[redacted]

point source counting, background measurements and other quality control measures were made to ensure proper calibration of the system, and to facilitate the interpretation of spectra.

The average adult male Rongelap body-burden for Cs-137 rose 56% from 6.7KBq (0.18 μCi) to 10KBq (0.28 μCi) during the interval July 1981 to June 1982. The mean adult female Cs-137 body burden increased 11% from 6.9KBq (0.19 μCi) to 7.1KBq (0.21 μCi); the male adolescent body burden remained at 6.3KBq (0.17 μCi); the female adolescent body burden decreased 15% from 9.3KBq (0.25 μCi) to 8.1KBq (0.22 μCi); for male children it increased 9% from 4.0KBq (0.11 μCi) to 4.4KBq (0.12 μCi) and for female childen it increased 82% from 3.5KBq (0.093 μCi) to 6.3KBq (0.17 μCi). Overall, the population exhibited a 1.8% per month rise in Cs-137 body burden during the July 1981 to June 1982 interval. This follows an apparently constant body burden (0.0% per month rise) of Cs-137 during the previous twenty four month interval, August 1979 to August 1981 and a constant declining body burden from the early 1960's until 1979 (see Graph One). This recent increase may have resulted from the relaxing of restrictions to the northern islands of Rongelap Atoll as a source of coconuts and coconut crabs. A summary of the Rongelap Atoll residents' June 1982 average Cs-137 body burden is given in Table Two.

The effective dose equivalent rate on July 10, 1982 from gamma emitters was estimated for various average body masses (see Table Three) for persons residing at Rongelap Atoll. These body masses represent the mean body mass of the adult, adolescent, and juvenile groups. The nuclide Cs-137 contributes the greatest portion of the total effective dose equivalent rate. The effective dose equivalent rate from Co-60 and Bi-207 was estimated to be less than 5×10^{-9} Sv a^{-1} (0.5 mrem per year) and was based on the minimum detection limit of the direct whole-body counting system. The net (natural background subtracted) external effective dose-equivalent rate is also reported in Table

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Rongelap Atoll is given for the average adult in Table Five. The activity intake data for Sr-90, Fe-55, and Co-60 were based on extropolation of prior body-burden and urine anlayses data, and a mathematical model describing the declining continuous intake pattern which was exhibited in the Rongelap population prior to 1981. Bi-207 activity was below our minimum detection limits, thus, the impact on total committed effective dose equivalent is insignificant. The intake for Cs-137 was based on the 1981 and 1982 field measurements and a mathematical model for increasing continuous intake. The total effective dose equivalent of 6.1×10^{-4} Sv (61 mrem) for the calendar year 1982 is less than the 5×10^{-3} Sv (500 mrem) annual limit recommended by the International Commission on Radiological Protection (ICRP Publication 26)

living on contaminated atolls. The former Bikinians provided samples for these studies as did some current residents of Majuro Atoll. Collections at Rongelap will provide an estimate of body burden during 1981 and 1982 and allow assessment of the effective dose equivalent since rehabitation of the atoll in 1957. The long mean residence time of Pu-239,240 in the body will allow for assessment of effective dose equivalent to the former Bikini residents while living at Bikini Atoll based on the analysis of recently collected samples.

The Cs-137 body burden of the former Bikini Atoll residents is now statistically indistinguishable from the comparison population values obtained at Majuro Atoll (see Table Two). The former Bikini residents have the lowest Cs-137 population body burden (see Graph Two) out of the four atoll populations currently under study. The increasing Cs-137 body burdens at Rongelap, Utirik and Enewetak imply that local phenomena influenced the elevation of Cs-137 in the diet. The observed decline in the former Bikinian body burdens was anticipated based on the value for the long-term biological turnover rate constant for Cs-137.

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ject to variation which is directly related to the daily intake of radioactive material.

Tables Six and Seven contain quality control results related to the precision and accuracy of the whole-body counting system. The accuracy of the whole-body count for Cs-137 was estimated to be about plus or minus 10% based on point source counting. The precision was within plus or minus 10% based on replicate counts. Whole body counts for Cs-137 above the minimum detection limit and for K39-41 were used to estimate precision (see Table Seven). The comparison between results from system one or system two was also determined

to be within plus or minus 10%. Variation in accuracy was largely due to the variation in the positioning of the point source relative to the standard geometry used for the computer analysis. Variation in background also affected the measurements.

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Reviewed by DJ Knowles Date 4/30/97