Cs and ^{90}Sr Assay of Urine in the Absence of Fresh Fission Products

A. Reagents

Strontium carrier solution: 20 mg Sr/ml

Yttrium carrier solution: 20 mg Y/ml

Calcium chloride: 0.1 M

Diethylhexylphosphoric acid: 20% in toluene

Nitric Acid: 16N

Hydrochloric: 0.08 N

Ammonium hydroxide: 15 N

Ammonium hydroxide wash solution: 1 ml 15 N in 500 ml H₂O

Sodium hydroxide: 6 M

B. Sample Preparation for ^{137}Cs Analysis

1. Loosen cap on sample bottle and place into ultrasonic cleaner for approximately 10 minutes to loosen and disperse solids.
2. Pour suspended sample into a 2 liter graduated cylinder and record total sample volume.
3. Measure 300 ml of sample into an aluminum can. Seal on lid.
4. Analyze sample with Ge(Li) detector system. Count for 4000 seconds.
5. When gamma analysis is completed and data is verified, return sample to analytical laboratory.

C. Procedure for ^{90}Sr Analysis

1. Remove urine from aluminum can and pour into 2 liter beaker. Rinse can and cover and add rinses to beaker.

2. Pour remaining sample from bottle into the 2 liter beaker, add 50 ml concentration HNO to bottle to rinse walls, add to beaker. Rinse with water and add to sample.
3. Adjust pH to approximately 1 and heat sample to 80°C. Stir.
4. Add to sample
Strontium carrier: 40 mg
Yttrium carrier: 40 mg
⁹⁰Sr tracer: 1 ml (X10,000 dpm)
CaCl 0.1 M: 50 ml
5. Digest sample at 80°C for 30 minutes while stirring.
6. Adjust pH = 4.
7. Add 40 ml saturated oxalic acid solution and mix well.
8. Drop add 6 M NaOH to adjust pH = 4.
9. Digest (with stirring) for 30 minutes.
10. Remove from heat, remove stirring bar, let settle overnight.
11. Filter entire sample through a 2 inch Whatman 42 filter paper mounted in filter assembly. Wash the precipitate once with ammonia wash solution.
12. Transfer filter paper and precipitate to a 150 ml beaker. Dry at 125°C in a muffle furnace. Slowly raise the temperature (over an eight hour period) to a maximum of 500°C. Continue heating at 500°C overnight.
13. Cool the sample and add small volumes of concentrated HNO. Evaporate slowly to dryness. Dissolve residue in 60 ml of 0.08 N HCl. Adjust pH = 1.

14. Transfer sample solution to a 125 ml separatory funnel and extract the yttrium with 60 ml of 20% HDEHP solution. Note time of extraction. Save aqueous phase for possible future reanalysis.
15. Wash the organic phase twice with 60 ml of 0.08 N HCl. Save the first wash and combine the aqueous phase from step 14.
16. Extract the yttrium from the organic phase with 2, 60 ml volumes of 3 N HNO₃. Shake for 2 minutes for each extraction and then combine 3 N HNO₃ solutions in a 150 ml beaker.
17. Evaporate the sample solution to a volume of approximately 3 ml and quantitatively transfer to a 50 ml centrifuge tube with several volumes of water.
18. Adjust the pH to 8-10 with NH₄OH to precipitate Y(OH)₃.
19. Centrifuge, decant and discard supernatant liquid.
20. Wash the precipitate with water, centrifuge, discard wash.
21. Dissolve the precipitate in 1:1 HCl (a few drops), slurry and add 25 ml water.
22. Add saturated oxalic acid (2-3 ml), then 2-3 drops of NH₄OH. Digest at 85°C for 1 hour.
23. Filter through a preweighed glass fiber filter disc, wash with water and ethyl alcohol. Dry at 110°C for 15 minutes.
24. Weigh the dried precipitate and filter paper. Mount on nylon disc, cover with 0.25 ml mylar and beta count for 60 minutes using low background anti-coincidence counters.
25. Correct for gravimetric yttrium yield and yttrium decay single separation.
26. Report data in pci/l urine at time of collection.

Appendix 3

Symbols, constants and equations used to calculate ^{90}Sr - ^{90}Y bone marrow dose equivalent during the uptake interval and the committed dose equivalent

The following definition, symbols, constants and equations describe the mathematical model used to calculate dose equivalent during and post the uptake interval. Intermediate steps can be used to determine body burdens or daily activity ingestion rates. The equations were developed with the assumption that the measured quantity from a bioassay program would be the urine activity concentration. Constant continuous uptake of ^{90}Sr - ^{90}Y through the ingestion pathway was assumed for the entire residence period. For ^{90}Sr , the uptake interval equals the residency period. As indicated previously ^{90}Sr disintegrations are divided equally between cortical and trabecular bone.

Mathematical Model

Symbols, Definitions and Units of Physical Quantities

- N_i^0 \equiv the number of atoms of species of concern present at time zero in compartment i , atoms,
- N_i \equiv the instantaneous number of atoms of species of concern present at time t in compartment i , atoms,
- P_i \equiv atom intake rate into compartment i from blood, atoms day^{-1} ,
- K_i \equiv the instantaneous fraction of atoms removed from compartment i per unit time by physiological mechanisms, day^{-1} ,
- λ \equiv the instantaneous fraction of atoms removed from compartment i per unit time by radiological mechanisms, day^{-1} ,
- q_i \equiv the instantaneous activity in compartment i at time t , Becquerels,
- E_i \equiv the instantaneous activity excretion rate from compartment i at time t , Becquerels day^{-1} ,

f_u \equiv the fraction of body activity excreted in urine,
 f_1 \equiv the fraction of GI tract activity entering blood,
 q \equiv the instantaneous activity in the body, Becquerels,
 P \equiv the atom ingestion rate, atoms day⁻¹,
 X_i \equiv the fraction of atoms entering blood deposited in compartment i ,
 t \equiv uptake interval, day,
 U \equiv instantaneous urine activity concentration, Becquerels liter⁻¹,
 U_m \equiv male urine excretion rate, liters day⁻¹,
 U_f \equiv female urine excretion rate, liters day⁻¹,
 Q \equiv quality factor,
 D_C \equiv disintegrations due to ⁹⁰Sr remaining in body following uptake interval, Becquerel days,
 D \equiv disintegrations due to ⁹⁰Sr in the body during uptake interval, Becquerel days,
 H_M \equiv the dose equivalent to red marrow during uptake interval, mrem,
 H_{BN} \equiv the dose equivalent to bone during uptake interval, mrem,
 H_M^C \equiv the dose equivalent to red marrow post uptake, mrem,
 H_{BN}^C \equiv the dose equivalent to bone post uptake, mrem,
 S_i \equiv the absorbed dose to red marrow per disintegration of ⁹⁰Sr in cortical bone, rads dis⁻¹,
 S_1 \equiv the absorbed dose to red marrow per disintegration of ⁹⁰Sr in trabecular bone, rads dis⁻¹,
 S_2 \equiv the absorbed dose to red marrow per disintegration of ⁹⁰Y in cortical bone, rads dis⁻¹,
 S_3 \equiv the absorbed dose to red marrow per disintegration of ⁹⁰Y in trabecular bone, rads dis⁻¹,

- S_4 \equiv the absorbed dose to bone per disintegration of ^{90}Sr in cortical bone, rads dis $^{-1}$,
 S_5 \equiv the absorbed dose to bone per disintegration ^{90}Sr in trabecular bone, rads dis $^{-1}$,
 S_6 \equiv the absorbed dose to bone per disintegration of ^{90}Y in cortical bone, rads dis $^{-1}$,
 S_7 \equiv the absorbed dose to bone per disintegration of ^{90}Y in trabecular bone, rads dis $^{-1}$.

EQUATIONS

$$\frac{dN_i}{dt} = -(\lambda + K_i) N_i + P_i, \quad (1)$$

$$N_i = N_i^0 e^{-(\lambda + K_i)t} + \frac{P_i}{\lambda + K_i} (1 - e^{-(\lambda + K_i)t}), \quad (2)$$

$$q_i = \lambda N_i, \quad (3)$$

$$E_i = K_i N_i \lambda, \quad (4)$$

$$\lambda P = \frac{UU_m}{f_1 f_u} \left(\frac{K_1 X_1}{\lambda + K_1} (1 - e^{-(\lambda + K_1)t}) + \right.$$

$$\left. \frac{K_2 X_2}{\lambda + K_2} (1 - e^{-(\lambda + K_2)t}) + \right.$$

$$\left. \frac{K_3 X_3}{\lambda + K_3} (1 - e^{-(\lambda + K_3)t}) \right) - 1 \quad (5)$$

$$\begin{aligned}
q = f_1 \lambda P & \left(\frac{X_1}{\lambda + K_1} (1 - e^{-(\lambda + K_1)t}) + \right. \\
& \frac{X_2}{\lambda + K_2} (1 - e^{-(\lambda + K_2)t}) + \\
& \left. \frac{X_3}{\lambda + K_3} (1 - e^{-(\lambda + K_3)t}) \right), \tag{6}
\end{aligned}$$

$$\begin{aligned}
D = \frac{f_1 \lambda P X_1}{\lambda + K_1} & \left(t - \frac{(1 - e^{-(\lambda + K_1)t})}{\lambda + K_1} \right) + \\
\frac{f_1 \lambda P X_2}{\lambda + K_2} & \left(t - \frac{(1 - e^{-(\lambda + K_2)t})}{\lambda + K_2} \right) + \\
\frac{f_1 \lambda P X_3}{\lambda + K_3} & \left(t - \frac{(1 - e^{-(\lambda + K_3)t})}{\lambda + K_3} \right), \tag{7}
\end{aligned}$$

$$\begin{aligned}
D_C = \frac{f_1 \lambda P X_1}{(\lambda + K_1)^2} & (1 - e^{-(\lambda + K_1)t}) + \\
\frac{f_1 \lambda P X_2}{(\lambda + K_2)^2} & (1 - e^{-(\lambda + K_2)t}) + \\
\frac{f_1 \lambda P X_3}{(\lambda + K_3)^2} & (1 - e^{-(\lambda + K_3)t}), \tag{8}
\end{aligned}$$

$$H_M = 4.32 \times 10^7 D Q (S_1 + S_2 + S_3 + S_4), \quad (9)$$

$$H_{BN} = 4.32 \times 10^7 D Q (S_5 + S_6 + S_7 + S_8), \quad (10)$$

$$H_M^C = 4.32 \times 10^7 D_C Q (S_1 + S_2 + S_3 + S_4), \quad (11)$$

$$H_{BN}^C = 4.32 \times 10^7 D_C Q (S_5 + S_6 + S_7 + S_8), \quad (12)$$

Values for Constants

| <u>Symbol</u> | <u>Value</u> | <u>Reference</u> |
|---------------|--------------------------------------|--|
| K_1 | $3.33 \times 10^{-1} \text{ d}^{-1}$ | W. S. Snyder, M. J. Cook and M. R. Ford, Health Physics, 10, 171 (1964). |
| K_2 | $2.27 \times 10^{-2} \text{ d}^{-1}$ | " |
| K_3 | $2.5 \times 10^{-4} \text{ d}^{-1}$ | " |
| X_1 | 0.73 | " |
| X_2 | 0.10 | " |
| X_3 | 0.17 | " |
| λ | $6.54 \times 10^{-5} \text{ d}^{-1}$ | 12th Edition, Chart of the Nuclides (1977). |
| f_u | 0.85 | ICRP 10 (1967). |
| f_l | 0.20 | ICRP 73/C2-34; ICRP 20 (1972). |
| U_m | 1.4 l d^{-1} | ICRP Reference Man |
| U_f | 1.0 l d^{-1} | ICRP Reference Man |
| Q | 1.0 | NCRP |

Values for Constants (Cont'd)

| <u>Symbol</u> | <u>Value</u> | <u>Reference</u> |
|----------------|--|------------------|
| S ₁ | 9.8 x 10 ⁻¹⁵ rads dis ⁻¹ | MIRD 11 |
| S ₂ | 7.3 x 10 ⁻¹³ rads dis ⁻¹ | MIRD 11 |
| S ₃ | 2.5 x 10 ⁻¹³ rads dis ⁻¹ | MIRD 11 |
| S ₄ | 4.3 x 10 ⁻¹² rads dis ⁻¹ | MIRD 11 |
| S ₅ | 6.3 x 10 ⁻¹³ rads dis ⁻¹ | MIRD 11 |
| S ₆ | 4.1 x 10 ⁻¹³ rads dis ⁻¹ | MIRD 11 |
| S ₇ | 3.0 x 10 ⁻¹² rads dis ⁻¹ | MIRD 11 |
| S ₈ | 1.7 x 10 ⁻¹² rads dis ⁻¹ | MIRD 11 |

Appendix C

Symbols, constants and equations used to calculate the $^{137}\text{Cs} - ^{137\text{m}}\text{Ba}$ total body dose equivalent during the uptake interval and the committed dose equivalent

The following definitions, symbols, constants and equations describe the mathematical model used to calculate the dose equivalent and the committed dose equivalent. Intermediate steps can be used to determine urine activity concentrations or daily ingestion rates. The equations were developed with the assumption that the body burden as determined from whole body counting, would be the measured quantity from the bioassay program. Three intervals of monotonically increasing, but constant and continuous uptake throughout an interval were assumed. Consequently, the equations must be repeated 3 times in order to obtain the total dose equivalent during the uptake interval. For ^{137}Cs , the uptake interval corresponds to the number of days out of the residence period that an individual maintained the proposed daily activity ingestion rate.

Mathematical Model

Symbols, Definitions and Units of Physical Quantities

- N_i^0 = the number of atoms of species of concern present at time zero in compartment i , atoms,
- N_i = the instantaneous number of atoms of species of concern present at time t in compartment i , atoms,
- P_i = atom intake rate into compartment i from blood, atoms day⁻¹,
- K_i = the instantaneous fraction of atoms removed from compartment i per unit time by physiological mechanisms, day⁻¹,

- λ \equiv the instantaneous fraction of atoms removed from compartment i per unit time by radiological mechanisms, day^{-1} ,
- q_i \equiv the instantaneous activity in compartment i at time t , Becquerels,
- E_i \equiv the instantaneous activity excretion rate from compartment i at time t , Becquerels day^{-1} ,
- f_u \equiv the fraction of body activity excreted in urine,
- f_l \equiv the fraction of GI tract activity entering blood,
- q \equiv the instantaneous activity in the body, Becquerels,
- q^0 \equiv the initial activity in the body, Becquerels,
- P \equiv the atom ingestion rate, atoms day^{-1} ,
- X_i \equiv the fraction of atoms entering blood deposited in compartment i ,
- t \equiv uptake interval, day,
- Q \equiv quality factor,
- D_C \equiv committed disintegrations due to ^{137}Cs remaining in body following uptake interval, Becquerel days,
- M \equiv mass of individual, kg,
- D \equiv disintegrations due to ^{137}Cs in the body during uptake interval, Becquerel days,
- H_{RB} \equiv the dose equivalent to the total body during the uptake interval, mRem,
- H_{PB} \equiv the dose equivalent to the total body post uptake interval, mRem,
- X'_i \equiv the fraction of radioactive atoms in the total body remaining in compartment i at the end of the uptake interval,
- S \equiv the absorbed dose to the total body per disintegration of ^{137}Cs - ^{137m}Ba in the total body, rads dis^{-1} ,

EQUATIONS

$$\frac{dN_i}{dt} = (\lambda + K_i)N_i + P_i, \quad (1)$$

$$N_i = N_i^0 e^{-(\lambda + K_i)t} + \frac{P_i}{\lambda + K_i} (1 - e^{-(\lambda + K_i)t}), \quad (2)$$

$$q_i = \lambda N_i, \quad (3)$$

$$E_i = K_i N_i \lambda_i \quad (4)$$

$$X'_i = \frac{\frac{X_i}{(K_i + \lambda)} (1 - e^{-(K_i + \lambda)t})}{\sum_i \frac{X_i}{(K_i + \lambda)} (1 - e^{-(K_i + \lambda)t})} \quad (5)$$

$$q = \lambda P \left[\frac{X_1 f_1}{(K_1 + \lambda)} (1 - e^{-(K_1 + \lambda)t}) + \right.$$

$$\left. \frac{X_2 f_1}{(K_2 + \lambda)} (1 - e^{-(K_2 + \lambda)t}) \right] +$$

$$q \left(X'_1 e^{-(K_1 + \lambda)t} + X'_2 e^{-(K_2 + \lambda)t} \right) \quad (6)$$

$$D = \frac{\lambda P X_1 f_1}{K_1 + \lambda} \left(t - \frac{(\lambda e^{-(\lambda + K_1)t})}{K_1 + \lambda} \right) +$$

$$\frac{\lambda P X_2 f_1}{K_2 + \lambda} \left(t - \frac{(1 - e^{-(\lambda + K_2)t})}{K_2 + \lambda} \right) \quad (7)$$

$$D_C = \frac{X_1' q^0}{K_1 + \lambda} (1 - e^{-(\lambda + K_1)\tau}) +$$

$$\frac{X_2' q^0}{K_2 + \lambda} (1 - e^{-(\lambda + K_2)\tau}), \quad (8)$$

$$H_{RB} = 8.64 \times 10^7 \text{ DQS}, \quad (9)$$

$$H_{PB} = 8.64 \times 10^7 D_{CQS}. \quad (10)$$

Values for Constants

| <u>Symbol</u> | <u>Value</u> | <u>Reference</u> |
|---------------|--|--------------------------------|
| K_1 | 0.7 d^{-1} | ICRP |
| K_2 | 0.006 d^{-1} | ICRP 10 |
| X_1 | 0.15 | ICRP 10 |
| X_2 | 0.85 | ICRP 10 |
| X'_1 | 0.002 | Uptake interval \gg 140 days |
| X'_2 | 0.998 | Uptake interval \gg 140 days |
| λ | $6.33 \times 10^{-5} \text{ d}^{-1}$ | Nuclear data tables |
| f_1 | 1.0 | ICRP 10 |
| Q | 1.0 | ICRP 26 |
| S | $1.05 \times 10^{-13} \text{ rads dis}^{-1}$ | MIRD 11 |

Table 1

Pooled or Mean Urine Activity Concentration for ^{90}Sr and ^{137}Cs

| <u>Year of Collection</u> | ^{90}Sr Urine Conc <u>pCi/l</u> | ^{137}Cs Urine Conc <u>nCi/l</u> | <u>Comment</u> |
|---------------------------|--|---|----------------------------|
| 1970 | 1.2 | 0.10 | 3640 ml - pooled |
| 1970 | 1.3 | 0.13 | 3365 ml - pooled |
| 1970 | 2.2 | - | 1100 ml - pooled |
| 1970 | 1.9 | - | 930 ml - pooled |
| 1971 | 0.96 | 0.22 | 3920 ml - pooled |
| 1971 | 0.89 | 0.20 | 2960 ml - pooled |
| 1971 | 1.2 | 0.21 | 3300 ml - pooled |
| 1971 | 3.9 | 0.11 | 500 ml - pooled |
| 1972 | 4.2 | 0.91 | 2700 ml - pooled |
| 1973 | 6.7 | 1.3 | mean of 14 people |
| 1974 | 2.3 | 1.3 | mean of 21 people |
| 1975 | 7.3 | 1.8 | pooled |
| 1975 | 3.1 | 1.3 | pooled |
| 1976 | 5.3 | 2.2 | mean of 26 people |
| 1977 | 3.9 | 7.7 | mean of 4 people |
| 1978 | 6.1 | 14. | mean of 35 people |
| 1979 | 2.6 | 1.3 | January, mean of 50 people |
| 1979 | 2.8 | .87 | May, mean of 40 people |
| 1980 | NA | NA | August |

NA = Not Analyzed

PRIVACY ACT MATERIAL REMOVED

Table 2
 Urine Activity Concentrations for Former Adult Male Bikini Island Residents
 1970 - 1980

| ID # | 1973 | | 1974 | | 1976 | | 1977 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs |
| | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l | Urine Conc. pCi/l | Urine Conc. nCi/l |
| (A) | 8.9 | 2.1 | <0.4 | 0.40 | | | | | | | | | | | | |
| (A) | 5.7 | 1.1 | | | | | | | | | | | | | | |
| (A) | 5.5 | 2.6 | | | | | | | | | | | | | | |
| (A) | 2.0 | 0.40 | | | | | | | | | | | | | | |
| (A) | 1.9 | 0.40 | | | | | | | | | | | | | | |
| (A) | 7.8 | 2.0 | - | - | | | | | | | | | | | | |
| (A) | | | 2.4 | 0.80 | | | | | | | | | | | | |
| (A) | | | | | 2.71 | 1.91 | NA | 0.58 | | | | | | | | |
| | | | | | 0.2 | 0.2 | | | | | | | | | | |
| 863 | | | | | | | | | 8.71 | 20.1 | | | | | | |
| | | | | | | | | | 2.6 | 0.45 | | | | | | |
| 6070 | | | 1.2 | 1.0 | 10.1 | 1.01 | | | 11.1 | 16.1 | 2.81 | 6.11 | | | | |
| | | | | | 0.6 | 0.2 | | | 1.6 | 0.41 | 0.70 | 0.14 | | | | |
| 6119* | | | | | | | | | NA | 16.1 | | | | | | |
| | | | | | | | | | | 0.44 | | | | | | |

PRIVACY ACT MATERIAL REMOVED

Table 2 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1977 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l |
| 6033 | | | | | | | | | 12 ± 1.2 | NA | | | | | | |
| 6018 | | | 3.0 | 0.60 | 7.1 ± 0.6 | 2.8 ± 0.2 | | | 7.6 ± 0.91 | NA | | | | | | |
| 6069* | | | | | | | | | NA | 16 ± 0.44 | | 1.2 ± 1.2 | 1.2 ± .12 | | | |
| 6068 | | | | | 2.3 ± 0.2 | 0.29 ± 0.06 | | | 2.9 ± 1.6 | 9.1 ± 0.31 | | | | | | |
| 6067 | | | | | 5.6 ± 0.6 | 1.9 ± 0.2 | | | 2.3 ± 0.73 | NA | 0.54 ± 0.25 | 5.2 ± 0.10 | 0.51 ± 0.95 | 2.0 ± 0.09 | | |
| 6067 | | | | | 2.8 ± 0.4 | 1.0 ± 0.2 | | | | | | | | | | |
| 6017 | 6.2 | 0.90 | | | | | | | 12 ± 2.7 | 37 ± 0.61 | | | 4.6 ± 2.0 | 1.4 ± 0.13 | | |
| 6019 | | | | | 1.6 ± 0.2 | 1.1 ± 0.2 | | | 10 ± 1.3 | NA | 3.1 ± 1.2 | 2.7 ± 0.17 | | | | |
| 6001 | | | | | 4.8 ± 0.8 | 2.9 ± 0.2 | | | | | | | | | | |
| | | | | | 12 ± 1.2 | 6.9 ± 0.4 | | | | | 0.56 ± 0.01 | 4.1 ± 0.21 | | | | |

Table 2 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1977 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l |
| 6073 | | | <0.2 | 1.5 | | | | | | | | | | | | |
| 6005 | | | | | | | | 2.0 ± 1.3 | 6.9 ± 0.26 | | | | -1.2 ± 16 | 1.3 ± 0.045 | | |
| 6008 | | | | | 5.5 ± 1.4 | 1.7 ± 0.2 | | | | | 1.3 ± 0.62 | 6.1 ± 0.25 | | | | |
| 6086 | 5.4 | 0.50 | 4.6 | 1.2 | 5.5 ± 0.4 | 0.9 ± 0.2 | | 9.4 ± 1.6 | 16 ± 0.40 | 0.71 ± 0.52 | 2.9 ± 0.17 | 5.9 ± 1.3 | 2.1 ± 0.095 | | | |
| 6071* | | | | | | | | NA | 16 ± 0.44 | 0.55 ± 1.0 | 4.5 ± 0.21 | | | | | |
| 6076 | | | | | 1.2 ± 0.2 | 1.2 ± 0.2 | | 0.93 ± 2.0 | 18 ± 0.43 | 0.37 ± 0.80 | 6.2 ± 0.25 | | | | | |
| 6072* | | | 2.5 | 0.50 | | | | NA | 16 ± 0.44 | | | | | | | |
| 813 | | | | | | | NA | 7.8 | | | | 2.5 ± 1.0 | 2.9 ± 0.11 | | | |
| 6118 | | | | | | | | | 1.8 ± 0.70 | NA | 1.4 ± 0.59 | 3.5 ± 0.085 | 0.67 ± 1.1 | 0.46 ± 0.076 | | |
| 6126 | | | | | 4.1 ± 0.4 | 3.2 ± 0.2 | | | 6.1 ± 2.6 | 11 ± 0.15 | | | | | | |

Table 2 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1977 | | 1978 | | 1979 - Jun. | | 1979 - May | | 1980 - Aug. | |
|------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l |
| 6003 | | | | | | | | | 9.8 ± 1.9 | 17 ± 0.41 | | | | | | |
| 6117 | | | | | 4.3 ± 0.4 | 1.9 ± 0.2 | <0.62 | NA | 8.4 ± 1.0 | NA | 1.4 ± 0.57 | 4.3 ± 0.21 | 1.2 ± 1.1 | 2.3 ± 0.16 | | |
| 6128 | | | | | 3.3 ± 0.4 | 2.7 ± 0.2 | 4.2 ± 2.0 | NA | 23.0 ± 6.0 | 5.1 ± 0.23 | 0.37 ± 0.41 | 1.5 ± 0.13 | | | | |
| 6125 | | | | | | | 4.1 ± 1.5 | 8.3 | 1.2 ± 0.64 | NA | | | -0.4 ± 1.4 | 1.7 ± 0.059 | | |
| 6007 | | | | | | | | | 4.8 ± 1.1 | 10 ± 0.32 | 1.2 ± 0.69 | 1.4 ± 0.12 | | | | |
| | | | | | | | | | | | 0.04 ± 0.68 | 8.0 ± 0.29 | | | | |
| 6066 | | | | | | | | | | | 1.5 ± 11 | 1.3 ± 0.16 | | | | |
| 864 | | | | | 13 ± 1.4 | 5.1 ± 0.2 | NA | 12 | | | | | | | | |
| 966 | | | | | 6.8 ± 0.6 | - | 6.6 ± 1.8 | 16 | | | | | | | | |
| 6135 | | | | | | | | | 2.4 ± 0.88 | NA | | | | | | |

Table 2 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1977 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l |
| 6096 | | | | | | | | | 4.3 ± 1.6 | 6.1 ± 0.25 | 0 ± 0.72 | 4.0 ± 0.20 | 1.1 ± 1.1 | 2.1 ± 0.15 | | |
| 6002 | | | | | 1.1 ± 0.2 | 0.9 ± 0.2 | | | 1.1 ± 0.39 | NA | | | | | | |
| 6161 | 2.2 | 0.60 | | | | | | | | | 0.86 ± 0.40 | 0.33 ± 0.030 | | | | |
| 6166 | | | | | | | | | | | 0.29 ± 0.52 | ND 0.9 | 0.39 ± 0.9 | ND | | |
| 6184 | | | | | | | | | | | 0.22 ± 0.53 | 0.10 ± 0.049 | 2.8 ± 3.0 | 0.099 ± 0.037 | | |
| 6210 | | | 3.2 | 1.7 | 2.0 ± 0.2 | 3.0 ± 0.2 | | | | | | | 0 ± 1.95 | 1.4 ± 0.12 | | |
| 6190 | | | | | | | | | | | | | | | | |
| 6205 | | | | | | | | | | | | | 0.4 ± 1.6 | ND | | |
| 6211 | | | | | | | | | | | | | 1.5 ± 5.3 | ND | | |
| 6218 | | | | | | | | | | | | | 0.9 ± 2.5 | ND | | |
| 6219 | | | | | | | | | | | | | 3.8 ± 5.4 | ND | | |

Table 2 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1977 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L |
| 6004* | | | | | | | | | NA | 16 ± 0.44 | | | | | | |
| Sample Size | 9 | 9 | 8 | 8 | 19 | 18 | 4 | 7 | 21 | 17 | 24 | 22 | 22 | 12 | | |
| Mean | 5.1 | 1.2 | 2.2 | 0.96 | 5.0 | 2.5 | 3.9 | 7.7 | 6.7 | 15 | 1.0 | 3.3 | 1.9 | 1.4 | | |
| Std Dev | 2.5 | 0.84 | 1.5 | 0.47 | 3.5 | 1.7 | 2.5 | 5.5 | 5.4 | 7.3 | 0.95 | 2.2 | 2.9 | 0.74 | | |
| Low | 1.9 | 0.4 | 0.2 | 0.5 | 1.1 | 0.29 | .62 | 0.58 | 0.93 | 5.1 | 0 | 0.10 | -1.2 | 0.099 | | |
| High | 8.9 | 2.6 | 4.6 | 1.7 | 13 | 5.1 | 6.6 | 16 | 23 | 37 | 3.1 | 6.3 | 12 | 2.3 | | |

Table 3
 Urine Activity Concentrations for Former Adult Female Bikini Island Residents
 1973 - 1980

| ID # | 1973 | | 1974 | | 1976 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L |
| | 11.6 | 2.1 | 3.8 | 3.2 | - | - | | | | | | | | |
| | 4.8 | 1.2 | - | - | - | - | | | | | | | | |
| | - | - | <0.1 | 1.0 | - | - | | | | | | | | |
| | - | - | - | - | 2.3 ± 0.4 | 1.4 ± 0.2 | | | | | | | | |
| | - | - | - | - | 9.6 ± 7.0 | 1.4 ± 0.2 | | | | | | | | |
| 6045 | | | | | | | 3.6 ± 1.9 | 17 ± 0.42 | | | | | | |
| 6112 | | | | | | | 3.9 ± 2.0 | 18 ± 0.42 | 0.082 ± 0.89 | 6.5 ± 0.13 | 2.5 ± 1.1 | 1.3 ± 0.076 | | |
| 6114 | | | | | | | 6.0 ± 2.7 | NA | 1.1 0.69 | 0.77 0.095 | | | | |
| 6111 | | | | | | | 3.9 ± 3.4 | 19 ± 0.50 | 0.39 ± 1.3 | 4.9 ± 0.23 | | | | |

Table 3 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L |
| 6122 | | | | | | | 3.8± 2.4 | 8.9± 0.40 | 0 ± 0.54 | 1.3 ± 0.12 | 1.8 ± 1.4 | 0.66 ± 0.089 | | |
| 6123 | | | | | | | | | 3.8 ± 2.3 | 5.0 ± 0.23 | | | | |
| 6059 | | | | | | | 4.8± 2.2 | 7.6± 0.29 | | | | | | |
| 6063 | | | | | 1.5 ± 0.4 | 1.6 ± 0.2 | | | | | | | | |
| 6032* | | | | | | | 2.0± .91 | 16 ± 0.44 | 0 ± 0.51 | 2.8 ± 0.17 | 7.5 ± 3.4 | 0.61 ± 0.069 | | |
| 6185 | | | | | | | | | | | 0.26± 0.99 | 0.046± 0.035 | | |
| 6108 | | | | | 7.6 ± 1.8 | 0.9 ± 0.2 | 4.5± 2.9 | 7.0± 0.27 | 2.3 ± 0.89 | 4.8 ± 0.23 | | | | |
| 6206 | | | | | | | | | | | -0.06± 1.2 | ND ^a | | |
| 6113 | | | | | | | 2.0± 1.2 | 6.7± 0.26 | 4.5 ± 5.4 | 2.6 ± 0.18 | 0.8 ± 1.8 | 0.57 ± 0.083 | | |
| 6065 | | | | | | | 13 ± 2.0 | 3.6± 0.19 | 2.4 ± 2.4 | 2.8 ± 0.23 | | | | |

Table 3 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L | ⁹⁰ Sr Urine Conc. pCi/L | ¹³⁷ Cs Urine Conc. nCi/L |
| 6097* | | | | | | | NA | 16 ± 0.44 | 0.38 ± 0.98 | 0.33 0.064 | 0.81 ± 1.1 | 0.83 ± 0.097 | | |
| 6109* | | | | | | | NA | 16 ± 0.44 | | | 1.9 ± 1.3 | 0.11 ± 0.043 | | |
| 6046 | | | | | | | 5.6 ± 1.2 | 13 ± 0.37 | | | 1.9 ± 1.3 | 0.11 ± 0.043 | | |
| 6098 | | | | | | | | | 0.71 ± 0.69 | 0.69 ± 0.20 | | | | |
| 6060 | | | | | | | | | 1.2 ± 0.82 | 1.7 ± 0.20 | 1.9 ± 1.4 | 0.59 ± 0.085 | | |
| 6222 | | | | | | | | | | | 0.58 ± 1.3 | ND | | |
| 6110 | | | | | | | | | | | 4.4 ± 1.8 | 0.61 ± 0.088 | | |
| 525 | | | | | | | 2.2 ± 0.82 | NA | | | 3.7 ± 1.6 | 0.17 ± 0.059 | | |
| 6064* | | | | | | | NA | 16 ± 0.44 | 0.91 ± 0.45 | 2.0 ± 0.066 | 2.7 ± 0.91 | 1.8 ± 0.088 | | |
| 6061 | | | | | | | 4.6 ± 0.91 | 14 ± 0.38 | | | | | | |

Table 3 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l |
| 6051 | | | | | | | | | | | 0.99 ± 0.84 | 0.20 ± 0.034 | | |
| 934 | | | | | 5.4 ± 0.4 | NA | 8.2 ± 1.4 | NA | | | 2.6 ± 1.5 | 2.1 ± 0.16 | | |
| 6062 | | | | | | | | | | | 10 ± 4.1 | 1.5 ± 0.13 | | |
| 6035 | | | | | | | 9.9 ± 2.0 | 14 ± 0.37 | 4.3 ± 2.9 | 2.7 ± 0.13 | | | | |
| 6115 | | | | | 5.1 ± 0.8 | 3.2 ± 0.2 | 6.0 ± 2.3 | 10 ± 0.33 | 0.61 ± 1.0 | 4.2 ± 0.21 | | | | |
| 6034* | | | | | | | NA | 16 ± 0.44 | | | 1.7 ± 1.6 | 0.57 ± 0.08 ± | | |
| 865 | | | | | 4.0 ± 0.4 | 1.4 ± 0.2 | | | | | 1.4 ± 1.1 | 0.71 ± 0.059 | | |
| 6036* | | | | | | | NA | 16 ± 0.44 | | | | | | |
| 6137 | | | | | | | | | 0.31 ± 0.87 | 0.36 ± 0.17 | | | | |
| 6139 | | | | | | | | | 1.1 ± 12.3 | ND | | | | |

Table 3 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|------|---|--|---|--|---|--|---|--|---|--|---|--|---|--|
| | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l | ⁹⁰ Sr Urine Conc. pCi/l | ¹³⁷ Cs Urine Conc. nCi/l |
| 6140 | | | | | | | | | 5.7 ± 6.9 | 0.17 ± 0.11 | | | | |
| 6144 | | | | | | | | | 0.82 ± 0.76 | 0.13 ± 0.050 | | | | |
| 6148 | | | | | | | | | 0.33 ± 0.73 | 0.13 ± 0.051 | 0.22 ± 0.98 | 0.10 ± 0.050 | | |
| 6151 | | | | | | | | | 3.1 ± 1.5 | 0.96 ± 0.11 | 1.7 ± 1.0 | 1.9 ± 0.091 | | |
| 6152 | | | | | | | | | 2.1 ± 2.5 | ND | -0.35 1.2 | ND | | |
| 6155 | | | | | 3.4 ± 0.6 | 0.50 ± 0.10 | | | 1.7 ± 0.73 | 2.5 ± 0.16 | 3.9 ± 1.2 | 0.82 ± 0.94 | | |
| 6159 | | | | | 2.4 ± 0.2 | 1.2 ± 0.2 | | | 0.17 ± 0.23 | 0.13 ± 0.022 | 0 ± 1.33 | 0.059 ± 0.027 | | |
| 6160 | | | | | | | | | 5.7 ± 0.95 | 2.8 ± 0.17 | 0.27 ± 0.81 | 0.33 ± 0.066 | | |
| 6163 | | | | | | | | | 0.38 ± 0.42 | 0.16 ± 0.054 | | | | |
| 6165 | | | | | | | | | 0.85 ± 0.89 | 0.075 ± 0.011 | | | | |

Table 3 (Cont'd)

| ID # | 1973 | | 1974 | | 1976 | | 1978 | | 1979 - Jan. | | 1979 - May | | 1980 - Aug. | |
|-------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs | ⁹⁰ Sr | ¹³⁷ Cs |
| | Urine Conc. pCi/L | Urine Conc. nCi/L | Urine Conc. pCi/L | Urine Conc. nCi/L | Urine Conc. pCi/L | Urine Conc. nCi/L | Urine Conc. pCi/L | Urine Conc. nCi/L | Urine Conc. pCi/L | Urine Conc. nCi/L | Urine Conc. pCi/L | Urine Conc. nCi/L | Urine Conc. pCi/L | Urine Conc. nCi/L |
| 6167 | | | | | | | | | 0.02 ± 0.52 | 0.081 ± 0.045 | 1.5 ± 1.2 | ND | | |
| 6175 | | | | | | | | | | | 2.7 ± 1.4 | ND | | |
| 6181 | | | | | | | | | | | 8.2 ± 11.3 | ND | | |
| Sample Size | 2 | 2 | 1 | 2 | 9 | 8 | 16 | 18 | 28 | 26 | 27 | 21 | | |
| Mean | 8.2 | 1.7 | 3.8 | 2.1 | 6.0 | 1.5 | 5.3 | 13 | 1.6 | 2.1 | 2.4 | 0.74 | | |
| Std. Dev. | 4.8 | 0.64 | - | 1.6 | 5.2 | 0.79 | 3.0 | 4.6 | 1.7 | 1.9 | 2.6 | 0.63 | | |
| Low | 4.8 | 1.2 | - | 1.0 | 1.5 | 0.50 | 2.0 | 3.6 | 0 | .075 | -0.35 | 0.046 | | |
| High | 11.6 | 2.1 | - | 3.2 | 9.6 | 3.2 | 13 | 19 | 5.7 | 6.5 | 10 | 2.1 | | |

Table 4

Urine Activity Concentrations for Former Adolescent Residents of Bikini Atoll
1978, 1979, and 1980

| ID # | Sex | 1978 | | Jan. 1979 | | May 1979 | | August 1980 | |
|-------------|-----|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|
| | | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L |
| 6127 | M | 1.7 ± 0.54 | NA | 2.2 ± 0.77 | 0.66 ± 0.037 | 1.4 ± 1.5 | 0.28 ± 0.066 | | |
| 6132 | M | 11 ± 2.4 | 30 ± .55 | | | | | | |
| 6011 | M | 29 ± 3.1 | 18 ± 0.43 | | | 33 ± 3.9 | 0.53 ± 0.083 | | |
| 6065 | M | | | | | 3.0 ± 1.2 | 0.18 ± 0.052 | | |
| 6169 | M | | | | | 0.78 ± 0.96 | ND | | |
| 6178 | M | | | | | 1.3 ± 1.3 | ND | | |
| 6183 | M | | | | | 4.4 ± 5.0 | ND | | |
| 6200 | M | | | | | 4.6 ± 1.5 | 1.1 ± 0.11 | | |
| 6131* | M | NA | 16 ± 0.44 | | | 1.9 ± 1.2 | 0.79 ± 0.095 | | |
| 6207 | M | | | | | -1.0 ± 1.8 | ND | | |
| Sample Size | | 3 | 3 | 1 | 1 | 9 | 5 | | |
| Mean | | 14 | 21 | 2.2 | 0.66 | 5.5 | 0.58 | | |
| Std. Dev. | | 14 | 7.6 | - | - | 11 | 0.38 | | |
| Low | | 1.7 | 16 | - | - | -1.0 | 0.18 | | |

Table 4 (Cont'd)

| ID # | Sex | 1978 | | Jan. 1979 | | May 1979 | | August 1980 | |
|-------------|-----|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|---------------------------|----------------------------|
| | | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L | ⁹⁰ Sr pCi/L | ¹³⁷ Cs nCi/L |
| High | | 29 | 30 | - | - | 13 | 1-1 | | |
| 6129 | F | | | 0.47±4.3 | 3.2±0.24 | | | | |
| 6091 | F | | | | | 17 | 114 | 0.57±0.11 | |
| 6173 | F | | | | | 5.5 ± 2.0 | ND | | |
| 6048 | F | | | | | -0.11±10 | 0.18 ± 0.13 | | |
| 6212 | F | | | | | -0.06± 1.5 | ND | | |
| Sample Size | | | | 1 | 1 | 4 | 2 | | |
| Mean | | | | 0.47 | 3.2 | 5.6 | 0.38 | | |
| Stand Dev | | | | - | - | 8.0 | 0.28 | | |
| Low | | | | - | - | -0.11 | 0.16 | | |
| High | | | | - | - | 17 | 0.57 | | |

Table 5

Urine Activity Concentrations for Former Children
Residents of Bikini Atoll - 1979, 1980

| ID # | Sex | May 1979 | | August 1980 |
|-------------|-----|---------------------------|----------------------------|-------------|
| | | ^{90}Sr pCi/l | ^{137}Cs nCi/l | |
| 6172 | M | 3.9 ± 1.5 | N.D. | |
| 6156 | M | 2.7 ± 1.3 | N.D. | |
| 6009 | M | 6.8 ± 3.8 | 0.15 ± 0.052 | |
| 6012 | M | 11 ± 3.4 | 0.31 ± 0.060 | |
| 6014 | M | 3.5 ± 2.2 | 0.093 ± 0.030 | |
| 6043 | M | 22 ± 23 | N.D. | |
| 6202 | M | 6.8 ± 9.4 | 0.071 ± 0.049 | |
| 6208 | M | -0.43 ± 1.1 | N.D. | |
| Sample Size | | 8 | 4 | |
| Mean | | 7.0 | 0.16 | |
| Std. Dev. | | 6.9 | 0.11 | |
| Low | | -0.43 | 0.071 | |
| High | | 22 | 0.31 | |
| 6203 | F | -0.32 ± 1.5 | N.D. | |
| 6204 | F | -0.22 ± 1.7 | 1.0 ± 0.11 | |
| 6213 | F | -0.15 ± 1.8 | N.D. | |
| 6217 | F | -0.08 ± 3.7 | N.D. | |
| Sample Size | | 4 | 1 | |
| Mean | | -0.19 | 1.0 | |

Table 5 (Cont'd)

| <u>ID #</u> | <u>Sex</u> | <u>May 1979</u> | | <u>August 1980</u> |
|-------------|------------|----------------------------------|-----------------------------------|--------------------|
| | | ^{90}Sr <u>pCi/l</u> | ^{137}Cs <u>nCi/l</u> | |
| Std. Dev. | | .10 | - | |
| Low | | -0.33 | - | |
| High | | -0.08 | - | |

PRIVACY ACT MATERIAL REMOVED

Table 6

Transuranic Urine Activity Concentrations at Bikini Atoll Residents: 1975-1977

| ID # | Name | EMU. | EMU. | EMU. | EMU. | EMU. | BMU. | BMU. | EMU. | EMU. |
|-------|------|---------------|---------------|---------------|-----------------------|-------------------------|-----------------------|-------------------------|-------------------------|-------------------------|
| | | 1970 239Pu | 1971 239Pu | 1974 239Pu | 1975 Fall 239Pu | 1976 Spring 239Pu | 1976 Fall 239Pu | 1977 Spring 239Pu | 1977 Spring 239Pu | 1977 Spring 239Pu |
| | | ICi/l | ICi/l | ICi/l | ICi/l | ICi/l | ICi/l | ICi/l | ICi/l | ICi/l |
| No ID | | - | - | - | - | - | - | - | - | <10 |
| 6159 | | - | - | 60 | - | - | - | - | - | - |
| 813 | | - | - | - | - | - | 0.73 ± 0.53 | 0.48 ± 0.45 | <10 | <10 |
| 6166 | | - | - | 10 | - | - | - | - | - | - |
| 6125 | | - | - | - | - | - | 0.73 ± 0.53 | 0.48 ± 0.45 | <10 | - |
| No ID | | - | - | 10 | - | - | - | - | - | - |
| 966 | | - | - | 10 | - | - | 0.01 ± 0.64 | 0.50 ± 0.53 | - | <10 |
| 6167 | | - | - | 10 | - | - | 0.73 ± 0.53 | 0.48 ± 0.45 | - | - |
| 864 | | - | - | 9 | - | - | 6.21 ± 1.4 | 1.02 ± 0.63 | 0.51 ± 0.43 | <10 |
| No ID | | - | - | 10 | - | - | - | - | - | - |
| No ID | | - | - | - | - | - | - | - | <10 | - |
| 6161 | | - | - | 4 | - | - | - | - | - | - |
| No ID | | - | - | - | - | - | - | - | <10 | - |
| 914 | | - | - | 20 | - | - | - | - | - | - |
| 6117 | | - | - | - | - | - | 0.73 ± 0.53 | 0.48 ± 0.45 | - | - |

PRIVACY ACT MATERIAL REMOVED

Table 6 (Cont'd)

| ID # | Name | EML 1970 | | EML 1971 | | EML 1974 | | EML 1975 | | EML 1976 | | EML 1977 | | BMMI 1977 | | IASL 1977 | | IASL 1977 | |
|-------|--------------------|----------|-------|----------|-------|----------|-------|----------|-------|----------|------|----------|------|-----------|-------|-----------|-------|-----------|------|
| | | ICI/L | ICI/L | ICI/L | ICI/L | ICI/L | ICI/L | ICI/L | ICI/L | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall | Spring | Fall |
| 6128 | | - | - | - | - | - | - | - | - | - | - | - | - | 0.73 | 10.53 | 0.48 | 10.45 | - | - |
| | | | | | | | | | | | | | | 0.46 | 10.27 | -0.04 | 10.09 | - | - |
| 6067 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6001 | | - | - | - | - | 20 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6067 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6210 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 6126 | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| No ID | | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Pooled | 3 | 4 | - | - | - | - | 1112 | 982 | - | - | - | - | - | - | - | - | - | - |
| | Urine | 2 | 4 | - | - | - | - | 1212 | - | - | - | - | - | - | - | - | - | - | - |
| | Urine | 20 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Controls | 24 | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Pheye | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Hot je | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Hajore Hospital | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | Hajore Police Wang | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | BHL | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | | | | | | | | | | | | |

Table 7
 Five Day Consecutive Urine Concentrations for ¹³⁷Cs and ⁹⁰Sr: January 1979

| ID # | ¹³⁷ Cs | | ⁹⁰ Sr | | ¹³⁷ Cs | | ⁹⁰ Sr | |
|------|-------------------|--------------------------------|------------------|--------------------------------|-------------------|--------------------------------|------------------|--------------------------------|
| | Mean ngl/l | Standard Deviation ngl/l | Mean ngl/l | Standard Deviation ngl/l | Mean ngl/l | Standard Deviation ngl/l | Mean ngl/l | Standard Deviation ngl/l |
| 55 | 0.32 | 0.13 | 0.21 | 0.50 | 0.41 | 0.12 | 0.12 | 1.1 |
| 58 | 0.40 | 0.16 | 0.21 | 0.60 | -0.03 | 0.12 | -0.41 | 0.50 |
| 6159 | 0.13 | 0.039 | 0.011 | 0.064 | 0.16 | 0.47 | -0.19 | 0.92 |
| 6118 | 3.5 | 1.0 | 2.1 | 4.9 | 1.4 | 0.30 | 0.48 | 4.2 |
| 57 | 0.18 | 0.039 | 0.12 | 0.23 | 0.27 | 0.65 | -0.86 | 0.78 |
| 6066 | 1.3 | 1.1 | 0.41 | 3.1 | 1.5 | 2.5 | -0.30 | 5.8 |
| 6112 | 6.5 | 2.9 | 0.064 | 2.0 | 9.8 | 0.82 | -0.71 | 0.73 |
| 6060 | 1.7 | 0.49 | 0.10 | 1.2 | 2.5 | 0.47 | 0.86 | 1.86 |
| 6064 | 2.0 | 0.36 | 0.033 | 1.5 | 2.4 | 0.91 | 0.14 | 3.2 |
| 6067 | 5.2 | 0.47 | 0.052 | 4.5 | 5.8 | 0.42 | 0 | 1.2 |
| 6070 | 6.3 | 1.1 | 0.070 | 5.0 | 2.8 | 0.90 | 2.1 | 3.8 |
| 6035 | 2.7 | 0.19 | 0.069 | 2.5 | 4.3 | 2.1 | 2.4 | 6.5 |
| 6161 | 0.33 | 0.11 | 0.015 | 0.23 | 0.48 | 0.79 | 0.12 | 2.1 |
| 254 | 0.26 | 0.067 | 0.013 | 0.19 | 0.34 | 0.21 | -0.060 | 0.45 |

Table 7 (Cont'd)

| ID # | ¹³⁷ Cs | | | ⁹⁰ Sr | | | | | |
|-----------|-------------------|--|--|------------------|---------------|---------------|--|--------------|---------------|
| | Mean nCi/L | Standard Deviation of Mean nCi/L | Counting Error of Mean nCi/L | Low nCi/L | High nCi/L | Mean nCi/L | Counting Error of Mean nCi/L | Low pCi/L | High pCi/L |
| 255 | 0.23 | 0.11 | 0.013 | 0.10 | 0.39 | -0.20 | 0.37 | -0.81 | 0.43 |
| 257 | 0.19 | 0.064 | 0.010 | 0.13 | 0.25 | -0.26 | 0.18 | -0.02 | .49 |
| N | 16 | | | | | | | | |
| \bar{x} | 2.0 | 0.52 | 0.064 | 9.8 | 1.7 | 1.1 | 0.64 | 0.12 | 2.1 |

Table 8

Summary of System Efficiency and MDLS for Field WBC System

| <u>Nuclide</u> | <u>Energy</u> | <u>Efficiency</u> | <u>MDL</u> | <u>Time</u> |
|-------------------|--------------------|----------------------|----------------|-------------|
| ¹³⁷ Cs | 662 KeV | 8.7×10^{-3} | 37 Bq (1 nCi) | 900 sec |
| ⁶⁰ Co | 1173 & 1334 KeV | 6.7×10^{-3} | 37 Bq (1 nCi) | 900 sec |
| ⁴⁰ K | 1460 KeV | 7.0×10^{-3} | 222 Bq (6 nCi) | 900 sec |

Table 9

Body Burden Data for Medically Registered Adult Males Relocated from Bikini Atoll

| Medical ID | Weight in Kilo-grams | Age (Yr) | Years on Bikini | 1974 ¹ | | 1977 ² | | 1978 | | January 1979 | | May 1979 | | August 1980 | |
|---------------------|----------------------|----------|-----------------|-------------------|-----------|-------------------|-----------|----------|-----------|-----------------|----------|-----------|-----------------|-------------|-----------|
| | | | | Potassium Grams | 137Cs µCi | Potassium Grams | 137Cs µCi | 60Co µCi | 137Cs µCi | Potassium Grams | 60Co µCi | 137Cs µCi | Potassium Grams | 60Co µCi | 137Cs µCi |
| 80 | 61 | 69 | 0.75 | - | - | 97.6 | 1.42 | 1.14 | - | - | - | - | - | - | - |
| 6006 | 63 | 37 | 0.75 | - | - | 141 | 2.39 | 1.47 | - | - | - | - | - | - | - |
| 863 | 67 | 27 | 4 | - | 146 | 0.729 | 4.93 | 2.36 | 179 | 2.5 | 1.1 | - | - | - | - |
| 6070 | 85 | 28 | 10 | 0.093 | 167 | 1.51 | 8.17 | 3.92 | 137 | 3.0 | 1.6 | - | - | - | - |
| 6004 | 95 | 28 | 0.25 | - | 167 | - | 1.88 | 1.33 | - | - | - | - | - | - | - |
| 6033 | 79 | 27 | 6 | 0.095 | 136 | 1.52 | 8.65 | 3.86 | - | - | - | - | - | - | - |
| 6018 | 89 | 34 | 6 | 0.22 | - | 180 | 14.3 | 5.88 | - | - | - | - | - | - | - |
| 6069 | 61 | 32 | 8 | - | - | 132 | 4.01 | 1.17 | - | - | - | - | - | - | - |
| 6068 | 79 | 56 | 6 | 0.051 | 144 | 0.778 | 6.17 | 3.07 | - | - | - | - | - | - | - |
| 6067 | 74 | 56 | 7 | - | 151 | 5.91 | 2.99 | 2.99 | 137 | 2.4 | 1.0 | 1.2 | 0.63 | 166 | 1.2 |
| 6066 | 94 | 32 | 3 | - | 168 | 2.04 | 0.820 | 0.820 | 171 | 1.2 | 0.48 | - | - | 166 | 1.2 |
| 6017 | 80 | 49 | 8 | - | 153 | 13.9 | 5.72 | 5.72 | - | - | - | - | - | 145 | - |
| 6019 | 60 | 48 | 5 | - | 119 | 0.791 | 3.95 | 1.03 | 135 | 2.9 | 0.39 | - | - | 139 | 1.5 |
| 6001 | 85 | 66 | 7 | 0.078 | 143 | 0.078 | 3.33 | 1.73 | 132 | 1.9 | 0.77 | - | - | 160 | - |
| 6073 | 85 | 24 | 7 | - | 132 | 0.775 | 4.19 | 2.18 | - | - | - | - | - | 160 | - |
| 6005 | 70 | 58 | 1.5 | - | - | 133 | 3.40 | 2.08 | - | - | - | - | - | 154 | - |
| 6008 | 55 | 32 | 4 | - | 153 | 1.99 | 5.00 | 1.96 | 148 | 3.2 | 1.3 | - | - | 152 | - |
| 6066 | 78 | 46 | 8 | 0.17 | 149 | 2.14 | 7.92 | 3.51 | 179 | 2.8 | 0.86 | 1.9 | 0.40 | 186 | 1.0 |
| 6071 | 78 | 32 | 0.75 | - | 136 | - | 2.26 | 1.72 | 136 | 1.2 | 0.93 | - | - | 185 | - |
| 6076 | 69 | 39 | 3 | - | - | 163 | 6.64 | 3.44 | 171 | 2.9 | 2.4 | - | - | 232 | - |
| 6072 | 55 | 20 | 0.67 | - | - | 128 | 2.96 | 1.75 | - | - | - | - | - | - | - |
| 813 | 58 | 23 | 4 | - | 143 | 0.995 | 3.65 | 1.69 | 154 | 1.8 | 0.61 | - | - | - | - |
| 6118 | 55 | 22 | 6 | 0.77 | 126 | 0.77 | 1.92 | 0.631 | 144 | 1.6 | 0.75 | 0.9 | 0.41 | 111 | - |
| 6126 | 55 | 35 | 2 | - | 149 | 2.21 | 7.79 | 3.10 | - | - | - | - | - | 141 | - |
| 6003 | 77 | 22 | 8 | 0.076 | 161 | 0.923 | 5.60 | 2.44 | - | - | - | - | - | - | - |
| 6117 | 80 | 22 | 6 | - | 169 | 1.15 | 6.09 | 2.68 | 172 | 2.9 | 0.90 | 1.5 | 0.44 | 177 | - |
| 6128 | 52 | 31 | 7 | - | 149 | 1.29 | 4.79 | 1.85 | 155 | 2.7 | 0.92 | - | - | 138 | - |
| 6125 | 64 | 35 | 9 | 0.10 | 150 | 1.54 | 5.65 | 2.52 | - | - | - | - | - | 169 | - |
| 6007 | 82 | 35 | 0.58 | - | 150 | - | 2.58 | 1.49 | 144 | 0.67 | 0.32 | 2.0 | 0.33 | 175 | - |
| 6130 | 69 | 29 | 0.42 | - | - | 127 | 2.20 | 1.46 | 156 | 1.5 | 1.5 | - | - | 111 | - |
| 6119 | 54 | 17 | 7 | - | - | 143 | 2.20 | 1.46 | 156 | 1.5 | 1.5 | - | - | - | - |
| 864 | 90 | 51 | 7 | 0.29 | 163 | 0.29 | 4.50 | 2.13 | - | - | - | - | - | - | - |
| 966 | 75 | 56 | 7 | - | 138 | 0.641 | 5.99 | 3.05 | - | - | - | - | - | - | - |
| 6135 | 81 | 35 | 1 | - | 133 | 3.23 | 14.8 | 5.71 | - | - | - | - | - | 155 | - |
| 6096 | 66 | 48 | 3 | - | 162 | 2.22 | 3.30 | 2.12 | - | - | - | - | - | 190 | - |
| 6002 | 66 | 65 | 2 | - | 145 | 1.93 | 4.32 | 1.91 | 146 | 2.5 | 1.3 | 0.9 | 0.7 | 120 | - |
| 6161 ^{3,4} | 64 | 34 | 5 | 0.081 | 130 | 1.04 | 2.21 | 1.26 | - | - | - | - | - | - | - |
| 6166 ^{3,4} | 64 | 58 | 7 | 0.072 | - | - | - | - | 142 | - | - | - | - | - | - |
| 6184 ⁴ | 50 | 59 | 5 | 0.043 | 150 | 0.072 | - | - | 146 | - | - | - | - | 146 | - |
| 6210 ⁴ | 85 | 35 | 10 | 0.124 | 156 | 0.124 | - | - | 130 | - | - | - | - | 144 | - |
| | | | | | 141 | 0.74 | - | - | - | - | - | - | - | 160 | - |

¹ Conard, R.A., BHL 50424.² Personal communication with S. Cohn.³ Individuals left Bikini Atoll 8 months prior to the August 1978 Relocation Program.⁴ Individuals received sick call medical care prior to April 1978 but were not officially registered.⁵ Data obtained August 1979.

Table 11

Body Burden Data for Medically Registered Adolescents Relocated from Bikini Atoll

| Medical ID | Height in Kilo-grams | Age (Yr) | Years on Bikini | 1977 | | | 1978 | | | January 1979 | | | May 1979 | | | August 1980 | | |
|----------------|----------------------|----------|-----------------|-----------------|----------------------------|----------------------|-----------------|----------------------------|----------------------|-----------------|----------------------------|----------------------|-----------------|----------------------------|----------------------|-----------------|----------------------------|----------------------|
| | | | | Potassium grams | ¹³⁷ Cs μ Ci | ⁶⁰ Co nCi | Potassium grams | ¹³⁷ Cs μ Ci | ⁶⁰ Co nCi | Potassium grams | ¹³⁷ Cs μ Ci | ⁶⁰ Co nCi | Potassium grams | ¹³⁷ Cs μ Ci | ⁶⁰ Co nCi | Potassium grams | ¹³⁷ Cs μ Ci | ⁶⁰ Co nCi |
| Males | | | | | | | | | | | | | | | | | | |
| 6167 | 36 | 12 | 4.5 | 84 | 0.959 | - | 53 | - | 0.204 | - | 94 | - | 0.075 | - | 95 | - | .0035 | |
| 6132 | 33 | 12 | 2 | - | - | 3.45 | - | - | - | - | - | - | - | - | 82 | - | .0038 | |
| 6131 | 38 | 16 | 6 | 96 | 1.31 | 3.40 | 108 | 2.1 | 0.76 | 1.4 | 133 | 1.4 | 0.32 | - | 139 | - | .015 | |
| 6011 | 40 | 11 | 6 | - | - | 1.34 | 59 | 1.0 | 0.055 | - | 74 | - | 0.017 | - | 99.7 | - | .0009 | |
| 6127 | 32 | 13 | 7 | 91 | 0.824 | 2.17 | 95 | 2.0 | 0.21 | - | 60 | - | 0.053 | - | 92 | - | .0033 | |
| 6133 | 27 | 11 | 7 | - | - | 3.42 | - | - | - | - | 55 | - | 0.022 | - | 59 | - | - | |
| 6015 | 29 | 11 | 1.42 | - | - | 1.18 | 37 | - | 0.071 | - | 60 | - | 0.016 | - | - | - | - | |
| Females | | | | | | | | | | | | | | | | | | |
| 6129 | 48 | 13 | 4 | 91 | 0.682 | 1.32 | 73 | 1.2 | 0.27 | - | 89 | - | 0.076 | - | 100 | - | .0044 | |
| 6048 | 40 | 13 | 0.25 | - | - | 2.61 | - | - | - | - | 121 | - | 0.074 | - | 108 | - | .0014 | |
| 6091 | 43 | 13 | 6 | - | - | 2.20 | 103 | 1.4 | 0.15 | - | 86 | - | 0.037 | - | - | - | - | |

Table 12

Body Burden Data for Medically Registered Children Relocated from Bikini Atoll

| Med- ical ID | Weight in Kilo- grams | Age (Yr) | Years on Bikini | 1978 | | | January 1979 | | | May 1979 | | | August 1980 | | |
|----------------|-----------------------|----------|-----------------|-------------------|----------|-----------|-------------------|-----------|-------------------|-----------|-------------------|-----------|-------------|--|--|
| | | | | Potas- sium Grams | 60Co uCi | 137Cs uCi | Potas- sium Grams | 137Cs uCi | Potas- sium Grams | 137Cs uCi | Potas- sium Grams | 137Cs uCi | | | |
| Males | | | | | | | | | | | | | | | |
| 6009 | 20 | 6 | 4 | 36 | 0.98 | 1.26 | - | - | 59 | 0.007 | 88 | .0010 | | | |
| 6049 | 23 | 8 | 2 | 47 | 2.7 | 1.71 | - | - | - | - | 59 | .0032 | | | |
| 6042 | 23 | 7 | 0.25 | 43 | 1.0 | 1.07 | - | - | - | - | - | - | | | |
| 6014 | 20 | 5 | 1.36 | 41 | 1.7 | 1.50 | - | - | 69 | 0.012 | 46 | - | | | |
| 6012 | 24 | 7 | 7 | 41 | 1.7 | 1.27 | - | - | 63 | 0.022 | 58 | .0025 | | | |
| 6023 | 28 | 8 | 4 | 52 | 1.7 | 1.28 | - | 0.16 | - | - | 71 | - | | | |
| 6016 | 27 | 10 | 7 | 53 | 2.5 | 1.43 | - | - | 51 | 0.039 | 62 | .0014 | | | |
| 6013 | 18 | 5 | 2 | 33 | 1.3 | 1.00 | - | - | - | - | - | - | | | |
| 6031* | 20 | 5 | 3 | - | - | - | - | - | 35 | 0.0028 | 37 | - | | | |
| 6029 | 20 | 6 | 5 | - | - | - | - | - | 25 | 0.0047 | 48 | .0009 | | | |
| 6100* | 17 | 5 | 4.3 | - | - | - | - | - | 24 | 0.015 | 43 | - | | | |
| 6021* | 19 | 5 | 4.3 | - | - | - | NC | 0.046 | 51 | 0.0062 | 49 | - | | | |
| 6020 | 20 | 6 | 2 | - | - | - | 72 | 0.056 | 37 | 0.0074 | 38 | - | | | |
| 6107* | 15 | 5 | 4.3 | - | - | - | 46 | 0.016 | 40 | 0.0026 | 37 | - | | | |
| 6074* | 20 | 5 | 4.3 | - | - | - | 34 | .009 | 25 | - | - | - | | | |
| 6116* | 14 | 5 | 3 | - | - | - | - | - | - | - | 33 | - | | | |
| Females | | | | | | | | | | | | | | | |
| 6094 | 34 | 10 | 6 | 51 | 2.3 | 2.02 | - | - | - | - | - | - | | | |
| 6092 | 29 | 8 | 6 | 52 | 2.8 | 2.25 | - | - | - | - | - | - | | | |
| 6080 | 34 | 7 | 0.58 | 50 | - | 0.543 | - | - | - | - | - | - | | | |
| 6010 | 29 | 8 | 7 | 56 | 1.8 | 1.41 | 50 | 0.17 | - | - | 71 | .0021 | | | |
| 6018 | 21 | 6 | 2 | 42 | 1.3 | 1.00 | - | - | - | - | 53 | .0019 | | | |
| 6105 | 22 | 5 | 3 | 31 | 1.2 | 0.967 | 65 | 0.053 | 29 | 0.0074 | 51 | - | | | |
| 6103 | - | 9 | 3 | 48 | 1.4 | 1.40 | - | - | - | - | 99 | .0046 | | | |
| 6028 | 25 | 7 | 5 | 52 | 1.4 | 1.26 | - | - | 49 | 0.015 | 75 | .0011 | | | |
| 6030 | 34 | 10 | 3 | 54 | 3.0 | 2.38 | 34 | 0.26 | 70 | 0.064 | 63 | .0018 | | | |
| 6027 | 22 | 6 | 3 | 36 | 5.6 | 1.16 | 58 | 0.042 | - | - | 56 | - | | | |
| 6044 | 18 | 6 | 5 | 35 | 6.4 | 1.15 | - | - | 36 | 0.0062 | - | - | | | |
| 6025 | 21 | 5 | 3 | 44 | 0.97 | 1.03 | 45 | 0.13 | 67 | 0.028 | 52 | - | | | |
| 6081 | 26 | 9 | 0.67 | 49 | - | 1.02 | - | - | - | - | - | - | | | |
| 6106 | 22 | 6 | 3 | 32 | - | 0.622 | 37 | 0.077 | 44 | 0.013 | 53 | - | | | |
| 6078* | 17 | 5 | - | - | - | - | 28 | 0.0030 | - | - | - | - | | | |
| 6088* | 15 | 5 | 4.3 | - | - | - | - | - | 33 | 0.0030 | - | - | | | |
| 6090 | 25 | 6 | 5 | - | - | - | - | - | 31 | 0.0049 | 47 | - | | | |
| 6101 | 19 | 6 | 5.3 | - | - | - | 12 | 0.051 | 15 | 0.0069 | 36 | - | | | |
| 6056* | 17 | 6 | 4.3 | - | - | - | NC | 0.046 | 49 | 0.0074 | 41 | - | | | |
| 6057 | 26 | 7 | 1 | - | - | - | - | - | 66 | 0.0058 | 33 | - | | | |
| 6079* | 19 | 5 | 3 | - | - | - | - | - | - | - | 33 | - | | | |

NC = Not calculated
* Individuals less than 5 years of age on 4/27/78

Table 11

Summary of 1918-1922 Epidemics for Various Populations, 1918 to 1922

| Population | 1918-1922 | | 1919 | | 1920 | | 1921 | | 1922 | |
|---------------------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|----------------|---------------|
| | Number Counted | Rate per 1000 | Number Counted | Rate per 1000 | Number Counted | Rate per 1000 | Number Counted | Rate per 1000 | Number Counted | Rate per 1000 |
| Adult Male | 10 | 1.8 (0.061) | 22 | 21 (0.57) | 36 (11) | 23 (0.61) | 17 | 31 (0.81) | 10 | 13 (0.34) |
| Adult Female | 13 | 0.67 (0.010) | 20 | 20 (0.53) | 34 | 15 (0.41) | 16 | 2.2 (0.060) | 23 | 0.29 (0.0079) |
| Male Children 11-15 yrs | 0 | 0 | 5 | 25 (0.65) | 6 (2) | 37 (0.95) | 6 | 2.0 (0.053) | 6 | 3.1 (0.084) |
| Female Children 11-15 yrs | 0 | 0 | 3 | 20 (0.56) | 3 | 28 (0.74) | 2 | 3.0 (0.15) | 3 | 1.5 (0.072) |
| Male Children 5-10 yrs | 0 | 0 | 0 | 0 | 0 (1) | 37 (0.95) | 1 | 3.0 (0.16) | 10 | 0.10 (0.0026) |
| Female Children 5-10 yrs | 0 | 0 | 0 | 0 | 16 | 20 (0.54) | 6 | 1.0 (0.047) | 11 | 0.11 (0.0028) |
| All Adults | 31 | 0.67 (0.010) | 42 | 40 (0.53) | 60 | 33 (0.43) | 31 | 2.2 (0.060) | 61 | 0.29 (0.0079) |

Table 13 (Cont'd)

Summary of ^{137}Cs Body Burden for Bikini Inhabitants, 1975 to 1979

| Regulation | Number Counted | Age Group | 1974/75 | | 1975/76 | | 1976/77 | | 1977/78 | | 1978/79 | | 1979/80 | |
|---------------|----------------|-----------|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|-------------------------------------|---|
| | | | Mean ^{137}Cs Burden (pCi) | Range of ^{137}Cs Burden (pCi) | Mean ^{137}Cs Burden (pCi) | Range of ^{137}Cs Burden (pCi) | Mean ^{137}Cs Burden (pCi) | Range of ^{137}Cs Burden (pCi) | Mean ^{137}Cs Burden (pCi) | Range of ^{137}Cs Burden (pCi) | Mean ^{137}Cs Burden (pCi) | Range of ^{137}Cs Burden (pCi) | Mean ^{137}Cs Burden (pCi) | Range of ^{137}Cs Burden (pCi) |
| All Children | 0 | 0-10 | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | 0.015 pCi (0.015 pCi) | |
| Total Average | 31 | 0-10 | 3.0 pCi (0.11 pCi) | 0.81 pCi (0.81 pCi) | 2.0 pCi (0.75 pCi) | 0.75 pCi (0.75 pCi) | 2.0 pCi (0.75 pCi) | 0.75 pCi (0.75 pCi) | 2.0 pCi (0.75 pCi) | 0.75 pCi (0.75 pCi) | 2.0 pCi (0.75 pCi) | 0.75 pCi (0.75 pCi) | 2.0 pCi (0.75 pCi) | |
| | 69 | 11-20 | 3.1 pCi (0.11 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | |
| | 71 | 21-30 | 3.1 pCi (0.11 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | 1.0 pCi (1.0 pCi) | 2.0 pCi (1.0 pCi) | |

00 - No data available for the specific column.

(1) One adult, counted at Bikini, was a visitor from Rongelap Atoll. He remained on ship with our staff while at Bikini and returned at home with us.

His body count was not used in this table.

(2) One male child in this age group was counted twice to determine what effect obscuring prior to the body count had on the final result. Only one result was used for this individual since both results were similar.

(3) A six month old child's data has not been included in this table and category due to the difference in geometry between a baby and our calibration phantom.

(4) The 1978 mean value for all individual counts includes the 3-10 year age group while the 1977 mean value has no representation in this sample section and the 1974 mean value has no child representation.

(5) The 1974 (0-10) and 1977 ^{137}Cs body burden data were obtained from S. Gaha, Brookhaven National Laboratory, Medical Department.

Table 14

Comparison of Observed
Versus Expected Reduction Factors

| Description | # of Persons | Mean Reduction Factor |
|---|-----------------|--------------------------|
| Expected Reduction Factor for Adult Males ⁽¹⁾ | NA | 2.4 |
| Observed Reduction Factor for Adult Bikini Males | 17 | 2.3 |
| Expected Reduction Factor for Adult Females ⁽²⁾ | NA | 3.5 |
| Observed Reduction Factor for Adult Bikini Females | 16 | 3.8 |
| Expected Reduction Factor for Children Ages 5-14 ⁽²⁾ | NA | 5.9 |
| Observed Reduction Factor for Children Ages 5-14 | 12 | 12. |

NA = Data Not Available

(1) Effective half time obtained from ICRP Publication 10A (ICRP 71).

(2) Effective half time obtained from NCRP Report 52 (NCRP 77).

Table 15
 ^{137}Cs Biological Removal Rate Constants for Marshallese Adult Males

| ID# | Date | ^{137}Cs μCi | Date | ^{137}Cs μCi | Date | ^{137}Cs μCi | K d ⁻¹ | K d ⁻¹ | K d ⁻¹ |
|------|---------|--------------------------|---------|--------------------------|---------|--------------------------|----------------------|----------------------|----------------------|
| 863 | 1/23/79 | 1.1 | 8/2/80 | 8.6×10^{-2} | | | | 4.7×10^{-3} | |
| 6067 | 1/24/79 | 1.0 | 5/1/79 | .63 | 8/1/80 | 8.8×10^{-2} | | 4.0×10^{-3} | 4.6×10^{-3} |
| 6066 | 1/24/79 | .48 | 5/18/79 | .45 | | | NA | | |
| 6017 | 5/21/79 | .52 | 7/31/80 | 4.2×10^{-2} | | | 6.2×10^{-3} | | |
| 6019 | 1/22/79 | .39 | 7/31/80 | 6.8×10^{-3} | | | NA | | |
| 6001 | 1/22/79 | .77 | 7/31/80 | 5.5×10^{-2} | | | 5.0×10^{-3} | | |
| 6073 | 5/15/79 | .12 | 8/1/80 | 1.6×10^{-1} | | | NA | | |
| 6005 | 5/21/79 | .16 | 7/31/80 | 7.8×10^{-3} | | | NA | | |
| 6008 | 1/23/79 | 1.3 | 8/1/80 | 1.0×10^{-1} | | | | | |
| 6086 | 1/23/79 | .86 | 5/16/79 | .40 | 7/30/80 | 2.9×10^{-2} | | 6.7×10^{-3} | 6.7×10^{-3} |
| 6071 | 1/23/79 | .93 | 8/3/80 | 5.8×10^{-2} | | | 5.2×10^{-3} | | |
| 6076 | 1/22/79 | 2.4 | 7/31/80 | 1.5×10^{-1} | | | 5.0×10^{-3} | | |
| 6118 | 1/24/79 | .75 | 5/17/79 | .41 | 8/1/80 | 2.8×10^{-2} | | 5.3×10^{-3} | 6.9×10^{-3} |
| 6117 | 1/24/79 | .90 | 5/16/79 | .44 | 7/31/80 | 2.2×10^{-2} | | 6.3×10^{-3} | 7.9×10^{-3} |
| 6128 | 1/25/79 | .92 | 8/4/80 | 4.2×10^{-2} | | | 5.9×10^{-3} | | |
| 6125 | 5/18/79 | .33 | 8/5/80 | 2.1×10^{-2} | | | 7.4×10^{-3} | | |
| 6007 | 1/23/79 | .32 | 8/4/80 | 1.8×10^{-2} | | | 6.3×10^{-3} | | |
| 6130 | 1/22/79 | 1.5 | 5/15/79 | .97 | 7/31/80 | 6.5×10^{-2} | | 3.8×10^{-3} | 6.4×10^{-3} |
| 966 | 5/15/79 | .48 | 7/31/80 | 2.1×10^{-2} | | | 8.3×10^{-3} | | |
| 6096 | 1/22/79 | 1.3 | 5/16/79 | .70 | 7/31/80 | 5.3×10^{-2} | | 5.4×10^{-3} | 6.2×10^{-3} |
| 6161 | 1/24/79 | .109 | 5/17/79 | .048 | | | 7.4×10^{-3} | | |
| 6166 | 1/24/79 | .023 | 5/16/79 | .011 | 7/31/80 | 2.8×10^{-3} | | NA | NA |

Table 15 (Cont'd)
 ^{137}Cs Biological Removal Rate Constants for Marshallese Adult Males (Cont'd)

| ID# | Date | ^{137}Cs μCi | Date | ^{137}Cs μCi | Date | ^{137}Cs μCi | K d^{-1} | K d^{-1} | K d^{-1} |
|------|---------|-------------------------------------|---------|-------------------------------------|---------|-------------------------------------|----------------------|----------------------|----------------------|
| 6184 | 1/25/79 | .067 | 5/17/79 | .025 | 8/1/80 | 7.3×10^{-3} | 9.1×10^{-3} | NA | NA |
| 6210 | 5/21/79 | .290 | 7/31/80 | 2.9×10^{-2} | | | 6.0×10^{-3} | | |
| 6190 | 5/16/79 | 6.0×10^{-3} | 7/31/80 | 7.1×10^{-3} | | | NA | | |
| 6223 | 5/21/79 | 99×10^{-3} | 8/4/80 | 1.5×10^{-2} | | | 6.3×10^{-3} | | |
| 6226 | 5/21/79 | MDL | 8/4/80 | 4.4×10^{-3} | | | NA | | |
| 6153 | 1/23/79 | 5.8×10^{-3} | 5/16/79 | 5.4×10^{-3} | | | NA | | |
| 6168 | 1/24/79 | 2.4×10^{-3} | 5/16/79 | MDL | 7/31/80 | MDL | NA | NA | NA |
| 6180 | 1/25/79 | 34×10^{-3} | 7/30/80 | 5.9×10^{-3} | | | NA | | |
| 6182 | 1/25/79 | 1220×10^{-3} | 5/16/79 | 620×10^{-3} | | | 6.0×10^{-3} | | |

Table 15 (Cont'd)
¹³⁷Cs Biological Removal Rate Constants for Marshallese Adult Females

| ID# | Date | ¹³⁷ Cs μCi | Date | ¹³⁷ Cs μCi | Date | ¹³⁷ Cs μCi | K d ⁻¹ | K d ⁻¹ | K d ⁻¹ |
|------|---------|--------------------------|---------|--------------------------|---------|--------------------------|-----------------------|-----------------------|-----------------------|
| 6112 | 1/24/79 | .98 | 5/16/79 | .46 | 7/30/80 | 2.3x10 ⁻² | 6.7x10 ⁻³ | 7.1x10 ⁻³ | 7.2x10 ⁻³ |
| 6114 | 1/23/79 | .12 | 8/3/80 | 5.5x10 ⁻³ | | | 8.7x10 ⁻³ | | |
| 6111 | 1/23/79 | .53 | 8/4/80 | 2.1x10 ⁻² | | | 6.1x10 ⁻³ | | |
| 6122 | 1/22/79 | .31 | 5/16/79 | .11 | 7/31/80 | 5.0x10 ⁻³ | 9.1x10 ⁻³ | 1.19x10 ⁻² | 1.26x10 ⁻² |
| 6123 | 1/22/79 | .62 | 5/17/79 | .25 | 7/31/80 | 1.1x10 ⁻² | 7.86x10 ⁻³ | 8.15x10 ⁻³ | 8.21x10 ⁻³ |
| 6032 | 1/22/79 | .77 | 5/16/79 | .26 | 7/31/80 | 4.4x10 ⁻³ | 9.5x10 ⁻³ | NA | NA |
| 6108 | 1/23/79 | .53 | 8/1/80 | 2.2x10 ⁻² | | | 6.07x10 ⁻³ | | |
| 6113 | 1/23/79 | .30 | 5/16/79 | .11 | 8/2/80 | 6.4x10 ⁻³ | 8.9x10 ⁻³ | 9.1x10 ⁻³ | 9.2x10 ⁻³ |
| 6065 | 1/22/79 | .36 | 8/2/80 | 8.0x10 ⁻³ | | | 8.3x10 ⁻³ | | |
| 6097 | 1/23/79 | .31 | 5/16/79 | .16 | 7/31/80 | 1.7x10 ⁻² | 5.8x10 ⁻³ | NA | NA |
| 6109 | 1/23/79 | .060 | 5/16/79 | .018 | 7/31/80 | 1.3x10 ⁻³ | 1.2x10 ⁻² | NA | NA |
| 6046 | 5/15/79 | .36 | 8/2/80 | 2.2x10 ⁻² | | | 6.7x10 ⁻³ | | |
| 6098 | 1/22/79 | .47 | 5/17/79 | .18 | 7/31/80 | 3.0x10 ⁻³ | 8.3x10 ⁻³ | NA | NA |
| 6060 | 1/24/79 | .18 | 5/17/79 | .059 | | | 9.8x10 ⁻³ | | |
| 6110 | 5/21/79 | .11 | 7/31/80 | 8.3x10 ⁻³ | | | 7.7x10 ⁻³ | | |
| 525 | 5/21/79 | .32 | 8/4/80 | 1.4x10 ⁻² | | | 7.9x10 ⁻³ | | |
| 6064 | 1/24/79 | .42 | 5/15/79 | .22 | 7/31/80 | 1.1x10 ⁻² | 5.8x10 ⁻³ | 7.5x10 ⁻³ | 7.9x10 ⁻³ |
| 6051 | 5/15/79 | .045 | 7/31/80 | 1.9x10 ⁻¹ | | | NA | | |
| 934 | 5/15/79 | .48 | 7/31/80 | 2.2x10 ⁻² | | | 7.4x10 ⁻³ | | |
| 6062 | 5/16/79 | .088 | 7/31/80 | 3.5x10 ⁻³ | | | NA | | |
| 6115 | 1/23/79 | .48 | 5/16/79 | .17 | 7/30/80 | 6.8x10 ⁻³ | 9.2x10 ⁻³ | 9.6x10 ⁻³ | 9.8x10 ⁻³ |
| 6034 | 5/21/79 | .15 | 8/1/80 | 7.5x10 ⁻³ | | | 8.9x10 ⁻³ | | |

Table 15 (Cont'd)
¹³⁷Cs Biological Removal Rate Constants for Marshallese Adult Females (Cont'd)

| ID# | Date | ¹³⁷ Cs μCi | Date | ¹³⁷ Cs μCi | Date | ¹³⁷ Cs μCi | $\frac{K}{d^{-1}}$ | $\frac{K}{d^{-1}}$ | $\frac{K}{d^{-1}}$ |
|------|---------|--------------------------|---------|--------------------------|---------|--------------------------|----------------------|----------------------|----------------------|
| 6167 | 1/24/79 | .015 | 5/16/79 | .0079 | 7/31/80 | 3.2x10 ⁻³ | 6.7x10 ⁻³ | NA | NA |
| 6159 | 1/24/79 | .028 | 5/17/79 | .012 | 8/2/80 | 2.3x10 ⁻² | 8.2x10 ⁻³ | NA | NA |
| 6148 | 1/23/79 | .037 | 5/16/79 | .015 | 7/31/80 | 5.5x10 ⁻³ | 8.5x10 ⁻³ | 6.6x10 ⁻³ | 6.1x10 ⁻³ |
| 6151 | 1/23/79 | .121 | 5/17/79 | .059 | | | 6.4x10 ⁻³ | | |
| 6137 | 1/22/79 | 3.8x10 ⁻³ | 5/17/79 | 1.7x10 ⁻³ | 8/1/80 | 2.4x10 ⁻³ | 2.7x10 ⁻² | NA | NA |
| 6140 | 1/22/79 | 27x10 ⁻³ | 5/17/79 | 8.6x10 ⁻³ | 7/31/80 | 5.6x10 ⁻⁴ | 1.1x10 ⁻² | NA | NA |
| 6144 | 1/22/79 | 37x10 ⁻³ | 5/17/79 | 13x10 ⁻³ | 8/1/80 | 2.0x10 ⁻³ | 9.8x10 ⁻³ | NA | NA |
| 6152 | 1/23/79 | 2.4x10 ⁻³ | 5/16/79 | 3.9x10 ⁻³ | 8/2/80 | 4.8x10 ⁻³ | | NA | NA |
| 6155 | 1/23/79 | 390x10 ⁻³ | 5/16/79 | 150x10 ⁻³ | 8/2/80 | 7.3x10 ⁻³ | 8.4x10 ⁻³ | 8.9x10 ⁻³ | 9.0x10 ⁻³ |
| 6160 | 1/24/79 | 360x10 ⁻³ | 5/17/79 | 140x10 ⁻³ | | | 8.4x10 ⁻³ | | |
| 6175 | 1/24/79 | 11x10 ⁻³ | 5/17/79 | 5.2x10 ⁻³ | | | 8.4x10 ⁻³ | | |
| 6181 | 1/25/79 | 8.5x10 ⁻³ | 5/17/79 | 4.6x10 ⁻³ | | | 7.4x10 ⁻³ | | NA |
| 6185 | 1/25/79 | 2.7x10 ⁻³ | 5/16/79 | 3.4x10 ⁻³ | | | | | NA |

Table 15 (Cont'd)
¹³⁷Cs Biological Removal Rate Constants for Marshallese Adolescents

| ID# | Date | ¹³⁷ Cs Bq | Date | ¹³⁷ Cs Bq | Date | ¹³⁷ Cs Bq | K d ⁻¹ | K d ⁻¹ | K d ⁻¹ |
|----------------|---------|-------------------------|---------|-------------------------|---------|-------------------------|----------------------|----------------------|----------------------|
| Males | | | | | | | | | |
| 6147 | 1/23/79 | .204 | 5/16/79 | .075 | 7/31/80 | 3.5x10 ⁻³ | 8.9x10 ⁻³ | | NA |
| 6131 | 1/23/79 | .76 | 5/16/79 | .32 | 8/1/80 | 1.5x10 ⁻² | 7.6x10 ⁻³ | 7.7x10 ⁻³ | 7.7x10 ⁻³ |
| 6011 | 1/23/79 | .055 | 5/16/79 | .017 | 7/31/80 | 9.0x10 ⁻⁴ | 1.1x10 ⁻² | | NA |
| 6127 | 1/22/79 | .21 | 5/16/79 | .053 | 8/1/80 | 3.3x10 ⁻³ | 1.2x10 ⁻² | | NA |
| 6133 | 5/16/79 | .022 | 7/31/80 | 6.6x10 ⁻⁴ | | | NA | | |
| 6015 | 1/24/79 | .071 | 5/17/79 | .016 | | | 1.4x10 ⁻² | | |
| 6178 | 1/24/79 | 2.0x10 ⁻³ | 5/17/79 | 1.7x10 ⁻³ | | | NA | | |
| Females | | | | | | | | | |
| 6129 | 1/22/79 | .27 | 5/17/79 | .076 | 7/31/80 | 4.4x10 ⁻³ | 1.1x10 ⁻² | | NA |
| 6048 | 5/21/79 | .074 | 8/5/80 | 1.4x10 ⁻³ | | | NA | | |
| 6091 | 1/24/79 | .15 | 5/17/79 | .037 | | | 1.3x10 ⁻² | | |
| 6173 | 1/24/79 | 4.0x10 ⁻³ | 8/1/80 | 2.2x10 ⁻³ | | | NA | | |
| 6170 | 1/24/79 | 2.8x10 ⁻³ | 5/17/79 | 1.8x10 ⁻³ | 7/31/80 | 9.7x10 ⁻⁴ | NA | | |
| 6141 | 1/22/79 | 2.7x10 ⁻³ | 5/16/79 | 1.5x10 ⁻³ | | | NA | | |

Table 15 (Cont'd)
¹³⁷Cs Biological Removal Rate Constants for Marshallese Children

| ID# | Date | ¹³⁷ Cs μCi | Date | ¹³⁷ Cs μCi | Date | ¹³⁷ Cs μCi | K d ⁻¹ | K d ⁻¹ | K d ⁻¹ |
|----------------|---------|--------------------------|---------|--------------------------|---------|--------------------------|----------------------|----------------------|----------------------|
| Males | | | | | | | | | |
| 6031 | 5/15/79 | 2.8x10 ⁻³ | 8/1/80 | 7.6x10 ⁻⁴ | | NA | NA | | |
| 6029 | 5/15/79 | 4.7x10 ⁻³ | 7/31/80 | 9.0x10 ⁻⁴ | | NA | NA | | |
| 6100 | 5/15/79 | 15x10 ⁻³ | 8/1/80 | 6.0x10 ⁻⁴ | | NA | NA | | |
| 6021 | 1/24/79 | 46x10 ⁻³ | 5/16/79 | 6.2x10 ⁻³ | 7/30/80 | 3.0x10 ⁻⁴ | 2.0x10 ⁻² | NA | NA |
| 6020 | 1/22/79 | 56x10 ⁻³ | 5/16/79 | 7.4x10 ⁻³ | 7/31/80 | 5.0x10 ⁻⁴ | 1.9x10 ⁻² | NA | NA |
| 6107 | 1/23/79 | 16x10 ⁻³ | 5/16/79 | 2.6x10 ⁻³ | 8/1/80 | 3.2x10 ⁻⁴ | 2.4x10 ⁻² | NA | NA |
| 6023 | 1/22/79 | .16 | 7/31/80 | 7.5x10 ⁻⁴ | | NA | NA | | |
| 6016 | 5/15/79 | 1.3 | 7/31/80 | 1.4x10 ⁻³ | | 1.9x10 ⁻² | 1.9x10 ⁻² | NA | NA |
| 6156 | 1/24/79 | 2.0x10 ⁻³ | 5/17/79 | 3.4x10 ⁻³ | 8/1/80 | 1.9x10 ⁻³ | NA | NA | NA |
| 6172 | 1/24/79 | 2.8x10 ⁻³ | 5/16/79 | 1.9x10 ⁻³ | 7/31/80 | 1.0x10 ⁻³ | NA | NA | NA |
| Females | | | | | | | | | |
| 6171 | 1/24/79 | 4.0x10 ⁻³ | 5/16/79 | 1.1x10 ⁻³ | 7/31/80 | 4.7x10 ⁻⁴ | NA | NA | NA |
| 6157 | 1/24/79 | 7.2x10 ⁻³ | 8/3/80 | 3.4x10 ⁻³ | | 1.5x10 ⁻³ | 1.5x10 ⁻³ | NA | NA |
| 6158 | 1/24/79 | 3.5x10 ⁻³ | 5/18/79 | 1.2x10 ⁻³ | 8/3/80 | 6.5x10 ⁻³ | NA | NA | NA |
| 6150 | 1/23/79 | 4.0x10 ⁻³ | 5/16/79 | 1.5x10 ⁻³ | 8/1/80 | 9.5x10 ⁻⁴ | 2.0x10 ⁻² | NA | NA |
| 6101 | 1/24/79 | 51x10 ⁻³ | 5/15/79 | 6.9x10 ⁻³ | | 1.8x10 ⁻² | 1.8x10 ⁻² | NA | NA |
| 6056 | 1/24/79 | 46x10 ⁻³ | 5/16/79 | 7.4x10 ⁻³ | | NA | NA | NA | NA |
| 6057 | 5/21/79 | 5.8x10 ⁻³ | 8/5/80 | 5.4x10 ⁻⁴ | | 9.2x10 ⁻³ | 9.2x10 ⁻³ | NA | NA |
| 6010 | 1/23/79 | .17 | 7/31/80 | 2.1x10 ⁻³ | | 1.9x10 ⁻² | 1.9x10 ⁻² | NA | NA |
| 6105 | 1/23/79 | .053 | 5/16/79 | 7.4x10 ⁻³ | 7/30/80 | 3.4x10 ⁻⁴ | 3.4x10 ⁻⁴ | 1.9x10 ⁻² | NA |

Table 15 (Cont'd)
 ^{137}Cs Biological Removal Rate Constants for Marshallese Children (Cont'd)

| ID# | Date | | ^{137}Cs μCi | | Date | | ^{137}Cs μCi | | ^{137}Cs μCi | | K d^{-1} | |
|------|----------|--|----------------------------------|--|---------|--|----------------------------------|--|----------------------------------|--|----------------------|----------------------|
| | (Cont'd) | | | | | | | | | | | |
| 6028 | 5/15/79 | | .015 | | 7/11/80 | | 1.1×10^{-3} | | | | | |
| 6030 | 1/22/79 | | .26 | | 5/16/79 | | .064 | | 7/31/80 | | 1.2×10^{-2} | 1.1×10^{-2} |
| 6025 | 1/23/79 | | .13 | | 5/16/79 | | .028 | | | | 1.4×10^{-2} | |
| 6160 | 1/23/79 | | .077 | | 5/16/79 | | .013 | | 7/31/80 | | 1.7×10^{-2} | NA |
| 6142 | 1/22/79 | | 2.3×10^{-3} | | 5/16/79 | | 1.0×10^{-3} | | 7/31/80 | | NA | NA |

Table 16

177
Comparison of Mean Long Term Biological Removal Rate Constants for the Former Bikini Atoll Population

| <u>Population Description</u> | <u>Group Size</u> | <u>K.d⁻¹ 1/79-5/79</u> | <u>Group Size</u> | <u>K.d⁻¹ 1/79-8/80</u> | <u>Group Size</u> | <u>K.d⁻¹ 5/79-8/80</u> | <u>Group Size</u> | <u>Average K.d⁻¹</u> |
|-------------------------------|-------------------|---------------------------------------|-------------------|---------------------------------------|-------------------|---------------------------------------|-------------------|-------------------------------------|
| Adult Males (22-59m) | 10 | .0061±.0017 | 13 | .0057±.00094 | 12 | .0068±.0010 | 35 | .0062±.0012 |
| Adult Females (19-70m) | 21 | .0084±.0016 | 13 | .0082±.0017 | 12 | .0084±.0016 | 46 | .0083±.0016 |
| Adolescents (11-15m) | 7 | .011±.0022 | 1 | .0077 | 1 | .0077 | 9 | .010±.0024 |
| Juveniles (5-10m) | 9 | .018±.0035 | 2 | .0072±.0050 | 3 | .015±.0064 | 14 | .016±.004 |

Table 17

Body Burden Data for Non-Medically Registered Adult Male Prior Residents of Bikini Atoll

| ID # | Age (yr) | Height (cm) | Weight (kg) | Yrs. On Bikini | Yrs. Off Bikini | January | | May | | August | |
|------|----------|-------------|-------------|----------------|-----------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|
| | | | | | | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1980 ¹³⁷ Cs Result nCi | 1980 Potassium Result Gram |
| 6136 | 48 | 150 | 58 | -- | 4 | 8.5 | 144 | -- | -- | -- | -- |
| 6138 | 20 | 163 | 57 | -- | 3 | 2.8 | 165 | -- | -- | -- | -- |
| 6153 | 23 | 160 | 65 | 1 | 1.42 | 5.8 | 170 | 5.4 | 146 | -- | -- |
| 6168 | 16 | 150 | 44 | 7 | 1.0 | 2.4 | 101 | -- | 100 | -- | 104 |
| 6174 | 52 | 174 | 84 | -- | 6 | 17 | 158 | -- | -- | -- | -- |
| 6180 | 22 | 173 | 67 | 4 | 1 | 34 | 141 | -- | -- | 5.9 | 153 |
| 6182 | 18 | 161 | 53 | 6 | 0.42 | 1220 | 122 | 620 | 131 | -- | -- |
| 6190 | 19 | 166 | 57 | 0.25 | 2 | -- | -- | 6.0 | 161 | 7.1 | 153 |
| 6205 | 42 | 170 | 81 | 4 | 4.5 | -- | -- | -- | 159 | -- | -- |
| 6211 | 19 | 163 | 55 | 1 | 3 | -- | -- | -- | 134 | -- | -- |
| 6218 | 56 | 158 | 72 | 2 | 10 | -- | -- | -- | 169 | -- | -- |
| 6219 | 30 | 173 | 60 | 2 | 9 | -- | -- | -- | 143 | -- | -- |
| 6220 | 26 | 166 | 66 | 2 | 9 | -- | -- | -- | 165 | -- | -- |
| 6221 | 53 | 175 | 82 | 2 | 9 | -- | -- | 4.2 | 139 | -- | -- |

Table 17 (Cont'd)
Body Burden Data for Non-Medically Registered Adult Male Prior Residents of Bikini Atoll

| ID # | Age (yr) | Height (cm) | Weight (kg) | Yrs. On Bikini | Yrs. Off Bikini | January | | | May | | August | |
|------|----------|-------------|-------------|----------------------------|-----------------|--------------------------------|-------------------------------------|--------------------------------|-------------------------------------|--------------------------------|-------------------------------------|--|
| | | | | | | 1979 137Cs Result nCi | 1979 Potassium Result Gram | 1979 137Cs Result nCi | 1979 Potassium Result Gram | 1980 137Cs Result nCi | 1980 Potassium Result Gram | |
| 6223 | 66 | 152 | 65 | 2 days May 14, 15, 1979 | .016 | -- | -- | 99 | 127 | 15 | 135 | |
| 6224 | 45 | 158 | 55 | 2 days May 14, 15, 1979 | .016 | -- | -- | 120 | 146 | -- | -- | |
| 6226 | 18 | 164 | 58 | 2 | 3 | -- | -- | -- | 137 | 4.4 | 152 | |

Table 18

Body Burden Data for Non-Medically Registered Adult Female Prior Residents of Bikini Atoll

| ID # | Age (yr) | Height (cm) | Weight (kg) | Yrs. On Bikini | Yrs. Off Bikini | January | | | May | | | August | |
|------|----------|-------------|-------------|----------------|-----------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|
| | | | | | | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1980 ¹³⁷ Cs Result nCi | 1980 Potassium Result Gram |
| 6137 | 38 | 161 | 64 | 0.33 | 4 | 3.8 | 113 | 1.7 | 112 | 2.4 | 99 | | |
| 6139 | 22 | 140 | 38 | -- | 3 | 2.1 | 89 | -- | -- | -- | -- | | |
| 6140 | 16 | 146 | 46 | 0.17 | 0.42 | 27 | 94 | 8.6 | 94 | -- | 69 | | |
| 6144 | 21 | 150 | 44 | 1 | 0.42 | 37 | 105 | 13 | 89 | 2.0 | -- | | |
| 6152 | 20 | 157 | 59 | 1 | 1.42 | 2.4 | 123 | 3.9 | 117 | 4.8 | 148 | | |
| 6155 | 24 | 155 | 66 | 6 | 0.42 | 390 | 120 | 150 | 96 | 7.3 | 88 | | |
| 6160 | 65 | 153 | 55 | 6 | 0.67 | 360 | 67 | 140 | 87 | -- | -- | | |
| 6165 | 36 | 142 | 60 | -- | 1.5 | 6.6 | 76 | -- | -- | -- | -- | | |
| 6175 | 24 | 155 | 63 | -- | -- | 11 | 90 | 5.2 | 92 | -- | -- | | |
| 6181 | 44 | 151 | 55 | 4 | 1 | 8.5 | 105 | 4.6 | 105 | -- | -- | | |
| 6185 | 21 | 144 | 41 | 3 | 2.5 | 2.7 | 74 | 3.4 | 79 | -- | 69 | | |
| 6187 | 21 | 152 | 54 | 0.019 | 1 | -- | -- | 1.6 | 107 | -- | -- | | |
| 6189 | 21 | 155 | -- | 2.5 | 1 | -- | -- | 1.9 | 114 | -- | -- | | |
| 6206 | 32 | 151 | 73 | 3 | 5.5 | -- | -- | -- | 116 | -- | -- | | |
| 6222 | 39 | 156 | 66 | 2.5 | 3 | -- | -- | -- | 98 | -- | -- | | |

Table 19
 Body Burden Data for Non Medically Registered Adolescents Prior Residents of Bikini Atoll

| ID # | Age (yr) | Height (cm) | Weight (kg) | Yrs. On Bikini | Yrs. Off Bikini | January | | | | May | | August | |
|---------------|----------|-------------|-------------|----------------|-----------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|--------|----|
| | | | | | | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1980 ¹³⁷ Cs Result nCi | 1980 Potassium Result Gram | | |
| Male | | | | | | | | | | | | | |
| 6169 | 14 | 167 | 46 | 7 | 1.0 | 1.2 | 108 | -- | 120 | -- | -- | -- | -- |
| 6178 | 12 | 157 | 33 | 6 | 1.0 | 2.0 | 46 | 1.7 | 70 | -- | -- | -- | -- |
| 6183 | 12 | 139 | 35 | -- | 1.67 | 1.0 | 36 | -- | 74 | -- | -- | -- | -- |
| 6200 | 14 | 155 | 43 | 1 | .71 | -- | -- | 110 | 111 | -- | -- | -- | -- |
| 6225 | 11 | 125 | 25 | 5 | 1.33 | -- | -- | -- | 53 | -- | -- | -- | -- |
| 6207 | 12 | 138 | 35 | 4 | 4.5 | -- | -- | -- | 78 | -- | -- | -- | -- |
| Female | | | | | | | | | | | | | |
| 6173 | 13 | 142 | 47 | 3 | 0.42 | 4.0 | 33 | -- | 48 | 2.2 | 74 | -- | -- |
| 6170 | 13 | 140 | 45 | 7 | 1.0 | 2.8 | 58 | 1.8 | 77 | .97 | 100 | -- | -- |
| 6162 | 12 | 147 | 50 | -- | 1.5 | 5.0 | 36 | -- | -- | -- | -- | -- | -- |
| 6212 | 14 | 151 | 50 | 1 | 3 | -- | -- | -- | 73 | -- | -- | -- | -- |
| 6141 | 12 | 138 | 33 | 0 | -- | 2.7 | 63 | 1.5 | 112 | -- | 60 | -- | -- |
| 6188 | 14 | 146 | 49 | 0 | -- | -- | -- | 2.9 | 107 | -- | -- | -- | -- |

Table 20

Body Burden Data for Non-Medically Registered Children Prior Residents of Bikini Atoll

| ID # | Age (yr) | Height (cm) | Weight (kg) | Yrs. On Bikini | Yrs. Off Bikini | January | | May | | August | |
|----------------|----------|-------------|-------------|----------------|-----------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|-----------------------------------|----------------------------|
| | | | | | | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1980 ¹³⁷ Cs Result nCi | 1980 Potassium Result Gram |
| <u>Males</u> | | | | | | | | | | | |
| 6156 | 9 | 130 | 34 | 6 | 1.0 | 2.0 | 53 | 3.4 | 59 | 1.9 | 75 |
| 6164 | 5 | 85 | 15 | -- | 1.5 | 8.0 | 40 | -- | -- | -- | -- |
| 6172 | 10 | 130 | 30 | 7 | 1.0 | 2.8 | 40 | 1.9 | 74 | 1.0 | 73 |
| 6202 | 6 | 100 | 19 | 5.3 | .72 | -- | -- | 1.8 | 53 | -- | -- |
| 6208 | 10 | 136 | 33 | 4 | 4.5 | -- | -- | -- | 76 | -- | -- |
| 6145 | 5 | 110 | 21 | -- | -- | 1.0 | 46 | -- | -- | -- | -- |
| 6186 | 5 | 104 | 20 | -- | -- | -- | -- | -- | 22 | -- | -- |
| <u>Females</u> | | | | | | | | | | | |
| 6179 | 8 | 115 | 22 | 4 | 1 | 1.2 | -- | -- | 59 | -- | -- |
| 6177 | 6 | 103 | 18 | -- | 6 | -- | -- | -- | 36 | -- | -- |
| 6176 | 8 | 144 | 24 | -- | 6 | -- | -- | -- | 38 | -- | -- |
| 6171 | 6 | 96 | 15 | 2.67 | 1.0 | 4.0 | 16 | 1.1 | 47 | -- | 29 |
| 6157 | 5 | 106 | 20 | 4 | 1.0 | 7.2 | 32 | -- | 54 | 3.4 | 44 |
| 6158 | 6 | 103 | 20 | 4 | 1.0 | 3.5 | 32 | 1.2 | 46 | 6.5 | 53 |

Table 20 (Cont'd)

| ID # | Age (yr) | Height (cm) | Weight (kg) | Yrs. On Bikini | Yrs. Off Bikini | January | | May | | August | |
|-------------------------|-------------|----------------|----------------|----------------------|-----------------------|--|-------------------------------------|--|-------------------------------------|--|-------------------------------------|
| | | | | | | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1979 ¹³⁷ Cs Result nCi | 1979 Potassium Result Gram | 1980 ¹³⁷ Cs Result nCi | 1980 Potassium Result Gram |
| <u>Females (cont'd)</u> | | | | | | | | | | | |
| 6150 | 8 | 120 | 25 | 4 | 0.42 | 4.0 | 42 | 1.5 | 40 | .95 | 45 |
| 6149 | 5 | 99 | 19 | 4.3 | 0.42 | 1.6 | 37 | -- | 32 | -- | 42 |
| 6203 | 5 | 92 | 15 | 4.1 | .72 | -- | -- | -- | 54 | -- | -- |
| 6204 | 5 | 104 | 21 | 1 | .72 | -- | -- | 1.1 | 57 | -- | -- |
| 6142 | 10 | 126 | 26 | 0 | -- | 2.3 | 52 | 1.0 | 72 | 1.0 | 67 |
| 6143 | 4 | 104 | 19 | 0 | -- | 1.2 | 41 | -- | 35 | -- | -- |
| 6191 | 6 | 113 | 23 | 0 | -- | -- | -- | 1.1 | 61 | -- | -- |
| 6213 | 10 | 121 | 25 | 1 | 3 | -- | -- | -- | 56 | -- | -- |
| 6217 | 10 | 126 | 25 | 2 | 9 | -- | -- | -- | 44 | -- | -- |

Table 21

Comparison Adult Males from Kili

| <u>Name</u> | <u>ID#</u> | <u>Age</u> | <u>August 1980</u> | |
|-------------|------------|------------|---------------------------------|----------------------------|
| | | | <u>¹³⁷Cs uCi</u> | <u>Potassium Grams</u> |
| | 2102 | 30 | 1.2x10 ⁻² | 164 |
| | 2103 | 20 | 1.3x10 ⁻² | 173 |
| | 2104 | 37 | 1.1x10 ⁻² | 166 |
| | 2105 | 38 | 9.5x10 ⁻³ | 170 |
| | 2107 | 38 | 1.5x10 ⁻² | 177 |
| | 2114 | 35 | 6.2x10 ⁻³ | 172 |
| | 2116 | 45 | 8.1x10 ⁻³ | 134 |
| | 2117 | 49 | 7.2x10 ⁻³ | 158 |
| | 2118 | 27 | 7.3x10 ⁻³ | 162 |
| | 2100 | 50 | 9.4x10 ⁻³ | 152 |
| | 2101 | 54 | 9.1x10 ⁻³ | 156 |
| | 1109 | 22 | 1.3x10 ⁻² | 176 |
| | 1111 | 34 | 1.5x10 ⁻² | 191 |
| | 1098 | 34 | 8.4x10 ⁻³ | 191 |
| | 1101 | 37 | 1.6x10 ⁻² | 188 |
| | 1102 | 39 | 3.1x10 ⁻³ | 112 |
| | 1103 | 55 | 6.5x10 ⁻³ | 121 |
| | 1104 | 26 | 5.7x10 ⁻³ | 135 |
| | 1105 | 22 | 3.9x10 ⁻³ | 136 |
| | 1107 | 36 | 2.8x10 ⁻³ | 180 |
| | 1106 | 26 | 1.4x10 ⁻³ | 184 |
| | 1108 | 23 | 7.5x10 ⁻³ | 189 |

Table 21 (Cont'd)

Comparison Adult Males from Kili (Cont'd)

| <u>Name</u> | <u>ID#</u> | <u>Age</u> | <u>August 1980</u> | |
|-------------|------------|------------|---------------------------------|----------------------------|
| | | | <u>¹³⁷Cs uCi</u> | <u>Potassium Grams</u> |
| | 1110 | 40 | 1.3×10^{-2} | 156 |
| | 2120 | 34 | 6.0×10^{-3} | 158 |
| | 2121 | 46 | 5.4×10^{-3} | 152 |
| | 2122 | 56 | 9.4×10^{-3} | 138 |
| | 2123 | 25 | 1.7×10^{-2} | 180 |
| | 2124 | 22 | 3.7×10^{-3} | 143 |
| | 2125 | 28 | 3.4×10^{-3} | 147 |

Table 21 (Cont'd)

Comparison Adult Males from Majuro

| <u>Name</u> | <u>ID#</u> | <u>Age</u> | <u>August 1980</u> | |
|-------------|------------|------------|---|----------------------------|
| | | | <u>^{137}Cs μCi</u> | <u>Potassium Grams</u> |
| | 1047 | 31 | 6.1×10^{-3} | 184 |
| | 2084 | 32 | 8.3×10^{-3} | 168 |
| | 2085 | 55 | 3.2×10^{-2} | 112 |
| | 2087 | 62 | 1.7×10^{-2} | 134 |
| | 2089 | 21 | 3.5×10^{-3} | 149 |
| | 2019 | 26 | 1.4×10^{-2} | 152 |
| | 2060 | 50 | 3.0×10^{-2} | 122 |
| | 2065 | 44 | 1.2×10^{-2} | 137 |
| | 1048 | 70 | 9.1×10^{-3} | 144 |
| | 1056 | 62 | 8.2×10^{-3} | 131 |
| | 1074 | 34 | 5.2×10^{-3} | 143 |
| | 1076 | 35 | 8.2×10^{-3} | 174 |
| | 1084 | 80 | 6.3×10^{-3} | 155 |
| | 1088 | 19 | 4.4×10^{-3} | 191 |
| | 1089 | 21 | 5.4×10^{-3} | 168 |
| | 1090 | 27 | 1.6×10^{-2} | 179 |
| | 1091 | 34 | 3.2×10^{-3} | 169 |
| | 1092 | 29 | 8.5×10^{-3} | 183 |
| | 1004 | 44 | 4.8×10^{-3} | 136 |
| | 2028 | 17 | 2.2×10^{-3} | 136 |
| | 2050 | 17 | 2.5×10^{-3} | 133 |

Table 22

PRIVACY ACT MATERIAL REMOVED

Comparison Adult Females from Maiuro

| <u>Name</u> | <u>ID#</u> | <u>Age</u> | <u>August 1980</u> | |
|-------------|------------|------------|---|----------------------------------|
| | | | <u>^{137}Cs</u> <u>μCi</u> | <u>Potassium</u> <u>Grams</u> |
| | 2015 | 36 | 2.3×10^{-3} | 97 |
| | 2091 | 40 | 4.0×10^{-3} | 117 |
| | 2055 | 38 | 4.7×10^{-3} | 98 |
| | 2059 | 32 | 9.6×10^{-3} | 86 |

PRIVACY ACT MATERIAL REMOVED

Table 22 (Cont'd)

PRIVACY ACT MATERIAL REMOVED

Comparison Adult Females from Kili

| <u>Name</u> | <u>ID#</u> | <u>Age</u> | <u>August 1980</u> | |
|-------------|------------|------------|---|----------------------------------|
| | | | <u>^{137}Cs</u> <u>μCi</u> | <u>Potassium</u> <u>Grams</u> |
| | 2119 | 45 | 2.5×10^{-3} | 99 |

PRIVACY ACT MATERIAL REMOVED

Table 26

Whole Body Counting Census

| <u>Date Counted</u> | <u>Total Counted</u> | <u>Medically Registered Population Total in April '78</u> | <u>Bikinians Medically¹ Registered in April '78</u> | <u>Number of Medically Registered Population Total Counted</u> | <u>Number of Relocated Bikini Residents Counted</u> | <u>Number of Non-relocated Residents Counted</u> |
|---|--------------------------|---|--|--|---|--|
| April 1978 | 99 | 143 | 135 | 99 | 99 | -- |
| January 1979 | 101 | 143 | 135 | 53 | 64 | 33 |
| May 1979 | 129 | 143 | 135 | 63 | 79 | 44 |
| January plus May 1979 Non Duplicate Counts | --- | --- | --- | 82 | 98 | 50 |

¹ Bikini Medical Registry included 34 persons under 5 years of age and not eligible for whole body counting in April 1978.

Table 27

Census of Medically Registered, Whole Body Counted, Relocated Bikini Residents

| <u>Date Counted</u> | <u>Adult Males</u> | <u>Adult Females</u> | <u>Male Adolescents Ages 11-15</u> | <u>Female Adolescents Ages 11-15</u> | <u>Male Children Ages 5-10</u> | <u>Female Children Ages 5-10</u> | <u>Total Persons Counted</u> | <u>Medically Registered Population Total in April 1978*</u> | <u>% of Medically Registered Population Counted</u> |
|---|--------------------|----------------------|------------------------------------|--------------------------------------|--------------------------------|----------------------------------|------------------------------|---|---|
| April 1978 | 36 | 32 | 6 | 3 | 8 | 14 | 99 | 143 | 69 |
| January 1979 | 17 | 16 | 4 | 2 | 1 | 6 | 46 | 143 | 32 |
| May 1979 | 14 | 19 | 5 | 3 | 4 | 6 | 51 | 143 | 36 |
| January plus May 1979 Duplicate Counts | 7 | 11 | 4 | 2 | 0 | 4 | 28 | 143 | 20 |

* Bill Scott-Medical Dept-BNL

Table 28

Genre of Non-Medically Registered Persons and Medically Registered Children Whole Body Counted Only in 1979

| Date Counted/ Classification | Adult | | Male Adolescent Age 11-15 | | Female Adolescent Age 11-15 | | Male Children Age 5-10 | | Female Children Age 5-10 | | Total Persons Counted |
|--|-----------|-----------|---------------------------|--|-----------------------------|--|------------------------|--|--------------------------|--|-----------------------|
| | Males | Females | | | | | | | | | |
| January 1979/ Non-relocated residents. | 8 | 11 | 3 | | 2 | | 3 | | 6 | | 33 |
| Relocated residents, not medically registered. | 2 | 5 | 1 | | 1 | | 0 | | 2 | | 11 |
| Relocated residents medically registered. | 0 | 0 | 0 | | 0 | | 4 | | 3* | | 7* |
| Non-residents. | 0 | 0 | 0 | | 1 | | 1 | | 2 | | 4 |
| TOTAL | 10 | 16 | 4 | | 4 | | 8 | | 13 | | 55 |

Table 28 (Cont'd)

| <u>Date Counted/ Classification</u> | <u>Adult Males</u> | <u>Adult Females</u> | <u>Male Adolescents Age 11-15</u> | <u>Female Adolescents Age 11-15</u> | <u>Male Children Age 5-10</u> | <u>Female Children Age 5-10</u> | <u>Total Persons Counted</u> |
|---|------------------------|--------------------------|---|---|---------------------------------------|---|--------------------------------------|
| May 1979/ | | | | | | | |
| Non-relocated residents. | 12 | 12 | 5 | 2 | 3 | 8 | 42 |
| Relocated residents not medically registered. | 3 | 5 | 2 | 1 | 1 | 4 | 16 |
| Relocated residents medically registered. | 0 | 0 | 0 | 0 | 7 | 5 | 12 |
| Transient. | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| Non-resident. | 0 | 0 | 0 | 2 | 1 | 3 | 6 |
| TOTAL | 17 | 17 | 7 | 5 | 12 | 20 | 78 |
| January and May 1979 Duplicate Counts | 6 | 13 | 4 | 3 | 6 | 12 | 44 |

* All but one individual in this classification recounted in May 1979.

Table 29

Summary of Residence Location for Persons Whole Body Counted in
January and May 1979

| Group/Class | | <u>Residence Atolls - Islands</u> | | | | <u>Total Counted</u> |
|--|-----|-----------------------------------|-------------|-------------|--------------------------|--------------------------|
| | | <u>Majuro- Ejit</u> | <u>Rita</u> | <u>Kili</u> | <u>Jaluit- Jabor</u> | |
| Relocated Marshallese/ Residents of Bikini Atoll | Jan | 26 | 37 | 1 | 0 | 64 |
| | May | 34 | 30 | 15 | 0 | 79 |
| Nonrelocated Marshallese/ Residents of Bikini Atoll | Jan | 4 | 29 | 0 | 0 | 33 |
| | May | 3 | 24 | 0 | 17 | 44 |
| Controls | Jan | 1 | 3 | 0 | 0 | 4 |
| | May | 3 | 3 | 0 | 0 | 6 |

Table 30

Frequency Distribution of Residence Location in January 1979

| | <u>Residence Atolls - Islands</u> | | | | <u>Total Counted</u> |
|---|-----------------------------------|-------------|-------------|--------------------------|--------------------------|
| | <u>Majuro- Ejit</u> | <u>Rita</u> | <u>Kili</u> | <u>Jaluit- Jabor</u> | |
| Relocated Medically Registered: | | | | | |
| Adult Males | 8 | 8 | 1 | 0 | 17 |
| Adult Females | 8 | 8 | 0 | 0 | 16 |
| Adolescent Males | 1 | 3 | 0 | 0 | 4 |
| Adolescent Females | 1 | 1 | 0 | 0 | 2 |
| Male Children | 1 | 0 | 0 | 0 | 1 |
| Female Children | 3 | 3 | 0 | 0 | 6 |
| Relocated Nonmedically Registered: | | | | | |
| Adult Males | 0 | 2 | 0 | 0 | 2 |
| Adult Females | 2 | 3 | 0 | 0 | 5 |
| Adolescent Males | 0 | 1 | 0 | 0 | 1 |
| Adolescent Females | 0 | 1 | 0 | 0 | 1 |
| Male Children | 1 | 3 | 0 | 0 | 4 |
| Female Children | 1 | 4 | 0 | 0 | 5 |
| Other Nonmedically Registered: | | | | | |
| Adult Males | 2 | 6 | 0 | 0 | 8 |
| Adult Females | 2 | 9 | 0 | 0 | 11 |
| Adolescent Males | 0 | 3 | 0 | 0 | 3 |
| Adolescent Females | 0 | 3 | 0 | 0 | 3 |
| Male Children | 1 | 3 | 0 | 0 | 4 |
| Female Children | 0 | 8 | 0 | 0 | 8 |

Table 31

Frequency Distribution of Residence Location in May 1979

| | <u>Residence Atolls - Islands</u> | | | | <u>Total Counted</u> |
|------------------------------------|-----------------------------------|-------------|-------------|--------------------------|--------------------------|
| | <u>Majuro- Ejit</u> | <u>Rita</u> | <u>Kili</u> | <u>Jaluit- Jabor</u> | |
| Relocated Medically Registered: | | | | | |
| Adult Males | 6 | 5 | 3 | 0 | 14 |
| Adult Females | 9 | 7 | 3 | 0 | 19 |
| Adolescent Males | 3 | 2 | 0 | 0 | 5 |
| Adolescent Females | 1 | 1 | 1 | 0 | 3 |
| Male Children | 1 | 0 | 3 | 0 | 4 |
| Female Children | 3 | 3 | 0 | 0 | 6 |
| Relocated Nonmedically Registered: | | | | | |
| Adult Males | 1 | 1 | 1 | 0 | 3 |
| Adult Females | 3 | 2 | 0 | 0 | 5 |
| Adolescent Males | 1 | 1 | 0 | 0 | 2 |
| Adolescent Females | 0 | 1 | 0 | 0 | 1 |
| Male Children | 3 | 4 | 1 | 0 | 8 |
| Female Children | 3 | 3 | 3 | 0 | 9 |
| Other Nonmedically Registered: | | | | | |
| Adult Males | 1 | 4 | 0 | 9 | 14 |
| Adult Females | 2 | 8 | 0 | 2 | 12 |
| Adolescent Males | 0 | 3 | 0 | 2 | 5 |
| Adolescent Females | 1* | 2** | 0 | 1 | 4 |
| Male Children | 1* | 2 | 0 | 1 | 4 |
| Female Children | 1* | 3** | 0 | 2 | 11 |

*individual is part of the control population.

**one or more individuals participated in the program as a control.

Medically Registered Relocated Adult Male ID Number,Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll-Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 80 | | --- | --- | 5/21 | Kili |
| 6006 | | --- | --- | --- | Kwajalein-Ebeye |
| 863 | | 1/23 | Majuro-Rita | --- | Majuro-Ejit |
| 6070 | | 1/24 | Majuro-Rita | --- | Maloelap |
| 6004 | | --- | --- | --- | Jaluit |
| 6033 | | --- | --- | --- | Majuro - (Rita?) |
| 6018 | | --- | --- | --- | Wotje |
| 6069 | | --- | --- | 5/15 | Majuro-Rita |
| 6068 | | --- | --- | --- | Majuro - (?) |
| 6067 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6066 | | 1/24 | Majuro-Rita | 5/18 | Majuro-Rita |
| 6017 | | --- | --- | 5/21 | Kili |
| 6019 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6001 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6073 | | --- | --- | 5/15 | Majuro-Ejit |
| 6005 | | --- | --- | 5/21 | Kili |
| 6008 | | 1/23 | Majuro-Rita | --- | Majuro-Ejit |
| 6086 | | 1/23 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6071 | | 1/23 | Majuro-Ejit | --- | Kili |
| 6076 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6072 | | --- | --- | --- | Kili |

Table 32 (Cont'd)

Medically Registered Relocated Adult Male ID Number.

Name and Residence Location (cont'd)

| | | | | |
|------|------|-------------|------|-----------------|
| 813 | 1/22 | Majuro-Rita | --- | Kili |
| 6118 | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6126 | --- | --- | --- | Kili |
| 6003 | --- | --- | --- | Ugelang |
| 6117 | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6128 | 1/25 | Kili | --- | Kili |
| 6125 | --- | --- | 5/18 | Majuro-Ejit |
| 6007 | 1/23 | Majuro-Ejit | --- | Kili |
| 6130 | 1/22 | Majuro-Ejit | 5/15 | Majuro-Ejit |
| 6119 | --- | --- | --- | Majuro- (Rita?) |
| 864 | --- | --- | --- | Majuro-Ejit |
| 966 | --- | --- | 5/15 | Majuro-Ejit |
| 6135 | --- | --- | --- | Lib |
| 6096 | 1/22 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6002 | --- | --- | --- | Kili |

Table 23

Medically Registered Relocated Adult Female ID Number,

Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|---------------------|-------------------------------|-------------------|-------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 6045 | | --- | --- | --- | Kwajalein-Ebeye |
| 6112 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6114 | | 1/23 | Majuro-Ejit | --- | Kili |
| 6111 | | 1/23 | Majuro-Ejit | --- | Kili |
| 6122 | | 1/22 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6123 | | 1/22 | Majuro-Ejit | 5/17 | Majuro-Ejit |
| 6059 | | --- | --- | --- | Kili |
| 6063 | | --- | --- | --- | Deceased |
| 6032 | | 1/22 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6124 | | --- | --- | --- | Kili |
| 6108 | | 1/23 | Majuro-Rita | --- | Majuro-Rita |
| 6058 | | --- | --- | --- | Kili |
| 6113 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6065 | | 1/22 | Majuro-Ejit | --- | Kili |
| 6097 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6109 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6046 | | --- | --- | 5/15 | Majuro-Ejit |
| 6098 | | 1/22 | Majuro-Ejit | 5/17 | Majuro-Ejit |
| 6060 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6036 | | --- | --- | --- | Jaluit |
| 6110 | | --- | --- | 5/21 | Kili |

Table 33 (Cont'd)

Medically Registered Relocated Adult Female ID Number,
Name and Residence Location (cont'd)

| | | | | |
|------|------|-------------|------|-------------|
| 525 | --- | --- | 5/21 | Kili |
| 6064 | 1/24 | Majuro-Rita | 5/15 | Majuro-Rita |
| 6061 | --- | --- | --- | Wotje |
| 6051 | --- | --- | 5/15 | Majuro-Ejit |
| 934 | --- | --- | 5/15 | Majuro-Rita |
| 6062 | --- | --- | 5/16 | Majuro-Ejit |
| 6035 | 1/24 | Majuro-Rita | --- | Maloelap |
| 6115 | 1/23 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6034 | --- | --- | 5/21 | Kili |
| 865 | --- | --- | 5/15 | Majuro-Ejit |
| 6050 | --- | --- | --- | Kili |

Table 34

Medically Registered Adolescents (Ages 11-14) ID Number,

Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|-----------------|-------------|---------------------|-----------------------------|-------------------|-------------------------------|
| | | <u>Count Date</u> | <u>Residence and Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| Males: | | | | | |
| 6132 | | --- | --- | --- | Kili |
| 6131 | | 1/21 | Majuro-Rita | 5/16 | Majuro-Ejit |
| 6011 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6127 | | 1/22 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6133 | | --- | --- | 5/15 | Majuro-Ejit |
| 6015 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| Females: | | | | | |
| 6129 | | 1/22 | Majuro-Ejit | 5/17 | Majuro-Ejit |
| 6048 | | --- | --- | 5/21 | Kili |
| 6091 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |

Table 35

Medically Registered Children (Ages 5-10) ID Number.

Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|-----------------------------|---|-----------------------------|---|
| | | <u>Count</u> <u>Date</u> | <u>Residence</u> <u>Atoll-Island</u> | <u>Count</u> <u>Date</u> | <u>Residence</u> <u>Atoll-Island</u> |
| Males: | | | | | |
| 6009 | | --- | --- | 5/21 | Kili |
| 6049 | | --- | --- | --- | Kili |
| 6042 | | --- | --- | --- | Jaluit |
| 6014 | | --- | --- | 5/21 | Kili |
| 6012 | | --- | --- | 5/21 | Kili |
| 6023 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6016 | | --- | --- | 5/15 | Majuro-Ejit |
| 6013 | | --- | --- | --- | Kili |
| Females: | | | | | |
| 6094 | | --- | --- | --- | Wotje |
| 6092 | | --- | --- | --- | Wotje |
| 6080 | | --- | --- | --- | Kili |
| 6010 | | 1/23 | Majuro-Ejit | --- | Majuro-Ejit |
| 6038 | | --- | --- | --- | Kili |
| 6105 | | 1/23 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6103 | | --- | --- | --- | Maloelap |
| 6028 | | --- | --- | 5/15 | Majuro-Ejit |
| 6030 | | 1/22 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6027 | | 1/23 | Majuro-Rita | --- | Majuro-Rita |
| 6044 | | --- | --- | 5/15 | Majuro-Rita |
| 6025 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6081 | | --- | --- | --- | Majuro-Ejit |
| 6106 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |

Nonmedically Registered Adult Female ID Number,Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll-Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 6137 | | 1/22 | Majuro-Ejit | 5/17 | Majuro-Ejit |
| 6139 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6140 | | 1/22 | Majuro-Ejit | 5/17 | Majuro-Ejit |
| 6144 | | 1/22 | Majuor-Ejit | 5/17 | Majuro-Ejit |
| 6148 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Ejit |
| 6151 | | 1/23 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6152 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6155 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6159 | | 1/24 | Majuro-Rita | 5/17 | Majuor-Rita |
| 6160 | | 1/24 | Majuor-Rita | 5/17 | Majuro-Rita |
| 6163 | | 1/24 | Majuro-Rita | --- | Majuro-Rita |
| 6165 | | 1/24 | Majuro-Rita | --- | Majuro-Rita |
| 6167 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6175 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6181 | | 1/25 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6185 | | 1/25 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6187 | | --- | --- | 5/16 | Majuro-Ejit |
| 6189 | | --- | --- | 5/16 | Majuro-Rita |
| 6206 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6222 | | --- | --- | 5/21 | Jaluit-Jabor |

Table 37

PRIVACY ACT MATERIAL REMOVED

Nonmedically Registered Adult Male ID Number.Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|-------------------------------------|-------------------------------|-------------------|-------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll-Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 6136 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6138 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6153 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6161 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6166 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6168 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6174 | | 1/24 | Majuro-Rita | --- | Majuro-Rita |
| 6180 | | 1/25 | Majuro-Rita | --- | Enewetak-Enewetak |
| 6182 | | 1/25 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6184 | | 1/25 | Majuro-Rita | 5/17 | Majuro-Ejit |
| 6190 | | --- | --- | 5/16 | Majuro-Ejit |
| 6205 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6210 | | --- | --- | 5/21 | Kili |
| 6211 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6218 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6219 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6220 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6221 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6223 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6224 | | <u>PRIVACY ACT MATERIAL REMOVED</u> | | 5/21 | Jaluit-Jabor |
| 6226 | | --- | --- | 5/21 | Jaluit-Jabor |

Nonmedically Registered Adolescent ID Number.Name and Residence Location

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|---------------------|-------------------------------|-------------------|-------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll-Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 6200 | | --- | --- | 5/17 | Majuro-Rita |
| 6207 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6225 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6188 | | --- | --- | 5/16 | Majuro-Ejit |
| 6212 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6147 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Ejit |
| 6169 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6178 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6183 | | 1/25 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6173 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6170 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6162 | | 1/24 | Majuro-Rita | --- | Aur |
| 6141 | | 1/22 | Majuro-Rita | 5/16 | Majuro-Rita |

Nonmedically Registered Juvenile ID Number.Name and Residence Locations

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|---------------------|-------------------------------|-------------------|-------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll-Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 6186 | | --- | --- | 5/16 | Majuro-Ejit |
| 6202 | | --- | --- | 5/21 | Kili |
| 6208 | | --- | --- | 5/21 | Majuro-Ejit |
| 6191 | | --- | --- | 5/16 | Majuro-Ejit |
| 6203 | | --- | --- | 5/21 | Kili |
| 6204 | | --- | --- | 5/21 | Kili |
| 6213 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6217 | | --- | --- | 5/21 | Jaluit-Jabor |
| 6156 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6164 | | 1/24 | Majuro-Rita | --- | Aur |
| 6172 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6179 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6177 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6176 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6171 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6157 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6158 | | 1/24 | Majuro-Rita | 5/18 | Majuro-Rita |
| 6150 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6149 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6142 | | 1/22 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6143 | | 1/22 | Majuro-Rita | 5/17 | Majuro-Rita |

Table 39 (Cont'd)

Nonmedically Registered Juvenile ID Number,

PRIVACY ACT MATERIAL REMOVED

Name and Residence Locations

| <u>ID#</u> | <u>Name</u> | <u>January 1979</u> | | <u>May 1979</u> | |
|------------|-------------|-----------------------|-----------------------------------|-----------------------|-----------------------------------|
| | | <u>Count Date</u> | <u>Residence Atoll-Island</u> | <u>Count Date</u> | <u>Residence Atoll-Island</u> |
| 6145 | | 1/22 | Majuro-Ejit | --- | Majuro-Ejit |
| 6031 | | --- | --- | 5/15 | Majuro-Ejit |
| 6029 | | --- | --- | 5/15 | Majuro-Ejit |
| 6100 | | --- | --- | 5/15 | Majuro-Rita |
| 6021 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6020 | | 1/22 | Majuro-Ejit | 5/16 | Majuro-Ejit |
| 6107 | | 1/23 | Majuro-Rita | 5/16 | Majuro-Rita |
| 6074 | | 1/24 | Majuro-Rita | 5/17 | Majuro-Rita |
| 6078 | | 1/23 | Majuro-Ejit | --- | Kili |
| 6088 | | --- | --- | 5/15 | Majuro-Ejit |
| 6090 | | --- | --- | 5/15 | Majuro-Ejit |
| 6101 | | 1/24 | Majuro-Rita | 5/15 | Majuro-Rita |
| 6056 | | 1/24 | Majuro-Rita | 5/16 | Majuro-Ejit |
| 6057 | | --- | --- | 5/21 | Kili |

PRIVACY ACT MATERIAL REMOVED

Table 40

Medically Registered Relocated Bikini Atoll ResidentsNot Whole Body Counted Since 1978

PRIVACY ACT MATERIAL REMOVED

| <u>ID #</u> | <u>Age</u> | <u>Name</u> | <u>Sex</u> | <u>Location</u> |
|-------------|------------|-------------|------------|------------------|
| 6132 | 12 | | M | Kili |
| 6049 | 8 | | M | Kili |
| 6042 | 7 | | M | Jaluit |
| 6013 | 5 | | M | Kili |
| 6094 | 10 | | F | Wotje |
| 6092 | 8 | | F | Wotje |
| 6080 | 7 | | F | Kili |
| 6038 | 6 | | F | Kili |
| 6103 | 9 | | F | Maloelap |
| 6081 | 9 | | F | Majuro, Ejit |
| 6006 | 37 | | M | Kwajalein, Ebeye |
| 6004 | 28 | | M | Jaluit |
| 6033 | 27 | | M | Majuro |
| 6018 | 34 | | M | Wotje |
| 6068 | 56 | | M | Majuro |
| 6072 | 20 | | M | Kili |
| 6126 | 35 | | M | Kili |
| 6003 | 22 | | M | Enewetak |
| 6119 | 17 | | M | Majuro |
| 864 | 51 | | M | Majuro, Ejit |
| 6135 | 35 | | M | Lib |
| 6002 | 65 | | M | Kili |

PRIVACY ACT MATERIAL REMOVED

Table 40 (Cont'd)

Medically Registered Relocated Bikini Atoll Residents

Not Whole Body Counted Since 1978 (cont'd)

| <u>ID #</u> | <u>Age</u> | <u>Name</u> | <u>Sex</u> | <u>Location</u> |
|-------------|------------|-------------|------------|-------------------|
| 6045 | 28 | | F | Kwajalein, Ebeye |
| 6059 | 19 | | F | Kili |
| 6124 | 54 | | F | Kili |
| 6058 | 18 | | F | Majuro, Ejit |
| 6036 | 27 | | F | Jaluit (Rongelap) |
| 6061 | 32 | | F | Wotje |
| 6050 | 22 | | F | Kili |

Total Missed = 30

Table 41

Individual Dosimetry Data for Bikinians -

Explanation of Column Headings

| <u>Column</u> | <u>Item or Derived Quality</u> | <u>Measured Quantity</u> | <u>Comments</u> |
|---------------|---|-------------------------------------|--|
| 1 | Name | - | Personal Interview |
| 2 | ID Number | - | BNL Medical Dept. & S&EP Div. Records |
| 3 | Residence Interval | - | Personal Interviews |
| 4 | ^{90}Sr and ^{90}Y Bone Marrow Dose Equivalent During and Post Residence Interval | Urine Activity Concentration | Three Compartment Model, Constant Continuous Uptake |
| 5 | ^{137}Cs + $^{137\text{m}}\text{Ba}$ Dose Equivalent During and Post Residence Interval | Body Burden Measurements | Two Compartment Model, Monotonically Increasing Uptake |
| 6 | Net External Dose Equivalent During Residence Interval | External Exposure Rate Measurements | Assumed Living Patterns |
| 7 | Total Body Dose Equivalent | - | Sum of Columns 5 & 6 |
| 8 | Total Bone Marrow Dose Equivalent During and Post Residence Interval | - | Sum of Columns 4, 5, and 6 |

PRIVACY ACT MATERIAL REMOVED

INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS

| <u>Name</u> | <u>ID Number</u> | <u>Residence Interval a</u> | ⁹⁰ Sr & ⁹⁰ Y Bone Marrow Dose Equiv. During & Post Residence Int. <u>mRem</u> | ¹³⁷ Cs + ^{137m} Ba Dose Equiv. During & Post Residence Int. <u>mRem</u> | <u>Net External Dose Equiv. During Residence Interval mRem</u> | <u>Total Body Dose Equiv. During & Post Residence Int. mRem</u> | <u>Total Bone Marrow Dose Equiv. During and Post Residence Interval mRem</u> |
|-------------|------------------|---------------------------------|--|---|--|---|--|
| | 6001 | 7.3 | 130* | 480 | 950 | 1400 | 1600 |
| | 6127 | 7.3 | 39 | 580 | 950 | 1500 | 1600 |
| | 6130 | .72 | 49 | 200 | 94 | 300 | 300 |
| | 6076 | 3.3 | 9.9 | 900 | 430 | 1300 | 1300 |
| | 813 | 4.3 | 77* | 600 | 560 | 1200 | 1200 |
| | 6019 | 5.3 | 190 | 420 | 690 | 1100 | 1300 |
| | 6111 | .80 | 7.7 | 150 | 100 | 250 | 260 |
| | 6097 | 4.3 | 51* | 430 | 520 | 950 | 1000 |
| | 6115 | 7.3 | 97 | 760 | 880 | 1600 | 1700 |
| | 6109 | 4.3 | 51* | 240 | 520 | 760 | 810 |
| | 6091 | 6.3 | 74* | 550 | 760 | 1300 | 1400 |
| | 6132 | 2.3 | 62 | 1200 | 300 | 1500 | 1600 |
| | 6046 | 2.0 | 27 | 400 | 240 | 600 | 700 |
| | 6061 | 6.3 | 65 | 630 | 760 | 1400 | 1500 |

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS (Cont'-1)

| <u>Name</u> | <u>ID Number</u> | <u>Residence Interval</u> <u>yr</u> | <u>⁹⁰Sr & ⁹⁰Y Bone Marrow Dose Equiv. During & Post Residence Int.</u> <u>mRem</u> | <u>¹³⁷Ca + ^{137m}Ba Dose Equiv. During & Post Residence Int.</u> <u>mRem</u> | <u>Net External Dose Equiv. During Residence Interval</u> <u>mRem</u> | <u>Total Body Dose Equiv. During & Post Residence Int.</u> <u>mRem</u> | <u>Total Bone Marrow Dose Equiv. During and Post Residence Interval</u> <u>mRem</u> |
|-------------|------------------|--|---|---|--|---|--|
| | 6066 | 3.3 | 59* | 400 | 430 | 830 | 890 |
| | 6070 | 10.3 | 185* | 870 | 1300 | 2200 | 2400 |
| | 6118 | 6.3 | 42 | 420 | 820 | 1200 | 1300 |
| | 6117 | 6.3 | 110* | 610 | 820 | 1400 | 1500 |
| | 6128 | 7.3 | 130* | 810 | 950 | 1800 | 1900 |
| | 6122 | 10.3 | 86 | 380 | 1200 | 1600 | 1700 |
| | 6015 | 1.7 | 31* | 650 | 220 | 870 | 900 |
| | 6030 | 3.3 | 39* | 1200 | 400 | 1600 | 1600 |
| | 6129 | 4.3 | 51* | 330 | 520 | 850 | 900 |
| | 6027 | 3.3 | 39* | 760 | 400 | 1200 | 1200 |
| | 6010 | 7.3 | 86* | 1100 | 900 | 2000 | 2100 |
| | 6105 | 3.3 | 39* | 1100 | 400 | 1500 | 1500 |
| | 6033 | 8.3 | 150* | 900 | 1100 | 2000 | 2100 |
| | 6007 | .88 | 15 | 190 | 110 | 300 | 310 |
| | 6008 | 4.3 | 77* | 850 | 560 | 1400 | 1500 |

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS (Cont'd)

| Name | ID Number | Residence Interval C. | ⁹⁰ Sr & ⁹⁰ Y Bone Marrow Dose Equiv. During & Post Residence Int. mRem | ¹³⁷ Cs + ^{137m} Ba Dose Equiv. During & Post Residence Int. mRem | Net External Dose Equiv. During Residence Interval mRem | Total Body Dose Equiv. During & Post Residence Int. mRem | Total Bone Marrow Dose Equiv. During and Post Residence Interval mRem |
|------|-----------|-----------------------|--|--|---|--|---|
| | 6071 | 1.0 | 18* | 220 | 130 | 350 | 370 |
| | 863 | 4.3 | 120 | 620 | 600 | 1200 | 1300 |
| | 6086 | 8.3 | 240 | 990 | 1100 | 2100 | 2300 |
| | 6069 | 8.3 | 150* | 580 | 1100 | 1700 | 1900 |
| | 6073 | 7.3 | 130* | 490 | 950 | 1400 | 1600 |
| | 6072 | 1.0 | 18* | 330 | 130 | 460 | 480 |
| | 6119 | 7.3 | 130* | 730 | 950 | 1700 | 1800 |
| | 864 | 7.3 | 130* | 960 | 950 | 1900 | 2000 |
| | 966 | 7.3 | 130* | 1400 | 950 | 2300 | 2500 |
| | 6059 | 1.3 | 15* | 240 | 160 | 400 | 410 |
| | 6124 | .88 | 10* | 180 | 110 | 390 | 400 |
| | 6058 | 5.3 | 63* | 550 | 600 | 1200 | 1300 |
| | 6036 | .64 | 7.6* | 260 | 77 | 340 | 340 |
| | 6110 | 8.3 | 98* | 450 | 1000 | 1400 | 1500 |
| | 6051 | 5.3 | 63* | 520 | 600 | 1200 | 1200 |

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS (Cont'd)

| Name | ID Number | Residence Interval (Y) | 90 Sr & 90 Y Bone Marrow Dose Equip. During & Post Residence Int. | | 137 Cs + 137m Ba Dose Equip. During & Post Residence Int. | | Net External Dose Equip. During Residence Interval | | Total Body Dose Equip. During & Post Residence Int. | | Total Bone Marrow Dose Equip. During and Post Residence Interval | |
|------|-----------|------------------------|---|------|---|------|--|------|---|------|--|------|
| | | | mRem | mRem | mRem | mRem | mRem | mRem | mRem | mRem | mRem | mRem |
| | 6092 | 6.3 | 74* | 1600 | 800 | 2400 | 2400 | 2400 | | | | |
| | 6080 | .88 | 10* | 200 | 110 | 310 | 310 | 320 | | | | |
| | 6038 | 2.3 | 27* | 1100 | 280 | 1400 | 1400 | 1400 | | | | |
| | 6103 | 3.3 | 39* | 1200 | 400 | 1600 | 1600 | 1600 | | | | |
| | 6028 | 5.3 | 63* | 1200 | 600 | 1800 | 1800 | 1900 | | | | |
| | 6044 | 5.3 | 63* | 1600 | 600 | 2200 | 2200 | 2300 | | | | |
| | 6062 | 4.3 | 51* | 540 | 520 | 1100 | 1100 | 1100 | | | | |
| | 6034 | 7.3 | 86* | 880 | 900 | 1800 | 1800 | 1900 | | | | |
| | 865 | 7.3 | 86* | 430 | 900 | 1300 | 1300 | 1400 | | | | |
| | 6050 | 2.3 | 27* | 410 | 300 | 710 | 710 | 740 | | | | |
| | 6009 | 4.3 | 77* | 1600 | 600 | 2200 | 2200 | 2300 | | | | |
| | 6049 | 2.3 | 41* | 1600 | 300 | 1900 | 1900 | 1900 | | | | |
| | 6042 | .55 | 10* | 510 | 72 | 580 | 580 | 590 | | | | |
| | 6014 | 1.6 | 29* | 1300 | 210 | 1500 | 1500 | 1500 | | | | |
| | 6012 | 7.3 | 130* | 1500 | 950 | 2400 | 2400 | 2600 | | | | |
| | 6016 | 7.3 | 130* | 1500 | 950 | 2400 | 2400 | 2600 | | | | |

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

(INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS (Cont'd))

| Name | ID Number | Residence Interval Q | ⁹⁰ Sr & ⁹⁰ Y Bone Marrow Dose Equiv. During & Post Residence Int. mRem | ¹³⁷ Cs + ^{137m} Ba Dose Equiv. During & Post Residence Int. mRem | Net External Dose Equiv. During Residence Interval mRem | Total Body Dose Equiv. During & Post Residence Int. mRem | Total Bone Marrow Dose Equiv. During and Post Residence Interval mRem |
|------|-----------|-------------------------|---|--|---|--|---|
| | 6013 | 2.3 | 41* | 1300 | 300 | 1600 | 1600 |
| | 6094 | 6.3 | 74* | 1300 | 800 | 2100 | 2200 |
| | 6005 | 1.8 | 12 | 470 | 230 | 700 | 710 |
| | 6135 | 1.3 | 11 | 330 | 170 | 500 | 510 |
| | 6125 | 9.3 | 45 | 890 | 1200 | 2100 | 2100 |
| | 6067 | 7.3 | 54 | 780 | 950 | 1700 | 1800 |
| | 6002 | 2.3 | 7.7 | 370 | 300 | 670 | 680 |
| | 6006 | 1.0 | 9.5 | 260 | 230 | 490 | 500 |
| | 6112 | 1.3 | 12 | 260 | 160 | 420 | 430 |
| | 6035 | 6.3 | 140 | 600 | 760 | 1400 | 1500 |
| | 6113 | 4.3 | 19 | 360 | 520 | 880 | 900 |
| | 6060 | 2.3 | 27* | 510 | 280 | 790 | 820 |
| | 6032 | 3.3 | 39* | 860 | 400 | 1400 | 1400 |
| | 6127 | 4.3 | 50* | 480 | 520 | 1000 | 1100 |
| | 6098 | 3.3 | 39* | 320 | 400 | 720 | 760 |

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS (Cont'd)

| Name | ID Number | Residence Interval <i>a</i> | ⁹⁰ Sr & ⁹⁰ Y Bone Marrow Dose Equiv. During & Post Residence Int. <i>mRem</i> | ¹³⁷ Cs + ^{137m} Ba Dose Equiv. During & Post Residence Int. <i>mRem</i> | Net External Dose Equiv. During Residence Interval <i>mRem</i> | Total Body Dose Equiv. During & Post Residence Int. <i>mRem</i> | Total Bone Marrow Dose Equiv. During and Post Residence Interval <i>mRem</i> |
|------|-----------|--------------------------------|--|---|--|---|--|
| | 6065 | 4.3 | 130 | 390 | 520 | 910 | 1000 |
| | 6004 | .55 | 10* | 130 | 72 | 200 | 210 |
| | 6018 | 6.3 | 150 | 1100 | 820 | 1900 | 2100 |
| | 6126 | 2.3 | 45 | 1100 | 300 | 1400 | 1400 |
| | 6003 | 8.3 | 250 | 580 | 1100 | 1700 | 1900 |
| | 6114 | 1.0 | 12* | 170 | 120 | 290 | 300 |
| | 6096 | 3.3 | 46 | 680 | 430 | 1100 | 1100 |
| | 80 | 1.0 | 18* | 200 | 130 | 330 | 350 |
| | 6017 | 8.3 | 330 | 1200 | 1100 | 2300 | 2700 |
| | 6045 | 1.0 | 9.0 | 150 | 120 | 270 | 280 |
| | 6108 | 4.3 | 43 | 210 | 520 | 730 | 770 |
| | 6063 | 4.3 | 19 | 620 | 520 | 1100 | 1100 |
| | 525 | 1.0 | 5.6 | 350 | 120 | 470 | 480 |
| | 934 | 6.3 | 120 | 1300 | 760 | 2100 | 2200 |
| | 6068 | 6.3 | 60 | 630 | 820 | 1500 | 1600 |
| | 6106 | 3.3 | 39* | 750 | 400 | 1100 | 1200 |

PRIVACY ACT MATERIAL REMOVED

PRIVACY ACT MATERIAL REMOVED

INDIVIDUAL DOSIMETRY DATA FOR BIKINIANS (Cont'd)

| <u>Name</u> | <u>ID Number</u> | <u>Residence Interval</u> <u>yr</u> | <u>⁹⁰Sr & ⁹⁰Y Bone Marrow Dose Equiv. During & Post Residence Int. mRem</u> | <u>¹³⁷Co + ^{137m}Ba Dose Equiv. During & Post Residence Int. mRem</u> | <u>Net External Dose Equiv. During Residence Interval mRem</u> | <u>Total Body Dose Equiv. During & Post Residence Int. mRem</u> | <u>Total Bone Marrow Dose Equiv. During and Post Residence Interval mRem</u> |
|-------------|------------------|--|---|---|--|---|--|
| | 6025 | 3.3 | 39* | 900 | 400 | 1300 | 1300 |
| | 6064 | 7.3 | 86* | 400 | 900 | 1300 | 1400 |
| | 6023 | 4.3 | 77* | 990 | 560 | 1500 | 1600 |
| | 6131 | 6.3 | 110* | 950 | 820 | 1800 | 1900 |
| | 6011 | 6.3 | 170 | 550 | 820 | 1400 | 1600 |
| | 6081 | .97 | 12* | 490 | 120 | 610 | 620 |
| | 6133 | 7.3 | 130* | 1900 | 950 | 2800 | 3000 |
| | 6048 | .55 | 6.5* | 590 | 72 | 660 | 670 |

*These values were derived from average male or average female daily activity ingestion rates for Sr-90.

PRIVACY ACT MATERIAL REMOVED

Table 42

1978 ¹³⁷Cs Body Burden of Bikinians Ordered by Family Group

| <u>Rank</u> | <u>Medical ID</u> | <u>WATO</u> | <u>Status of Family Member</u> | <u>Body Burden kBq</u> |
|-------------|-------------------|-------------|--------------------------------|------------------------|
| 1 | 6018 | unknown | H | 220.0 |
| | 6061 | | W | 82.0 |
| | 6094 | | C(F) | 75.0 |
| | 6092 | | C(F) | 83.0 |
| 2 | 966 | | H | 210.0 |
| | 934 | | W | 200.0 |
| | 6016 | | C(M) | 53.0 |
| | 6044 | | C(F) | 43.0 |
| 3 | 6017 | | H | 210.0 |
| | 6034 | | W | 140.0 |
| | 6009 | | C(M) | 47.0 |
| 4 | 6070 | unknown | H | 150.0 |
| | 6035 | | W | 100.0 |
| 5 | 6033 | unknown | H | 140.0 |
| | 6058 | | W | 77.0 |
| 6 | 6126 | unknown | H | 120.0 |
| | 6050 | | W | 50.0 |
| | 6132 | | C(M) | 68.0 |
| | 6038 | | C(F) | 37.0 |
| | 6049 | | C(M) | 63.0 |
| | 6013 | | C(M) | 37.0 |
| 7 | 864 | | H | 110.0 |
| | 865 | | W | 49.0 |
| | 6119 | | C(M) | 79.0 |
| | 6133 | | C(M) | 78.0 |
| | 6028 | | C(F) | 47.0 |
| | 6091 | | C(F) | 43.0 |
| | 6090 | | C() | |
| 8 | 6068 | | H | 110.0 |
| | 6112 | | W | 65.0 |
| | 6118 | | C(M) | 23.0 |
| 9 | 6117 | | H | 99.0 |
| | 6063 | | W | 56.0 |
| 10 | 6125 | | H | 93.0 |
| | 6062 | | W | 53.0 |

Table 42 (Cont'd)

PRIVACY ACT MATERIAL REMOVED

| <u>Rank</u> | <u>Medical ID</u> | <u>WATO</u> | <u>Status of Family Member</u> | <u>Body Burden kBq</u> |
|-------------|-------------------|-------------|--------------------------------|------------------------|
| 11 | 6003 | | H | 90.0 |
| | 6097 | | W | 47.0 |
| 12 | 863 | | H | 87.0 |
| | 6113 | | W | 38.0 |
| | 6025 | | C(F) | 38.0 |
| 13 | 6073 | | H | 80.0 |
| | 6051 | | W | 53.0 |
| 14 | 6005 | | H | 77.0 |
| | 6046 | | W | 78.0 |
| | 6014 | | C(M) | 56.0 |
| 15 | 6008 | unknown | H | 72.0 |
| | 6108 | | W | 27.0 |
| | 6027 | | C(F) | 43.0 |
| 16 | 6128 | | H | 69.0 |
| | 6131 | | C(M) | 63.0 |
| | 6011 | | C(M) | 31.0 |
| 17 | 6072 | unknown | H | 65.0 |
| | 6059 | | W | 32.0 |
| 18 | 6001 | unknown | H | 64.0 |
| | 6122 | | W | 49.0 |
| | 6076 | | C(M) | 130.0 |
| 19 | 6071 | unknown | H | 64.0 |
| | 6111 | | W | 49.0 |
| | 6081 | | C(F) | 38.0 |
| 20 | 813 | | H | 62.0 |
| | 6065 | | W | 39.0 |
| 21 | 6007 | unknown | H | 55.0 |
| | 6114 | | W | 30.0 |
| | 6080 | | C(F) | 20.0 |
| 22 | 6130 | | H | 54.0 |
| | 6098 | | W | 33.0 |
| 23 | 6006 | unknown | H | 54.0 |

PRIVACY ACT MATERIAL REMOVED

Table 42 (Cont'd)

PRIVACY ACT MATERIAL REMOVED

| <u>Rank</u> | <u>Medical ID</u> | <u>WATO</u> | <u>Status of Family Member</u> | <u>Body Burden kBq</u> |
|-------------|-------------------|-------------|------------------------------------|------------------------|
| 24 | 6004 | unknown | H | 49.0 |
| | 6036 | | W | 57.0 |
| | 6042 | | C(M) | 39.0 |
| 25 | 6069 | | H | 43.0 |
| | 6064 | | W | 34.0 |
| | 6103 | | C(F) | 52.0 |
| 26 | 80 | | H | 42.0 |
| | 525 | | W | 87.0 |
| | 6048 | | C(F) | 76.0 |
| | 6012 | | C(M) | 47.0 |
| 27 | 6019 | | H | 38.0 |
| | 6123 | | W | 52.0 |
| | 6065 | | C(F) | 39.0 |
| | 6023 | | C(M) | 47.0 |
| 28 | 6066 | | H | 30.0 |
| | 6060 | | W | 51.0 |
| 29 | 6110 | | W | 56.0 |
| | 6127 | | C(M) | 27.0 |
| | 6010 | | C(F) | 52.0 |

PRIVACY ACT MATERIAL REMOVED

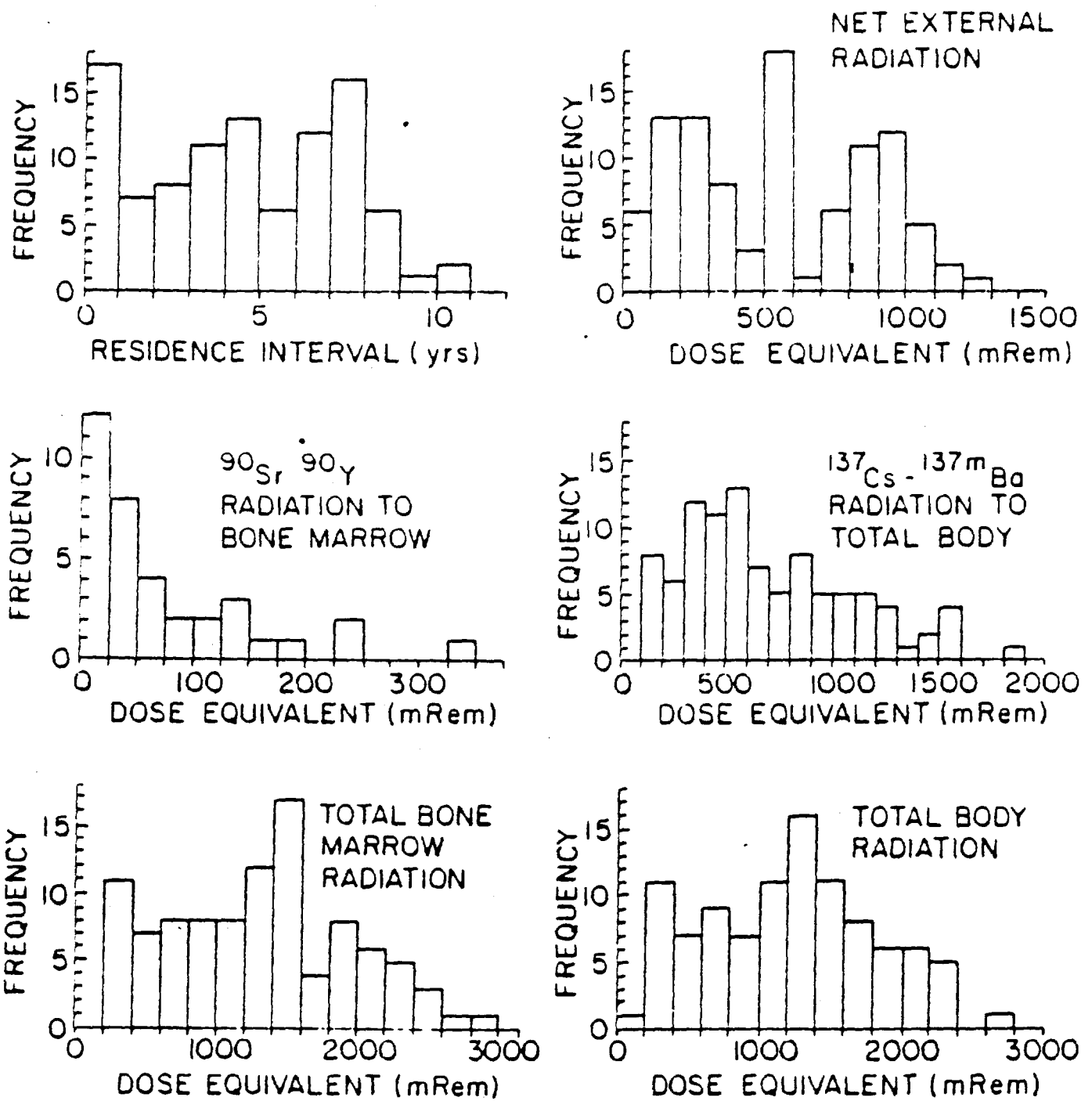


Fig. 1. TOTAL MALE AND FEMALE DISTRIBUTION OF DOSE EQUIVALENT (DURING AND POST RESIDENCE) OR RESIDENCE INTERVAL FOR INHABITANTS OF BIKINI ISLAND, BIKINI ATOLL

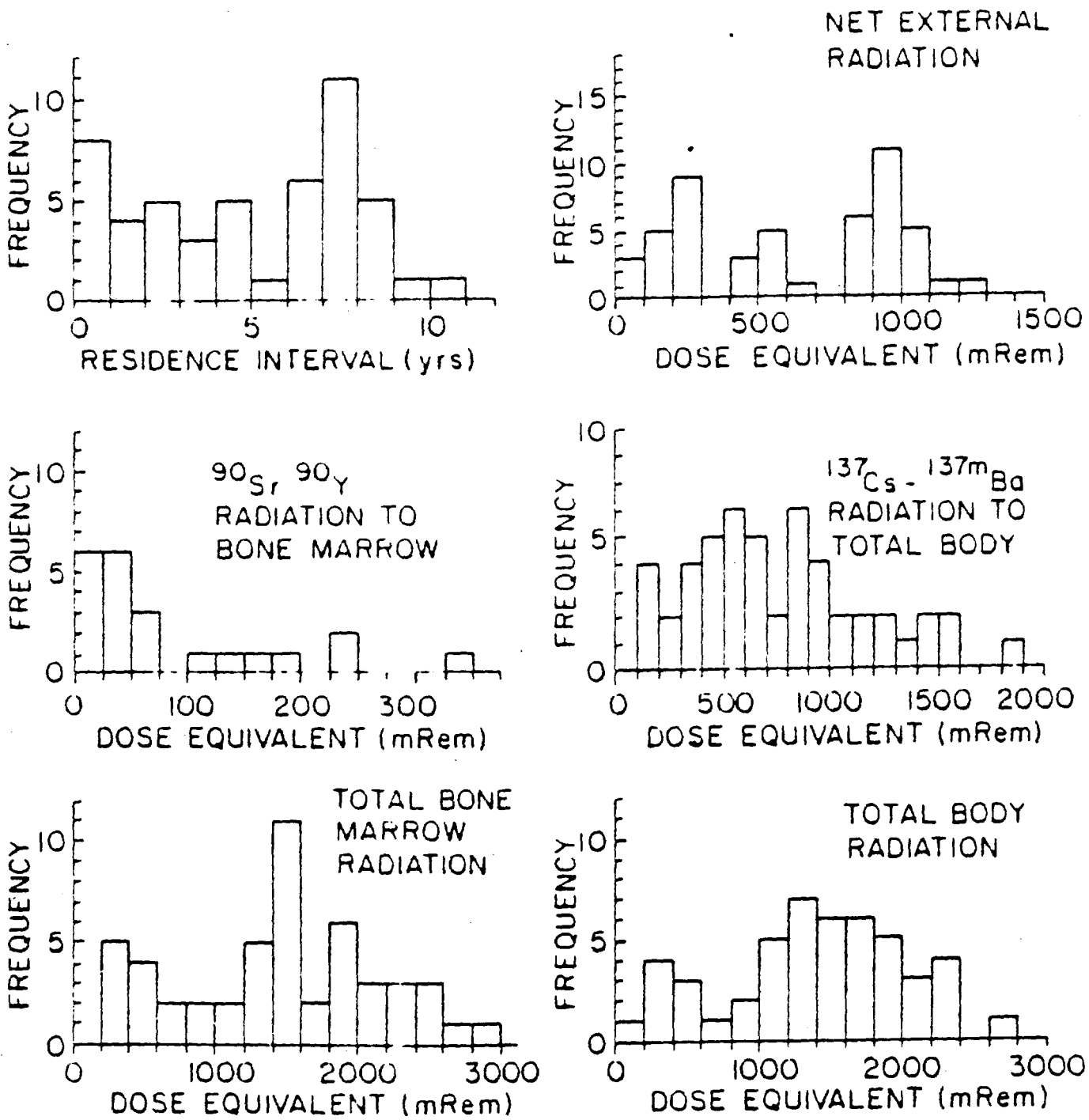


Fig. 2 TOTAL MALE DISTRIBUTION OF DOSE EQUIVALENT (DURING AND POST RESIDENCE) OR RESIDENCE INTERVAL FOR INHABITANTS OF BIKINI ISLAND, BIKINI ATOLL

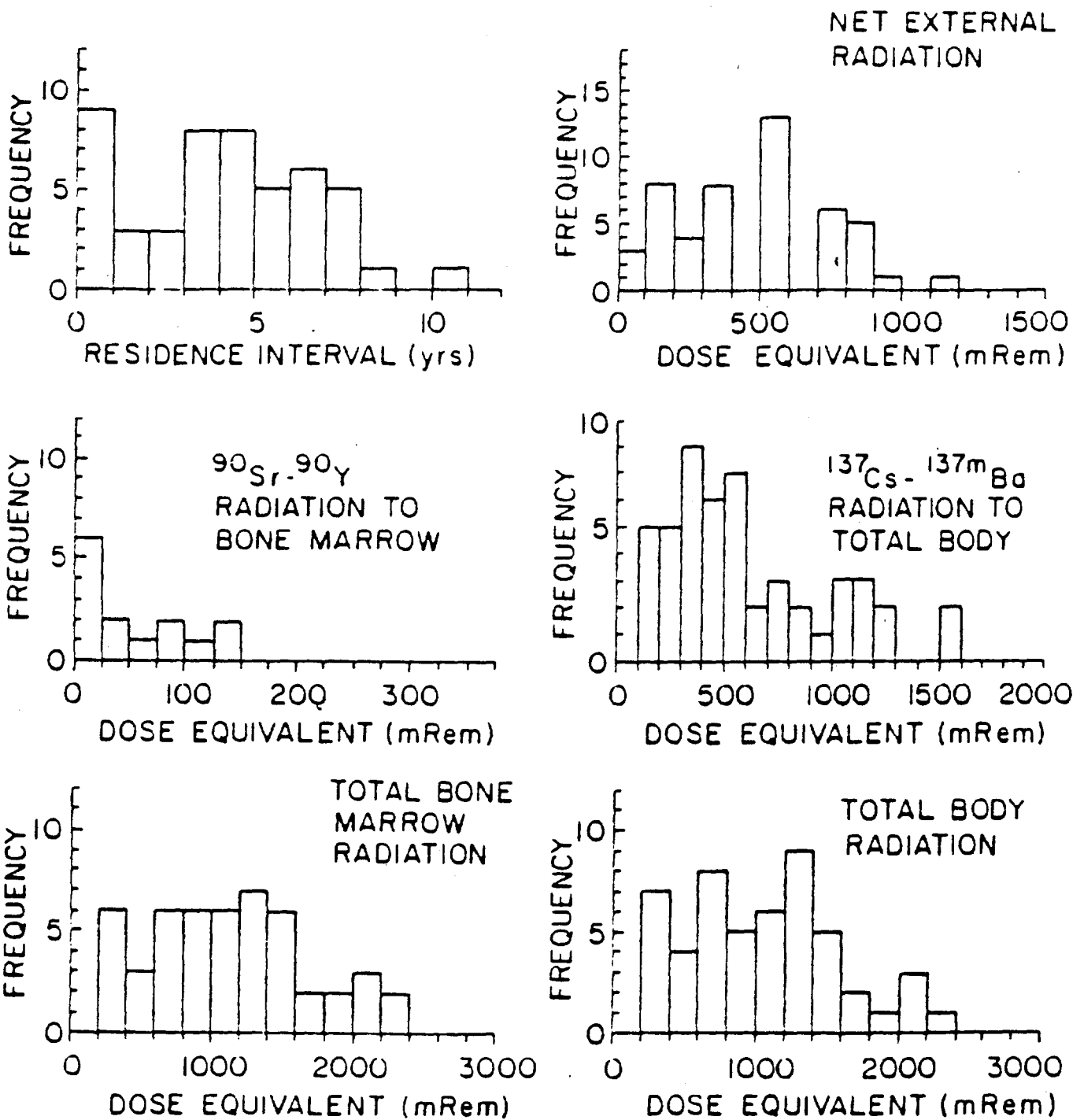


Fig. 3. TOTAL FEMALE DISTRIBUTION OF DOSE EQUIVALENT (DURING AND POST RESIDENCE) OR RESIDENCE INTERVAL FOR INHABITANTS OF BIKINI ISLAND, BIKINI ATOLL