Technical Basis for Radiological Release of Grand Junction Office Building 2

Volume 2, Dose Assessment Supporting Data

July 1997

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Grand Junction Office Remedial Action Program
Technical Basis for Radiological Release
of Grand Junction Office Building 2
Volume 2, Dose Assessment Supporting Data

July 1997

MASTER

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Introduction

The second volume of the *Grand Junction Office Remedial Action Program Technical Basis for Radiological Release of Grand Junction Office Building 2* report includes the data quality objectives (DQO), sampling plan, collected data, and analysis used to model future radiation doses to members of the public occupying Building 2 on the U.S. Department of Energy (DOE) Grand Junction Office (GJO) site. This volume was assembled by extracting relevant components of the *Grand Junction Projects Office Remedial Action Project Building 2 Public Dose Evaluation* (DOE 1996) and inserting recent additional data that was gathered and dose pathway modeling that was performed.

The intent of this document is to provide all derived guidance decisions, assumptions, measured data, testing results, and pathway modeling software input and output data that supports the discussion and determinations presented in Volume 1 of this report. For constructive employment of this document, the reader is encouraged to closely follow Volume 1 for proper association with the segment of information being examined.

Section 1.0

Data Quality Objectives

Introductory Note

The DQO Process was completed prior to the first edition of the *GJPORAP Building 2 Public Dose Evaluation* (DOE 1996). However, several points are noted below for clarification purpose.

- *WASTREN-Grand Junction* and MACTEC-Environmental Restoration Services have replaced RUST Geotech (Rust) as the DOE-GJO prime contractors.
- Following publication of the first edition, reviewers expressed concern regarding use of the Building 12 "Log Cabin" as the sole reference survey unit for dose rate surveys. Consequently, additional data were collected from Building 26 and pooled with Building 12 to calculate a revised background dose rate. All measurements were then statistically analyzed as pooled data.
- For consideration of dose predictions related to future use of a sanitary landfill site where Building 2 debris has been disposed, additional dose modeling was performed using the radionuclide transport code RESRAD (ANL/EAD/LD-3).

The remainder of this Section contains a reproduction of the Rust Geotech, Inc. document, "DQO's, Use Scenarios, and Affected Area Designation for GJPORAP Building 2 Characterization," Rev.1, April 30, 1996, which was published with the *GJPORAP Building 2 Public Dose Evaluation* (DOE 1996).

DQOs, Use Scenarios, and Affected Area Designation for GJPORAP Building 2 Characterization

Rev 1.
April 30, 1996

Rust Geotech, Inc.

Prepared by Robert Morris and David Thorne

Executive Summary

This document defines the Data Quality Objectives (DQO) and future use assumptions necessary for predicting the public dose associated with future use of Building 2 as part of the DOE Grand Junction Office Remedial Action Program (GJORAP). A formal definition of the "affected areas," which is needed for design of the sampling plan, is also included.

The DQO states that the building may be released for unrestricted use if the predicted dose (excluding radon) to a member of the public occupying the building is less than 15 mrem in a typical year, and less than 30 mrem in the year when demolition occurs. The required confidence level needed for sampling to establish the future dose is set at the 95 percent level. In keeping with proposed EPA guidance (FR No. 246, 59:66415) the dose criteria do not include the contribution from indoor radon, either from naturally occurring radium-bearing soils or fill material situated beneath or near the building. However the radon concentration in Building 2 must not exceed the level recommended to the public by the EPA and Centers for Disease Control in "A Citizen's Guide to Radon" (EPA 402-K92-001), which is 4 pCi/L.

Future use of Building 2 is expected to be the same as its current use: an office facility occupied for eight hours per day, five days per week. Some day the building will be demolished. Exposure to potentially radioactive dust on surfaces that are currently inaccessible may occur, along with larger doses compared with normal occupancy. Demolition is assumed to take 80 hours to complete. No beneficial use of the building debris is expected; all will go to a sanitary landfill.

The "affected area" of Building 2 is the exposed surfaces (including drain lines) that existed during the era of its use as a locker and shower facility for uranium workers. Subsequent construction on the building, which includes interior walls, wood paneling, and floor coverings installed over a leveling slab are unaffected.

DQOS, Use Scenarios, and Affected Area Designation for GJORAP Building 2 Characterization

This document defines the Data Quality Objectives (DQO) and future use assumptions necessary for predicting the public dose associated with future use of Building 2 as part of the DOE Grand Junction Office Remedial Action Program (GJORAP). A formal definition of the "affected areas," which is needed for design of the sampling plan, is also included.

Part I. Data Quality Objectives

The Data Quality Objectives (DQO) process (EPA 1995) includes seven steps to define the data needed for decision-making. In a separate document (Morris 1996) the DQOs for Pipe Explorer operations in Building 2 were specified.

DQO Step 1: State the Problem

Data is needed to define the contaminant level of alpha, and beta/gamma emitting radionuclides, associated with prior operations in Building 2. It is assumed that "yellowcake" (nominally U_3O_8) is the primary radiological contaminant, although uranium mill tailings may also be involved. The dose rate and radon concentrations also need to be evaluated to find out the dose impact of the existing environment in Building 2.

The contaminant level data will be used in a model to predict the radiation dose likely to occur if the contaminants are left in place. Measurements will include dose rate, radon concentration, and surface contamination on accessible and inaccessible surfaces.

The data and resulting dose model will be incorporated into a report to be issued by the GJORAP Program at the end of February 1996. Therefore, the data report should be submitted to the project health physicist by February 15, 1996.

DQO Step 2: Identify the Decision

Building 2 may be released from radiological control for unrestricted use if the following criteria are met:

Criteria 1: The best estimate of annual Total Effective Dose Equivalent (TEDE) above background (not including dose from naturally-occurring or DOE-enhanced radon and short-lived progeny) to a member of the public under the most likely use scenario for a typical year may not exceed 15 mrem/year above background.

Criteria 2: The best estimate of the annual TEDE above background (not including dose from naturally-occurring or DOE-enhanced radon and short-lived progeny) to a member of the public during a full year that includes building demolition may not exceed 30 mrem/year above background.

Criteria 3: The concentration of radon in the building should be less than the EPA guide value of 4 pCi/L.¹

Criteria 4: For surface contamination on currently accessible surfaces²:

Removable beta contamination should be reduced to levels consistent with those in NRC RegGuide 1.86³.

Total beta contamination should be reduced to levels that are ALARA. The process used to establish the ALARA level will be documented in the closeout report for the building for those normally and currently accessible surfaces exceeding the applicable value in NRC RegGuide 1.86.

In a year of normal occupancy the contaminant levels on inaccessible surfaces and within drainage pipes will not contribute appreciably to dose. In the year of demolition, a short duration exposure to the inaccessible contaminants will occur. The contribution to dose from this pathway will be modeled.

Other areas of Building 2 are of potential interest in future dose scenarios, but we assume that remedial action will be taken to correct these conditions before release. For example, undocumented spot checks of the soil next to the building foundation suggests uranium mill tailings contamination may need to be removed. Prior surveys have shown surface contamination in attic insulation and on wooden structural members. This insulation may need to be removed, and wood may need to be decontaminated. Surveys confirming the adequacy of this cleanup should be performed before release of the building.

DQO Step 3: Identify Inputs

Inputs include the following:

Assumptions for RESRAD-Build (ANL/EAD/LD-3), or a similar dosimetry model.

Dose conversion factors and specific activity factors for yellowcake and uranium mill tailings obtained from technical basis documents for internal dosimetry

¹In keeping with proposed EPA guidance (FR Vol. 59, No. 246, p. 66415) the dose criteria do not include the contribution from indoor radon, either from naturally occurring radium-bearing soils or fill material situated beneath or near the building. However the radon concentration in Building 2 must not exceed the level recommended to the public by the EPA and Centers for Disease Control in "A Citizen's Guide to Radon" (EPA 402-K92-001), which is 4 pCi/L.

²Surface contamination will be assessed by measuring high energy beta and gamma ray emissions. It is recognized that the radionuclides found in yellowcake and uranium mill tailings also emit alpha radiation however in most cases the proportions of alpha emissions to beta emissions is near unity and the alpha and beta limits are to be applied separately. Since beta emissions are more readily detected than alpha emissions, measurement of only the beta signal is assumed to be sufficient to characterize the hazard.

³The surface contamination guidelines for uranium in NRC RegGuide 1.86 are the same as those published by DOE in all current regulatory documents.

Future use assumptions for the building. The assumptions for future use of Building 2 are in Part II of this document.

Data from the survey and reference units listed in Table 1.

Laboratory analysis of a high-activity sample to confirm the assumptions regarding radionuclides associated with Building 2.

Background levels of the quantities of concern are normally subtracted from the gross level in the survey. In most cases the background is established by measuring the same phenomenon in a reference area. However, sometimes long-term estimates of the background may be better, for example, area TLD data may provide a better estimate when averaged over a quarter or year. When it is judged that long-term average estimates of background are more reliable, these may be used instead of or in addition to the point measurement of background in the reference area. Since radon levels will be compared with a gross screening level recommended by the EPA, no background subtraction will be used.

Surface contamination background levels are generally assumed to be near zero. However, contamination survey meters are affected by ambient beta and gamma ray background and consequently instrument background will be subtracted.

Besides the external dose rate data set obtained with the PIC measurements, an equivalent data set has been historically measured at GJO as part of the area TLD program. This data set may be used to supplement or confirm the PIC measurements.

Similarly, a 1989 nationwide survey of radon concentration in DOE buildings may have included Building 2. If so, that information may be used to supplement the data collected in this characterization effort.

Calibration of the beta survey instruments will be done using NIST-traceable Chlorine-36 sources, according to a written procedure. Chlorine-36 is chosen because it has an intermediate beta energy that will conservatively approximate the energy of the beta emissions from the suspected radionuclides.

DQO Step 4: Define the Boundaries

Affected Area Designation

By defining what portions of a facility have been affected by prior operations, the sampling intensity for an area can be established. Here the affected area is influenced both by location and by date of construction. The originally exposed surfaces on the north end of the building are affected. The originally exposed surfaces in the adjacent area to the south are affected by proximity. However, the building has been remodeled several times since that original use. New walls and wall or floor coverings are not expected to be affected by the original operations, consequently these will be designated as unaffected.

Survey Units

The areas of the building will be divided into survey units. The survey units will be broadly classified as dose rate survey units, radon survey units, and contamination survey units. A summary of the survey units is provided in Table 1-1.

Table 1-1. Sampling Units for Building 2 and Reference Area

Measurement Type	Total Sampling Units	Building 12 (Log Cabin)	Building 2 (South End)	Building 2 (North End)
PIC	3	all one unit	all one unit	all one unit
Radon	3	all one unit	all one unit	all one unit
Accessible Surfaces	4	none	old walls one unit	old walls one unit
			new walls one unit	new walls one unit
Inaccessible Surfaces	7	none	floor one unit	floor one unit
			walls two units	walls three units

Dose rate survey units

Building 2 will be divided into two logical dose rate survey units: 1) the telecommunications center to the north and; 2) the copy center and surrounding offices. A reference building will also be used statistically to compare the dose rate survey data. Building 12, "Log Cabin," will be used for this purpose and will be the reference survey unit for dose rate surveys.

Radon survey units

Only two logical survey units exist in Building 2, the telecommunications center and the balance of the building. These are logically separate because they are separately ventilated, and ventilation is strongly associated with radon decay product concentration. Other possible survey units, such as the attic are discounted because they are not routinely occupied and any elevated radon concentration would be more easily shown by elevated surface contamination levels in the attic. Building 12, "Log Cabin," will serve as the reference building for radon measurements since it is considered unaffected and is built on original soils.

Surface contamination survey units

Building 2 will be divided into two areas: 1) the telecommunications center (i.e., historical mill worker change room) and 2) the southern area of the building (i.e., copy center and offices). Each area will contain several survey units for surface activity surveys. In addition, the survey units are different for accessible (i.e., new walls and accessible old walls) and inaccessible surfaces (i.e., old covered walls).

Accessible surfaces—the telecommunications center will consist of two units: 1) all new walls are one survey unit; and 2) the old walls are the other survey unit. The southern portion of Building 2 has two survey units consisting of all new walls as one unit and old walls as the other unit.

Inaccessible surfaces—the telecommunications center will consist of four units: 1) the north wall; 2) the east wall; 3) the west wall; and 4) the floor. The southern portion of Building 2 has three survey units: 1) the floor, 2) the east wall and half of the south wall; and 3) the west wall and half of the south wall.

DQO Step 5: Develop a Decision Rule

The dose rate measurements from the reference building will be compared with the Building 2 data using the Wilcoxon Rank Sum (WRS) test and the Quantile test. Both are nonparametric statistical tests (NUREG-1505).

For the WRS test, the total number of required samples from the reference area and survey units combined is (NUREG-1505):

$$N = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2}{12\alpha(1-c)(P_r - 0.5)^2} \quad (1)$$

where:

- α = specified Type I error rate
- β = specified Type II error rate
- $Z_{1-\alpha/2}$ = 100(1 - $\alpha/2$) percentile of the standard normal distribution function
- $Z_{1-\beta}$ = 100(1 - β) percentile of the standard normal distribution function
- c = proportion of samples to be collected in the reference area

The proportion, c , of measurements to be taken from the reference area is determined from the following:

$$c = \frac{v^2 h^2}{v^2 h^2 + 1} \quad (2)$$

where:

- h = number of survey units being compared with the given reference area
- v = $\sigma_{\text{reference}}/\sigma_{\text{survey}}$ the ratio of the standard deviation of the measurements in the reference area to the standard deviation of the measurements in the survey units.

The value of v must be estimated from previous samples or expert opinion. Lacking any information to the contrary, assuming that $v = 1$ is reasonable (NUREG-1505).

Once N is calculated, then $m = c \cdot N$ samples will be taken from the reference area, and $n = (1 - c) \cdot N$ samples will be taken from each survey unit being compared with it.

For the WRS test, the specification of the criteria is based on the amount of the shift, Δ , toward higher values in the survey unit that is important to detect compared with the reference distribution.

The criterion for dose rate surveys using pressurized ionization chambers is based on detecting a dose 15 mrem above background. The value of Δ was chosen as 15 mrem above background.

If σ is the standard deviation of the measurements in the reference area, then Δ/σ , expresses this shift as the number of standard deviations toward higher values that would be considered "large" for the distribution of measurements in the survey unit. The shift Δ is a fixed value depending on the criteria of interest. However, the ease or difficulty of detecting this shift statistically depends on the variability in the data, expressed by σ . Therefore, the statistical hypothesis must depend not solely on the absolute shift Δ , but on the relative shift Δ/σ , which expresses the shift relative to the variability in the measurements at a given site.

Some estimate for σ is needed, based on prior sampling or other information. Radiation control technicians who were interviewed about the dose rate at GJO generally agree that the exposure rate ranges from 10 to 14 $\mu\text{R/hr}$. This provides an estimate of $\sigma = 9 \text{ mrem/year}^4$.

P_r is the specified probability required to detect that a random measurement from the survey unit be larger than a random measurement from the reference area. P_r is greater than 0.5 whenever $\Delta/\sigma > 0$.

P_r is determined using the specified shift Δ/σ that must be detected with power $1 - \beta$. Values of P_r computed for a normal distribution are determined as follows:

$$P_r = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^{\frac{\Delta}{\sqrt{2}\sigma}} e^{-x^2/2} dx = \Phi\left(\frac{\Delta}{\sqrt{2}\sigma}\right) \quad (3)$$

The normal distribution is used here only to enable the conversion of the values of Δ/σ to values of P_r to calculate the appropriate sample size and error rates. The normal distribution is not used actually to conduct the test.

For an σ and β error rate of 0.05 and the comparison of the reference area to two survey units (i.e., north and south ends of Building 2, the required number of samples was determined to be 38. The data is given in Table 1-2.

⁴This is an overestimate of sigma that was discovered to be in error after the sampling plan had already been issued. In fact, sigma is closer to 1 mrem/yr. Rather than change this value and the associated calculations, we will simply acknowledge the error and note that the result was excess measurement of the gamma exposure rate. No adverse affect on the data set occurred.

Table 1-2. Determination of the Number of Pressurized Ionization Chamber Measurements for Building 2 and Reference Area

0.5	0.5	1.96	1.645	0.59	
		D/s			N + 20%
15	15.00	1.0000	0.7600	66	79
15	14.12	1.0625	0.7740	60	72
15	13.33	1.1250	0.7870	54	65
15	12.63	1.1875	0.7990	50	60
15	12.00	1.2500	0.8120	46	55
15	11.43	1.3125	0.8230	43	51
15	10.91	1.3750	0.8350	40	48
15	10.43	1.4375	0.8450	38	45
15	10.00	1.5000	0.8560	35	42
15	9.60	1.5625	0.8650	34	40
15	9.23	1.6250	0.8750	32	38
15	8.89	1.6875	0.8840	30	36
15	8.57	1.7500	0.8920	29	35
15	8.28	1.8125	0.9000	28	34
15	8.00	1.8750	0.9080	27	32
15	7.74	1.9375	0.9150	26	31
15	7.50	2.0000	0.9210	25	30

When applying statistical tests, it should be understood that the use of these hypotheses will occasionally allow some survey unit measurements to be larger than some reference area measurements without rejecting the null hypotheses. The central issue addressed by these statistical tests, is whether the site measurements are sufficiently larger to be considered significantly (statistically) different from reference area measurements. Therefore, to apply these tests, what is meant by "larger" must be defined. This is one purpose of constructing the desired power curve as a function of residual radioactivity as shown in the next section.

The WRS test is able to detect uniform failure of the building of interest from meeting the desired decision error level. It is not able to detect hot-spots of contamination. The Quantile test described NUREG-1505 will also be used to analyze this data set for nonuniform contamination. However, the main objective of this study is to evaluate the potential dose to normal occupants and a future demolition of the building. Therefore the mean activity and dose is the primary objective of this study, not the detection of hot-spots.

The dose rate data will be used to assess the dose from the external exposure pathway. The external dose will be added to the dose from additional pathways evaluated using the RESRAD-Build model.

The radon data will be compared with the reference building and to long-term community averages, but the dose from radon will not be included in the total dose to the building occupants. Instead the radon concentration will be evaluated against the EPA screening guideline value.

Contamination levels on accessible and inaccessible surfaces will be used for input into the RESRAD-Build model for the determination of the potential dose to building occupants and demolition crews. In addition, the contamination levels on accessible surfaces will be compared with present DOE standards for release.

The survey procedure for scans, direct measurements, and smears on accessible surfaces was taken from NUREG/CR-5849. A square grid of 1 m by 1 m will be established in Building 2. Scanning of accessible surfaces to identify locations of residual and near surface activity will be done according to the following schedule:

Affected area surfaces—100% of floors and walls

Unaffected area surfaces—10% of floors and walls

Direct measurements of surface activity will be done at systematically and randomly selected locations and at locations of elevated direct radiation, identified by surface scans. At least 30 measurement locations for each survey unit must be selected on the grid points by a random process. If the location contains items that prevent the measurement, then the nearest accessible location should be measured and the location noted on the standard survey forms. An integrated count will be obtained at each randomly selected grid point.

A smear for removable contamination will be obtained at each location of a direct surface activity measurement. These smears should encompass an area of 100 cm². Smears will be placed into envelopes or other individual containers, to prevent cross-contamination while awaiting analysis.

Inaccessible surfaces will require the use of core samples to estimate the mean and variance of the total beta contamination level. The number of required samples was determined and subsequently optimized based on the cost of sampling and the importance of the result, using the following equation (ASTM 1982):

$$N = \frac{\sigma^2 z^2}{E^2} \quad (4)$$

where:

N	=	number of required samples in a sampling unit
z	=	a value corresponding to a confidence level (in this case the 95% CL) for the normal distribution (z = 1.96 in this case)
σ	=	preliminary estimate of the standard deviation of the contamination level in a sampling unit, in dpm/100 cm ² .
E	=	the acceptable error in a sampling unit, in dpm/100 cm ² .

The assumed parameters and results are shown in Table 1-3. The value of sigma was selected after examining survey data from accessible surfaces. E was chosen after estimating an order-of-magnitude effect on the dose because of various contamination levels. The result is a rough estimate of the number of required samples.

Table 1-3. Parameters Used to Estimate Required Number of Samples in Each Sampling Unit

Sampling Units	σ	E	N
North Walls	15,000	10,000	9
North Floor	15,000	12,000	6
South Walls	15,000	10,000	9
South Floor	15,000	12,000	6

A total of 24 cores will be taken in the southern end of Building 2. Eighteen cores will be taken on the walls, i.e., 9 cores on each wall sampling unit. Six core samples will be obtained from the floor sampling unit.

A total of 34 cores will be taken in the northern end of Building 2. Twenty-six cores will be taken on the walls, i.e., 9 cores on each wall sampling unit. Six cores will be taken from the floor sampling unit. It may not be possible to randomly select the sampling locations on the walls or floors in the northern end because the telecommunications equipment, which cannot be moved, blocks access. In that case, an attempt will be made to obtain representative sampling to extent it is feasible. Any significant departure from representative sampling will be discussed in the final report.

The original wall and floor surface will be separated from the cores and direct measurements (i.e., integrated counts) will be taken for gross beta measurements. In addition, a smear for removable contamination will also be obtained for each core.

The main decision rule for the occupants of the building will be based upon a TEDE of 15 mrem above background. The dose to building occupants will be determined from the survey data by using the RESRAD-Build model.

The decision rule for demolition crews of the building will be based upon a TEDE of 30 mrem above background. The dose to demolition crews will be determined from the survey data by using the RESRAD-Build model.

DQO Step 6: Specify Limits on Decision Errors

Limits on the decision error rates are developed to establish appropriate goals for limiting uncertainty in the data. This is done by establishing the goals for the Type I error rate and the Type II error rate.

Discomfort curves were developed for each survey and sampling measurement to be taken in Building 2. These curves provide the acceptable error levels and the area of no discomfort for each measurement type and final dose values. Discomfort curves are easy to understand graphical descriptions of the confidence the decision maker needs as a product of the analysis. Each discomfort curve, which is a continuous function, is transformed into a step function curve, called the acceptable decision error curve. This curve matches the discrete confidence levels traditionally used in statistical evaluations.

From this statistical power curve, that can be tested using as a null hypothesis is derived. Power curves are used to define the number of samples needed confidently to estimate a particular quantity, such as dose rate. The discomfort, acceptable decision error, and power curves for the each quantity to be measured are grouped; see Figures 1-1a through 1-5c. The discomfort curves represent the value judgements of the authors, based on informed consideration of current regulation and practice, and newly proposed regulations.

DQO Step 7: Optimize the Design

Occasionally the predetermined location for a measurement will not be accessible because of obstructions. Then a field variance will be noted and the data will be collected from the nearest accessible point. Variances deemed to be important to the estimate of dose will be discussed in the final report.

Because core sampling is an expensive process, effort was made to optimize the sampling plan for inaccessible areas. The effect of various contamination levels on dose during the demolition scenario was estimated using omphaloskepsis and order-of-magnitude calculations. After the effect on dose was estimated, the value for E, the acceptable error was increased. By maximizing E, the required number of samples is minimized.

Part II. Future Use of Building 2

Future use of a building is difficult to predict with accuracy. However, we believe that assuming that this 50-year-old World War II-era wooden structure has a useful life of 30 years or less is reasonable. Future use is likely to be continued as an office and telecommunications structure, or perhaps as classroom, but not as a residential structure. This likely use limits occupancy by any individual to 240 days per year, eight hours per day. HVAC is not expected to be substantially different from current practice. Adjacent land use is unlikely to be agricultural because of the soil type and depth near the structure.

Inevitably the building will be demolished at some future date that poses a risk to the constructions workers involved and potentially to workers operating the landfill where debris and rubble will be disposed. Demolition, which will result in elevated airborne dust concentration, is assumed to occur during a two-week period. Only new equipment unaffected by prior operations, is expected to be salvaged. Building materials, such as copper wiring, drain pipe, wood, and concrete rubble, are assumed to go to a sanitary landfill and not put to any future beneficial use.

References

- ASTM 1982. ASTM E122-72, "Standard Recommended Practice for Choice of Sample Size to Estimate the Average Quality of a Lot or Process." 1982. Annual Book of ASTM Standards.
- EPA 1995. *Guidance for Planning for Data Collection in Support of Environmental Decision Making Using the Data Quality Objective Process*. Interim final. EPA QA/G-4, 1995.
- Morris 1996. *Data Quality Objectives for the GJPORAP Building 2 Pipe Explorer™ Operation*. Robert Morris. Rust Geotech, Inc. 1996.
- NUREG/CR-5849. Manual for Conducting Radiological Surveys in Support of License Termination. Draft Report for comment. NUREG/CR-5849/ORAU-92/C57. J. D. Berger. U. S. Nuclear Regulatory Commission. 1992.
- NUREG-1505. *A Nonparametric Statistical Methodology for the Design and Analysis of Final Status Decommissioning Surveys*. Draft Report for Comment. U. S. Nuclear Regulatory Commission. August 1995.
- ANL/EAD/LD-3. *RESRAD-Build: A Computer Model for Analyzing the Radiological Doses Resulting from the Remediation and Occupancy of Buildings Contaminated with Radioactive Material*. Environmental Assessment Division, Argonne National Laboratory. November 1994.

Figure 1-1a. Decision Maker's "Discomfort Curve"

Figure 1-1b. Acceptable Decision Errors

Figure 1-1c. Chart of Desired Power for Setting Decision Error Rate Targets

Figure 1-2a. Decision Maker's "Discomfort Curve"

Figure 1-2b. Acceptable Decision Errors

Figure 1-2c. Chart of Desired Power for Setting Decision Error Rate Targets

Figure 1-3a. Decision Maker's "Discomfort Curve"

Figure 1-3b. Acceptable Decision Errors

Figure 1-3c. Chart of Desired Power for Setting Decision Error Rate Targets

Figure 1-4a. Decision Maker's "Discomfort Curve"

Figure 1-4b. Acceptable Decision Errors

Figure 1-4c. Chart of Desired Power for Setting Decision Error Rate Targets

Figure 1-5a. Decision Maker's "Discomfort Curve"

Figure 1-5b. Acceptable Decision Errors

Figure 1-5c. Chart of Desired Power for Setting Decision Error Rate Targets

Section 2.0

Sampling Plan

This section contains a reproduction of the document, "Radiological Sampling and Survey Plan for Building 2 at the DOE Grand Junction Projects Office," dated January 19, 1996 for Rust Geotech, Inc., which was published with the *GJPORAP Building 2 Public Dose Evaluation* (DOE 1996).

**Radiological Survey and Sampling Plan for Building 2
at the DOE Grand Junction Projects Office**

January 19, 1996

Rust Geotech, Inc.

Prepared by Robert Morris

1.0 Introduction

Building 2 is located at the Department of Energy's (DOE's) Grand Junction Office (GJO) in Grand Junction, Colorado. Currently, Building 2 contains the copy and reproduction equipment in the south end of the building and the telecommunications center at the north end of the building. Historically, the south end of Building 2 was used as a warehouse. The north end of the building was a change room facility containing lockers and showers for uranium-refinery and mill workers. The north end of building 2 is suspected of containing nonuniform contamination related to the change room activities of the mill workers and thus probably contains U-238 and its decay products. The south end of the building is not suspected of being significantly contaminated and most likely contains uniform contamination in small quantities related to surrounding activities at the mill.

Building 2 has been identified for demolition under the Grand Junction Office Remedial Action Program (GJORAP). However, because of the large cost of such activities related to the telecommunications equipment, a study is being done to predict the radiation dose to the public if the building is released for unrestricted use. The radiation dose will relate to contamination level in the building. This radiological survey and sampling plan were developed to guide the survey and sample collection activities related to Building 2 in support of the development of this variance.

A report (Rust 1996) describing the data quality objectives for this study has been prepared. It should be consulted for clarification of any questions that may arise in carrying out this sampling plan.

2.0 Sampling Units

Two buildings were chosen for this sampling plan. The "Log Cabin" of Building 12 was chosen as the reference area, which is the unaffected area for comparison with the affected area (i.e., Building 2). Building 2 was divided into two areas, 1) the southern area containing the copy center and 2) the northern area containing the communications equipment. The southern area is considered affected with uniform contamination, while the northern area is considered affected with non-uniform contamination.

Various sampling units were identified depending on the type of measurement being taken. These sampling units and their descriptions are given in Table 2-1. Sampling units will be 100 ft² for non-uniform contamination and 1000 ft² for uniform contamination areas.

3.0 Potential Contaminants

Based on knowledge of site operations and results from GJO radiological surveys, the principal contaminants associated with GJO buildings are uranium isotopes and their associated daughter products including Ra-226 and Th-230. These radionuclides are present in uranium mill-tailings and tailings contaminated soil and concrete. Uranium may also be present as yellowcake, primarily as surface contamination.

Table 2-1. Sampling Units for Building 2 and Reference Area

Measurement Type	Total Sampling Units	Building 12 (Log Cabin)	Building 2 (South End)	Building 2 (North End)
PIC	3	all one unit	all one unit	all one unit
Radon	3	all one unit	all one unit	all one unit
Accessible Surfaces	4	none	old walls one unit	old walls one unit
			new walls one unit	new walls one unit
Inaccessible Surfaces	7	none	floor one unit	floor one unit
			walls two units	walls three units

The sampling units for inaccessible wall surfaces in the south end of Building 2 consist of the 1) the west and half of the south wall as one unit and 2) the east and half of the south wall as the other unit. The north end of Building 2 has three wall sampling units for inaccessible surfaces, where each wall, north, east, and west are each individual units.

4.0 Pressurized Ionization Chamber Measurements

A total of thirty-eight Pressurized Ionization Chamber (PIC) measurements will be taken in the Building 938 and in Building 12 (i.e., Log Cabin). Standard survey procedures will be followed for these surveys. Twenty-two PIC measurements will be taken in Building 12 (i.e., Log Cabin) to find the average dose in the reference building. Sixteen PIC measurements will be taken in Building 2, eight measurements in the northern portion of the building (i.e. telecommunications center), and eight measurements in the southern portion of the building, (i.e., copy center). All PIC measurements will be taken one meter off the floor and one meter from all walls at evenly spaced square grid locations. Occasionally, the grid point may be obscured by office equipment, in these cases the PIC measurement will be taken at the nearest accessible point to the selected grid point. All measurement locations and measurement values will be noted on standard survey forms. PIC measurements will follow applicable procedures contained in the *Field Assessments Procedures Manual*, Chapter 11.

5.0 Radon Measurements

One radon measurement will be taken in each sampling unit. One each in Building 12 (i.e Log Cabin), the southern portion of Building 2 (i.e., copy center), and in the northern portion of Building 2 (i.e., telecommunications center). These measurements will be taken with track etch FA Chip 10 detectors emplaced during winter time for a minimum of one month. Radon measurements will follow applicable procedures contained in the *Field Assessments Procedures Manual*, Chapter 10.

6.0 Beta Measurements on Accessible Surfaces

Beta survey measurements for surface activity will consist of a combination of surface scans, direct measurements, and measurements of removable activity. Instrument background, established in a nearby unaffected area, should be subtracted from the measurements. Only Building 2 will be involved in these measurements, no reference measurements in Building 12 are needed. All survey measurements for

surface activity will follow applicable procedures contained in the *Field Assessments Procedures Manual*, Chapter 22. A square grid will be established at one meter intervals for Building 2.

Scanning of accessible surfaces to identify locations of residual and near-surface activity will be done according to the methods defined in NUREG 5849 (Berger 1992). In summary that method includes the following:

Affected area surfaces—100% of floor and walls

Unaffected area surfaces—10% of floor and walls up to 2 meters above the floor

Scanning speeds will be no greater than one detector width per second. All scanning results will be noted on standard field record forms.

Direct measurements of surface activity will be taken in Building 2. Surface activity measurements will be performed at systematically and randomly selected locations and at locations of elevated direct radiation, identified by surface scans. At least 30 measurement locations for each survey unit must be selected on the grid points by a random process. If the location contains items that prevent the measurement, then the nearest accessible location should be measured and the location noted on the standard survey form. One minute integrated counts will be obtained at each location randomly selected grid point.

A smear for removable contamination will be obtained at each location of a direct surface activity measurement. These smears should encompass an area of 100 cm². Smears will be placed into envelopes or other individual containers, to prevent cross-contamination while awaiting analysis.

Survey instruments should be calibrated with NIST-traceable beta sources that approximate the energy of beta emissions associated with uranium and associated radionuclides expected to occur in Building 2. Chlorine-36 beta sources will provide acceptable approximations of the expected energy.

7.0 Sampling of Inaccessible Surfaces

Inaccessible surfaces will be sampled in Building 2 using the applicable procedure in the *Field Assessments Procedures Manual*, Chapter 13. Inaccessible surfaces will require the use of coring machines, therefore, a Radiation Work Permit will be required from Health and Safety to ensure worker protection and identification of any potential release of contamination. Using the square grid system established at one meter intervals for Building 2, cores will be taken at accessible grid points chosen, to the extent feasible, to represent the entire sampling unit. The sampling locations will be noted on the standard survey forms.

It may not be feasible to select the sampling locations on the northern sampling units in a truly random manner because access may be blocked by the sensitive telecommunications equipment. Sampling locations should be selected based on the sampler's judgement. Field notes should describe why sampling locations were selected if they deviate significantly from a random pattern or if contiguous areas larger than 4 m² could not be accessed.

Before sampling in the northern portion of Building 2, the telecommunications equipment should be protected from airborne dust. This may be done by covering equipment with plastic sheeting and using a

high efficiency vacuum cleaner to capture the air near the wall coring operations. Any covering or interference with the telecommunication equipment should be verbally approved by the telecommunication supervisor before installation to prevent damaging this sensitive and expensive equipment. Vibrations near the telecommunication equipment should be minimized.

A total of 24 cores will be taken in the southern end of Building 2. Nine cores will be taken on each wall sampling unit in the southern end of Building 2. The sampling units for inaccessible wall surfaces in the south end of Building 2 consist of the 1) the west and half of the south wall as one unit, and 2) the east and half of the south wall as the other unit. Six core samples will be obtained from the floor sampling unit.

A total of 34 cores will be taken in the northern end of Building 2. Twenty-six cores will be taken on the walls, i.e., 9 cores on each wall sampling unit. The north end of Building 2 has three wall sampling units for inaccessible surfaces, where each wall, north, east, and west are each individual units. Six cores will be taken from the floor sampling unit.

The original wall surface and floor surfaces will be separated from the cores and direct measurement (i.e., integrated one minute counts) will be made. In addition, a smear for removable contamination will also be obtained for each core.

8.0 Data and Records Management

Data and records will be managed according to policies and procedures and the GJORAP Records Management Plan. Original copies of the base maps and field record forms for Building 2 and 12 (i.e., Log Cabin) will be retained by the organizations that collect the data until all surveys and sampling for the buildings are completed. Within 30 days of completing the surveys, the organizations that collected the data will forward copies of the documents to the project manager. The project manager will then forward the final report alone, with copies of the base maps and field record forms to the GJO Records Management Section for storage in the appropriate folio. All field and technical data will be archived by GJO in the GJO records storage vaults until DOE authorizes disposal.

9.0 References

Berger, J.D. 1992. *Manual for Conducting Radiological Surveys in Support of License Termination*. NUREG/CR-5849, ORAU-92/C57, Draft Report for Comment, Environmental Survey and Site Assessment Program, Energy/Environmental Systems Division, Oak Ridge Associated Universities, Oak Ridge, TN, 37831-0117.

Rust, 1996. "DQOS, Use Scenarios, and Affected Area Designation for GJPORAP Building 2 Characterization." Robert Morris and David Thorne, Rust Geotech, Inc. 1996.

Section 3.0
Dose Rate Measurements and
Statistical Tests

Introduction

This section presents tables and figures representing characterization dose rate measurements, statistical test results and comparisons, and survey maps. This information is presented in the following order:

1. Pressurized ion chamber dose rate measurements obtained in Buildings 2, 12, and 26
2. Statistical test results for pooling data from the Building 2 survey units and the Building 12 and 26 reference units
3. Histogram graphs for pooled data results
4. Box-and-Whisker plots for pooled data results
5. Wilcoxon Rank Sum test results for comparison of the pooled survey units to the pooled reference units.
6. Quantile test results for comparison of the pooled survey units to the pooled reference units
7. "T test" results for comparison of the pooled survey units to the pooled reference units
8. Kurtosis and skew test results for comparison of the pooled survey units to the pooled reference units
9. Survey location maps

The interpretation of this information is discussed in Section 2.0 of Volume 1 of this report.

Table 3-1. Exposure Rate Measurements Using Pressurized Ion Chamber

Building 2					Building 12		
North Survey Unit		South Survey Unit			Reference Survey Unit		
Loc	Exp Rate $\mu\text{R/hr}$	Loc	Exp Rate $\mu\text{R/hr}$	Duplicate $\mu\text{R/hr}$	Loc	Exp Rate $\mu\text{R/hr}$	Duplicate $\mu\text{R/hr}$
R11	11.9	R1	10.9		R1	9.9	
R12	12.1	R2	11.6		R2	11.2	
R13	12.3	R3	11.8		R3	11.0	
R14	11.8	R4	11.8		R4	10.9	
R15	12.1	R5	12.0	12.2	R5	13.1	
R16	11.8	R6	11.9		R6	10.8	11.4
R17	11.8	R7	12.3		R7	11.4	
R18	12.1	R8	12.0		R8	10.8	
		R9	11.8		R9	11.3	
		R10	11.6		R10	10.8	
					R11	10.5	
					R12	10.3	
					R13	10.5	
					R14	10.5	
					R15	10.5	
					R16	11.1	
					R17	11.3	
					R18	11.3	
					R19	10.8	
					R20	10.9	
					R21	11.3	
					R22	10.5	
Mean	11.99		11.77			10.94	
Std Dev	0.189		0.368			0.618	

**Table 3-2. Correlation of Gamma Scintillometer with Pressurized Ionization Chamber
(GJO Building 26)**

PIC Manufacture/ Model: Rueter Stokes RSS-111	SN: <u>NA</u>	PROPERTY NUMBER: <u>511292</u>
Calibration Expires: <u>7-25-97</u>	Date: <u>4-8-97</u>	Operators: <u>M Cobb, K Moe, E. C. Langer</u>

NOTE: Operational checks must be performed on each instrument before data is collected.

Location	PIC (μ R/h)	Gamma Scintillometer Number <u>S09930</u>			Average <u>μR/h / cps</u>
		Person 1	Person 2	Person 3	
1 E	12.5	80	90	80	12.9 / 83.3
1 S	12.8	80	85	80	
1 W	13.3	85	85	85	
2 E	12.0	80	80	75	12.7 / 80.0
2 S	13.6	85	80	80	
2 W	12.5	80	80	80	
3 E	12.6	80	80	80	12.5 / 76.1
3 S	13.1	70	70	75	
3 W	11.8	75	75	80	
4 E					
4 S					
4 W					
5 E					
5 S					
5 W					
6 E					
6 S					
6 W					

Verified By: <u>[Signature]</u>	Date: <u>4/8/97</u>
---------------------------------	---------------------

pic-scin.frm:16APR96

Two-Sample Analysis Results			

	<u>B2</u> <u>Pooled</u>	<u>B12/26</u> <u>Pooled</u>	<u>Pooled</u>
Sample Statistics: Number of Obs.	18	31	49
Average	11.8667	11.4484	11.602
Variance	0.0988235	1.00925	0.679945
Std. Deviation	0.314362	1.00461	0.824589
Median	11.85	11.2	11.8
Difference between Means = 0.41828			
Conf. Interval For Diff. in Means:	95	Percent	
(Equal Vars.) Sample 1 - Sample 2	-0.0734081	0.909967	47 D.F.
(Unequal Vars.) Sample 1 - Sample 2	0.0236562	0.812903	39.0 D.F.
Ratio of Variances = 0.0979181			
Conf. Interval for Ratio of Variances:	95	Percent	
Sample 1 - Sample 2	0.0434058	0.24506	17 30 D.F.
Hypothesis Test for H0: Diff = 0	Computed t statistic = 1.71178		
vs Alt: NE	Sig. Level = 0.0935289		
at Alpha = 0.05	so do not reject H0.		

Figure 3-1. Two-Sample Analysis Results

Variable:	B2N	B2S	B2Pool
Sample size	8.	10.	18.
Average	11.9875	11.77	11.856667
Median	12.	11.8	11.85
Mode	12.1	11.8	11.8
Geometric mean	11.986207	11.764685	11.862529
Variance	0.035536	0.135667	0.093324
Standard deviation	0.188509	0.36833	0.314352
Standard error	0.066648	0.116476	0.074095
Minimum	11.8	10.9	10.9
Maximum	12.3	12.3	12.3
Range	0.5	1.4	1.4
Lower quartile	11.8	11.6	11.8
Upper quartile	12.1	12.	12.1
Interquartile range	0.3	0.4	0.3
Skewness	0.407855	-1.369821	-1.570541
Standardized skewness	0.47095	-1.768431	-2.72043
Kurtosis	-1.157587	3.479457	4.657051
Standardized kurtosis	-0.668333	2.24598	4.033124
Coeff. of variation	1.572548	3.129393	2.649119
Sum	95.9	117.7	213.6

Variable:	B12	B26	B1226pool
Sample size	22.	9.	31.
Average	10.940909	12.688889	11.448367
Median	10.85	12.6	11.2
Mode	10.5	12.5	10.5
Geometric mean	10.925135	12.676926	11.407171
Variance	0.382532	0.341111	1.009247
Standard deviation	0.618492	0.584047	1.004613
Standard error	0.131863	0.194682	0.180434
Minimum	9.9	11.8	9.9
Maximum	13.1	13.6	13.6
Range	3.2	1.8	3.7
Lower quartile	10.5	12.5	10.8
Upper quartile	11.3	13.1	12.5
Interquartile range	0.8	0.6	1.7
Skewness	1.890195	0.00956	0.730297
Standardized skewness	3.61945	0.011832	1.659937
Kurtosis	6.649718	-0.636309	-0.598542
Standardized kurtosis	6.36662	-0.389558	-0.680252
Coeff. of variation	5.653023	4.602824	8.775149
Sum	240.7	114.2	354.9

Figure 3-2. Analysis Results for Buildings 2, 12, and 26

Figure 3-3. Histograms for Building 2

Figure 3-4. Histograms for Pooled Reference Buildings

Graphically summarizes a set of univariate observations. Box-and-whisker plots are useful for helping you detect outliers and asymmetry in data.

A box-and-whisker plot divides the data into four areas of equal frequency. A box encloses the middle 50 percent of the data values, between the first and third quartiles. A vertical line in the box is the median. A whisker extends to the left from the first quartile to the smallest data value within 1.5 interquartile ranges from the first quartile. Another whisker extends to the right from the third quartile to the largest data value within 1.5 interquartile ranges from the third quartile. The system plots outliers as separate data points; a plus sign through an outlier means that the outlier is more than three interquartile ranges away from the first or third quartile.

Figure 3-5. Box-and-Whisker Plot of Building 2 and Reference Buildings

Table 3-3. Comparison of PIC Data From Buildings 12 and 26 With Building 2, North

Wilcoxon Rank Sum Test							
Comparison of PIC data from Building 12 and 26 with Building 2, North							
See NUREG 1505							
				Sorted Data		Rank of	
Data	Area	Ranks		Data	Area	Ranks	Samples
1	9.9 R	1	0	9.9 R		1	0
2	11.2 R	16	0	10.3 R		2	0
3	11 R	14	0	10.5 R		5	0
4	10.9 R	12.5	0	10.5 R		5	0
5	13.1 R	36.5	0	10.5 R		5	0
6	10.8 R	9.5	0	10.5 R		5	0
7	11.4 R	21	0	10.5 R		5	0
8	10.8 R	9.5	0	10.8 R		9.5	0
9	11.3 R	18.5	0	10.8 R		9.5	0
10	10.8 R	9.5	0	10.8 R		9.5	0
11	10.5 R	5	0	10.8 R		9.5	0
12	10.3 R	2	0	10.9 R		12.5	0
13	10.5 R	5	0	10.9 R		12.5	0
14	10.5 R	5	0	11.0 R		14	0
15	10.5 R	5	0	11.1 R		15	0
16	11.1 R	15	0	11.2 R		16	0
17	11.3 R	18.5	0	11.3 R		18.5	0
18	11.3 R	18.5	0	11.3 R		18.5	0
19	10.8 R	9.5	0	11.3 R		18.5	0
20	10.9 R	12.5	0	11.3 R		18.5	0
21	11.3 R	18.5	0	11.4 R		21	0
22	10.5 R	5	0	11.8 R		23.5	0
23	12.5 R	32.5	0	11.8 S		23.5	23.5
24	12.8 R	35	0	11.8 S		23.5	23.5
25	13.3 R	38	0	11.8 S		23.5	23.5
26	12 R	27	0	11.9 S		26	26
27	13.6 R	39	0	12.0 R		27	0
28	12.5 R	32.5	0	12.1 S		29	29
29	12.6 R	34	0	12.1 S		29	29
30	13.1 R	36.5	0	12.1 S		29	29
31	11.8 R	23.5	0	12.3 S		31	31
32	11.9 S	26	26	12.5 R		32.5	0
33	12.1 S	29	29	12.5 R		32.5	0
34	12.3 S	31	31	12.6 R		34	0
35	11.8 S	23.5	23.5	12.8 R		35	0
36	12.1 S	29	29	13.1 R		36.5	0
37	11.8 S	23.5	23.5	13.1 R		36.5	0
38	11.8 S	23.5	23.5	13.3 R		38	0
39	12.1 S	29	29	13.6 R		39	0
780.0							
Sum		780		Sum		780	
W _s		214.5		W _s		214.5	
Critical Value for $\alpha/2=0.025$, $n=8$, $m=31$ is 218							
Critical Value estimate for $\alpha/2 = 0.025$, $n=8$, $m=31$ is 214.5							
Null hypothesis that there is no difference in exposure rate between survey units is ACCEPTED.							

Table 3-4. Comparison of PIC Data From Buildings 12 and 26 With Building 2, South

Wilcoxon Rank Sum Test							
Comparison of PIC data from Building 12 and 26 with Building 2, South							
See NUREG 1505							
Data	Area	Ranks		Sorted Data			Rank of Samples
				Data	Area	Ranks	
1.	9.9 R	1	0.	9.9 R		1	0
2.	11.2 R	17	0.	10.3 R		2	0
3.	11 R	15	0.	10.5 R		5	0
4.	10.9 R	13	0.	10.5 R		5	0
5.	13.1 R	38.5	0.	10.5 R		5	0
6.	10.8 R	9.5	0.	10.5 R		5	0
7.	11.4 R	22	0.	10.5 R		5	0
8.	10.8 R	9.5	0.	10.8 R		9.5	0
9.	11.3 R	19.5	0.	10.8 R		9.5	0
10.	10.8 R	9.5	0.	10.8 R		9.5	0
11.	10.5 R	5	0.	10.8 R		9.5	0
12.	10.3 R	2	0.	10.9 R		13	0
13.	10.5 R	5	0.	10.9 R		13	0
14.	10.5 R	5	0.	10.9 R		13	13
15.	10.5 R	5	0.	11.0 R		15	0
16.	11.1 R	16	0.	11.1 R		16	0
17.	11.3 R	19.5	0.	11.2 R		17	0
18.	11.3 R	19.5	0.	11.3 R		19.5	0
19.	10.8 R	9.5	0.	11.3 R		19.5	0
20.	10.9 R	13	0.	11.3 R		19.5	0
21.	11.3 R	19.5	0.	11.3 R		19.5	0
22.	10.5 R	5	0.	11.4 R		22	0
23.	12.5 R	34.5	0	11.6 S		23.5	23.5
24.	12.8 R	37	0.	11.6 S		23.5	23.5
25.	13.3 R	40	0.	11.8 R		26.5	0
26.	12 R	31	0.	11.8 S		26.5	26.5
27.	13.6 R	41	0	11.8 S		26.5	26.5
28.	12.5 R	34.5	0.	11.8 S		26.5	26.5
29.	12.6 R	36	0.	11.9 S		29	29
30.	13.1 R	38.5	0.	12.0 R		31	0
31.	11.8 R	26.5	0.	12.0 S		31	31
32.	10.9 S	13	13	12.0 S		31	31
33.	11.6 S	23.5	23.5	12.3 S		33	33
34.	11.8 S	26.5	26.5	12.5 R		34.5	0
35.	11.8 S	26.5	26.5	12.5 R		34.5	0
36.	12 S	31	31	12.6 R		36	0
37.	11.9 S	29	29	12.8 R		37	0
38.	12.3 S	33	33	13.1 R		38.5	0
39.	12 S	31	31	13.1 R		38.5	0
40.	11.8 S	26.5	26.5	13.3 R		40	0
41.	11.6 S	23.5	23.5	13.6 R		41	0
861.0							
	Sum	861			Sum	861	
		$ W_s $	263.5			$ W_s $	263.5
Critical Value for $\alpha/2=0.025$, $n=10$, $m=31$ is 276.							
Critical Value estimate for $\alpha/2 = 0.025$, $n=10$, $m=31$ is 263.5							
Null hypothesis that there is no difference in exposure rate between survey units is ACCEPTED.							

Table 3-5. Comparison of PIC Data From Buildings 12 and 26 With Building 2, North and South

Quantile Test				
Comparison of PIC data from Building 12 and 26 with Building 2 North and South				
Nearest entry in Table A-4 is for m=30, n=10				
This entry has k=6, r=6 and alphaQ = alpha/2=0.026				
From the WRS Table the r=6 largest measurments are:				
Data	Area	Rank		
12.6	R	34		
12.8	R	35		
13.1	R	36.5		
13.1	R	36.5		
13.3	R	38		
13.6	R	39		
Reject if k is greater than or equal to critical value of 6.				
k=0, therefore the null hypothesis is ACCEPTED.				
When the null hypothesis is true:				
Calculate exact alpha:		mean k	std dev k	
n	m	r	$(n*r)/(m+n)$	$\text{SQRT}((m*n*r)/((m+n)^2*(m+n-1)))$
8	31	6	1.2308	0.9217
k=	Prob	alpha		
0	0.2257	1.0000		
1	0.4166	0.7743		
2	0.2700	0.3577		
3	0.0772	0.0877		
4	0.0100	0.0105		
5	0.0005	0.0005		
6	0.0000	0.0000		

Table 3-6. Distribution Tests (T Test)

TTEST:		Comparison of PIC Data	
Bldg 2 Pooled		Bldg 12 & 26 Pooled	
Location	Exp Rate	Location	Exp Rate
	microR/hr		microR/hr
R1	10.9	R1	9.9
R2	11.6	R2	11.2
R3	11.8	R3	11
R4	11.8	R4	10.9
R5	12	R5	13.1
R6	11.9	R6	10.8
R7	12.3	R7	11.4
R8	12	R8	10.8
R9	11.8	R9	11.3
R10	11.6	R10	10.8
R11	11.9	R11	10.5
R12	12.1	R12	10.3
R13	12.3	R13	10.5
R14	11.8	R14	10.5
R15	12.1	R15	10.5
R16	11.8	R16	11.1
R17	11.8	R17	11.3
R18	12.1	R18	11.3
		R19	10.8
		R20	10.9
		R21	11.3
		R22	10.5
		1E	12.5
		1S	12.8
		1W	13.3
		2E	12
		2S	13.6
		2W	12.5
		3E	12.6
		3S	13.1
		3W	11.8
Pooled s^2		1.1673	1.2368
Pooled s		0.305505	0.988277
Pooled Mean		11.86667	11.44839
TTEST Probability		0.038287	
The probability is low (0.04 or 1 in 26) that the difference in means is due to chance relevant to unequal sample populations, therefore the null hypothesis that there is no difference between the pooled exposure rates is ACCEPTED.			

Table 3-7. Distribution Tests (KURT and SKEW Tests)

KURT and SKEW Tests		Comparison of PIC Data	
Bldg 2 Pooled		Bldg 12 & 26 Pooled	
Location	Exp Rate	Location	Exp Rate
	microR/hr		microR/hr
R1	10.9	R1	9.9
R2	11.6	R2	11.2
R3	11.8	R3	11
R4	11.8	R4	10.9
R5	12	R5	13.1
R6	11.9	R6	10.8
R7	12.3	R7	11.4
R8	12	R8	10.8
R9	11.8	R9	11.3
R10	11.6	R10	10.8
R11	11.9	R11	10.5
R12	12.1	R12	10.3
R13	12.3	R13	10.5
R14	11.8	R14	10.5
R15	12.1	R15	10.5
R16	11.8	R16	11.1
R17	11.8	R17	11.3
R18	12.1	R18	11.3
		R19	10.8
		R20	10.9
		R21	11.3
		R22	10.5
		1E	12.5
		1S	12.8
		1W	13.3
		2E	12
		2S	13.6
		2W	12.5
		3E	12.6
		3S	13.1
		3W	11.8
KURT	4.657051		-0.59854224
SKEW	-1.57064		0.73029697

PROJECT LOCATION GRAND JUNCTION PROJECTS OFFICE GRAND JUNCTION, CO		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO	
PROJECT NO. RUST First Geotech 400 E. 1st Avenue, Suite 200 Grand Junction, CO 81505		COMPLETION REPORTS	
		GJPORAP	
		BUILDING 12 - FIGURE 3-6 PIC and RDC Measurement Location	
		PROJECT NO. FAS-031-0002-00-000 DRAWING NO. 10000700.DWG	
		SHEET 1 OF 5

FLOOR PLAN

LEGEND:

- R12 PRESSURIZED ION CHAMBER (PIC) MEASUREMENT LOCATION
 MEASUREMENT LOCATION NUMBER
 MEASUREMENT LOCATION
- RDC RADON DECAY PRODUCT CONCENTRATION (RDC) MEASUREMENT LOCATION

LEGEND:

ROOM NUMBER AND ELEVATION LABEL

PRESSURIZED ION CHAMBER (PIC) MEASUREMENT LOCATION
MEASUREMENT LOCATION NUMBER
MEASUREMENT LOCATION

RADON DECAY PRODUCT CONCENTRATION (RDC) MEASUREMENT LOCATION

PROJECT LOCATION GRAND JUNCTION PROJECT'S OFFICE GRAND JUNCTION, CO		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO	
IDENTIFICATION / VERIFICATION DATE NAME CITY LOCATION COUNTRY		GJPORAP	
PROJECT NO. FAS-031-0002-00-000		BUILDING 2 - FIGURE 3-7 PIC and RDC MEASUREMENT LOCATIONS	
REVISION NO. 10000600.DWG		2 5

Section 4.0

Radon Measurements

RUST GEOTECH INC.

MEMO TO: R. Morris

FROM: C. Miracle *cm*

DATE: February 13, 1996

SUBJECT: *D* RBC results for GJPO Building 46 (copy center)

The Landauer Track-etch cup results for the copy center room and the telecommunications room both measured at less than .0050 Working Levels. The readings are "less than indicated value" due to the low number of tracks on the film. Therefore, the measurements have determined that there is no significant radon within the structure. The third background measurement taken in the "log cabin" portion of building 12 is also less than .0050 Working Levels.

If you have any further questions regarding the measurements taken, please contact me at 6291.

/cm

ALPHA-TRACK MEASUREMENT SUMMARY SHEET

Location Number: /	Address: GJPO
Other information: Telecommunications Room	
Start Date: 11/3/96	End Date: 2/2/97
Number of Days:	Batch Number: 40

$$\frac{\text{Exposure (pCi/L/days)}}{\text{Number of Days}} = \text{Radon Concentration (pCi/L)}$$

$$\frac{\text{Radon Concentration}}{200} = \text{RDC (Working Level)}$$

Detector Number	Tracks per mm ²	Exposure (pCi/L/days)	Radon Concentration (pCi/L)	RDC (working level)
3892176	0.4	30.0	< 1.00	< .0050
3892289	0.0	30.0	< 1.00	< .0050
3892274	0.2	30.0	< 1.00	< .0050
Average				< .0050

CRITERIA USED FOR PLACEMENT					
Placement	Pickup		Placement	Pickup	
N/A		Basement	✓		Detector facing room
N/A		Area of interior removal	✓		At least 18 inches from floor
✓		Lowest habitable level	✓		Serial numbers match pouch
N/A		Highest interior gamma exposure	✓		Detectors away from doors, vents, heat, window or sunlight
✓		Least ventilated area			Detectors are not damaged at pickup
		Other			

Explanation of deviation from placement criteria:

Technician: CM	Verified: CM
----------------	--------------

alpha-dat.frm, August 31, 1995

ALPHA-TRACK MEASUREMENT SUMMARY SHEET

Location Number: 3	Address: GJPC
Other information:	
Copy Center Location 2	
Start Date: 11/3/96	End Date: 2/2/97
Number of Days: 212/96	Batch Number: 40

$$\frac{\text{Exposure (pCi/L/days)}}{\text{Number of Days}} = \text{Radon Concentration (pCi/L)}$$

$$\frac{\text{Radon Concentration}}{200} = \text{RDC (Working Level)}$$

Detector Number	Tracks per mm ²	Exposure (pCi/L/days)	Radon Concentration (pCi/L)	RDC (working level)
3892268	0.6	30.0	<1.00	< .0050
3892280	0.0	30.0	<1.00	< .0050
3892159	0.1	30.0	<1.00	< .0050
Average				< .0050

CRITERIA USED FOR PLACEMENT					
Placement	Pickup		Placement	Pickup	
N/A		Basement	✓		Detector facing room
N/A		Area of interior removal	✓		At least 18 inches from floor
✓		Lowest habitable level	✓		Serial numbers match pouch
N/A		Highest interior gamma exposure	✓		Detectors away from doors, vents, heat, window or sunlight
✓		Least ventilated area			Detectors are not damaged at pickup
		Other			

Explanation of deviation from placement criteria:

Technician: Cm

Verified: Cm

alpha-dat.frm, August 31, 1995

Radon Monitoring Report

LANDAUER

SEND REPORT & 5 1/4" DISKETTE
TO NAME & ADDRESS ON SHIPPING
DOCUMENT.

Landauer, Inc. 2 Science Road Glenwood, Illinois 60425-1586
Telephone (708) 755-7911 Facsimile: (708) 755-7916

Accl. No. 0400051

Detector Number	Detector Type	Starting Date	Ending Date	Field Data / Comments	Exposure pCi/d-days	Avg. Radon Conc. pCi/l	GROSS COUNT	NET COUNT	AVG NET TRACKS/ MM SQ.	LOT NO.
3851473	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	36	0	0.0	N1111
3892159	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	41	2	0.1	R1196
3892176	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	46	7	0.4	R1196
3892206	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	27	0	0.0	R1196
3892264	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	35	0	0.0	R1196
3892268	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	49	10	0.6	R1196
3892274	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	42	3	0.2	R1196
3892280	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	38	0	0.0	R1196
3892289	DRN	03-JAN-96	02-FEB-96	* - LESS THAN INDICATED VALUE	* 30.0	* 1.0	38	0	0.0	R1196

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

Q.C. Release WAB	Process No. A18147	Report Date 08-FEB-96	Date Received 05-FEB-96
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PAGE 1 OF 1

Section 5.0

Contamination Measurements

5.1 Contamination Survey Results

The following tables in this section include the measurement results from contamination surveys in Grand Junction Office (GJO) Building 2. Table 5-2 presents scanning measurements for each accessible survey unit. Table 5-3 presents one-minute scaler measurements at discrete sampling locations, in other words the "direct measurements," for each survey unit. In addition, semi-quantitative smear test results are located in this table. Table 5-4 presents quantitative results of each of the smear tests that exhibited elevated results in semi-quantitative measurements. Table 5-5 includes the data from inaccessible surfaces in the floor and walls obtained using core samples. Table 5-6 presents the same data from Table 5-5 but sorted by material type.

5.2 Team Leader Notes

The survey team leader's notes, located in the U.S. Department of Energy (DOE) GJO vault as part of *WASTREN-Grand Junction* record number GJRP7307, provides detailed information collected while making the measurements. This information includes notations on paint coverings on surfaces and descriptions of each core configuration, unusual conditions, and problems encountered while executing the sampling plan.

5.3 Floor Sampling Unit

After data were collected it became apparent that measurements on all currently accessible floor surfaces should be grouped as a survey unit. This was not identified as a separate survey unit during the data quality objectives (DQO) process.

5.4 Measurement Location Identifiers

Sample locations are illustrated on drawings associated with these tables. In most cases, the location identifiers include additional information as described below.

Scan measurement location identifiers each begin with either the letter "F" or the letter "W" indicating floor or wall sampling units, then followed by the grid location, a hyphen, and then the letter "N" or the letter "S" indicating the north or south end of the building.

Core-sample location identifiers all begin with the letter "C" followed by a location number.

For cores obtained through floor slabs the location number is followed by a hyphen and a letter. The top surface of the top slab is designated as "A," the bottom surface of the top slab is designated as "B," and the top surface of the bottom slab, that was typically left in place, is designated as "C."

For cores obtained through the walls, the location number is followed by a hyphen and a letter. The top surface of the wall material (the one accessible from the room) is designated as "A," the back surface of this material is designated as "B." If additional wall materials are encountered, each surface is sequentially lettered. The original wall for that location has no letter designation. Sample C22, illustrated in Figure 5-1, is typical of this group. At this sample location, the accessible surface is sheetrock. Sample C22-A is the side facing the room and C22-B is the unfinished side. Behind the sheetrock is a layer of celotex. The side facing the room is C22-C; the back is C22-D. An original wood surface, that was not cored, is designated simply as C22.

Location C22 Example

Figure 5-1. Illustration of Core Location Numbering Scheme

Direct measurement location identifiers each begin with a "D" followed by a location number. When this is followed by a hyphen and a number, the number indicates the height above the floor in meters of the grid where the measurement was obtained.

5.5 Instrument Selection

Most scanning and direct measurements were obtained using an NE Electra rate meter equipped with a DP6A probe. When these probes were out of service, or unsuitable because of size or shape, the Eberline E600 equipped with an SHP 330 probe was used. For measurements obtained at the bottom of the hole created by core sampling, an Eberline E600 equipped with an Eberline PG2 low energy gamma probe operating in the gross count mode was used. The PG2 was calibrated as described below, using a chlorine-36 beta source. The PG2 was selected because of the "end window" geometry and diameter that will fit into the core hole.

5.6 Minimum Detectable Concentrations

The Minimum Detectable Concentration (MDC) of each instrument was calculated using the following equation.

$$MDC = 3.0 + 3.29 * \frac{\sqrt{R_{bkg} * t_g * (1 + \frac{t_g}{t_{bkg}})}}{K * t_g} \quad (1)$$

where:

- MDC = the minimum surface concentration in dpm/100 cm² that corresponds to the detection limit, L_D .
- L_D = the detection limit above which we are 95% certain that the net count rate is really larger than the critical level, L_C .
- L_C = the critical level above a net count rate of zero which results in a 5% Type I error rate.
- R_{bkg} = is the background count rate in counts per minute (cpm).
- t_{bkg} = is the background count time in minutes.
- t_g = is the gross count time in minutes.
- K = a proportionality constant that includes all necessary corrections factors, in this case limited to the instrument efficiency, and probe area correction to 100 cm².

Instruments used had nominal characteristics that are presented in Table 5-1.

Table 5-1. Nominal Characteristics for Instruments

Instrument/ Probe	Probe area, cm ²	Readout units	Nominal bkg in readout units	Nominal bkg count rate, cpm	Normal count time, min	Instrument efficiency, c/d	MDC, dpm/ 100 cm ²
E600/PG2	12	dpm	9500	1400	1	0.148	1200
E600/SHP330	15	dpm/ 100 cm ²	1400	350	1	0.248	360
Electra/DP6A	100	dpm	2000	480	1	0.240	450
Ludlum 2929 smear counter	NA	cpm	60	60	1	0.214	180

A nominal, and conservatively high, background count rate in cpm is used to calculate the MDC for an instrument. In modern instruments that read out in dpm or dpm/100 cm² background count rates are not displayed in cpm. To obtain the background count rate in cpm from an instrument that displays results in dpm, multiply the background in dpm by the efficiency. To obtain background count rate in cpm when the display is in dpm/100 cm², multiply the background in dpm/100 cm² by the efficiency and the probe area/100.

5.7 Calibration

All detectors were calibrated using chlorine-36 National Institute of Standards and Technology (NIST)-traceable beta sources. Chlorine-36 was selected because it has an intermediate energy that has been determined to be the best approximation of beta energy associated with uranium mill tailings and yellowcake that is available in an NIST-traceable beta surface contamination standard (DOE 1996).

**Table 5-2
Building 2 Scan Measurements**

Survey Unit Information			Data as Displayed on Meter, dpm/100 cm ²		Bkg. as Displayed on Meter, dpm/100 cm ²	Activity, dpm/100 cm ²		Status
Survey Unit	Location ID	Material Type	High	Low		High	Low	Exceeds Limit?
North Old Wall Survey Unit								
OLD WALLS	W05-N	Concrete	3147	1797	1858	1289	-61	no
OLD WALLS	W06-N	Concrete	3610	2109	1858	1752	251	no
OLD WALLS	W07-N	Concrete	4516	1799	1570	2946	229	no
OLD WALLS	W07-N	Radiator	10300	2600	1570	8730	1030	maybe
OLD WALLS	W08-N	Concrete	3046	1605	1570	1476	35	no
OLD WALLS	W09-N	Concrete	2418	1830	1570	848	260	no
OLD WALLS	W10-N	Concrete	4408	1692	1596	2812	96	no
North New Wall Survey Unit								
NEW WALLS	W01-N	Sheetrock	2104	963	1298	806	-335	no
NEW WALLS	W02-N	Paneling	1438	1003	1483	-45	-480	no
NEW WALLS	W03-N	Plywood	1846	960	1298	548	-338	no
NEW WALLS	W04-N	plywood	2264	1095	1292	972	-197	no
NEW WALLS	W11-N	Sheetrock	1641	1125	1229	412	-104	no
NEW WALLS	W12-N	Sheetrock	1715	1103	1229	486	-126	no
South Old Wall Survey Unit								
OLD WALLS	W32-S	Concrete	11800	1800	1446	10354	354	maybe
OLD WALLS	W33-S	Concrete	2797	1844	1746	1051	98	no
OLD WALLS	W34-S	Concrete	2942	1990	1540	1402	450	no
OLD WALLS	W35-S	Concrete	2790	1450	1261	1529	189	no
South New Wall Survey Unit								
NEW WALLS	W01-S	Paneling	1475	922	1292	183	-370	no
NEW WALLS	W03-S	Cork Board	1219	911	1298	-79	-387	no
NEW WALLS	W04-S	Paneling	2000	1125	1216	784	-91	no
NEW WALLS	W05-S	Paneling	1612	1010	1216	396	-206	no
NEW WALLS	W06-S	Paneling	1600	1017	1292	308	-275	no
NEW WALLS	W07-S	Paneling	1719	1109	1216	503	-107	no
NEW WALLS	W08-S	Paneling	1807	1117	1292	515	-175	no
NEW WALLS	W09-S	Paneling	1646	1110	1216	430	-106	no
NEW WALLS	W10-S	Paneling	1929	1124	1325	604	-201	no
NEW WALLS	W11-S	Sheetrock	1536	1080	1325	211	-245	no
NEW WALLS	W12-S	Sheetrock	1531	1016	1088	443	-72	no
NEW WALLS	W13-S	Sheetrock	1856	1094	1305	551	-211	no
NEW WALLS	W14-S	Sheetrock	1569	891	1305	264	-414	no
NEW WALLS	W15-S	Sheetrock	1641	1188	1229	412	-41	no
NEW WALLS	W16-S	Sheetrock	1516	1141	1305	211	-164	no
NEW WALLS	W17-S	Sheetrock	1656	1359	1305	351	54	no
NEW WALLS	W18-S	Sheetrock	1609	1109	1471	138	-362	no
NEW WALLS	W19-S	Sheetrock	1651	1151	1471	180	-320	no

Table 5-2
Building 2 Scan Measurements

Survey Unit Information			Data as Displayed on Meter, dpm/100 cm ²		Bkg. as Displayed on Meter, dpm/100 cm ²	Activity, dpm/100 cm ²		Status
Survey Unit	Location ID	Material Type	High	Low		High	Low	Exceeds Limit?
NEW WALLS	W20-S	Sheetrock	1672	1156	1305	367	-149	no
NEW WALLS	W21-S	Sheetrock	1719	1331	1305	414	26	no
NEW WALLS	W22-S	Sheetrock	1531	1113	1229	302	-116	no
NEW WALLS	W23-S	Sheetrock	1934	984	1229	705	-245	no
NEW WALLS	W24-S	Sheetrock	1563	938	1117	446	-179	no
NEW WALLS	W25-S	Paneling	1922	1078	1117	805	-39	no
NEW WALLS	W26-S	Sheetrock	1271	949	1338	-67	-389	no
NEW WALLS	W27-S	Paneling	1797	1229	1338	459	-109	no
NEW WALLS	W28-S	Paneling	1431	979	1471	-40	-492	no
NEW WALLS	W29-S	Sheetrock	1641	1031	1338	303	-307	no
NEW WALLS	W30-S	Paneling	1749	1171	1117	632	54	no
NEW WALLS	W31-S	Paneling	1542	1041	1858	-316	-817	no
North Floor Survey Unit								
FLOOR	F01-N	Vinyl	2205	1638	1261	944	377	no
FLOOR	F02-N	Vinyl	2500	1600	1504	996	96	no
FLOOR	F03-N	Vinyl	2403	1875	1261	1142	614	no
FLOOR	F04-N	Vinyl	2240	1378	1504	736	-126	no
FLOOR	F05-N	Vinyl	2556	1895	1261	1295	634	no
South Floor Survey Unit								
FLOOR	F02-S	Carpet	2548	1438	1700	848	-262	no
FLOOR	F03-S	Carpet	2250	1478	1700	550	-222	no
FLOOR	F04-S	Carpet	3107	2204	1265	1842	939	no
FLOOR	F01-S	Carpet	2630	1438	1700	930	-262	no
FLOOR	F05-S	Carpet	2540	1632	1700	840	-68	no
FLOOR	F06-S	Carpet	2633	1488	1690	943	-202	no
FLOOR	F07-S	Carpet	2957	1677	1690	1267	-13	no
FLOOR	F08-S	Carpet	2909	1867	1746	1163	121	no
FLOOR	F09-S	Carpet	2510	1867	1265	1245	602	no
FLOOR	F10-S	Carpet	2559	1516	1746	813	-230	no
FLOOR	F11-S	Carpet	2500	1506	1746	754	-240	no
FLOOR	F12-S	Carpet	2459	1597	1746	713	-149	no
FLOOR	F13-S	Carpet	2506	1834	1746	760	88	no
FLOOR	F14-S	Vinyl	2484	1614	1690	794	-76	no
FLOOR	F15-S	Vinyl	2239	1400	1690	549	-290	no
FLOOR	F16-S	Vinyl	2368	1548	1690	678	-142	no
FLOOR	F17-S	Vinyl	2016	1547	1746	270	-199	no
FLOOR	F18-S	Vinyl	2510	1488	1690	820	-202	no
FLOOR	F19-S	Concrete	7680	1963	1333	6347	630	maybe

Table 5-3
Building 2 Accessible Surfaces Direct and Smear Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Motor	Bkg. as Displayed on Motor	Motor Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm ²	1 Sigma Uncertainty, dpm/100 cm ²	Exceeds Generic Limit?	Data as Displayed on Motor, dpm	Bkg. as Displayed on Motor, dpm	Activity, dpm/100 cm ²
North Old Wall Survey Unit														
OLD WALL	D032-0	VINYL	Electra/DP6A	2012	2078	dpm	483	499	-66	131	no	2400	2078	322
OLD WALL	D032-1	CONCRETE	Electra/DP6A	2294	1665	dpm	551	400	629	128	no	2282	1665	617
OLD WALL	D040-0	CONCRETE	Electra/DP6A	2054	1500	dpm	493	360	554	122	no	1846	1500	346
OLD WALL	D040-1	CONCRETE	Electra/DP6A	2021	1500	dpm	485	360	521	121	no	1667	1500	167
OLD WALL	D075	CONCRETE	Electra/DP6A	3467	1963	dpm	832	471	1504	150	no	2254	1963	291
OLD WALL	D076	CONCRETE	Electra/DP6A	2396	1796	dpm	575	431	600	132	no	2142	1796	346
OLD WALL	D077	CONCRETE	Electra/DP6A	2104	1796	dpm	505	431	308	127	no	2221	1796	425
OLD WALL	D078	CONCRETE	Electra/DP6A	1733	1796	dpm	416	431	-63	121	no	2271	1796	475
OLD WALL	D079	CONCRETE	Electra/DP6A	2208	1796	dpm	530	431	412	129	no	2367	1796	571
OLD WALL	D080	CONCRETE	Electra/DP6A	2383	1621	dpm	572	389	762	129	no	2400	1621	779
OLD WALL	D081	CONCRETE	Electra/DP6A	2517	1621	dpm	604	389	896	131	no	2325	1621	704
OLD WALL	D082	CONCRETE	Electra/DP6A	2508	1621	dpm	602	389	887	131	no	2533	1621	912
OLD WALL	D083	CONCRETE	Electra/DP6A	2925	1621	dpm	702	389	1304	138	no	2421	1621	800
OLD WALL	D084	CONCRETE	Electra/DP6A	3647	1788	dpm	875	429	1859	150	no	1525	1788	-263
OLD WALL	D085	CONCRETE	Electra/DP6A	2008	1490	dpm	482	358	518	121	no	2338	1490	848
OLD WALL	D086	CONCRETE	Electra/DP6A	3779	1490	dpm	907	358	2289	148	no	2046	1490	556
OLD WALL	D087	CONCRETE	Electra/DP6A	2750	1490	dpm	660	358	1260	133	no	2379	1490	889
OLD WALL	D088	CONCRETE	Electra/DP6A	2271	1490	dpm	545	358	781	125	no	2213	1490	723
OLD WALL	D089	CONCRETE	Electra/DP6A	5049	1600	dpm	1212	384	3449	166	no	2310	1600	710
OLD WALL	D090	METAL	Electra/DP6A	12400	2070	dpm	2976	497	10330	246	yes	2210	2070	140
OLD WALL	D091	CONCRETE	Electra/DP6A	3229	2008	dpm	775	482	1221	148	no	2078	2008	70
OLD WALL	D092	CONCRETE	Electra/DP6A	2054	1692	dpm	493	406	362	125	no	2042	1692	350
OLD WALL	D093	CONCRETE	Electra/DP6A	1975	1692	dpm	474	406	283	124	no	2067	1692	375
OLD WALL	D094	CONCRETE	Electra/DP6A	1796	1692	dpm	431	406	104	121	no	1892	1692	200
OLD WALL	D095	CONCRETE	Electra/DP6A	2538	1692	dpm	609	406	846	133	no	2046	1692	354
OLD WALL	D096	CONCRETE	Electra/DP6A	1979	1692	dpm	475	406	287	124	no	2142	1488	654
Survey Unit Mean =				1225				Survey Unit Standard Deviation =				2010		
North New Wall Survey Unit														
NEW WALL	D031-0	PLYWOOD	Electra/DP6A	1642	1529	dpm	394	367	113	115	no	2029	1529	500
NEW WALL	D031-1	PLYWOOD	Electra/DP6A	1317	1529	dpm	316	367	-212	109	no	1918	1529	389
NEW WALL	D031-2	PLYWOOD	Electra/DP6A	1338	1529	dpm	321	367	-191	109	no	1875	1529	346
NEW WALL	D032-2	SHEETROCK	Electra/DP6A	1400	1722	dpm	336	413	-322	114	no	2176	1722	454
NEW WALL	D033-0	SHEETROCK	Electra/DP6A	1747	1722	dpm	419	413	25	120	no	1922	1722	200
NEW WALL	D033-1	SHEETROCK	Electra/DP6A	1171	1722	dpm	281	413	-551	110	no	1633	1722	-89
NEW WALL	D033-2	SHEETROCK	Electra/DP6A	1180	1722	dpm	283	413	-542	110	no	1641	1722	-81
NEW WALL	D034-0	PLYWOOD	Electra/DP6A	1592	1533	dpm	382	368	59	114	no	1879	1533	346
NEW WALL	D034-1	PLYWOOD	Electra/DP6A	1524	1533	dpm	366	368	-9	113	no	1383	1533	-150

Table 5-3
Building 2 Accessible Surfaces Direct and Smear Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
NEW WALL	D034-2	PLYWOOD	Electra/DP6A	1363	1533	dpm	327	368	-170	110	no	1571	1533	38		
NEW WALL	D035-0	PLYWOOD	Electra/DP6A	1646	1530	dpm	395	367	116	115	no	1971	1530	441		
NEW WALL	D035-1	PLYWOOD	Electra/DP6A	1325	1530	dpm	318	367	-205	109	no	1891	1530	361		
NEW WALL	D035-2	PLYWOOD	Electra/DP6A	1238	1530	dpm	297	367	-292	107	no	2038	1530	508		
NEW WALL	D036-0	VINYL	Electra/DP6A	1902	2078	dpm	456	499	-176	129	no	2094	2078	16		
NEW WALL	D036-1	PLYWOOD	Electra/DP6A	1518	1347	dpm	364	323	171	109	no	2200	1347	853		
NEW WALL	D036-2	PLYWOOD	Electra/DP6A	1441	1347	dpm	346	323	94	108	no	2102	1347	755		
NEW WALL	D037-0	VINYL	Electra/DP6A	1743	1882	dpm	418	452	-139	123	no	1747	1882	-135		
NEW WALL	D037-1	PLYWOOD	Electra/DP6A	1310	1347	dpm	314	323	-37	105	no	1710	1347	363		
NEW WALL	D037-2	PLYWOOD	Electra/DP6A	1130	1347	dpm	271	323	-217	102	no	1771	1347	424		
NEW WALL	D038-0	SHEETROCK	Electra/DP6A	1688	1479	dpm	405	355	209	115	no	1663	1479	184		
NEW WALL	D038-1	SHEETROCK	Electra/DP6A	1254	1479	dpm	301	355	-225	107	no	1725	1479	246		
NEW WALL	D038-2	SHEETROCK	Electra/DP6A	1238	1479	dpm	297	355	-241	106	no	1700	1479	221		
NEW WALL	D039-0	PANELING	Electra/DP6A	1625	1437	dpm	390	345	188	113	no	2135	1437	698		
NEW WALL	D039-1	PANELING	Electra/DP6A	1367	1437	dpm	328	345	-70	108	no	2061	1437	624		
NEW WALL	D039-2	PANELING	Electra/DP6A	1278	1437	dpm	307	345	-159	106	no	1931	1437	494		
NEW WALL	D040-2	SHEETROCK	Electra/DP6A	1242	1500	dpm	298	360	-258	107	no	1692	1500	192		
Survey Unit Mean =							-117		Survey Unit Standard Deviation =						203	
South Old Wall Survey Unit																
OLD WALL	D071	CONCRETE	Electra/DP6A	10700	1690	dpm	2568	406	9010	227	yes	779	806	-27		
OLD WALL	D072	CONCRETE	Electra/DP6A	2583	1446	dpm	620	347	1137	130	no	967	806	161		
OLD WALL	D073	CONCRETE	Electra/DP6A	2453	1746	dpm	589	419	707	132	no	645	806	-161		
OLD WALL	D074	CONCRETE	Electra/DP6A	2790	1540	dpm	670	370	1250	134	no	860	806	54		
Survey Unit Mean =							3026		Survey Unit Standard Deviation =						3996	
South New Wall Survey Unit																
NEW WALL	D041	SHEETROCK	Electra/DP6A	1335	1384	dpm	320	332	-49	106	no	1678	1706	-28		
NEW WALL	D042	PANELING	Electra/DP6A	1171	1450	dpm	281	348	-279	105	no	1679	1638	41		
NEW WALL	D043	VINYL	Electra/DP6A	1796	2041	dpm	431	490	-245	126	no	1665	1706	-41		
NEW WALL	D044	SHEETROCK	Electra/DP6A	1355	1384	dpm	325	332	-29	107	no	1649	1706	-57		
NEW WALL	D045	PANELING	Electra/DP6A	1204	1450	dpm	289	348	-246	105	no	1792	1638	154		
NEW WALL	D046	SHEETROCK	Electra/DP6A	1376	1384	dpm	330	332	-8	107	no	1596	1706	-110		
NEW WALL	D047	SHEETROCK	Electra/DP6A	1318	1384	dpm	316	332	-66	106	no	1780	1706	74		
NEW WALL	D048	SHEETROCK	Electra/DP6A	1171	1384	dpm	281	332	-213	103	no	1494	1706	-212		
NEW WALL	D049	SHEETROCK	Electra/DP6A	1347	1384	dpm	323	332	-37	107	no	1592	1706	-114		
NEW WALL	D050	SHEETROCK	Electra/DP6A	1392	1384	dpm	334	332	8	108	no	1739	1706	33		
NEW WALL	D051	PANELING	Electra/DP6A	1458	1450	dpm	350	348	8	110	no	1529	1638	-109		
NEW WALL	D052	SHEETROCK	Electra/DP6A	1343	1384	dpm	322	332	-41	107	no	1531	1706	-175		

Table 5-3
Building 2 Accessible Surfaces Direct and Smear Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Motor	Bkg. as Displayed on Motor	Motor Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Motor, dpm	Bkg. as Displayed on Motor, dpm	Activity, dpm/100 cm2		
NEW WALL	D053	PANELING	Electra/DP6A	1129	1450	dpm	271	348	-321	104	no	1483	1638	-155		
NEW WALL	D054	SHEETROCK	Electra/DP6A	1404	1384	dpm	337	332	20	108	no	1612	1706	-94		
NEW WALL	D055	SHEETROCK	Electra/DP6A	1445	1384	dpm	347	332	61	109	no	1665	1706	-41		
NEW WALL	D056	SHEETROCK	Electra/DP6A	1302	1384	dpm	312	332	-82	106	no	1637	1706	-69		
NEW WALL	D057	PANELING	Electra/DP6A	1163	1450	dpm	279	348	-287	104	no	1546	1638	-92		
NEW WALL	D058	SHEETROCK	Electra/DP6A	1347	1384	dpm	323	332	-37	107	no	1680	1706	-26		
NEW WALL	D059	SHEETROCK	Electra/DP6A	1265	1384	dpm	304	332	-119	105	no	1563	1706	-143		
NEW WALL	D060	SHEETROCK	Electra/DP6A	1442	1450	dpm	346	348	-8	110	no	1567	1638	-71		
NEW WALL	D061	SHEETROCK	Electra/DP6A	1302	1384	dpm	312	332	-82	106	no	1559	1706	-147		
NEW WALL	D062	SHEETROCK	Electra/DP6A	1388	1450	dpm	333	348	-62	109	no	1688	1638	50		
NEW WALL	D063	PANELING	Electra/DP6A	1388	1450	dpm	333	348	-62	109	no	1571	1638	-67		
NEW WALL	D064	SHEETROCK	Electra/DP6A	1279	1450	dpm	307	348	-171	107	no	1479	1638	-159		
NEW WALL	D065	SHEETROCK	Electra/DP6A	1292	1450	dpm	310	348	-158	107	no	1596	1638	-42		
NEW WALL	D066	SHEETROCK	Electra/DP6A	1579	1450	dpm	379	348	129	112	no	1583	1638	-55		
NEW WALL	D067	PANELING	Electra/DP6A	1083	1450	dpm	260	348	-367	103	no	1563	1638	-75		
NEW WALL	D068	SHEETROCK	Electra/DP6A	1490	1384	dpm	358	332	106	109	no	1494	1706	-212		
NEW WALL	D069	SHEETROCK	Electra/DP6A	1215	1450	dpm	292	348	-235	105	no	1458	1638	-180		
NEW WALL	D070	PANELING	Electra/DP6A	1171	1450	dpm	281	348	-279	105	no	1450	1638	-188		
Survey Unit Mean =				-105			Survey Unit Standard Deviation =								131	
North Floor Survey Unit																
FLOOR	D003	VINYL	Electra/DP6A	2267	1804	dpm	544	433	463	130	no	2196	1804	392		
FLOOR	D015	VINYL	Electra/DP6A	1825	1804	dpm	438	433	21	123	no	1808	1804	4		
FLOOR	D017	VINYL	Electra/DP6A	1788	1804	dpm	429	433	-16	122	no	2075	1804	271		
FLOOR	D019	VINYL	Electra/DP6A	1881	1804	dpm	451	433	77	124	no	1875	1804	71		
FLOOR	D102	CARPET	Electra/DP6A	2029	1261	dpm	487	303	768	117	no	1710	1261	449		
FLOOR	D103	CARPET	Electra/DP6A	2057	1261	dpm	494	303	796	118	no	1637	1261	376		
Survey Unit Mean =				352			Survey Unit Standard Deviation =								375	
South Floor Survey Unit																
FLOOR	D001	CARPET	Electra/DP6A	2074	2016	dpm	498	484	58	131	no	2094	2016	78		
FLOOR	D002	CARPET	Electra/DP6A	2110	2016	dpm	506	484	94	131	no	2106	2016	90		
FLOOR	D004	VINYL	Electra/DP6A	2274	2078	dpm	546	499	196	135	no	1918	2078	-160		
FLOOR	D005	CARPET	Electra/DP6A	2102	2016	dpm	504	484	86	131	no	1820	2016	-196		
FLOOR	D006	CARPET	Electra/DP6A	2027	1998	dpm	486	480	29	130	no	2008	1998	10		
FLOOR	D007	CARPET	Electra/DP6A	2245	2016	dpm	539	484	229	133	no	2057	2016	41		
FLOOR	D008	CARPET	Electra/DP6A	2204	2016	dpm	529	484	188	133	no	1959	2016	-57		
FLOOR	D009	VINYL	Electra/DP6A	2309	2016	dpm	554	484	293	134	no	1902	2016	-114		
FLOOR	D010	CARPET	Electra/DP6A	2163	1998	dpm	519	480	165	132	no	1902	1998	-96		

Table 5-3
Building 2 Accessible Surfaces Direct and Smear Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm ²	1 Sigma Uncertainty, dpm/100 cm ²	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm ²
FLOOR	D011	CARPET	Electra/DP6A	2126	2016	dpm	510	484	110	131	no	1902	2016	-114
FLOOR	D012	VINYL	Electra/DP6A	1928	2078	dpm	463	499	-150	129	no	2029	2078	-49
FLOOR	D013	CARPET	Electra/DP6A	2320	2016	dpm	557	484	304	134	no	1980	2016	-36
FLOOR	D014	CARPET	Electra/DP6A	2367	1998	dpm	568	480	369	135	no	1984	1998	-14
FLOOR	D016	CARPET	Electra/DP6A	2180	2016	dpm	523	484	164	132	no	1931	2016	-85
FLOOR	D018	CARPET	Electra/DP6A	1963	2016	dpm	471	484	-53	129	no	1835	2016	-181
FLOOR	D020	CARPET	Electra/DP6A	2138	1788	dpm	513	429	350	128	no	1600	1788	-188
FLOOR	D021	VINYL	Electra/DP6A	1776	2078	dpm	426	499	-302	127	no	2049	2078	-29
FLOOR	D022	CARPET	Electra/DP6A	1833	1788	dpm	440	429	45	123	no	1754	1788	-34
FLOOR	D023	CARPET	Electra/DP6A	1963	2016	dpm	471	484	-53	129	no	1861	2016	-155
FLOOR	D024	CARPET	Electra/DP6A	2151	2016	dpm	516	484	135	132	no	1967	2016	-49
FLOOR	D025	CARPET	Electra/DP6A	2236	2016	dpm	537	484	220	133	no	1608	2016	-408
FLOOR	D026	VINYL	Electra/DP6A	2026	2078	dpm	486	499	-52	131	no	1976	2078	-102
FLOOR	D027	CARPET	Electra/DP6A	2129	1788	dpm	511	429	341	128	no	1663	1788	-125
FLOOR	D028	CARPET	Electra/DP6A	2042	1788	dpm	490	429	254	126	no	1688	1788	-100
FLOOR	D029	CARPET	Electra/DP6A	2123	1998	dpm	510	480	125	131	no	1843	1998	-155
FLOOR	D030	CARPET	Electra/DP6A	2023	2016	dpm	486	484	7	130	no	1918	2016	-98
FLOOR	D097	CONCRETE	Electra/DP6A	6760	1333	dpm	1622	320	5427	184	yes	1583	1638	-55
FLOOR	D098	CARPET	Electra/DP6A	3315	1265	dpm	796	304	2050	138	no	1490	1265	225
FLOOR	D099	CARPET	Electra/DP6A	2416	1910	dpm	580	458	506	134	no	2135	1910	225
FLOOR	D100	CARPET	Electra/DP6A	3067	1871	dpm	736	449	1196	143	no	1963	1871	92
FLOOR	D101	CARPET	Electra/DP6A	2123	1265	dpm	510	304	858	119	no	1596	1265	331
Survey Unit Mean =				425				Survey Unit Standard Deviation =				1025		

Table 5-4						
Potentially Elevated Building 2 Smears						
Ludlum Model 2929 Scaler						
Survey Unit	Sample ID	Instrument Reading, counts	Bkg, counts	Net dpm	Beta Cal Factor	Exceeds Limit?
NORTH-E	C034-B	52	59	-32.7	4.67	no
NORTH-E	D036-1	59	56	13.7	4.57	no
NORTH-E	D036-2	53	56	-13.7	4.57	no
NORTH-E	C037-A	51	59	-37.4	4.67	no
NORTH-E	D039-0	63	56	32.0	4.57	no
NORTH-W	D080	56	56	0.0	4.57	no
NORTH-W	D081	70	56	64.0	4.57	no
NORTH-W	D082	58	56	9.1	4.57	no
NORTH-W	D083	67	56	50.3	4.57	no
NORTH-W	D085	70	56	64.0	4.57	no
NORTH-W	D087	55	56	-4.6	4.57	no
NORTH-W	D088	54	56	-9.1	4.57	no
NORTH-W	C014-B	55	59	-18.7	4.67	no
NORTH-W	C015-B	60	59	4.7	4.67	no
NORTH-W	C016-A	49	59	-46.7	4.67	no
NORTH-W	C016-B	45	59	-65.4	4.67	no
NORTH-N	C023-A	35	59	-112.1	4.67	no
NORTH-N	C025	44	59	-70.1	4.67	no
NORTH-N	C026-B	55	59	-18.7	4.67	no
NORTH-N	C029-E	54	59	-23.4	4.67	no
NORTH-N	C029-F	49	59	-46.7	4.67	no
NORTH-N	C031	50	59	-42.0	4.67	no
SOUTH-E	C052-C	53	59	-28.0	4.67	no
SOUTH-E	C052-D	61	59	9.3	4.67	no
SOUTH-E	C053-B	65	59	28.0	4.67	no
SOUTH-E	C054-B	66	59	32.7	4.67	no
SOUTH-E	C054-D	50	59	-42.0	4.67	no
SOUTH-E	C055-A	71	59	56.0	4.67	no
SOUTH-W	C045-B	75	59	74.7	4.67	no
SOUTH-W	C045-C	65	59	28.0	4.67	no
SOUTH-W	C046-C	52	59	-32.7	4.67	no
SOUTH-W	C046-D	66	59	32.7	4.67	no
SOUTH-W	C049-A	65	59	28.0	4.67	no
SOUTH-F	C010-B	50	59	-42.0	4.67	no
		Mean		-4.67		
		Std Dev		43.29		
		1 sigma UCL		38.63		

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2
North Floor Survey Unit														
NORTH-F	C01-A	CONCRETE	E600/SHP330	1370	914	dpm/100cm²	340	227	456	96	no	779	994	-215
NORTH-F	C01-B	CONCRETE	E600/SHP330	1102	887	dpm/100cm²	273	220	215	90	no	725	994	-269
NORTH-F	C01-C	CONCRETE	E600/SHP330	1209	887	dpm/100cm²	300	220	322	92	no	1048	994	54
NORTH-F	C02-A	CONCRETE	E600/SHP330	1612	1102	dpm/100cm²	400	273	510	105	no	725	994	-269
NORTH-F	C03-A	CONCRETE	E600/SHP330	1561	1319	dpm/100cm²	387	327	242	108	no	591	994	-403
NORTH-F	C03-B	CONCRETE	E600/SHP330	1317	887	dpm/100cm²	327	220	430	94	no	994	994	0
NORTH-F	C04-C	CONCRETE	E600/SHP330	4380	887	dpm/100cm²	1086	220	3493	146	no	698	994	-296
NORTH-F	C05-A	CONCRETE	E600/SHP330	1397	1021	dpm/100cm²	346	253	376	99	no	725	994	-269
NORTH-F	C05-B	CONCRETE	E600/SHP330	1397	887	dpm/100cm²	346	220	510	96	no	914	994	-80
NORTH-F	C05-C	CONCRETE	E600/SHP330	4510	887	dpm/100cm²	1118	220	3623	148	no	806	994	-188
NORTH-F	C06-A	CONCRETE	E600/SHP330	1451	861	dpm/100cm²	360	214	590	97	no	618	994	-376
NORTH-F	C06-B	CONCRETE	E600/SHP330	1048	887	dpm/100cm²	260	220	161	88	no	833	994	-161
NORTH-F	C06-C	CONCRETE	E600/SHP330	3190	887	dpm/100cm²	791	220	2303	128	no	672	994	-322
NORTH-F	C13-A	CONCRETE	E600/SHP330	1397	833	dpm/100cm²	346	207	564	95	no	698	994	-296
NORTH-F	C13-B	CONCRETE	E600/SHP330	1397	833	dpm/100cm²	346	207	564	95	no	860	994	-134
NORTH-F	C13-C	CONCRETE	E600/SHP330	3220	833	dpm/100cm²	799	207	2387	128	no	994	994	0
Survey Unit Mean =				1047				Survey Unit Standard Deviation =				1185		
North - North Wall Survey Unit														
NORTH-N	C23	CONCRETE	E600/PG2	10180	7040	dpm	1507	1042	26062	2831	yes	940	806	134
NORTH-N	C23-A	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	1048	806	242
NORTH-N	C23-B	PLWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	672	806	-134
NORTH-N	C23-C	SHEETROCK	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	994	806	188
NORTH-N	C23-D	SHEETROCK	E600/SHP330	967	833	dpm/100cm²	240	207	134	85	no	860	806	54
NORTH-N	C24	SHEETROCK	E600/PG2	7090	7040	dpm	1049	1042	415	2565	no	697	806	-109
NORTH-N	C24-A	PLYWOOD	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	698	806	-108
NORTH-N	C24-B	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	806	806	0
NORTH-N	C25	CONCRETE	E600/PG2	9870	7040	dpm	1461	1042	23489	2806	yes	1021	806	215
NORTH-N	C25-A	PLYWOOD	E600/SHP330	862	833	dpm/100cm²	214	207	29	83	no	645	806	-161
NORTH-N	C25-B	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	698	806	-108
NORTH-N	C25-C	SHEETROCK	E600/SHP330	672	833	dpm/100cm²	167	207	-161	78	no	672	806	-134
NORTH-N	C25-D	SHEETROCK	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	833	806	27
NORTH-N	C26	CONCRETE	E600/PG2	10440	7040	dpm	1545	1042	28220	2852	yes	698	806	-108
NORTH-N	C26-A	PLYWOOD	E600/SHP330	887	833	dpm/100cm²	220	207	54	83	no	645	806	-161
NORTH-N	C26-B	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	1075	806	269
NORTH-N	C27	WOOD	E600/PG2	9290	7040	dpm	1375	1042	18675	2757	yes	698	806	-108
NORTH-N	C27-A	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	833	806	27
NORTH-N	C27-B	PLYWOOD	E600/SHP330	591	833	dpm/100cm²	147	207	-242	76	no	994	806	188
NORTH-N	C28	CONCRETE	E600/PG2	11180	7040	dpm	1655	1042	34362	2912	yes	591	806	-215
NORTH-N	C28-A	PLYWOOD	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	537	806	-269
NORTH-N	C28-B	PLYWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	860	806	54
NORTH-N	C29	WOOD	E600/PG2	7940	7040	dpm	1175	1042	7470	2641	yes			0

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT									SMEAR MEASUREMENT			
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
NORTH-N	C29-A	PLYWOOD	E600/SHP330	591	833	dpm/100cm²	147	207	-242	76	no	725	806	-81		
NORTH-N	C29-B	PLYWOOD	E600/SHP330	1021	833	dpm/100cm²	253	207	188	86	no	698	806	-108		
NORTH-N	C29-C	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	672	806	-134		
NORTH-N	C29-D	PLYWOOD	E600/SHP330	967	833	dpm/100cm²	240	207	134	85	no	725	806	-81		
NORTH-N	C29-E	PLYWOOD	E600/SHP330	1344	1075	dpm/100cm²	333	267	269	99	no	1021	806	215		
NORTH-N	C29-F	PLYWOOD	E600/SHP330	779	1075	dpm/100cm²	193	267	-296	86	no	1048	806	242		
NORTH-N	C30	WOOD	E600/PG2	8280	7040	dpm	1225	1042	10292	2670	yes	860	806	54		
NORTH-N	C30-A	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	887	806	81		
NORTH-N	C30-B	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	698	806	-108		
NORTH-N	C31	CONCRETE	E600/PG2	9600	7040	dpm	1421	1042	21248	2783	yes	1129	806	323		
NORTH-N	C31-A	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	698	806	-108		
NORTH-N	C31-B	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	833	806	27		
Survey Unit Mean =				4868			Survey Unit Standard Deviation =								9913	
North - East Wall Survey Unit																
NORTH-E	C32	CONCRETE	E600/PG2	10980	9460	dpm	1625	1400	12616	3085	yes			0		
NORTH-E	C32-A	PLYWOOD	E600/SHP330	1021	833	dpm/100cm²	253	207	188	86	no	833	806	27		
NORTH-E	C32-B	PLYWOOD	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	914	806	108		
NORTH-E	C32-C	SHEETROCK	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	816	806	10		
NORTH-E	C32-D	SHEETROCK	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	591	806	-215		
NORTH-E	C33	WOOD	E600/PG2	8870	9460	dpm	1313	1400	-4897	2921	no			0		
NORTH-E	C33-A	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	672	806	-134		
NORTH-E	C33-B	PLYWOOD	E600/SHP330	725	833	dpm/100cm²	180	207	-108	79	no	618	806	-188		
NORTH-E	C33-C	SHEETROCK	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	698	806	-108		
NORTH-E	C33-D	SHEETROCK	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	403	806	-403		
NORTH-E	C34	CONCRETE	E600/PG2	13470	9460	dpm	1994	1400	33283	3267	yes			0		
NORTH-E	C34-A	PLYWOOD	E600/SHP330	1209	833	dpm/100cm²	300	207	376	91	no	672	806	-134		
NORTH-E	C34-B	PLYWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	1048	806	242		
NORTH-E	C34-C	SHEETROCK	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	752	806	-54		
NORTH-E	C34-D	SHEETROCK	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	967	806	161		
NORTH-E	C35	WOOD	E600/PG2	7770	9460	dpm	1150	1400	-14027	2832	no	672	806	-134		
NORTH-E	C35-A	PANELING	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	994	806	188		
NORTH-E	C35-B	PANELING	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	673	806	-133		
NORTH-E	C35-C	CELOTEX	E600/SHP330	1209	833	dpm/100cm²	300	207	376	91	no	698	806	-108		
NORTH-E	C35-D	CELOTEX	E600/SHP330	994	833	dpm/100cm²	247	207	161	86	no	698	806	-108		
NORTH-E	C36	CONCRETE	E600/PG2	10510	9460	dpm	1555	1400	8715	3049	yes	860	806	54		
NORTH-E	C36-A	PANELING	E600/SHP330	725	833	dpm/100cm²	180	207	-108	79	no	569	806	-237		
NORTH-E	C36-B	PANELING	E600/SHP330	725	833	dpm/100cm²	180	207	-108	79	no	994	806	188		
NORTH-E	C37	CONCRETE	E600/PG2	9200	9460	dpm	1362	1400	-2158	2947	no	672	806	-134		
NORTH-E	C37-A	PANELING	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	1021	806	215		
NORTH-E	C37-B	PANELING	E600/SHP330	940	833	dpm/100cm²	233	207	107	85	no	833	806	27		
NORTH-E	C38	WOOD	E600/PG2	8060	6530	dpm	1193	966	12699	2606	yes			0		
NORTH-E	C38-A	PANELING	E600/SHP330	729	833	dpm/100cm²	181	207	-104	79	no	833	806	27		

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
NORTH-E	C38-B	PANELING	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	457	806	-349		
NORTH-E	C38-C	CELOTEX	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	887	806	81		
NORTH-E	C38-D	CELOTEX	E600/SHP330	967	833	dpm/100cm²	240	207	134	85	no	887	806	81		
NORTH-E	C39	WOOD	E600/PG2	7740	6530	dpm	1146	966	10043	2577	yes			0		
NORTH-E	C39-A	PANELING	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	376	806	-430		
NORTH-E	C39-B	PANELING	E600/SHP330	564	833	dpm/100cm²	140	207	-269	75	no	779	806	-27		
NORTH-E	C39-C	PLYWOOD	E600/SHP330	1774	833	dpm/100cm²	440	207	941	103	no	833	806	27		
NORTH-E	C39-D	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	967	806	161		
NORTH-E	C39-E	CELOTEX	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	967	806	161		
NORTH-E	C39-F	CELOTEX	E600/SHP330	752	833	dpm/100cm²	186	207	-81	80	no	860	806	54		
NORTH-E	C40	WOOD	E600/PG2	8510	6530	dpm	1259	966	16434	2646	yes	779	806	-27		
NORTH-E	C40-A	PANELING	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	779	806	-27		
NORTH-E	C40-B	PANELING	E600/SHP330	994	833	dpm/100cm²	247	207	161	86	no	645	806	-161		
NORTH-E	C40-C	PLYWOOD	E600/SHP330	1182	833	dpm/100cm²	293	207	349	90	no	779	806	-27		
NORTH-E	C40-D	PLYWOOD	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	994	806	188		
NORTH-E	C40-E	CELOTEX	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	967	806	161		
NORTH-E	C40-F	CELOTEX	E600/SHP330	645	833	dpm/100cm²	160	207	-188	77	no	672	806	-134		
Survey Unit Mean =				1659			Survey Unit Standard Deviation =								6706	
North - West Wall Survey Unit																
NORTH-W	C14	WOOD	E600/PG2	7840	7090	dpm	1160	1049	6225	2636	yes	672	806	-134		
NORTH-W	C14-A	PLYWOOD	E600/SHP330	1586	833	dpm/100cm²	393	207	753	99	no	914	887	27		
NORTH-W	C14-B	PLYWOOD	E600/SHP330	1559	833	dpm/100cm²	387	207	726	98	no	1129	887	242		
NORTH-W	C14-C	CELOTEX	E600/SHP330	887	833	dpm/100cm²	220	207	54	83	no	967	887	80		
NORTH-W	C14-D	CELOTEX	E600/SHP330	887	833	dpm/100cm²	220	207	54	83	no	967	887	80		
NORTH-W	C15	WOOD	E600/PG2	10710	7090	dpm	1585	1049	30046	2878	yes	967	806	161		
NORTH-W	C15-A	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	887	887	0		
NORTH-W	C15-B	SHEETROCK	E600/SHP330	1129	833	dpm/100cm²	280	207	296	89	no	1129	887	242		
NORTH-W	C15-C	MASONITE	E600/SHP330	915	833	dpm/100cm²	227	207	82	84	no	914	887	27		
NORTH-W	C15-D	MASONITE	E600/SHP330	1102	833	dpm/100cm²	273	207	269	88	no	1021	887	134		
NORTH-W	C15-E	CELOTEX	E600/SHP330	2150	833	dpm/100cm²	533	207	1317	110	no	779	887	-108		
NORTH-W	C15-F	CELOTEX	E600/SHP330	1451	833	dpm/100cm²	360	207	618	96	no	779	887	-108		
NORTH-W	C16	WOOD	E600/PG2	7720	7090	dpm	1143	1049	5229	2626	yes			0		
NORTH-W	C16-A	SHEETROCK	E600/SHP330	1290	833	dpm/100cm²	320	207	457	93	no	1155	887	268		
NORTH-W	C16-B	SHEETROCK	E600/SHP330	1344	833	dpm/100cm²	333	207	511	94	no	1182	887	295		
NORTH-W	C16-C	CELOTEX	E600/SHP330	1102	833	dpm/100cm²	273	207	269	88	no	1021	887	134		
NORTH-W	C16-D	CELOTEX	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	725	887	-162		
NORTH-W	C17	WOOD	E600/PG2	8200	7870	dpm	1214	1165	2739	2735	no			0		
NORTH-W	C17-A	PLYWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	806	806	0		
NORTH-W	C17-B	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	940	806	134		
NORTH-W	C17-C	SHEETROCK	E600/SHP330	1270	833	dpm/100cm²	315	207	437	92	no	833	806	27		
NORTH-W	C17-D	SHEETROCK	E600/SHP330	1102	833	dpm/100cm²	273	207	269	88	no	725	806	-81		
NORTH-W	C17-E	CELOTEX	E600/SHP330	967	833	dpm/100cm²	240	207	134	85	no	806	806	0		

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2
NORTH-W	C17-F	CELOTEX	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	860	806	54
NORTH-W	C18	WOOD	E600/PG2	10050	7870	dpm	1487	1165	18094	2888	yes			0
NORTH-W	C18-A	SHEETROCK	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	752	887	-135
NORTH-W	C18-B	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	806	887	-81
NORTH-W	C18-C	CELOTEX	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	672	887	-215
NORTH-W	C18-D	CELOTEX	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	887	887	0
NORTH-W	C19	WOOD	E600/PG2	8950	7870	dpm	1325	1165	8964	2798	yes	940	806	134
NORTH-W	C19-A	SHEETROCK	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	914	806	108
NORTH-W	C19-B	SHEETROCK	E600/SHP330	752	833	dpm/100cm²	186	207	-81	80	no	645	806	-161
NORTH-W	C19-C	CELOTEX	E600/SHP330	940	833	dpm/100cm²	233	207	107	85	no	779	806	-27
NORTH-W	C19-D	CELOTEX	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	591	806	-215
NORTH-W	C20	WOOD	E600/PG2	7940	7870	dpm	1175	1165	581	2713	no	645	806	-161
NORTH-W	C20-A	SHEETROCK	E600/SHP330	812	833	dpm/100cm²	201	207	-21	81	no	483	806	-323
NORTH-W	C20-B	SHEETROCK	E600/SHP330	940	833	dpm/100cm²	233	207	107	85	no	940	806	134
NORTH-W	C21	WOOD	E600/PG2	8580	7870	dpm	1270	1165	5893	2767	yes			0
NORTH-W	C21-A	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	887	806	81
NORTH-W	C21-B	SHEETROCK	E600/SHP330	725	833	dpm/100cm²	180	207	-108	79	no	940	806	134
NORTH-W	C21-C	CELOTEX	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	645	806	-161
NORTH-W	C21-D	CELOTEX	E600/SHP330	994	833	dpm/100cm²	247	207	161	86	no	645	806	-161
NORTH-W	C22	WOOD	E600/PG2	8340	7870	dpm	1234	1165	3901	2747	no	779	806	-27
NORTH-W	C22-A	SHEETROCK	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	806	806	0
NORTH-W	C22-B	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	698	806	-108
NORTH-W	C22-C	CELOTEX	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	806	806	0
NORTH-W	C22-D	CELOTEX	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	806	806	0
Survey Unit Mean =				1897				Survey Unit Standard Deviation =				5254		
South Floor Survey Unit														
SOUTH-F	C07-A	CONCRETE	E600/SHP330	1021	967	dpm/100cm²	253	240	54	90	no	967	1102	-135
SOUTH-F	C07-B	CONCRETE	E600/SHP330	1048	967	dpm/100cm²	260	240	81	90	no	940	1102	-162
SOUTH-F	C07-C	CONCRETE	E600/SHP330	1720	967	dpm/100cm²	427	240	753	104	no	914	1102	-188
SOUTH-F	C08-A	CONCRETE	E600/SHP330	1451	1424	dpm/100cm²	360	353	27	108	no	833	940	-107
SOUTH-F	C08-B	CONCRETE	E600/SHP330	1102	1424	dpm/100cm²	273	353	-322	101	no	967	940	27
SOUTH-F	C08-C	CONCRETE	E600/SHP330	2520	1424	dpm/100cm²	625	353	1096	126	no	806	940	-134
SOUTH-F	C09-A	CONCRETE	E600/SHP330	1048	1075	dpm/100cm²	260	267	-27	93	no	994	940	54
SOUTH-F	C09-B	CONCRETE	E600/SHP330	1155	1075	dpm/100cm²	286	267	80	95	no	833	940	-107
SOUTH-F	C09-C	CONCRETE	E600/SHP330	2090	1075	dpm/100cm²	518	267	1015	113	no	860	940	-80
SOUTH-F	C10-A	CONCRETE	E600/SHP330	1639	860	dpm/100cm²	406	213	779	100	no	1048	940	108
SOUTH-F	C10-B	CONCRETE	E600/SHP330	1182	860	dpm/100cm²	293	213	322	91	no	1424	940	484
SOUTH-F	C10-C	CONCRETE	E600/SHP330	2410	860	dpm/100cm²	598	213	1550	115	no	940	940	0
SOUTH-F	C11-A	CONCRETE	E600/SHP330	1397	1021	dpm/100cm²	346	253	376	99	no	860	940	-80
SOUTH-F	C11-B	CONCRETE	E600/SHP330	1424	1021	dpm/100cm²	353	253	403	99	no	940	940	0
SOUTH-F	C11-C	CONCRETE	E600/SHP330	2710	1021	dpm/100cm²	672	253	1689	123	no	779	940	-161
SOUTH-F	C12-A	CONCRETE	E600/SHP330	1397	645	dpm/100cm²	346	160	752	91	no	806	940	-134

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2
SOUTH-F	C12-B	CONCRETE	E600/SHP330	1586	645	dpm/100cm²	393	160	941	95	no	698	940	-242
SOUTH-F	C12-C	CONCRETE	E600/SHP330	3300	645	dpm/100cm²	818	160	2655	126	no	591	940	-349
Survey Unit Mean =				679								Survey Unit Standard Deviation = 743		
South - East/South Wall Survey Unit														
SOUTH-E	C50	INSULATION	E600/PG2	9960	6720	dpm	1474	995	26892	2786	yes			0
SOUTH-E	C50-A	PANELING	E600/SHP330	1021	1129	dpm/100cm²	253	280	-108	93	no	779	779	0
SOUTH-E	C50-B	PANELING	E600/SHP330	1209	1129	dpm/100cm²	300	280	80	97	no	725	779	-54
SOUTH-E	C50-C	CELOTEX	E600/SHP330	833	1129	dpm/100cm²	207	280	-296	89	no	725	779	-54
SOUTH-E	C50-D	CELOTEX	E600/SHP330	1182	1129	dpm/100cm²	293	280	53	97	no	725	779	-54
SOUTH-E	C51	INSULATION	E600/PG2	8750	7600	dpm	1295	1125	9545	2759	yes			0
SOUTH-E	C51-A	PANELING	E600/SHP330	1129	1129	dpm/100cm²	280	280	0	95	no	752	779	-27
SOUTH-E	C51-B	PANELING	E600/SHP330	1036	1129	dpm/100cm²	257	280	-93	93	no	940	779	161
SOUTH-E	C51-C	SHEETROCK	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	752	779	-27
SOUTH-E	C51-D	SHEETROCK	E600/SHP330	1236	1129	dpm/100cm²	307	280	107	98	no	833	779	54
SOUTH-E	C52	INSULATION	E600/PG2	8580	7600	dpm	1270	1125	8134	2744	yes			0
SOUTH-E	C52-A	PANELING	E600/SHP330	672	1129	dpm/100cm²	167	280	-457	85	no	940	779	161
SOUTH-E	C52-B	PANELING	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	860	779	81
SOUTH-E	C52-C	SHEETROCK	E600/SHP330	1344	1129	dpm/100cm²	333	280	215	100	no	1048	779	269
SOUTH-E	C52-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm²	267	280	-54	94	no	1371	779	592
SOUTH-E	C53	INSULATION	E600/PG2	7490	7600	dpm	1109	1125	-913	2650	no			0
SOUTH-E	C53-A	PANELING	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	725	779	-54
SOUTH-E	C53-B	PANELING	E600/SHP330	940	1129	dpm/100cm²	233	280	-189	91	no	1129	779	350
SOUTH-E	C53-C	SHEETROCK	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	725	779	-54
SOUTH-E	C53-D	SHEETROCK	E600/SHP330	887	1129	dpm/100cm²	220	280	-242	90	no	806	779	27
SOUTH-E	C54	INSULATION	E600/PG2	9180	7830	dpm	1359	1159	11205	2814	yes			0
SOUTH-E	C54-A	PANELING	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	967	779	188
SOUTH-E	C54-B	PANELING	E600/SHP330	994	1129	dpm/100cm²	247	280	-135	93	no	1129	779	350
SOUTH-E	C54-C	SHEETROCK	E600/SHP330	940	1129	dpm/100cm²	233	280	-189	91	no	806	779	27
SOUTH-E	C54-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm²	267	280	-54	94	no	1021	779	242
SOUTH-E	C55	INSULATION	E600/PG2	8150	7830	dpm	1206	1159	2656	2727	no			0
SOUTH-E	C55-A	PANELING	E600/SHP330	1371	1129	dpm/100cm²	340	280	242	100	no	1102	779	323
SOUTH-E	C55-B	PANELING	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	940	779	161
SOUTH-E	C55-C	SHEETROCK	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	887	779	108
SOUTH-E	C55-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm²	267	280	-54	94	no	564	779	-215
SOUTH-E	C56	MASONITE	E600/PG2	5140	7120	dpm	761	1054	-16434	2389	no			0
SOUTH-E	C56-A	PANELING	E600/SHP330	860	1129	dpm/100cm²	213	280	-269	90	no	887	779	108
SOUTH-E	C56-B	PANELING	E600/SHP330	940	1129	dpm/100cm²	233	280	-189	91	no	806	779	27
SOUTH-E	C57	WOOD	E600/PG2	7770	7120	dpm	1150	1054	5395	2633	yes			0
SOUTH-E	C57-A	PANELING	E600/SHP330	779	1129	dpm/100cm²	193	280	-350	88	no	591	779	-188
SOUTH-E	C57-B	PANELING	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	752	779	-27
SOUTH-E	C57-C	SHEETROCK	E600/SHP330	860	1129	dpm/100cm²	213	280	-269	90	no	833	779	54
SOUTH-E	C57-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm²	267	280	-54	94	no	887	779	108

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
SOUTH-E	C57-E	WOOD	E600/SHP330	1155	1129	dpm/100cm ²	286	280	26	96	no	833	779	54		
SOUTH-E	C57-F	WOOD	E600/SHP330	914	1129	dpm/100cm ²	227	280	-215	91	no	645	779	-134		
SOUTH-E	C58	CELOTEX	E600/PG2	6210	7120	dpm	919	1054	-7553	2491	no			0		
SOUTH-E	C58-A	PANELING	E600/SHP330	967	1129	dpm/100cm ²	240	280	-162	92	no	860	779	81		
SOUTH-E	C58-B	PANELING	E600/SHP330	1182	1129	dpm/100cm ²	293	280	53	97	no	967	779	188		
SOUTH-E	C58-C	CELOTEX	E600/SHP330	1397	1129	dpm/100cm ²	346	280	268	101	no	645	779	-134		
SOUTH-E	C58-D	CELOTEX	E600/SHP330	967	1129	dpm/100cm ²	240	280	-162	92	no	967	779	188		
Survey Unit Mean =				786			Survey Unit Standard Deviation =								5526	
South - West/South Wall Survey Unit																
SOUTH-W	C41	CELOTEX	E600/PG2	9060	8310	dpm	1341	1230	6225	2843	yes			0		
SOUTH-W	C41-A	PANELING	E600/SHP330	725	833	dpm/100cm ²	180	207	-108	79	no	779	806	-27		
SOUTH-W	C41-B	PANELING	E600/SHP330	994	833	dpm/100cm ²	247	207	161	86	no	887	806	81		
SOUTH-W	C41-C	CELOTEX	E600/SHP330	1290	833	dpm/100cm ²	320	207	457	93	no	591	806	-215		
SOUTH-W	C41-D	CELOTEX	E600/SHP330	806	833	dpm/100cm ²	200	207	-27	81	no	833	806	27		
SOUTH-W	C42	WOOD	E600/PG2	8960	8310	dpm	1326	1230	5395	2835	yes			0		
SOUTH-W	C42-A	SHEETROCK	E600/SHP330	672	833	dpm/100cm ²	167	207	-161	78	no	645	806	-161		
SOUTH-W	C42-B	SHEETROCK	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	457	806	-349		
SOUTH-W	C43	WOOD	E600/PG2	8490	6960	dpm	1257	1030	12699	2682	yes			0		
SOUTH-W	C43-A	PANELING	E600/SHP330	1102	1129	dpm/100cm ²	273	280	-27	95	no	914	779	135		
SOUTH-W	C43-B	PANELING	E600/SHP330	806	1129	dpm/100cm ²	200	280	-323	88	no	887	779	108		
SOUTH-W	C43-C	PLYWOOD	E600/SHP330	806	1129	dpm/100cm ²	200	280	-323	88	no	672	779	-107		
SOUTH-W	C43-D	PLYWOOD	E600/SHP330	915	1129	dpm/100cm ²	227	280	-214	91	no	994	779	215		
SOUTH-W	C43-E	CELOTEX	E600/SHP330	1290	1129	dpm/100cm ²	320	280	161	99	no	887	779	108		
SOUTH-W	C43-F	CELOTEX	E600/SHP330	1102	1129	dpm/100cm ²	273	280	-27	95	no	645	779	-134		
SOUTH-W	C44	WOOD	E600/PG2	8880	7600	dpm	1314	1125	10624	2770	yes			0		
SOUTH-W	C44-A	PANELING	E600/SHP330	698	1129	dpm/100cm ²	173	280	-431	86	no	752	779	-27		
SOUTH-W	C44-B	PANELING	E600/SHP330	725	1129	dpm/100cm ²	180	280	-404	86	no	994	779	215		
SOUTH-W	C44-C	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	753	779	-26		
SOUTH-W	C44-D	SHEETROCK	E600/SHP330	860	1129	dpm/100cm ²	213	280	-269	90	no	591	779	-188		
SOUTH-W	C45	WOOD	E600/PG2	8150	7120	dpm	1206	1054	8549	2666	yes			0		
SOUTH-W	C45-A	PANELING	E600/SHP330	618	1129	dpm/100cm ²	153	280	-511	84	no	940	779	161		
SOUTH-W	C45-B	PANELING	E600/SHP330	672	1129	dpm/100cm ²	167	280	-457	85	no	1021	779	242		
SOUTH-W	C45-C	SHEETROCK	E600/SHP330	1209	1129	dpm/100cm ²	300	280	80	97	no	1104	779	325		
SOUTH-W	C45-D	SHEETROCK	E600/SHP330	940	1129	dpm/100cm ²	233	280	-189	91	no	752	779	-27		
SOUTH-W	C46	INSULATION	E600/PG2	9450	6700	dpm	1399	992	22825	2742	yes			0		
SOUTH-W	C46-A	PANELING	E600/SHP330	914	1129	dpm/100cm ²	227	280	-215	91	no	887	779	108		
SOUTH-W	C46-B	PANELING	E600/SHP330	807	1129	dpm/100cm ²	200	280	-322	88	no	940	779	161		
SOUTH-W	C46-C	CELOTEX	E600/SHP330	887	1129	dpm/100cm ²	220	280	-242	90	no	1021	779	242		
SOUTH-W	C46-D	CELOTEX	E600/SHP330	887	1129	dpm/100cm ²	220	280	-242	90	no	1182	779	403		
SOUTH-W	C47	INSULATION	E600/PG2	8950	6700	dpm	1325	992	18675	2699	yes			0		
SOUTH-W	C47-A	PANELING	E600/SHP330	914	1129	dpm/100cm ²	227	280	-215	91	no	914	779	135		
SOUTH-W	C47-B	PANELING	E600/SHP330	779	1129	dpm/100cm ²	193	280	-350	88	no	887	779	108		

Table 5-5
Building 2 Inaccessible Wall and Floor Core Measurements

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2
SOUTH-W	C47-C	CELOTEX	E600/SHP330	752	1129	dpm/100cm ²	186	280	-377	87	no	967	779	188
SOUTH-W	C47-D	CELOTEX	E600/SHP330	672	1129	dpm/100cm ²	167	280	-457	85	no	860	779	81
SOUTH-W	C48	INSULATION	E600/PG2	8750	6650	dpm	1295	984	17430	2677	yes			0
SOUTH-W	C48-A	PLYWOOD	E600/SHP330	994	1129	dpm/100cm ²	247	280	-135	93	no	806	779	27
SOUTH-W	C48-B	PLYWOOD	E600/SHP330	887	1129	dpm/100cm ²	220	280	-242	90	no	860	779	81
SOUTH-W	C48-C	CELOTEX	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	510	779	-269
SOUTH-W	C48-D	CELOTEX	E600/SHP330	994	1129	dpm/100cm ²	247	280	-135	93	no	860	779	81
SOUTH-W	C49	WOOD	E600/PG2	8640	6720	dpm	1279	995	15936	2674	yes			0
SOUTH-W	C49-A	PANELING	E600/SHP330	967	1129	dpm/100cm ²	240	280	-162	92	no	1182	779	403
SOUTH-W	C49-B	PANELING	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	967	779	188
SOUTH-W	C49-C	SHEETROCK	E600/SHP330	1155	1129	dpm/100cm ²	286	280	26	96	no	967	779	188
SOUTH-W	C49-D	SHEETROCK	E600/SHP330	860	1129	dpm/100cm ²	213	280	-269	90	no	779	779	0
Survey Unit Mean =				2499				Survey Unit Standard Deviation =				5962		

Table 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm ²	1 Sigma Uncertainty, dpm/100 cm ²	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm ²
Celotex Material														
NORTH-W	C14-C	CELOTEX	E600/SHP330	887	833	dpm/100cm ²	220	207	54	83	no	967	887	80
NORTH-W	C14-D	CELOTEX	E600/SHP330	887	833	dpm/100cm ²	220	207	54	83	no	967	887	80
NORTH-W	C15-E	CELOTEX	E600/SHP330	2150	833	dpm/100cm ²	533	207	1317	110	no	779	887	-108
NORTH-W	C15-F	CELOTEX	E600/SHP330	1451	833	dpm/100cm ²	360	207	618	96	no	779	887	-108
NORTH-W	C16-C	CELOTEX	E600/SHP330	1102	833	dpm/100cm ²	273	207	269	88	no	1021	887	134
NORTH-W	C16-D	CELOTEX	E600/SHP330	914	833	dpm/100cm ²	227	207	81	84	no	725	887	-162
NORTH-W	C17-E	CELOTEX	E600/SHP330	967	833	dpm/100cm ²	240	207	134	85	no	806	806	0
NORTH-W	C17-F	CELOTEX	E600/SHP330	779	833	dpm/100cm ²	193	207	-54	81	no	860	806	54
NORTH-W	C18-C	CELOTEX	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	672	887	-215
NORTH-W	C18-D	CELOTEX	E600/SHP330	806	833	dpm/100cm ²	200	207	-27	81	no	887	887	0
NORTH-W	C19-C	CELOTEX	E600/SHP330	940	833	dpm/100cm ²	233	207	107	85	no	779	806	-27
NORTH-W	C19-D	CELOTEX	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	591	806	-215
NORTH-W	C21-C	CELOTEX	E600/SHP330	860	833	dpm/100cm ²	213	207	27	83	no	645	806	-161
NORTH-W	C21-D	CELOTEX	E600/SHP330	994	833	dpm/100cm ²	247	207	161	86	no	645	806	-161
NORTH-W	C22-C	CELOTEX	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	806	806	0
NORTH-W	C22-D	CELOTEX	E600/SHP330	914	833	dpm/100cm ²	227	207	81	84	no	806	806	0
NORTH-E	C35-C	CELOTEX	E600/SHP330	1209	833	dpm/100cm ²	300	207	376	91	no	698	806	-108
NORTH-E	C35-D	CELOTEX	E600/SHP330	994	833	dpm/100cm ²	247	207	161	86	no	698	806	-108
NORTH-E	C38-C	CELOTEX	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	887	806	81
NORTH-E	C38-D	CELOTEX	E600/SHP330	967	833	dpm/100cm ²	240	207	134	85	no	887	806	81
NORTH-E	C39-E	CELOTEX	E600/SHP330	1075	833	dpm/100cm ²	287	207	242	88	no	967	806	161
NORTH-E	C39-F	CELOTEX	E600/SHP330	752	833	dpm/100cm ²	186	207	-81	80	no	860	806	54
NORTH-E	C40-E	CELOTEX	E600/SHP330	698	833	dpm/100cm ²	173	207	-135	79	no	967	806	161
NORTH-E	C40-F	CELOTEX	E600/SHP330	645	833	dpm/100cm ²	160	207	-188	77	no	672	806	-134
SOUTH-W	C41	CELOTEX	E600/PG2	9060	8310	dpm	1341	1230	6225	2843	yes			0
SOUTH-W	C41-C	CELOTEX	E600/SHP330	1290	833	dpm/100cm ²	320	207	457	93	no	591	806	-215
SOUTH-W	C41-D	CELOTEX	E600/SHP330	806	833	dpm/100cm ²	200	207	-27	81	no	833	806	27
SOUTH-W	C43-E	CELOTEX	E600/SHP330	1290	1129	dpm/100cm ²	320	280	161	99	no	887	779	108
SOUTH-W	C43-F	CELOTEX	E600/SHP330	1102	1129	dpm/100cm ²	273	280	-27	95	no	645	779	-134
SOUTH-W	C46-C	CELOTEX	E600/SHP330	887	1129	dpm/100cm ²	220	280	-242	90	no	1021	779	242
SOUTH-W	C46-D	CELOTEX	E600/SHP330	887	1129	dpm/100cm ²	220	280	-242	90	no	1182	779	403
SOUTH-W	C47-C	CELOTEX	E600/SHP330	752	1129	dpm/100cm ²	186	280	-377	87	no	967	779	188
SOUTH-W	C47-D	CELOTEX	E600/SHP330	672	1129	dpm/100cm ²	167	280	-457	85	no	860	779	81
SOUTH-W	C48-C	CELOTEX	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	510	779	-269
SOUTH-W	C48-D	CELOTEX	E600/SHP330	994	1129	dpm/100cm ²	247	280	-135	93	no	860	779	81
SOUTH-E	C50-C	CELOTEX	E600/SHP330	833	1129	dpm/100cm ²	207	280	-296	89	no	725	779	-54
SOUTH-E	C50-D	CELOTEX	E600/SHP330	1182	1129	dpm/100cm ²	293	280	53	97	no	725	779	-54
SOUTH-E	C58	CELOTEX	E600/PG2	6210	7120	dpm	919	1054	-7553	2491	no			0
SOUTH-E	C58-C	CELOTEX	E600/SHP330	1397	1129	dpm/100cm ²	346	280	268	101	no	645	779	-134
SOUTH-E	C58-D	CELOTEX	E600/SHP330	967	1129	dpm/100cm ²	240	280	-162	92	no	967	779	188
Survey Unit Mean =				45				Survey Unit Standard Deviation =				1596		

Table 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2
Concrete Material														
NORTH-F	C01-A	CONCRETE	E600/SHP330	1370	914	dpm/100cm ²	340	227	456	96	no	779	994	-215
NORTH-F	C01-B	CONCRETE	E600/SHP330	1102	887	dpm/100cm ²	273	220	215	90	no	725	994	-269
NORTH-F	C01-C	CONCRETE	E600/SHP330	1209	887	dpm/100cm ²	300	220	322	92	no	1048	994	54
NORTH-F	C02-A	CONCRETE	E600/SHP330	1612	1102	dpm/100cm ²	400	273	510	105	no	725	994	-269
NORTH-F	C03-A	CONCRETE	E600/SHP330	1561	1319	dpm/100cm ²	387	327	242	108	no	591	994	-403
NORTH-F	C03-B	CONCRETE	E600/SHP330	1317	887	dpm/100cm ²	327	220	430	94	no	994	994	0
NORTH-F	C04-C	CONCRETE	E600/SHP330	4380	887	dpm/100cm ²	1086	220	3493	146	no	698	994	-296
NORTH-F	C05-A	CONCRETE	E600/SHP330	1397	1021	dpm/100cm ²	346	253	376	99	no	725	994	-269
NORTH-F	C05-B	CONCRETE	E600/SHP330	1397	887	dpm/100cm ²	346	220	510	96	no	914	994	-80
NORTH-F	C05-C	CONCRETE	E600/SHP330	4510	887	dpm/100cm ²	1118	220	3623	148	no	806	994	-188
NORTH-F	C06-A	CONCRETE	E600/SHP330	1451	861	dpm/100cm ²	360	214	590	97	no	618	994	-376
NORTH-F	C06-B	CONCRETE	E600/SHP330	1048	887	dpm/100cm ²	260	220	161	88	no	833	994	-161
NORTH-F	C06-C	CONCRETE	E600/SHP330	3190	887	dpm/100cm ²	791	220	2303	128	no	672	994	-322
SOUTH-F	C07-A	CONCRETE	E600/SHP330	1021	967	dpm/100cm ²	253	240	54	90	no	967	1102	-135
SOUTH-F	C07-B	CONCRETE	E600/SHP330	1048	967	dpm/100cm ²	260	240	81	90	no	940	1102	-162
SOUTH-F	C07-C	CONCRETE	E600/SHP330	1720	967	dpm/100cm ²	427	240	753	104	no	914	1102	-188
SOUTH-F	C08-A	CONCRETE	E600/SHP330	1451	1424	dpm/100cm ²	360	353	27	108	no	833	940	-107
SOUTH-F	C08-B	CONCRETE	E600/SHP330	1102	1424	dpm/100cm ²	273	353	-322	101	no	967	940	27
SOUTH-F	C08-C	CONCRETE	E600/SHP330	2520	1424	dpm/100cm ²	625	353	1096	126	no	806	940	-134
SOUTH-F	C09-A	CONCRETE	E600/SHP330	1048	1075	dpm/100cm ²	260	267	-27	93	no	994	940	54
SOUTH-F	C09-B	CONCRETE	E600/SHP330	1155	1075	dpm/100cm ²	286	267	80	95	no	833	940	-107
SOUTH-F	C09-C	CONCRETE	E600/SHP330	2090	1075	dpm/100cm ²	518	267	1015	113	no	860	940	-80
SOUTH-F	C10-A	CONCRETE	E600/SHP330	1639	860	dpm/100cm ²	406	213	779	100	no	1048	940	108
SOUTH-F	C10-B	CONCRETE	E600/SHP330	1182	860	dpm/100cm ²	293	213	322	91	no	1424	940	484
SOUTH-F	C10-C	CONCRETE	E600/SHP330	2410	860	dpm/100cm ²	598	213	1550	115	no	940	940	0
SOUTH-F	C11-A	CONCRETE	E600/SHP330	1397	1021	dpm/100cm ²	346	253	376	99	no	860	940	-80
SOUTH-F	C11-B	CONCRETE	E600/SHP330	1424	1021	dpm/100cm ²	353	253	403	99	no	940	940	0
SOUTH-F	C11-C	CONCRETE	E600/SHP330	2710	1021	dpm/100cm ²	672	253	1689	123	no	779	940	-161
SOUTH-F	C12-A	CONCRETE	E600/SHP330	1397	645	dpm/100cm ²	346	160	752	91	no	806	940	-134
SOUTH-F	C12-B	CONCRETE	E600/SHP330	1586	645	dpm/100cm ²	393	160	941	95	no	698	940	-242
SOUTH-F	C12-C	CONCRETE	E600/SHP330	3300	645	dpm/100cm ²	818	160	2655	126	no	591	940	-349
NORTH-F	C13-A	CONCRETE	E600/SHP330	1397	833	dpm/100cm ²	346	207	564	95	no	698	994	-296
NORTH-F	C13-B	CONCRETE	E600/SHP330	1397	833	dpm/100cm ²	346	207	564	95	no	860	994	-134
NORTH-F	C13-C	CONCRETE	E600/SHP330	3220	833	dpm/100cm ²	799	207	2387	128	no	994	994	0
NORTH-N	C23	CONCRETE	E600/PG2	10180	7040	dpm	1507	1042	26062	2831	yes	940	806	134
NORTH-N	C25	CONCRETE	E600/PG2	9870	7040	dpm	1461	1042	23489	2806	yes	1021	806	215
NORTH-N	C26	CONCRETE	E600/PG2	10440	7040	dpm	1545	1042	28220	2852	yes	698	806	-108
NORTH-N	C28	CONCRETE	E600/PG2	11180	7040	dpm	1655	1042	34362	2912	yes	591	806	-215
NORTH-N	C31	CONCRETE	E600/PG2	9600	7040	dpm	1421	1042	21248	2783	yes	1129	806	323

Table 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm ²	1 Sigma Uncertainty, dpm/100 cm ²	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm ²
NORTH-E	C32	CONCRETE	E600/PG2	10980	9460	dpm	1625	1400	12616	3085	yes			0
NORTH-E	C34	CONCRETE	E600/PG2	13470	9460	dpm	1994	1400	33283	3267	yes			0
NORTH-E	C36	CONCRETE	E600/PG2	10510	9460	dpm	1555	1400	8715	3049	yes	860	806	54
NORTH-E	C37	CONCRETE	E600/PG2	9200	9460	dpm	1362	1400	-2158	2947	no	672	806	-134
Survey Unit Mean =				4996				Survey Unit Standard Deviation =				9747		
Insulation Material														
SOUTH-W	C46	INSULATION	E600/PG2	9450	6700	dpm	1399	992	22825	2742	yes			0
SOUTH-W	C47	INSULATION	E600/PG2	8950	6700	dpm	1325	992	18675	2699	yes			0
SOUTH-W	C48	INSULATION	E600/PG2	8750	6650	dpm	1295	984	17430	2677	yes			0
SOUTH-E	C50	INSULATION	E600/PG2	9960	6720	dpm	1474	995	26892	2786	yes			0
SOUTH-E	C51	INSULATION	E600/PG2	8750	7600	dpm	1295	1125	9545	2759	yes			0
SOUTH-E	C52	INSULATION	E600/PG2	8580	7600	dpm	1270	1125	8134	2744	yes			0
SOUTH-E	C53	INSULATION	E600/PG2	7490	7600	dpm	1109	1125	-913	2650	no			0
SOUTH-E	C54	INSULATION	E600/PG2	9180	7830	dpm	1359	1159	11205	2814	yes			0
SOUTH-E	C55	INSULATION	E600/PG2	8150	7830	dpm	1206	1159	2656	2727	no			0
Survey Unit Mean =				12939				Survey Unit Standard Deviation =				9224		
Masonite Material														
NORTH-W	C15-C	MASONITE	E600/SHP330	915	833	dpm/100cm ²	227	207	82	84	no	914	887	27
NORTH-W	C15-D	MASONITE	E600/SHP330	1102	833	dpm/100cm ²	273	207	269	88	no	1021	887	134
SOUTH-E	C56	MASONITE	E600/PG2	5140	7120	dpm	761	1054	-16434	2389	no			0
Survey Unit Mean =				-5361				Survey Unit Standard Deviation =				9590		
Paneling Material														
NORTH-E	C35-A	PANELING	E600/SHP330	806	833	dpm/100cm ²	200	207	-27	81	no	994	806	188
NORTH-E	C35-B	PANELING	E600/SHP330	779	833	dpm/100cm ²	193	207	-54	81	no	673	806	-133
NORTH-E	C36-A	PANELING	E600/SHP330	725	833	dpm/100cm ²	180	207	-108	79	no	569	806	-237
NORTH-E	C36-B	PANELING	E600/SHP330	725	833	dpm/100cm ²	180	207	-108	79	no	994	806	188
NORTH-E	C37-A	PANELING	E600/SHP330	779	833	dpm/100cm ²	193	207	-54	81	no	1021	806	215
NORTH-E	C37-B	PANELING	E600/SHP330	940	833	dpm/100cm ²	233	207	107	85	no	833	806	27
NORTH-E	C38-A	PANELING	E600/SHP330	729	833	dpm/100cm ²	181	207	-104	79	no	833	806	27
NORTH-E	C38-B	PANELING	E600/SHP330	806	833	dpm/100cm ²	200	207	-27	81	no	457	806	-349
NORTH-E	C39-A	PANELING	E600/SHP330	914	833	dpm/100cm ²	227	207	81	84	no	376	806	-430
NORTH-E	C39-B	PANELING	E600/SHP330	564	833	dpm/100cm ²	140	207	-269	75	no	779	806	-27
NORTH-E	C40-A	PANELING	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	779	806	-27
NORTH-E	C40-B	PANELING	E600/SHP330	994	833	dpm/100cm ²	247	207	161	86	no	645	806	-161
SOUTH-W	C41-A	PANELING	E600/SHP330	725	833	dpm/100cm ²	180	207	-108	79	no	779	806	-27
SOUTH-W	C41-B	PANELING	E600/SHP330	994	833	dpm/100cm ²	247	207	161	86	no	887	806	81
SOUTH-W	C43-A	PANELING	E600/SHP330	1102	1129	dpm/100cm ²	273	280	-27	95	no	914	779	135
SOUTH-W	C43-B	PANELING	E600/SHP330	806	1129	dpm/100cm ²	200	280	-323	88	no	887	779	108
SOUTH-W	C44-A	PANELING	E600/SHP330	698	1129	dpm/100cm ²	173	280	-431	86	no	752	779	-27
SOUTH-W	C44-B	PANELING	E600/SHP330	725	1129	dpm/100cm ²	180	280	-108	79	no	779	806	-27

Table 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
SOUTH-W	C45-A	PANELING	E600/SHP330	618	1129	dpm/100cm²	153	280	-511	84	no	940	779	161		
SOUTH-W	C45-B	PANELING	E600/SHP330	672	1129	dpm/100cm²	167	280	-457	85	no	1021	779	242		
SOUTH-W	C46-A	PANELING	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	887	779	108		
SOUTH-W	C46-B	PANELING	E600/SHP330	807	1129	dpm/100cm²	200	280	-322	88	no	940	779	161		
SOUTH-W	C47-A	PANELING	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	914	779	135		
SOUTH-W	C47-B	PANELING	E600/SHP330	779	1129	dpm/100cm²	193	280	-350	88	no	887	779	108		
SOUTH-W	C49-A	PANELING	E600/SHP330	967	1129	dpm/100cm²	240	280	-162	92	no	1182	779	403		
SOUTH-W	C49-B	PANELING	E600/SHP330	1075	1129	dpm/100cm²	267	280	-54	94	no	967	779	188		
SOUTH-E	C50-A	PANELING	E600/SHP330	1021	1129	dpm/100cm²	253	280	-108	93	no	779	779	0		
SOUTH-E	C50-B	PANELING	E600/SHP330	1209	1129	dpm/100cm²	300	280	80	97	no	725	779	-54		
SOUTH-E	C51-A	PANELING	E600/SHP330	1129	1129	dpm/100cm²	280	280	0	95	no	752	779	-27		
SOUTH-E	C51-B	PANELING	E600/SHP330	1036	1129	dpm/100cm²	257	280	-93	93	no	940	779	161		
SOUTH-E	C52-A	PANELING	E600/SHP330	672	1129	dpm/100cm²	167	280	-457	85	no	940	779	161		
SOUTH-E	C52-B	PANELING	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	860	779	81		
SOUTH-E	C53-A	PANELING	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	725	779	-54		
SOUTH-E	C53-B	PANELING	E600/SHP330	940	1129	dpm/100cm²	233	280	-189	91	no	1129	779	350		
SOUTH-E	C54-A	PANELING	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	967	779	188		
SOUTH-E	C54-B	PANELING	E600/SHP330	994	1129	dpm/100cm²	247	280	-135	93	no	1129	779	350		
SOUTH-E	C55-A	PANELING	E600/SHP330	1371	1129	dpm/100cm²	340	280	242	100	no	1102	779	323		
SOUTH-E	C55-B	PANELING	E600/SHP330	1048	1129	dpm/100cm²	260	280	-81	94	no	940	779	161		
SOUTH-E	C56-A	PANELING	E600/SHP330	860	1129	dpm/100cm²	213	280	-269	90	no	887	779	108		
SOUTH-E	C56-B	PANELING	E600/SHP330	940	1129	dpm/100cm²	233	280	-189	91	no	806	779	27		
SOUTH-E	C57-A	PANELING	E600/SHP330	779	1129	dpm/100cm²	193	280	-350	88	no	591	779	-188		
SOUTH-E	C57-B	PANELING	E600/SHP330	914	1129	dpm/100cm²	227	280	-215	91	no	752	779	-27		
SOUTH-E	C58-A	PANELING	E600/SHP330	967	1129	dpm/100cm²	240	280	-162	92	no	860	779	81		
SOUTH-E	C58-B	PANELING	E600/SHP330	1182	1129	dpm/100cm²	293	280	53	97	no	967	779	188		
Survey Unit Mean =				-133			Survey Unit Standard Deviation =								184	
Plywood Material																
NORTH-W	C14-A	PLYWOOD	E600/SHP330	1586	833	dpm/100cm²	393	207	753	99	no	914	887	27		
NORTH-W	C14-B	PLYWOOD	E600/SHP330	1559	833	dpm/100cm²	387	207	726	98	no	1129	887	242		
NORTH-W	C17-A	PLYWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	806	806	0		
NORTH-W	C17-B	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	940	806	134		
NORTH-N	C23-A	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	1048	806	242		
NORTH-N	C23-B	PLWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	672	806	-134		
NORTH-N	C24-A	PLYWOOD	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	698	806	-108		
NORTH-N	C24-B	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	806	806	0		
NORTH-N	C25-A	PLYWOOD	E600/SHP330	862	833	dpm/100cm²	214	207	29	83	no	645	806	-161		
NORTH-N	C25-B	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	698	806	-108		
NORTH-N	C26-A	PLYWOOD	E600/SHP330	887	833	dpm/100cm²	220	207	54	83	no	645	806	-161		
NORTH-N	C26-B	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	1075	806	269		
NORTH-N	C27-A	PLYWOOD	E600/SHP330	833	833	dpm/100cm²	207	207	0	82	no	833	806	27		
NORTH-N	C27-B	PLYWOOD	E600/SHP330	591	833	dpm/100cm²	147	207	-242	76	no	994	806	188		
NORTH-N	C28-A	PLYWOOD	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	537	806	-269		

Table 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
NORTH-N	C28-B	PLYWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	860	806	54		
NORTH-N	C29-A	PLYWOOD	E600/SHP330	591	833	dpm/100cm²	147	207	-242	76	no	725	806	-81		
NORTH-N	C29-B	PLYWOOD	E600/SHP330	1021	833	dpm/100cm²	253	207	188	86	no	698	806	-108		
NORTH-N	C29-C	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	672	806	-134		
NORTH-N	C29-D	PLYWOOD	E600/SHP330	967	833	dpm/100cm²	240	207	134	85	no	725	806	-81		
NORTH-N	C29-E	PLYWOOD	E600/SHP330	1344	1075	dpm/100cm²	333	267	269	99	no	1021	806	215		
NORTH-N	C29-F	PLYWOOD	E600/SHP330	779	1075	dpm/100cm²	193	267	-296	86	no	1048	806	242		
NORTH-N	C30-A	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	887	806	81		
NORTH-N	C30-B	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	698	806	-108		
NORTH-N	C31-A	PLYWOOD	E600/SHP330	806	833	dpm/100cm²	200	207	-27	81	no	698	806	-108		
NORTH-N	C31-B	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	833	806	27		
NORTH-E	C32-A	PLYWOOD	E600/SHP330	1021	833	dpm/100cm²	253	207	188	86	no	833	806	27		
NORTH-E	C32-B	PLYWOOD	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	914	806	108		
NORTH-E	C33-A	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	672	806	-134		
NORTH-E	C33-B	PLYWOOD	E600/SHP330	725	833	dpm/100cm²	180	207	-108	79	no	618	806	-188		
NORTH-E	C34-A	PLYWOOD	E600/SHP330	1209	833	dpm/100cm²	300	207	376	91	no	672	806	-134		
NORTH-E	C34-B	PLYWOOD	E600/SHP330	860	833	dpm/100cm²	213	207	27	83	no	1048	806	242		
NORTH-E	C39-C	PLYWOOD	E600/SHP330	1774	833	dpm/100cm²	440	207	941	103	no	833	806	27		
NORTH-E	C39-D	PLYWOOD	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	967	806	161		
NORTH-E	C40-C	PLYWOOD	E600/SHP330	1182	833	dpm/100cm²	293	207	349	90	no	779	806	-27		
NORTH-E	C40-D	PLYWOOD	E600/SHP330	1075	833	dpm/100cm²	267	207	242	88	no	994	806	188		
SOUTH-W	C43-C	PLYWOOD	E600/SHP330	806	1129	dpm/100cm²	200	280	-323	88	no	672	779	-107		
SOUTH-W	C43-D	PLYWOOD	E600/SHP330	915	1129	dpm/100cm²	227	280	-214	91	no	994	779	215		
SOUTH-W	C48-A	PLYWOOD	E600/SHP330	994	1129	dpm/100cm²	247	280	-135	93	no	806	779	27		
SOUTH-W	C48-B	PLYWOOD	E600/SHP330	887	1129	dpm/100cm²	220	280	-242	90	no	860	779	81		
Survey Unit Mean =				63			Survey Unit Standard Deviation =								273	
Sheetrock Material																
NORTH-W	C15-A	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	887	887	0		
NORTH-W	C15-B	SHEETROCK	E600/SHP330	1129	833	dpm/100cm²	280	207	296	89	no	1129	887	242		
NORTH-W	C16-A	SHEETROCK	E600/SHP330	1290	833	dpm/100cm²	320	207	457	93	no	1155	887	268		
NORTH-W	C16-B	SHEETROCK	E600/SHP330	1344	833	dpm/100cm²	333	207	511	94	no	1182	887	295		
NORTH-W	C17-C	SHEETROCK	E600/SHP330	1270	833	dpm/100cm²	315	207	437	92	no	833	806	27		
NORTH-W	C17-D	SHEETROCK	E600/SHP330	1102	833	dpm/100cm²	273	207	269	88	no	725	806	-81		
NORTH-W	C18-A	SHEETROCK	E600/SHP330	698	833	dpm/100cm²	173	207	-135	79	no	752	887	-135		
NORTH-W	C18-B	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	806	887	-81		
NORTH-W	C19-A	SHEETROCK	E600/SHP330	779	833	dpm/100cm²	193	207	-54	81	no	914	806	108		
NORTH-W	C19-B	SHEETROCK	E600/SHP330	752	833	dpm/100cm²	186	207	-81	80	no	645	806	-161		
NORTH-W	C20-A	SHEETROCK	E600/SHP330	812	833	dpm/100cm²	201	207	-21	81	no	483	806	-323		
NORTH-W	C20-B	SHEETROCK	E600/SHP330	940	833	dpm/100cm²	233	207	107	85	no	940	806	134		
NORTH-W	C21-A	SHEETROCK	E600/SHP330	914	833	dpm/100cm²	227	207	81	84	no	887	806	81		
NORTH-W	C21-B	SHEETROCK	E600/SHP330	725	833	dpm/100cm²	180	207	-108	79	no	940	806	134		
NORTH-W	C22-A	SHEETROCK	E600/SHP330	1048	833	dpm/100cm²	260	207	215	87	no	806	806	0		

TABLE 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT				
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm2	1 Sigma Uncertainty, dpm/100 cm2	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm2		
NORTH-N	C23-C	SHEETROCK	E600/SHP330	779	833	dpm/100cm ²	193	207	-54	81	no	994	806	188		
NORTH-N	C23-D	SHEETROCK	E600/SHP330	967	833	dpm/100cm ²	240	207	134	85	no	860	806	54		
NORTH-N	C24	SHEETROCK	E600/PG2	7090	7040	dpm	1049	1042	415	2565	no	697	806	-109		
NORTH-N	C25-C	SHEETROCK	E600/SHP330	672	833	dpm/100cm ²	167	207	-161	78	no	672	806	-134		
NORTH-N	C25-D	SHEETROCK	E600/SHP330	833	833	dpm/100cm ²	207	207	0	82	no	833	806	27		
NORTH-E	C32-C	SHEETROCK	E600/SHP330	833	833	dpm/100cm ²	207	207	0	82	no	816	806	10		
NORTH-E	C32-D	SHEETROCK	E600/SHP330	779	833	dpm/100cm ²	193	207	-54	81	no	591	806	-215		
NORTH-E	C33-C	SHEETROCK	E600/SHP330	698	833	dpm/100cm ²	173	207	-135	79	no	698	806	-108		
NORTH-E	C33-D	SHEETROCK	E600/SHP330	833	833	dpm/100cm ²	207	207	0	82	no	403	806	-403		
NORTH-E	C34-C	SHEETROCK	E600/SHP330	698	833	dpm/100cm ²	173	207	-135	79	no	752	806	-54		
NORTH-E	C34-D	SHEETROCK	E600/SHP330	806	833	dpm/100cm ²	200	207	-27	81	no	967	806	161		
SOUTH-W	C42-A	SHEETROCK	E600/SHP330	672	833	dpm/100cm ²	167	207	-161	78	no	645	806	-161		
SOUTH-W	C42-B	SHEETROCK	E600/SHP330	1048	833	dpm/100cm ²	260	207	215	87	no	457	806	-349		
SOUTH-W	C44-C	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	753	779	-26		
SOUTH-W	C44-D	SHEETROCK	E600/SHP330	860	1129	dpm/100cm ²	213	280	-269	90	no	591	779	-188		
SOUTH-W	C45-C	SHEETROCK	E600/SHP330	1209	1129	dpm/100cm ²	300	280	80	97	no	1104	779	325		
SOUTH-W	C45-D	SHEETROCK	E600/SHP330	940	1129	dpm/100cm ²	233	280	-189	91	no	752	779	-27		
SOUTH-W	C49-C	SHEETROCK	E600/SHP330	1155	1129	dpm/100cm ²	286	280	26	96	no	967	779	188		
SOUTH-W	C49-D	SHEETROCK	E600/SHP330	860	1129	dpm/100cm ²	213	280	-269	90	no	779	779	0		
SOUTH-E	C51-C	SHEETROCK	E600/SHP330	1048	1129	dpm/100cm ²	260	280	-81	94	no	752	779	-27		
SOUTH-E	C51-D	SHEETROCK	E600/SHP330	1236	1129	dpm/100cm ²	307	280	107	98	no	833	779	54		
SOUTH-E	C52-C	SHEETROCK	E600/SHP330	1344	1129	dpm/100cm ²	333	280	215	100	no	1048	779	269		
SOUTH-E	C52-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	1371	779	592		
SOUTH-E	C53-C	SHEETROCK	E600/SHP330	1048	1129	dpm/100cm ²	260	280	-81	94	no	725	779	-54		
SOUTH-E	C53-D	SHEETROCK	E600/SHP330	887	1129	dpm/100cm ²	220	280	-242	90	no	806	779	27		
SOUTH-E	C54-C	SHEETROCK	E600/SHP330	940	1129	dpm/100cm ²	233	280	-189	91	no	806	779	27		
SOUTH-E	C54-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	1021	779	242		
SOUTH-E	C55-C	SHEETROCK	E600/SHP330	914	1129	dpm/100cm ²	227	280	-215	91	no	887	779	108		
SOUTH-E	C55-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	564	779	-215		
SOUTH-E	C57-C	SHEETROCK	E600/SHP330	860	1129	dpm/100cm ²	213	280	-269	90	no	833	779	54		
SOUTH-E	C57-D	SHEETROCK	E600/SHP330	1075	1129	dpm/100cm ²	267	280	-54	94	no	887	779	108		
Survey Unit Mean =				13			Survey Unit Standard Deviation =								195	
Wood Material																
NORTH-N	C27	WOOD	E600/PG2	9290	7040	dpm	1375	1042	18675	2757	yes	698	806	-108		
NORTH-N	C29	WOOD	E600/PG2	7940	7040	dpm	1175	1042	7470	2641	yes			0		
NORTH-N	C30	WOOD	E600/PG2	8280	7040	dpm	1225	1042	10292	2670	yes	860	806	54		
NORTH-E	C33	WOOD	E600/PG2	8870	9460	dpm	1313	1400	-4897	2921	no			0		
NORTH-E	C35	WOOD	E600/PG2	7770	9460	dpm	1150	1400	-14027	2832	no	672	806	-134		
NORTH-E	C38	WOOD	E600/PG2	8060	6530	dpm	1193	966	12699	2606	yes			0		
NORTH-E	C39	WOOD	E600/PG2	7740	6530	dpm	1146	966	10043	2577	yes			0		
NORTH-E	C40	WOOD	E600/PG2	8510	6530	dpm	1259	966	16434	2646	yes	779	806	-27		
NORTH-W	C14	WOOD	E600/PG2	7840	7090	dpm	1160	1049	6225	2636	yes	672	806	-134		
NORTH-W	C15	WOOD	E600/PG2	10710	7090	dpm	1585	1049	30046	2878	yes	967	806	161		

Table 5-6
Building 2 Wall Core Measurements Sorted By Material Type

SURVEY POINT DATA				DIRECT MEASUREMENT								SMEAR MEASUREMENT		
Survey Unit	Survey Location ID	Material Type	Instrument/ Probe	Data as Displayed on Meter	Bkg. as Displayed on Meter	Meter Readout Units	Measured Count Rate, cpm	Background Count Rate, cpm	Activity, dpm/100 cm ²	1 Sigma Uncertainty, dpm/100 cm ²	Exceeds Generic Limit?	Data as Displayed on Meter, dpm	Bkg. as Displayed on Meter, dpm	Activity, dpm/100 cm ²
NORTH-W	C16	WOOD	E600/PG2	7720	7090	dpm	1143	1049	5229	2626	yes			0
NORTH-W	C17	WOOD	E600/PG2	8200	7870	dpm	1214	1165	2739	2735	no			0
NORTH-W	C18	WOOD	E600/PG2	10050	7870	dpm	1487	1165	18094	2888	yes			0
NORTH-W	C19	WOOD	E600/PG2	8950	7870	dpm	1325	1165	8964	2798	yes	940	806	134
NORTH-W	C20	WOOD	E600/PG2	7940	7870	dpm	1175	1165	581	2713	no	645	806	-161
NORTH-W	C21	WOOD	E600/PG2	8580	7870	dpm	1270	1165	5893	2767	yes			0
NORTH-W	C22	WOOD	E600/PG2	8340	7870	dpm	1234	1165	3901	2747	no	779	806	-27
SOUTH-E	C57	WOOD	E600/PG2	7770	7120	dpm	1150	1054	5395	2633	yes			0
SOUTH-E	C57-E	WOOD	E600/SHP330	1155	1129	dpm/100cm ²	286	280	26	96	no	833	779	54
SOUTH-E	C57-F	WOOD	E600/SHP330	914	1129	dpm/100cm ²	227	280	-215	91	no	645	779	-134
SOUTH-W	C42	WOOD	E600/PG2	8960	8310	dpm	1326	1230	5395	2835	yes			0
SOUTH-W	C43	WOOD	E600/PG2	8490	6960	dpm	1257	1030	12699	2682	yes			0
SOUTH-W	C44	WOOD	E600/PG2	8880	7600	dpm	1314	1125	10624	2770	yes			0
SOUTH-W	C45	WOOD	E600/PG2	8150	7120	dpm	1206	1054	8549	2666	yes			0
SOUTH-W	C49	WOOD	E600/PG2	8640	6720	dpm	1279	995	15936	2674	yes			0
Survey Unit Mean =				7871				Survey Unit Standard Deviation =				8681

LEGEND:

- 1 ROOM NUMBER AND ELEVATION LABEL
- W11-S SURVEY AREA
NORTH OR SOUTH (N S) SURVEY UNIT IDENTIFIER
2nd & 3rd CHARACTERS: UNIQUE SURVEY NUMBER
1st CHARACTER: WALL OR FLOOR (W F) IDENTIFIER

GRAND JUNCTION PROJECTS OFFICE GRAND JUNCTION, CO		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO	
PROJECT NO.		IDENTIFICATION / VERIFICATION	
DRAWN BY		DATE	
CHECKED BY		PROJECT NO.	
APPROVED BY		BUILDING 2 - FIGURE 5-2 SCAN MEASUREMENT LOCATIONS	
PROJECT NO. FAS-031-0002-00-000		SHEET 3 OF 5	
DRAWING NO. 10000600.DWG

LEGEND:

1 ROOM NUMBER AND ELEVATION LABEL
S

D43-1 DIRECT MEASUREMENT / SMEAR LOCATION
HEIGHT FROM FLOOR (IN METERS)
MEASUREMENT / SMEAR NUMBER
INDICATES DIRECT MEASUREMENT / SMEAR

PROJECT LOCATION GRAND JUNCTION PROJECTS OFFICE GRAND JUNCTION, CO		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO	
IDENTIFICATION / VERIFICATION		GJPORAP	
DATE	SCALE	BUILDING 2 - FIGURE 5-3 DIRECT MEASUREMENTS / SMEARS LOCATIONS	
PROJECT NO.	DATE	PROJECT NO. FAS-031-0002-00-000	
PROJECT NO. 10000800.DWG		4 5

LEGEND:

1 S ROOM NUMBER AND ELEVATION LABEL

C33 CORE SAMPLE LOCATION
CORE LOCATION NUMBER
CORE LOCATION

PROJECT LOCATION GRAND JUNCTION PROJECTS OFFICE GRAND JUNCTION, CO		U.S. DEPARTMENT OF ENERGY GRAND JUNCTION PROJECTS OFFICE, COLORADO GJPORAP	
IDENTIFICATION / VERIFICATION DATE YEAR LOCATED STUDY LOCATION REMARKS		BUILDING 2 -- FIGURE 5-4 CORE LOCATIONS FLOORS AND WALLS	
PROJECT NO. FAS-031-0002-00-000		SHEET 5 OF 5	
DRAWING NO. 10000600.DWG

Section 6.0

RESRAD-Build Input Data

6.1 RESRAD-Build Input Data for Normal Occupancy With Covering Materials

6.1.1 Occupancy Characteristics

Total time spent on site:	250 days	(50 weeks/year, 5 days/week, 8 hr/day)
Fraction of time in B2:	0.3	where 1 = 24 hours/day
Times set for evaluation:	1,10,20,30	years

6.1.2 Building Characteristics

Number of Rooms: 2

Room 1, North End of Building 2

Height:	2.4 m	
Area:	50.5 m ²	Nominally 5.8 x 8.7 m
Air exchange rate:	1/hr	
Outdoor inflow:	50 m ³ /hr	

Room 2, South End of Building 2

Height:	2.4 m	
Area:	138 m ²	Nominally 5.8 x 23.8 m
Air exchange rate:	1/hr	
Outdoor inflow:	50 m ³ /hr	
Total Air Exchange Rate		
N21 (net inflow 1-2): 10/hr		
Deposition velocity:	0.01 m/s	default
Resuspension rate:	5.00e ⁻⁷ /s	default

6.1.3 Receptor Characteristics

Number of receptors: 2

Receptor 1

Position:	3,3,1	approximate room center
Room number:	1	North end
Time fraction:	0.27	ratio of size of room 1 to room 2
Inhalation rate:	18 m ³ /d	default
Ingestion rate:	0.0001 m ² /d	default

Receptor 2

Position:	20,2,1	approximate room center
Room number:	2	South end
Time fraction:	0.73	ratio of room sizes
Inhalation rate:	18 m ³ /d	default
Ingestion rate:	0.0001 m ² /d	default

6.1.4 Source and Shielding Characteristics

Number of sources: 6

In all cases the activity is assumed to be refined uranium in naturally occurring activity ratios of 47.33% ^{238}U , 2.2% ^{235}U , and 50.47% ^{234}U .

To obtain the input information for each radionuclide, the total activity listed below in pCi/m² is multiplied by the factor for each isotope.

All sources described here are area sources, coded as type 2. The figure on the next page shows the location of the sources.

The source removal time is 30 years, 1 month (10,950 days).

6.1.4.1 Source 1

Contamination on concrete in the east wall of Room 1 (telecommunications room) is on the original concrete which is now covered by plywood, sheetrock, or paneling. The contamination averaged 13,114 dpm/100 cm² with a standard deviation of 14,828. This is the same as 596,100 pCi/m² with a standard deviation of 674,000. Radioactivity for input to the model is split according to the natural activity ratios described above and results in the following: ^{234}U : 301,000 pCi/m², ^{235}U : 13,100 pCi/m², ^{238}U : 282,000 pCi/m². Concrete was encountered up to about 1 m height along the whole wall. No concrete was found above 1 m. This is consistent with visible structures remaining from the shower and toilet facilities.

To construct a model input the center point and area of the idealized source needs to be defined. Choose the center point as the center of the wall 1/2 meter above grade. Using the southeast corner at floor level as the origin, this point is nominally 28.2/0/0.5. The area is the length of the wall, 8.7 m, times the 1 m concrete height for an area of 8.7 m². The source direction is the vector perpendicular to the face of the source and is coincident with x, y, or z vectors with respect to the origin. In this case the source direction is the same as y, which is coded as 2. The source has an area geometry which is coded as 2.

The source is described as an area source covered by sheetrock or paneling. The survey team leader notes indicate two of the points were covered by 2.0 cm of plywood over 1.5 cm of sheetrock. The other two sampled locations were covered by 0.5 cm of paneling which is similar to masonite or plywood. For purposes of this model we assume the source is covered with one layer of wood, 1 cm thick. Since wood is not a choice in the shielding materials, the best match to effective Z among the choices is water which is coded as 2. The density of wood is nominally 0.5 g/cm³. The air release fraction of the material that is eroded is assumed to be 0.1. The remainder contaminates skin, clothing, and other items and is removed from the site. The removable fraction is assumed to approach zero since it is beneath wall coverings. A value of 0.001 is selected.

6.1.4.2 Source 2

This is similar to Source 1 except it is in the north wall which is 5.8 m wide with a center point of 32.5/3/0.5. The area of the source is 5.8 m². The direction of the source is the same as x, which is coded as 1. The contamination averaged 26,676 dpm/100 cm² with a standard deviation of 5,036.

This is the same as 1,212,545 pCi/m² with a standard deviation of 228,909. Radioactivity for input to the model is split according to the natural activity ratios described above and results in the following: ²³⁴U: 612,000 pCi/m², ²³⁵U: 26,700 pCi/m², ²³⁸U: 574,000 pCi/m².

In two of the five locations, the concrete is covered by 2 cm of plywood over 1 cm of sheetrock. In the other locations, the covering is 2 cm of plywood. For modeling we assume the system is a volume source of two layers with the top layer being 2 cm of wood. Since wood is not a choice in the shielding materials, the best match to effective Z among the choices is water which is coded as 2. The density of wood is nominally 0.5 g/cm³. The air release fraction of the material that is eroded is assumed to be 0.1. The remainder contaminates skin, clothing, and other items and is removed from the site. The removable fraction is assumed to approach zero since it is beneath wall coverings. A value of 0.001 is selected.

6.1.4.3 Source 3

This source is the insulation present in the south wall which extends into the southern ends of the east and west walls. For simplicity the model will show this source only in the south wall and compensate for the other affected areas by doubling the average contamination level for this material type. The south wall is 2.4 m high and 5.8 m long for an area of 13.9 m². The source direction is x, which is coded as 1. The center point is 0/3/1. The mean contamination level for the insulation was 12,939 dpm/100 cm² with a standard deviation of 9,224. This is the same as 588,100 pCi/m² with a standard deviation of 419,000. Doubling the activity to account for the simplification in source geometry, the activity to be used in the model is 1,176,000 pCi/m². Radioactivity for input to the model is split according to the natural activity ratios described above and results in the following: ²³⁴U: 594,000 pCi/m², ²³⁵U: 25,900 pCi/m², ²³⁸U: 557,000 pCi/m². For modeling purposes we assume the activity to be in a plane below 0.5 cm of paneling over 1 cm of sheetrock, giving the same effect as 1.5 cm of sheetrock. Since sheetrock is not a choice in the shielding materials, the best match to effective Z among the choices is probably concrete, which is coded as 1. The density of is assumed to be 0.5 g/cm³. The air release fraction of the material that is eroded is assumed to be 0.1. The remainder contaminates skin, clothing, and other items and is removed from the site. The removable fraction is assumed to approach zero since it is beneath wall coverings. A value of 0.001 is selected.

6.1.4.4 Source 4

This source is the structural wood found in almost all exterior walls. The average activity on all of the wood found in all of the survey units was 7,871 dpm/100 cm² with a standard deviation of 8,681. This is the same as 357,000 pCi/m² with a standard deviation of 395,000. Radioactivity for input to the model is split according to the natural activity ratios described above and results in the following: ²³⁴U: 180,000 pCi/m², ²³⁵U: 7,900 pCi/m², ²³⁸U: 169,000 pCi/m². Assume the contaminated wood is studs that occur uniformly through all exterior walls and cover 1 1/2 out of every 16 linear inches of wall (in other words, 9.4 percent). The walls are 2.4 in high and the linear dimension of all the exterior sums to approximately 77 m. Then the affected area for the whole structure is 17 m². Since this source is assumed to be symmetrically distributed, and the receptors are assumed to be in the center of each room, the source can be approximated by putting it all in one of the long walls, say the west walls with a center point of 20/5.8/1. The source direction is y or 2. Assume the wood is covered by 2 cm of sheetrock. Since sheetrock is not a choice in the shielding materials, the best match to effective Z among the choices is probably concrete which is coded as 1. The density of is assumed to be 0.5 g/cm³. The air release fraction of the material that is eroded is assumed to be 0.1.

The remainder contaminates skin, clothing, and other items and is removed from the site. The removable fraction is assumed to approach zero since it is beneath wall coverings. A value of 0.001 is selected.

6.1.4.5 Source 5

This source is the direct contamination measured on the surface of the North - Old Walls Survey Unit, which is the northwest wall of the telecommunications room. The mean contamination level is 1,484 dpm/100 cm² with a standard deviation of 2,313. This is the same as 67,500 pCi/m² with a standard deviation of 105,000. Radioactivity for input to the model is split according to the natural activity ratios described above and results in the following: ²³⁴U: 34,000 pCi/m², ²³⁵U: 1,500 pCi/m², ²³⁸U: 32,000 pCi/m². The center point is 28/5.8/1.2. The affected area is 20.8 m². The source direction is y or 2. The air release fraction is assumed to be 0.1 because of particle size and agglomeration. Assume the removable fraction is 0.5. Assume that the material is under a layer of paint with a thickness of 0.01 cm and a density of 2 g/cm³. The shielding characteristics of paint are assumed to be simulated by concrete of the same thickness.

6.1.4.6 Source 6

This source is the inaccessible contamination measured between the concrete slabs for the north and south rooms. Figure 6-1 presents the Building 2 model sources. To simplify the model and because there is not much difference between the means of the survey units, the data from the survey units will be averaged together. The mean contamination level is 1,906 dpm/100 cm² with a standard deviation of 1,039. This is the same as 86,600 pCi/m² with a standard deviation of 47,200. Radioactivity for input to the model is split according to the natural activity ratios described above and results in the following: ²³⁴U: 44,000 pCi/m², ²³⁵U: 1,900 pCi/m², ²³⁸U: 41,000 pCi/m². The center point is 16/3/0. The affected area is the whole floor or 189 m². The source direction is z or 3. The source is assumed to exist under a 10 cm concrete slab. The air release fraction of the material that is eroded is assumed to be 0.1. The remainder contaminates skin, clothing, and other items and is removed from the site. The removable fraction is assumed to approach zero since it is beneath floor coverings. A value of 0.001 is selected.

The south west wall cores indicate that this might be modeled as a source. However inspection of the data shows that the elevated activity is associated with insulation and wood which have already been modeled as sources 3 and 4.

Levels of surface contamination in all other survey units are less than 1,000 dpm/100 cm² which is 1/5 of the guideline value and deemed insignificant for this dose assessment.

6.2 RESRAD-Build Input Data for Normal Occupancy Without Covering Materials

Exposure conditions are the same except wall and floor coverings are removed and the release fractions are increased. All contamination, except in the subsurface drain lines, is accessible and removable. This scenario could not be repeated annually because the contaminants would be removed or covered. Therefore, it should be interpreted as a single-year exposure scenario.

Figure 6-1. Building 2 RESRAD-Build Model Sources

6.3 RESRAD-Build Input Data for Demolition

NOTE: Unless otherwise specified, the input parameters are the same as the normal occupancy case in 6.1.

6.3.1 Occupancy Characteristics

Total time spent on site: 10 days, 2 weeks, 5 days/wk, 8 hr/day
Fraction of time in B2: 0.3 (where 1 = 24 hours/day)
Times set for evaluation: 0 years

6.3.2 Building Characteristics

Number of rooms: 1 a bubble of air over the downed building

Room 1, North End of Building 2

Height: 3 m

Area: 200

Nominally

Total Air Exchange Rate: 15 air chgs/hr; light breeze

Deposition velocity: 0.01 m/s default

Resuspension rate: $1.00e^{-5}/s$ lots of airborne debris

6.3.3 Receptor Characteristics

Number of receptors: 1

Receptor 1

Position: 15,3,1 approximate room center

6.3.4 Source and Shielding Characteristics

Number of sources: 6

The source terms remain the same except that the release fractions are modified to account for the destruction actions occurring and the associated aerosol generation rate.

In each case where the air release fraction is 0.1, it is changed to 0.2.

The removable fraction is increased to 0.01.

The time for source removal is 11 days so that it all of it is exposed during the demolition.

Section 7.0

RESRAD-Build Output Data

7.1 Normal Occupancy With Covering Materials

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:11 Page: 0- 0 : 1 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP

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 RESRAD-BUILD Input Parameters
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Number of Sources : 6
 Number of Receptors: 2
 Total Time : 2.400000E+02 days
 Fraction Inside : 3.000000E-01

===== Receptor Information =====

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	3.000	3.000	1.000	0.270	1.80E+01	1.00E-04
2	2	20.000	3.000	1.000	0.730	1.80E+01	1.00E-04

===== Receptor-Source Relationship =====

Recept	Source 1			Source 2			Source 3			Source 4			Source 5		
	Density	Thickness	Or	Density	Thickness	Or	Density	Thickness	Or	Density	Thickness	Or	Density	Thickness	Or
	[g/cm3]	[cm]		[g/cm3]	[cm]		[g/cm3]	[cm]		[g/cm3]	[cm]		[g/cm3]	[cm]	
1	5.00E-01	1.00E+00	RT	5.00E-01	2.00E+00	RT	5.00E-01	1.50E+00	RT	5.00E-01	2.00E+00	RT	2.00E+00	1.00E-02	RT
2	5.00E-01	1.00E+00	RT	5.00E-01	2.00E+00	RT	5.00E-01	1.50E+00	RT	5.00E-01	2.00E+00	RT	2.00E+00	1.00E-02	RT

Recept	Source 6		
	Density	Thickness	Or
	[g/cm3]	[cm]	
1	2.50E+00	1.00E+01	RT
2	2.50E+00	1.00E+01	RT

Building Air Exchange Rate: 1.00E+00 1/hr

Air Exchanges [m3/hr]

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

===== Source Information =====

Source: 1
 Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50[m]
 Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	2.820E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.310E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	3.010E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05
CO-60	1.000E+00	2.600E-05	1.500E-04	2.750E-04	1.020E-05	1.470E-02

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:11 Page: 0- 3 : 5 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50[m]
 Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	5.740E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	2.670E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	6.120E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 3
Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00[m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::		Dose Conversion Factors				
Nuclide Concentration		Ingestion	Inhalation	External	External	Submersion
				(Surface)	(Volume)	
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	5.570E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	2.590E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	5.940E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:11 Page: 0- 3 : 7 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00[m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	1.690E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	7.900E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	1.800E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:11 Page: 0- 3 : 8 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20[m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 1.098E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	3.200E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.500E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	3.400E+04	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00[m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	4.100E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.900E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	4.400E+04	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Assessment for Time: 1
Time =1.00E+00 yr

Source Information

Source: 1
Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]
Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.820E+05
	U-235	1.310E+04
	U-234	3.010E+05
	PA-231	2.770E-01
	TH-230	2.711E+00
	AC-227	4.379E-03
	RA-226	5.875E-04
	PB-210	6.043E-06
	CO-60	8.767E-01

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:12 Page: 1- 1 : 11 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 1.00000 years

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.740E+05
	U-235	2.670E+04
	U-234	6.120E+05
	PA-231	5.645E-01
	TH-230	5.512E+00
	AC-227	8.926E-03
	RA-226	1.194E-03
	PB-210	1.229E-05

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.570E+05
	U-235	2.590E+04
	U-234	5.940E+05
	PA-231	5.476E-01
	TH-230	5.350E+00
	AC-227	8.658E-03
	RA-226	1.159E-03
	PB-210	1.193E-05

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.690E+05
	U-235	7.900E+03
	U-234	1.800E+05
	PA-231	1.670E-01
	TH-230	1.621E+00
	AC-227	2.641E-03
	RA-226	3.513E-04
	PB-210	3.614E-06

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	3.147E+04
	U-235	1.475E+03
	U-234	3.343E+04
	PA-231	3.119E-02
	TH-230	3.011E-01
	AC-227	4.931E-04
	RA-226	6.526E-05
	PB-210	6.713E-07

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:12 Page: 1- 1 : 13 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 1.00000 years

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z .
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.100E+04
	U-235	1.900E+03
	U-234	4.400E+04
	PA-231	4.017E-02
	TH-230	3.963E-01
	AC-227	6.352E-04
	RA-226	8.588E-05
	PB-210	8.834E-07

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RESRAD-BUILD Dose Tables

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Receptor Point-Source Doses

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[mrem]

		Source	Source	Source	Source	Source	Source	Total
		1	2	3	4	5	6	
Receptor	1	2.3E-04	2.9E-04	6.0E-03	2.6E-04	2.6E-02	5.2E-04	3.4E-02
Receptor	2	1.2E-03	1.0E-03	3.7E-03	7.0E-03	6.1E-02	3.8E-03	7.8E-02
Total		1.4E-03	1.3E-03	9.7E-03	7.2E-03	8.7E-02	4.3E-03	1.1E-01

Pathway Detail of Doses

[mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor	3.28E-05	3.59E-09	2.27E-11	1.94E-04	2.23E-20	1.06E-06
1	7.56E-04	1.09E-08	5.22E-11	4.46E-04	1.19E-19	2.43E-06
2	7.89E-04	1.45E-08	7.49E-11	6.40E-04	1.41E-19	3.48E-06
Total						

Source: 2	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor	2.34E-05	4.87E-09	3.08E-11	2.63E-04	3.02E-20	1.43E-06
1	4.15E-04	1.48E-08	7.08E-11	6.05E-04	1.61E-19	3.29E-06
2	4.38E-04	1.96E-08	1.02E-10	8.68E-04	1.91E-19	4.72E-06
Total						

Source: 3	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor	5.47E-03	9.27E-09	5.87E-11	5.02E-04	1.33E-19	2.73E-06
1	3.53E-04	8.22E-08	3.94E-10	3.37E-03	8.04E-19	1.83E-05
2	5.82E-03	9.15E-08	4.53E-10	3.87E-03	9.37E-19	2.11E-05
Total						

Source: 4	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor	7.40E-05	3.44E-09	2.18E-11	1.86E-04	4.94E-20	1.01E-06
1	5.71E-03	3.05E-08	1.46E-10	1.25E-03	2.98E-19	6.80E-06
2	5.78E-03	3.40E-08	1.68E-10	1.44E-03	3.47E-19	7.81E-06
Total						

Source: 5	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor	9.61E-06	4.87E-07	3.09E-09	2.63E-02	3.01E-18	1.43E-04
1	2.36E-04	1.48E-06	7.09E-09	6.04E-02	1.60E-17	3.28E-04
2	2.46E-04	1.96E-06	1.02E-08	8.66E-02	1.90E-17	4.71E-04
Total						

Source: 6	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor	1.64E-05	9.27E-09	5.87E-11	5.04E-04	1.34E-19	2.74E-06
1	3.89E-04	8.22E-08	3.94E-10	3.38E-03	8.10E-19	1.84E-05
2	4.05E-04	9.15E-08	4.53E-10	3.89E-03	9.44E-19	2.11E-05
Total						

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:12 Page: 1- 4 : 16 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 1.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.14E-04	7.86E-04	9.00E-04
U-234	2.74E-10	6.68E-10	9.42E-10
TH-230	3.02E-15	7.11E-15	1.01E-14
RA-226	2.11E-18	4.83E-17	5.04E-17
PB-210	1.21E-22	5.25E-22	6.46E-22
U-235			
U-235	1.09E-05	1.66E-04	1.77E-04
PA-231	9.94E-10	2.99E-09	3.98E-09
AC-227	8.03E-11	2.85E-10	3.66E-10
U-234			
U-234	1.03E-04	2.52E-04	3.55E-04
TH-230	2.28E-09	5.36E-09	7.64E-09
RA-226	2.70E-12	6.18E-11	6.45E-11
PB-210	6.65E-16	2.88E-15	3.54E-15
CO-60			
CO-60	5.57E-09	1.28E-07	1.34E-07

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.39E-04	6.01E-04	7.40E-04
U-234	3.69E-10	8.56E-10	1.23E-09
TH-230	4.09E-15	9.45E-15	1.35E-14
RA-226	1.81E-18	2.93E-17	3.11E-17
PB-210	1.54E-22	4.54E-22	6.08E-22
U-235			
U-235	1.03E-05	9.88E-05	1.09E-04
PA-231	1.33E-09	3.42E-09	4.74E-09
AC-227	1.06E-10	2.95E-10	4.01E-10
U-234			
U-234	1.39E-04	3.23E-04	4.62E-04
TH-230	3.08E-09	7.12E-09	1.02E-08
RA-226	2.31E-12	3.75E-11	3.98E-11
PB-210	8.43E-16	2.49E-15	3.33E-15

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	4.51E-03	1.82E-03	6.33E-03
U-234	7.85E-10	4.72E-09	5.51E-09
TH-230	8.59E-15	5.23E-14	6.09E-14
RA-226	3.79E-16	2.63E-17	4.05E-16
PB-210	1.87E-21	1.94E-21	3.80E-21
U-235			
U-235	1.17E-03	1.44E-04	1.32E-03
PA-231	8.01E-09	1.70E-08	2.50E-08
AC-227	1.10E-09	1.33E-09	2.43E-09
U-234			
U-234	2.96E-04	1.78E-03	2.07E-03
TH-230	6.47E-09	3.94E-08	4.59E-08
RA-226	4.84E-10	3.36E-11	5.17E-10
PB-210	1.02E-14	1.06E-14	2.08E-14

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.43E-04	5.04E-03	5.18E-03
U-234	2.62E-10	1.82E-09	2.08E-09
TH-230	2.90E-15	2.02E-14	2.31E-14
RA-226	5.21E-18	4.01E-16	4.06E-16
PB-210	1.22E-22	2.24E-21	2.36E-21
U-235			
U-235	1.97E-05	1.24E-03	1.26E-03
PA-231	1.00E-09	1.20E-08	1.30E-08
AC-227	8.28E-11	1.43E-09	1.52E-09
U-234			
U-234	9.84E-05	6.85E-04	7.83E-04
TH-230	2.18E-09	1.52E-08	1.74E-08
RA-226	6.65E-12	5.12E-10	5.19E-10
PB-210	6.66E-16	1.23E-14	1.29E-14

Source: 5

Nuclide	Receptor ₁	Receptor ₂	Total
U-238			
U-238	1.20E-02	2.78E-02	3.98E-02
U-234	3.69E-08	8.47E-08	1.22E-07
TH-230	4.08E-13	9.38E-13	1.35E-12
RA-226	2.38E-18	1.86E-17	2.09E-17
PB-210	1.48E-20	3.31E-20	4.79E-20
U-235			
U-235	5.66E-04	1.34E-03	1.91E-03
PA-231	1.31E-07	3.02E-07	4.33E-07
AC-227	1.03E-08	2.30E-08	3.33E-08
U-234			
U-234	1.38E-02	3.18E-02	4.56E-02
TH-230	3.07E-07	7.04E-07	1.01E-06
RA-226	3.02E-12	2.36E-11	2.66E-11
PB-210	8.08E-14	1.81E-13	2.61E-13

Source: 6

Nuclide	Receptor ₁	Receptor ₂	Total
U-238			
U-238	2.45E-04	1.91E-03	2.15E-03
U-234	7.03E-10	4.72E-09	5.42E-09
TH-230	7.79E-15	5.23E-14	6.01E-14
RA-226	2.62E-18	6.16E-17	6.42E-17
PB-210	2.74E-22	1.85E-21	2.12E-21
U-235			
U-235	1.15E-05	9.24E-05	1.04E-04
PA-231	2.48E-09	1.68E-08	1.93E-08
AC-227	1.90E-10	1.31E-09	1.50E-09
U-234			
U-234	2.67E-04	1.79E-03	2.06E-03
TH-230	5.91E-09	3.97E-08	4.56E-08
RA-226	3.37E-12	7.92E-11	8.25E-11
PB-210	1.51E-15	1.02E-14	1.17E-14

Title : GJO Bldg 2 Occupancy w/ Covering Mtl

Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 10.0000 years

Assessment for Time: 2
Time =1.00E+01 yr

Source Information

Source: 1

Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]

Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]

Fraction released to air: 1.000E-01

Removable fraction: 1.000E-03

Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.819E+05
	U-235	1.310E+04
	U-234	3.009E+05
	PA-231	2.769E+00
	TH-230	2.710E+01
	AC-227	3.989E-01
	RA-226	5.865E-02
	PB-210	5.637E-03
	CO-60	2.681E-01

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:14 Page: 2- 1 : 20 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 10.0000 years

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.738E+05
	U-235	2.669E+04
	U-234	6.118E+05
	PA-231	5.643E+00
	TH-230	5.510E+01
	AC-227	8.129E-01
	RA-226	1.193E-01
	PB-210	1.146E-02

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.568E+05
	U-235	2.589E+04
	U-234	5.938E+05
	PA-231	5.474E+00
	TH-230	5.348E+01
	AC-227	7.886E-01
	RA-226	1.157E-01
	PB-210	1.112E-02

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.689E+05
	U-235	7.897E+03
	U-234	1.799E+05
	PA-231	1.670E+00
	TH-230	1.621E+01
	AC-227	2.405E-01
	RA-226	3.507E-02
	PB-210	3.371E-03

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.668E+04
	U-235	1.251E+03
	U-234	2.834E+04
	PA-231	2.644E-01
	TH-230	2.553E+00
	AC-227	3.809E-02
	RA-226	5.525E-03
	PB-210	5.310E-04

Source: 6
Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 0.000E+00 [l/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration
		[pCi/m2]
	U-238	4.099E+04
	U-235	1.899E+03
	U-234	4.399E+04
	PA-231	4.016E-01
	TH-230	3.962E+00
	AC-227	5.785E-02
	RA-226	8.574E-03
	PB-210	8.241E-04

[mm]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	2.3E-04	2.9E-04	6.0E-03	2.6E-04	2.6E-02	5.2E-04	3.4E-02
Receptor 2	1.2E-03	1.0E-03	3.7E-03	7.0E-03	6.1E-02	3.8E-03	7.8E-02
Total	1.4E-03	1.3E-03	9.7E-03	7.2E-03	8.7E-02	4.3E-03	1.1E-01

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.28E-05	3.59E-09	2.27E-11	1.94E-04	2.22E-18	1.06E-06
2	7.56E-04	1.09E-08	5.22E-11	4.46E-04	1.18E-17	2.43E-06
Total	7.89E-04	1.45E-08	7.49E-11	6.40E-04	1.41E-17	3.48E-06

Source: 2						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.34E-05	4.87E-09	3.08E-11	2.63E-04	3.01E-18	1.43E-06
2	4.15E-04	1.48E-08	7.08E-11	6.05E-04	1.60E-17	3.29E-06
Total	4.38E-04	1.96E-08	1.02E-10	8.68E-04	1.91E-17	4.72E-06

Source: 3						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.47E-03	9.27E-09	5.87E-11	5.02E-04	1.33E-17	2.73E-06
2	3.52E-04	8.22E-08	3.94E-10	3.37E-03	8.03E-17	1.83E-05
Total	5.82E-03	9.15E-08	4.53E-10	3.87E-03	9.36E-17	2.11E-05

Source: 4						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	7.40E-05	3.44E-09	2.18E-11	1.86E-04	4.94E-18	1.01E-06
2	5.71E-03	3.05E-08	1.46E-10	1.25E-03	2.97E-17	6.80E-06
Total	5.78E-03	3.40E-08	1.68E-10	1.44E-03	3.47E-17	7.81E-06

Source: 5						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	8.15E-06	4.87E-07	3.09E-09	2.63E-02	3.00E-16	1.43E-04
2	2.00E-04	1.48E-06	7.09E-09	6.04E-02	1.60E-15	3.28E-04
Total	2.08E-04	1.96E-06	1.02E-08	8.67E-02	1.90E-15	4.71E-04

Source: 6						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.64E-05	9.27E-09	5.87E-11	5.04E-04	1.34E-17	2.74E-06
2	3.89E-04	8.22E-08	3.94E-10	3.38E-03	8.08E-17	1.84E-05
Total	4.05E-04	9.15E-08	4.53E-10	3.89E-03	9.43E-17	2.11E-05

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:14 Page: 2- 4 : 25 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 10.0000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.14E-04	7.86E-04	9.00E-04
U-234	2.74E-09	6.68E-09	9.42E-09
TH-230	3.02E-13	7.11E-13	1.01E-12
RA-226	2.38E-15	5.46E-14	5.69E-14
PB-210	4.17E-18	1.81E-17	2.22E-17
U-235			
U-235	1.09E-05	1.66E-04	1.77E-04
PA-231	9.94E-09	2.99E-08	3.98E-08
AC-227	7.31E-09	2.60E-08	3.33E-08
U-234			
U-234	1.03E-04	2.52E-04	3.55E-04
TH-230	2.28E-08	5.36E-08	7.64E-08
RA-226	2.69E-10	6.17E-09	6.44E-09
PB-210	6.20E-13	2.68E-12	3.30E-12
CO-60			
CO-60	1.70E-09	3.93E-08	4.10E-08

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.39E-04	6.01E-04	7.40E-04
U-234	3.69E-09	8.56E-09	1.23E-08
TH-230	4.09E-13	9.44E-13	1.35E-12
RA-226	2.04E-15	3.31E-14	3.52E-14
PB-210	5.30E-18	1.56E-17	2.09E-17
U-235			
U-235	1.03E-05	9.87E-05	1.09E-04
PA-231	1.33E-08	3.41E-08	4.74E-08
AC-227	9.65E-09	2.69E-08	3.65E-08
U-234			
U-234	1.39E-04	3.23E-04	4.62E-04
TH-230	3.08E-08	7.11E-08	1.02E-07
RA-226	2.30E-10	3.74E-09	3.97E-09
PB-210	7.86E-13	2.32E-12	3.11E-12

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:14 Page: 2- 4 : 26 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBI\B2BAR.INP Evaluation Time: 10.0000 years

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	4.51E-03	1.82E-03	6.32E-03
U-234	7.85E-09	4.72E-08	5.51E-08
TH-230	8.59E-13	5.23E-12	6.09E-12
RA-226	4.27E-13	2.96E-14	4.57E-13
PB-210	6.43E-17	6.67E-17	1.31E-16
U-235			
U-235	1.17E-03	1.44E-04	1.32E-03
PA-231	8.01E-08	1.70E-07	2.50E-07
AC-227	1.00E-07	1.21E-07	2.21E-07
U-234			
U-234	2.96E-04	1.78E-03	2.07E-03
TH-230	6.47E-08	3.94E-07	4.59E-07
RA-226	4.83E-08	3.35E-09	5.16E-08
PB-210	9.55E-12	9.90E-12	1.94E-11

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.43E-04	5.04E-03	5.18E-03
U-234	2.62E-09	1.82E-08	2.08E-08
TH-230	2.90E-13	2.02E-12	2.31E-12
RA-226	5.88E-15	4.53E-13	4.59E-13
PB-210	4.19E-18	7.72E-17	8.14E-17
U-235			
U-235	1.97E-05	1.24E-03	1.26E-03
PA-231	1.00E-08	1.20E-07	1.30E-07
AC-227	7.54E-09	1.31E-07	1.38E-07
U-234			
U-234	9.84E-05	6.85E-04	7.83E-04
TH-230	2.18E-08	1.52E-07	1.74E-07
RA-226	6.64E-10	5.11E-08	5.18E-08
PB-210	6.21E-13	1.14E-11	1.21E-11

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.20E-02	2.78E-02	3.98E-02
U-234	3.69E-07	8.47E-07	1.22E-06
TH-230	4.08E-11	9.38E-11	1.35E-10
RA-226	2.58E-15	1.85E-14	2.11E-14
PB-210	5.09E-16	1.14E-15	1.65E-15
U-235			
U-235	5.66E-04	1.34E-03	1.90E-03
PA-231	1.31E-06	3.02E-06	4.33E-06
AC-227	9.37E-07	2.09E-06	3.03E-06
U-234			
U-234	1.38E-02	3.18E-02	4.56E-02
TH-230	3.07E-06	7.04E-06	1.01E-05
RA-226	2.91E-10	2.08E-09	2.37E-09
PB-210	7.53E-11	1.68E-10	2.44E-10

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.45E-04	1.91E-03	2.15E-03
U-234	7.03E-09	4.72E-08	5.42E-08
TH-230	7.79E-13	5.23E-12	6.01E-12
RA-226	2.96E-15	6.95E-14	7.25E-14
PB-210	9.43E-18	6.37E-17	7.31E-17
U-235			
U-235	1.15E-05	9.24E-05	1.04E-04
PA-231	2.48E-08	1.68E-07	1.93E-07
AC-227	1.73E-08	1.19E-07	1.36E-07
U-234			
U-234	2.67E-04	1.79E-03	2.06E-03
TH-230	5.90E-08	3.97E-07	4.56E-07
RA-226	3.36E-10	7.90E-09	8.24E-09
PB-210	1.41E-12	9.52E-12	1.09E-11

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:15 Page: 3- 1 : 28 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 20.0000 years

```
=====
=====
=====
Assessment for Time: 3
Time =2.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1

Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]
Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.818E+05
	U-235	1.309E+04
	U-234	3.008E+05
	PA-231	5.535E+00
	TH-230	5.418E+01
	AC-227	1.445E+00
	RA-226	2.342E-01
	PB-210	4.188E-02
	CO-60	7.189E-02

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
 Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.736E+05
	U-235	2.668E+04
	U-234	6.116E+05
	PA-231	1.128E+01
	TH-230	1.102E+02
	AC-227	2.946E+00
	RA-226	4.761E-01
	PB-210	8.515E-02

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
 Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.566E+05
	U-235	2.588E+04
	U-234	5.936E+05
	PA-231	1.094E+01
	TH-230	1.069E+02
	AC-227	2.858E+00
	RA-226	4.621E-01
	PB-210	8.265E-02

Source: 4
Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [l/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.689E+05
	U-235	7.895E+03
	U-234	1.799E+05
	PA-231	3.338E+00
	TH-230	3.240E+01
	AC-227	8.717E-01
	RA-226	1.400E-01
	PB-210	2.505E-02

Source: 5
Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [l/hr]
Fraction released to air: 1.000E-01
Removable fraction: 5.000E-01
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.136E+04
	U-235	1.001E+03
	U-234	2.269E+04
	PA-231	4.232E-01
	TH-230	4.087E+00
	AC-227	1.105E-01
	RA-226	1.766E-02
	PB-210	3.159E-03

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:15 Page: 3- 1 : 31 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 20.0000 years

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.097E+04
	U-235	1.899E+03
	U-234	4.397E+04
	PA-231	8.028E-01
	TH-230	7.920E+00
	AC-227	2.096E-01
	RA-226	3.423E-02
	PB-210	6.122E-03

RESRAD-BUILD Dose Tables

Receptor Point-Source Doses

		[mrem]						
		Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor	1	2.3E-04	2.9E-04	6.0E-03	2.6E-04	2.6E-02	5.2E-04	3.4E-02
Receptor	2	1.2E-03	1.0E-03	3.7E-03	7.0E-03	6.1E-02	3.8E-03	7.8E-02
Total		1.4E-03	1.3E-03	9.7E-03	7.2E-03	8.7E-02	4.3E-03	1.1E-01

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:15 Page: 3- 3 : 33 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 20.0000 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.28E-05	3.59E-09	2.27E-11	1.94E-04	8.88E-18	1.06E-06
2	7.56E-04	1.09E-08	5.22E-11	4.46E-04	4.73E-17	2.43E-06
Total	7.88E-04	1.45E-08	7.49E-11	6.40E-04	5.62E-17	3.48E-06

Source: 2						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.34E-05	4.87E-09	3.08E-11	2.64E-04	1.20E-17	1.43E-06
2	4.14E-04	1.48E-08	7.08E-11	6.05E-04	6.41E-17	3.29E-06
Total	4.38E-04	1.96E-08	1.02E-10	8.69E-04	7.61E-17	4.73E-06

Source: 3						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.47E-03	9.27E-09	5.87E-11	5.02E-04	5.32E-17	2.73E-06
2	3.52E-04	8.22E-08	3.94E-10	3.37E-03	3.21E-16	1.83E-05
Total	5.82E-03	9.15E-08	4.53E-10	3.87E-03	3.74E-16	2.11E-05

Source: 4						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	7.39E-05	3.44E-09	2.18E-11	1.86E-04	1.97E-17	1.01E-06
2	5.71E-03	3.05E-08	1.47E-10	1.25E-03	1.19E-16	6.80E-06
Total	5.78E-03	3.40E-08	1.68E-10	1.44E-03	1.39E-16	7.81E-06

Source: 5						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.52E-06	4.87E-07	3.09E-09	2.63E-02	1.20E-15	1.43E-04
2	1.60E-04	1.48E-06	7.09E-09	6.04E-02	6.39E-15	3.28E-04
Total	1.67E-04	1.96E-06	1.02E-08	8.67E-02	7.58E-15	4.72E-04

Source: 6						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.64E-05	9.28E-09	5.87E-11	5.04E-04	5.36E-17	2.74E-06
2	3.89E-04	8.22E-08	3.94E-10	3.38E-03	3.23E-16	1.84E-05
Total	4.05E-04	9.17E-08	4.53E-10	3.89E-03	3.76E-16	2.12E-05

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.14E-04	7.86E-04	9.00E-04
U-234	5.48E-09	1.34E-08	1.88E-08
TH-230	1.21E-12	2.84E-12	4.05E-12
RA-226	1.90E-14	4.36E-13	4.55E-13
PB-210	6.30E-17	2.72E-16	3.35E-16
U-235			
U-235	1.09E-05	1.66E-04	1.77E-04
PA-231	1.99E-08	5.98E-08	7.96E-08
AC-227	2.65E-08	9.42E-08	1.21E-07
U-234			
U-234	1.03E-04	2.52E-04	3.55E-04
TH-230	4.55E-08	1.07E-07	1.53E-07
RA-226	1.08E-09	2.46E-08	2.57E-08
PB-210	4.61E-12	1.99E-11	2.45E-11
CO-60			
CO-60	4.57E-10	1.05E-08	1.10E-08

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.39E-04	6.01E-04	7.40E-04
U-234	7.38E-09	1.71E-08	2.45E-08
TH-230	1.64E-12	3.78E-12	5.41E-12
RA-226	1.63E-14	2.65E-13	2.81E-13
PB-210	7.99E-17	2.36E-16	3.16E-16
U-235			
U-235	1.03E-05	9.87E-05	1.09E-04
PA-231	2.65E-08	6.83E-08	9.48E-08
AC-227	3.50E-08	9.74E-08	1.32E-07
U-234			
U-234	1.39E-04	3.23E-04	4.62E-04
TH-230	6.16E-08	1.42E-07	2.04E-07
RA-226	9.19E-10	1.49E-08	1.59E-08
PB-210	5.84E-12	1.73E-11	2.31E-11

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	4.51E-03	1.82E-03	6.32E-03
U-234	1.57E-08	9.44E-08	1.10E-07
TH-230	3.44E-12	2.09E-11	2.44E-11
RA-226	3.41E-12	2.37E-13	3.65E-12
PB-210	9.69E-16	1.01E-15	1.98E-15
U-235			
U-235	1.17E-03	1.44E-04	1.32E-03
PA-231	1.60E-07	3.40E-07	5.00E-07
AC-227	3.62E-07	4.40E-07	8.02E-07
U-234			
U-234	2.96E-04	1.78E-03	2.07E-03
TH-230	1.29E-07	7.88E-07	9.17E-07
RA-226	1.93E-07	1.34E-08	2.06E-07
PB-210	7.09E-11	7.36E-11	1.44E-10

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.43E-04	5.04E-03	5.18E-03
U-234	5.23E-09	3.64E-08	4.16E-08
TH-230	1.16E-12	8.08E-12	9.24E-12
RA-226	4.70E-14	3.62E-12	3.67E-12
PB-210	6.32E-17	1.16E-15	1.23E-15
U-235			
U-235	1.97E-05	1.24E-03	1.26E-03
PA-231	2.00E-08	2.39E-07	2.60E-07
AC-227	2.73E-08	4.73E-07	5.00E-07
U-234			
U-234	9.84E-05	6.85E-04	7.83E-04
TH-230	4.36E-08	3.04E-07	3.47E-07
RA-226	2.65E-09	2.04E-07	2.07E-07
PB-210	4.62E-12	8.50E-11	8.97E-11

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.20E-02	2.77E-02	3.98E-02
U-234	7.38E-07	1.69E-06	2.43E-06
TH-230	1.63E-10	3.75E-10	5.38E-10
RA-226	1.97E-14	1.26E-13	1.45E-13
PB-210	7.68E-15	1.72E-14	2.48E-14
U-235			
U-235	5.65E-04	1.33E-03	1.89E-03
PA-231	2.63E-06	6.03E-06	8.66E-06
AC-227	3.40E-06	7.58E-06	1.10E-05
U-234			
U-234	1.38E-02	3.18E-02	4.56E-02
TH-230	6.13E-06	1.41E-05	2.02E-05
RA-226	1.11E-09	7.07E-09	8.18E-09
PB-210	5.60E-10	1.25E-09	1.81E-09

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.45E-04	1.91E-03	2.15E-03
U-234	1.41E-08	9.44E-08	1.08E-07
TH-230	3.11E-12	2.09E-11	2.40E-11
RA-226	2.36E-14	5.55E-13	5.79E-13
PB-210	1.42E-16	9.61E-16	1.10E-15
U-235			
U-235	1.15E-05	9.24E-05	1.04E-04
PA-231	4.97E-08	3.36E-07	3.86E-07
AC-227	6.27E-08	4.32E-07	4.94E-07
U-234			
U-234	2.67E-04	1.79E-03	2.06E-03
TH-230	1.18E-07	7.93E-07	9.11E-07
RA-226	1.34E-09	3.16E-08	3.29E-08
PB-210	1.05E-11	7.07E-11	8.12E-11

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:16 Page: 4- 1 : 37 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 30.0000 years

```
=====
=====
===== Assessment for Time: 4 =====
===== Time =3.00E+01 yr =====
=====
=====
```

===== Source Information =====

Source: 1
Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]
Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.817E+05
	U-235	1.309E+04
	U-234	3.007E+05
	PA-231	8.299E+00
	TH-230	8.124E+01
	AC-227	2.962E+00
	RA-226	5.260E-01
	PB-210	1.317E-01
	CO-60	1.927E-02

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:16 Page: 4- 1 : 38 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 30.0000 years

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration
		[pCi/m2]
	U-238	5.734E+05
	U-235	2.667E+04
	U-234	6.114E+05
	PA-231	1.691E+01
	TH-230	1.652E+02
	AC-227	6.037E+00
	RA-226	1.069E+00
	PB-210	2.678E-01

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration
		[pCi/m2]
	U-238	5.564E+05
	U-235	2.587E+04
	U-234	5.934E+05
	PA-231	1.641E+01
	TH-230	1.603E+02
	AC-227	5.856E+00
	RA-226	1.038E+00
	PB-210	2.599E-01

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-03
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.688E+05
	U-235	7.892E+03
	U-234	1.798E+05
	PA-231	5.005E+00
	TH-230	4.858E+01
	AC-227	1.786E+00
	RA-226	3.145E-01
	PB-210	7.875E-02

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.603E+04
	U-235	7.515E+02
	U-234	1.703E+04
	PA-231	4.766E-01
	TH-230	4.602E+00
	AC-227	1.701E-01
	RA-226	2.980E-02
	PB-210	7.460E-03

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:16 Page: 4- 1 : 40 **
Title : GJO Bldg 2 Occupancy w/ Covering Mtl
Input File : C:\WINBI.D\B2BAR.INP Evaluation Time: 30.0000 years

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-03
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.096E+04
	U-235	1.898E+03
	U-234	4.396E+04
	PA-231	1.204E+00
	TH-230	1.188E+01
	AC-227	4.296E-01
	RA-226	7.688E-02
	PB-210	1.925E-02

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:16 Page: 4- 2 : 41 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 30.0000 years

RESRAD-BUILD Dose Tables

Receptor Point-Source Doses

[mrem]

	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	2.3E-04	2.9E-04	6.0E-03	2.6E-04	2.6E-02	5.2E-04	3.4E-02
Receptor 2	1.2E-03	1.0E-03	3.7E-03	7.0E-03	6.1E-02	3.8E-03	7.8E-02
Total	1.4E-03	1.3E-03	9.7E-03	7.2E-03	8.7E-02	4.3E-03	1.1E-01

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.28E-05	3.59E-09	2.27E-11	1.94E-04	1.99E-17	1.06E-06
2	7.55E-04	1.09E-08	5.22E-11	4.46E-04	1.06E-16	2.43E-06
Total	7.88E-04	1.45E-08	7.49E-11	6.41E-04	1.26E-16	3.49E-06
Source: 2						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.34E-05	4.87E-09	3.08E-11	2.64E-04	2.70E-17	1.43E-06
2	4.14E-04	1.48E-08	7.08E-11	6.05E-04	1.44E-16	3.29E-06
Total	4.38E-04	1.96E-08	1.02E-10	8.69E-04	1.71E-16	4.73E-06
Source: 3						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.47E-03	9.27E-09	5.87E-11	5.02E-04	1.19E-16	2.73E-06
2	3.52E-04	8.22E-08	3.94E-10	3.37E-03	7.20E-16	1.83E-05
Total	5.82E-03	9.15E-08	4.53E-10	3.87E-03	8.40E-16	2.11E-05
Source: 4						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	7.39E-05	3.44E-09	2.18E-11	1.86E-04	4.43E-17	1.01E-06
2	5.70E-03	3.05E-08	1.47E-10	1.25E-03	2.67E-16	6.80E-06
Total	5.78E-03	3.40E-08	1.68E-10	1.44E-03	3.11E-16	7.82E-06
Source: 5						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	4.90E-06	4.87E-07	3.09E-09	2.63E-02	2.69E-15	1.43E-04
2	1.20E-04	1.48E-06	7.09E-09	6.04E-02	1.43E-14	3.29E-04
Total	1.25E-04	1.96E-06	1.02E-08	8.67E-02	1.70E-14	4.72E-04
Source: 6						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.64E-05	9.28E-09	5.87E-11	5.04E-04	1.20E-16	2.74E-06
2	3.89E-04	8.22E-08	3.94E-10	3.39E-03	7.25E-16	1.84E-05
Total	4.05E-04	9.15E-08	4.53E-10	3.89E-03	8.46E-16	2.12E-05

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.14E-04	7.86E-04	8.99E-04
U-234	8.21E-09	2.01E-08	2.83E-08
TH-230	2.72E-12	6.39E-12	9.11E-12
RA-226	6.41E-14	1.47E-12	1.53E-12
PB-210	3.01E-16	1.30E-15	1.60E-15
U-235			
U-235	1.09E-05	1.66E-04	1.77E-04
PA-231	2.98E-08	8.96E-08	1.19E-07
AC-227	5.43E-08	1.93E-07	2.47E-07
U-234			
U-234	1.03E-04	2.52E-04	3.55E-04
TH-230	6.83E-08	1.61E-07	2.29E-07
RA-226	2.41E-09	5.53E-08	5.77E-08
PB-210	1.45E-11	6.27E-11	7.72E-11
CO-60			
CO-60	1.23E-10	2.82E-09	2.95E-09

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.39E-04	6.01E-04	7.40E-04
U-234	1.11E-08	2.57E-08	3.68E-08
TH-230	3.68E-12	8.50E-12	1.22E-11
RA-226	5.49E-14	8.92E-13	9.47E-13
PB-210	3.82E-16	1.13E-15	1.51E-15
U-235			
U-235	1.03E-05	9.87E-05	1.09E-04
PA-231	3.98E-08	1.02E-07	1.42E-07
AC-227	7.17E-08	2.00E-07	2.71E-07
U-234			
U-234	1.39E-04	3.23E-04	4.62E-04
TH-230	9.24E-08	2.13E-07	3.06E-07
RA-226	2.06E-09	3.36E-08	3.56E-08
PB-210	1.84E-11	5.43E-11	7.26E-11

** RESRAD-BUILD Program Output, Version 2.10 04/17/97 16:16 Page: 4- 4 : 44 **
 Title : GJO Bldg 2 Occupancy w/ Covering Mtl
 Input File : C:\WINBLD\B2BAR.INP Evaluation Time: 30.0000 years

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	4.50E-03	1.82E-03	6.32E-03
U-234	2.35E-08	1.42E-07	1.65E-07
TH-230	7.73E-12	4.71E-11	5.48E-11
RA-226	1.15E-11	7.98E-13	1.23E-11
PB-210	4.63E-15	4.81E-15	9.44E-15
U-235			
U-235	1.17E-03	1.44E-04	1.32E-03
PA-231	2.40E-07	5.10E-07	7.50E-07
AC-227	7.42E-07	9.02E-07	1.64E-06
U-234			
U-234	2.96E-04	1.78E-03	2.07E-03
TH-230	1.94E-07	1.18E-06	1.38E-06
RA-226	4.33E-07	3.00E-08	4.63E-07
PB-210	2.23E-10	2.31E-10	4.54E-10

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.43E-04	5.03E-03	5.18E-03
U-234	7.85E-09	5.46E-08	6.24E-08
TH-230	2.61E-12	1.82E-11	2.08E-11
RA-226	1.58E-13	1.22E-11	1.24E-11
PB-210	3.02E-16	5.56E-15	5.87E-15
U-235			
U-235	1.97E-05	1.24E-03	1.26E-03
PA-231	3.00E-08	3.59E-07	3.89E-07
AC-227	5.60E-08	9.69E-07	1.03E-06
U-234			
U-234	9.84E-05	6.85E-04	7.83E-04
TH-230	6.54E-08	4.56E-07	5.21E-07
RA-226	5.95E-09	4.58E-07	4.64E-07
PB-210	1.45E-11	2.67E-10	2.82E-10

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.20E-02	2.77E-02	3.97E-02
U-234	1.11E-06	2.54E-06	3.65E-06
TH-230	3.68E-10	8.44E-10	1.21E-09
RA-226	6.35E-14	3.49E-13	4.13E-13
PB-210	3.67E-14	8.20E-14	1.19E-13
U-235			
U-235	5.65E-04	1.32E-03	1.88E-03
PA-231	3.94E-06	9.05E-06	1.30E-05
AC-227	6.96E-06	1.55E-05	2.25E-05
U-234			
U-234	1.38E-02	3.18E-02	4.56E-02
TH-230	9.20E-06	2.11E-05	3.03E-05
RA-226	2.38E-09	1.31E-08	1.55E-08
PB-210	1.76E-09	3.93E-09	5.69E-09

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.45E-04	1.91E-03	2.15E-03
U-234	2.11E-08	1.42E-07	1.63E-07
TH-230	7.01E-12	4.71E-11	5.41E-11
RA-226	7.96E-14	1.87E-12	1.95E-12
PB-210	6.80E-16	4.59E-15	5.27E-15
U-235			
U-235	1.15E-05	9.24E-05	1.04E-04
PA-231	7.45E-08	5.05E-07	5.79E-07
AC-227	1.28E-07	8.85E-07	1.01E-06
U-234			
U-234	2.67E-04	1.79E-03	2.06E-03
TH-230	1.77E-07	1.19E-06	1.37E-06
RA-226	3.02E-09	7.09E-08	7.39E-08
PB-210	3.29E-11	2.22E-10	2.55E-10

RESRAD-BUILD Dose (Time) Tables

Receptor Doses By Time

[mrem]

Time [yr]

	1.00E+00	1.00E+01	2.00E+01	3.00E+01
1	3.37E-02	3.37E-02	3.37E-02	3.37E-02
2	7.76E-02	7.76E-02	7.76E-02	7.76E-02

Receptor Doses Per Year

[mrem/yr]

Time [yr]

	1.00E+00	1.00E+01	2.00E+01	3.00E+01
1	5.13E-02	5.13E-02	5.13E-02	5.13E-02
2	1.18E-01	1.18E-01	1.18E-01	1.18E-01
				<u>1.69E-01</u>

7.2 Normal Occupancy Without Covering Materials

RESRAD-BUILD Table of Contents

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=====
 =====
 =====
 RESRAD-BUILD Input Parameters
 =====
 =====
 =====

Number of Sources : 6
 Number of Receptors: 2
 Total Time : 2.400000E+02 days
 Fraction Inside : 3.000000E-01

===== Receptor Information =====

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	3.000	3.000	1.000	0.270	1.80E+01	1.00E-04
2	2	20.000	3.000	1.000	0.730	1.80E+01	1.00E-04

===== Receptor-Source Relationship =====

Recept	Source 1			Source 2			Source 3			Source 4			Source 5		
	Density	Thickness	Or	Density	Thickness	Or	Density	Thickness	Or	Density	Thickness	Or	Density	Thickness	Or
	[g/cm3]	[cm]		[g/cm3]	[cm]		[g/cm3]	[cm]		[g/cm3]	[cm]		[g/cm3]	[cm]	
1	5.00E-01	0.00E+00	RT	5.00E-01	0.00E+00	RT	5.00E-01	0.00E+00	RT	5.00E-01	0.00E+00	RT	2.00E+00	0.00E+00	RT
2	5.00E-01	0.00E+00	RT	5.00E-01	0.00E+00	RT	5.00E-01	0.00E+00	RT	5.00E-01	0.00E+00	RT	2.00E+00	0.00E+00	RT

Recept	Source 6		
	Density	Thickness	Or
	[g/cm3]	[cm]	
1	2.50E+00	0.00E+00	RT
2	2.50E+00	0.00E+00	RT

Building Air Exchange Rate: 1.00E+00 1/hr

Air Exchanges [m3/hr]

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

===== Source Information =====

Source: 1
 Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50[m]
 Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	2.820E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.310E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	3.010E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05
CO-60	1.000E+00	2.600E-05	1.500E-04	2.750E-04	1.020E-05	1.470E-02

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:09 Page: 0- 3 : 5 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50[m]
 Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration		Dose Conversion Factors				
		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	5.740E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	2.670E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	6.120E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00[m]
 Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
 Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::		Dose Conversion Factors			
Nuclide Concentration					
		Ingestion	Inhalation	External (Surface)	External Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]
U-238	5.570E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08
U-235	2.590E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07
U-234	5.940E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09
					1.600E-04
					9.030E-04
					8.930E-07
					2.010E-04
					2.040E-06
					2.160E-03
					1.040E-02
					1.430E-05

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:09 Page: 0- 3 : 7 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00[m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	1.690E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	7.900E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	1.800E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20[m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E+00
 Time to Remove: 1.098E+04 [day]
 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	3.200E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.500E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	3.400E+04	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:09 Page: 0- 3 : 9 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00[m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z

Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	4.100E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.900E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	4.400E+04	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Assessment for Time: 1	
Time =1.00E+00 yr	

Source Information

Source: 1
 Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]
 Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.819E+05
	U-235	1.310E+04
	U-234	3.009E+05
	PA-231	2.769E-01
	TH-230	2.710E+00
	AC-227	4.378E-03
	RA-226	5.873E-04
	PB-210	6.041E-06
	CO-60	8.764E-01

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:10 Page: 1- 1 : 11 **
Title : GJO Bldg 2 Occupancy w/o Covering Mtl
Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 1.00000 years

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.738E+05
	U-235	2.669E+04
	U-234	6.118E+05
	PA-231	5.644E-01
	TH-230	5.510E+00
	AC-227	8.923E-03
	RA-226	1.194E-03
	PB-210	1.228E-05

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.568E+05
	U-235	2.589E+04
	U-234	5.938E+05
	PA-231	5.475E-01
	TH-230	5.348E+00
	AC-227	8.656E-03
	RA-226	1.159E-03
	PB-210	1.192E-05

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.689E+05
	U-235	7.897E+03
	U-234	1.799E+05
	PA-231	1.670E-01
	TH-230	1.621E+00
	AC-227	2.640E-03
	RA-226	3.512E-04
	PB-210	3.613E-06

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E+00
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	3.094E+04
	U-235	1.450E+03
	U-234	3.287E+04
	PA-231	3.066E-02
	TH-230	2.960E-01
	AC-227	4.848E-04
	RA-226	6.415E-05
	PB-210	6.599E-07

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.099E+04
	U-235	1.899E+03
	U-234	4.399E+04
	PA-231	4.016E-02
	TH-230	3.962E-01
	AC-227	6.350E-04
	RA-226	8.585E-05
	PB-210	8.831E-07

=====
 =====
 =====
 RESRAD-BUILD Dose Tables
 =====
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 =====

Receptor Point-Source Doses							
[mrem]							
	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	2.0E-03	2.7E-03	1.2E-02	2.0E-03	5.3E-02	5.6E-03	7.7E-02
Receptor 2	5.3E-03	6.5E-03	3.4E-02	2.0E-02	1.2E-01	4.6E-02	2.3E-01
Total	7.3E-03	9.2E-03	4.6E-02	2.2E-02	1.7E-01	5.2E-02	3.1E-01

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:10 Page: 1- 3 : 15 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 1.00000 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.58E-05	3.59E-08	2.27E-10	1.94E-03	2.23E-19	1.06E-05
2	8.24E-04	1.09E-07	5.22E-10	4.46E-03	1.19E-18	2.43E-05
Total	8.60E-04	1.45E-07	7.49E-10	6.40E-03	1.41E-18	3.48E-05

Source: 2						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.55E-05	4.87E-08	3.08E-10	2.63E-03	3.02E-19	1.43E-05
2	4.61E-04	1.48E-07	7.08E-10	6.05E-03	1.61E-18	3.29E-05
Total	4.87E-04	1.96E-07	1.02E-09	8.68E-03	1.91E-18	4.72E-05

Source: 3						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.54E-03	9.27E-08	5.87E-10	5.02E-03	1.33E-18	2.73E-05
2	3.84E-04	8.22E-07	3.94E-09	3.37E-02	8.04E-18	1.83E-04
Total	6.93E-03	9.15E-07	4.53E-09	3.87E-02	9.37E-18	2.11E-04

Source: 4						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	9.16E-05	3.44E-08	2.18E-10	1.86E-03	4.94E-19	1.01E-05
2	7.07E-03	3.05E-07	1.46E-09	1.25E-02	2.98E-18	6.80E-05
Total	7.16E-03	3.40E-07	1.68E-09	1.44E-02	3.47E-18	7.81E-05

Source: 5						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	9.58E-06	9.75E-07	6.18E-09	5.26E-02	6.01E-18	2.86E-04
2	2.35E-04	2.95E-06	1.42E-08	1.21E-01	3.20E-17	6.57E-04
Total	2.45E-04	3.93E-06	2.04E-08	1.73E-01	3.80E-17	9.43E-04

Source: 6						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.25E-04	9.27E-08	5.87E-10	5.04E-03	1.34E-18	2.74E-05
2	1.25E-02	8.22E-07	3.94E-09	3.38E-02	8.10E-18	1.84E-04
Total	1.30E-02	9.15E-07	4.53E-09	3.89E-02	9.44E-18	2.11E-04

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:10 Page: 1- 4 : 16 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 1.00000 years

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.14E-04	2.66E-03	3.58E-03
U-234	2.72E-09	6.31E-09	9.03E-09
TH-230	3.01E-14	6.94E-14	9.95E-14
RA-226	2.29E-18	5.01E-17	5.24E-17
PB-210	1.11E-21	2.80E-21	3.91E-21
U-235			
U-235	4.85E-05	2.64E-04	3.12E-04
PA-231	9.63E-09	2.29E-08	3.25E-08
AC-227	7.57E-10	1.80E-09	2.56E-09
U-234			
U-234	1.03E-03	2.38E-03	3.41E-03
TH-230	2.27E-08	5.23E-08	7.51E-08
RA-226	2.93E-12	6.41E-11	6.70E-11
PB-210	6.07E-15	1.54E-14	2.15E-14
CO-60			
CO-60	5.73E-09	1.32E-07	1.38E-07

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.22E-03	3.12E-03	4.34E-03
U-234	3.69E-09	8.49E-09	1.22E-08
TH-230	4.09E-14	9.39E-14	1.35E-13
RA-226	2.06E-18	3.13E-17	3.33E-17
PB-210	1.49E-21	3.45E-21	4.94E-21
U-235			
U-235	6.12E-05	2.25E-04	2.86E-04
PA-231	1.31E-08	3.04E-08	4.35E-08
AC-227	1.03E-09	2.35E-09	3.38E-09
U-234			
U-234	1.39E-03	3.20E-03	4.59E-03
TH-230	3.08E-08	7.07E-08	1.02E-07
RA-226	2.63E-12	3.99E-11	4.26E-11
PB-210	8.14E-15	1.89E-14	2.70E-14

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	7.28E-03	1.57E-02	2.30E-02
U-234	7.58E-09	4.72E-08	5.48E-08
TH-230	8.00E-14	5.23E-13	6.03E-13
RA-226	3.96E-16	2.93E-17	4.25E-16
PB-210	5.67E-21	1.86E-20	2.43E-20
U-235			
U-235	1.45E-03	7.95E-04	2.25E-03
PA-231	3.18E-08	1.67E-07	1.99E-07
AC-227	2.88E-09	1.28E-08	1.57E-08
U-234			
U-234	2.86E-03	1.78E-02	2.06E-02
TH-230	6.03E-08	3.94E-07	4.54E-07
RA-226	5.06E-10	3.74E-11	5.44E-10
PB-210	3.11E-14	1.02E-13	1.33E-13

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.20E-04	1.11E-02	1.20E-02
U-234	2.61E-09	1.81E-08	2.07E-08
TH-230	2.89E-14	1.96E-13	2.25E-13
RA-226	5.65E-18	4.27E-16	4.33E-16
PB-210	1.06E-21	1.01E-20	1.11E-20
U-235			
U-235	5.86E-05	1.72E-03	1.78E-03
PA-231	9.36E-09	6.97E-08	7.91E-08
AC-227	7.18E-10	5.82E-09	6.54E-09
U-234			
U-234	9.84E-04	6.81E-03	7.80E-03
TH-230	2.18E-08	1.48E-07	1.69E-07
RA-226	7.21E-12	5.45E-10	5.52E-10
PB-210	5.79E-15	5.50E-14	6.08E-14

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.41E-02	5.54E-02	7.95E-02
U-234	7.38E-08	1.69E-07	2.43E-07
TH-230	8.17E-13	1.88E-12	2.69E-12
RA-226	4.15E-18	2.25E-17	2.66E-17
PB-210	2.96E-20	6.61E-20	9.57E-20
U-235			
U-235	1.13E-03	2.64E-03	3.77E-03
PA-231	2.63E-07	6.03E-07	8.66E-07
AC-227	2.06E-08	4.59E-08	6.65E-08
U-234			
U-234	2.77E-02	6.36E-02	9.12E-02
TH-230	6.13E-07	1.41E-06	2.02E-06
RA-226	5.29E-12	2.86E-11	3.39E-11
PB-210	1.62E-13	3.61E-13	5.22E-13

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.69E-03	2.49E-02	2.76E-02
U-234	7.08E-09	4.83E-08	5.54E-08
TH-230	7.81E-14	5.27E-13	6.05E-13
RA-226	3.20E-17	7.54E-16	7.86E-16
PB-210	2.98E-21	2.43E-20	2.73E-20
U-235			
U-235	2.14E-04	3.26E-03	3.47E-03
PA-231	2.53E-08	1.79E-07	2.05E-07
AC-227	1.96E-09	1.46E-08	1.65E-08
U-234			
U-234	2.68E-03	1.83E-02	2.10E-02
TH-230	5.92E-08	4.00E-07	4.59E-07
RA-226	4.12E-11	9.69E-10	1.01E-09
PB-210	1.65E-14	1.34E-13	1.50E-13

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.721E+05
	U-235	2.661E+04
	U-234	6.100E+05
	PA-231	5.626E+00
	TH-230	5.494E+01
	AC-227	8.105E-01
	RA-226	1.189E-01
	PB-210	1.143E-02

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.551E+05
	U-235	2.581E+04
	U-234	5.920E+05
	PA-231	5.458E+00
	TH-230	5.332E+01
	AC-227	7.862E-01
	RA-226	1.154E-01
	PB-210	1.109E-02

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:11 Page: 2- 1 : 21 **
Title : GJO Bldg 2 Occupancy w/o Covering Mtl
Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 10.0000 years

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.684E+05
	U-235	7.874E+03
	U-234	1.794E+05
	PA-231	1.665E+00
	TH-230	1.616E+01
	AC-227	2.398E-01
	RA-226	3.497E-02
	PB-210	3.361E-03

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E+00
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.136E+04
	U-235	1.001E+03
	U-234	2.269E+04
	PA-231	2.116E-01
	TH-230	2.044E+00
	AC-227	3.049E-02
	RA-226	4.423E-03
	PB-210	4.251E-04

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:11 Page: 2- 1 : 22 **
Title : GJO Bldg 2 Occupancy w/o Covering Mtl
Input File : C:\WINBLD\B2NOBAR.INEvaluation Time: 10.0000 years

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.086E+04
	U-235	1.894E+03
	U-234	4.385E+04
	PA-231	4.004E-01
	TH-230	3.950E+00
	AC-227	5.768E-02
	RA-226	8.548E-03
	PB-210	8.216E-04

```

*** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:11 Page: 2- 2 :
Title : GJO Bldg 2 Occupancy w/o Covering Mtl
Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 10.0000 years

```

RESRAD-BUILD Dose Tables

Receptor Point-Source Doses

[mrem]

	Source	Source	Source	Source	Source	Source	Total
1	2.0E-03	2.7E-03	1.2E-02	2.0E-03	5.3E-02	5.6E-03	7.7E-02
Receptor 1	5.3E-03	6.5E-03	3.4E-02	2.0E-02	1.2E-01	4.6E-02	2.3E-01
2	7.3E-03	9.2E-03	4.6E-02	2.2E-02	1.7E-01	5.2E-02	3.1E-01
Receptor 2							
Total							

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:11 Page: 2- 3 : 24 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 10.0000 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.57E-05	3.59E-08	2.27E-10	1.94E-03	2.22E-17	1.06E-05
2	8.22E-04	1.09E-07	5.22E-10	4.46E-03	1.18E-16	2.43E-05
Total	8.58E-04	1.45E-07	7.49E-10	6.40E-03	1.41E-16	3.48E-05

Source: 2						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.54E-05	4.87E-08	3.08E-10	2.63E-03	3.01E-17	1.43E-05
2	4.60E-04	1.48E-07	7.08E-10	6.05E-03	1.60E-16	3.29E-05
Total	4.86E-04	1.96E-07	1.02E-09	8.68E-03	1.91E-16	4.72E-05

Source: 3						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.53E-03	9.27E-08	5.87E-10	5.02E-03	1.33E-16	2.73E-05
2	3.83E-04	8.22E-07	3.94E-09	3.37E-02	8.03E-16	1.83E-04
Total	6.91E-03	9.15E-07	4.53E-09	3.87E-02	9.36E-16	2.11E-04

Source: 4						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	9.13E-05	3.44E-08	2.18E-10	1.86E-03	4.94E-17	1.01E-05
2	7.05E-03	3.05E-07	1.46E-09	1.25E-02	2.97E-16	6.80E-05
Total	7.14E-03	3.40E-07	1.68E-09	1.44E-02	3.47E-16	7.81E-05

Source: 5						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.61E-06	9.75E-07	6.18E-09	5.26E-02	6.00E-16	2.86E-04
2	1.62E-04	2.95E-06	1.42E-08	1.21E-01	3.20E-15	6.57E-04
Total	1.69E-04	3.93E-06	2.04E-08	1.73E-01	3.80E-15	9.43E-04

Source: 6						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.24E-04	9.27E-08	5.87E-10	5.04E-03	1.34E-16	2.74E-05
2	1.24E-02	8.22E-07	3.94E-09	3.38E-02	8.08E-16	1.84E-04
Total	1.29E-02	9.15E-07	4.53E-09	3.89E-02	9.43E-16	2.11E-04

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.14E-04	2.66E-03	3.58E-03
U-234	2.72E-08	6.31E-08	9.03E-08
TH-230	3.01E-12	6.94E-12	9.95E-12
RA-226	2.58E-15	5.64E-14	5.90E-14
PB-210	3.81E-17	9.65E-17	1.35E-16
U-235			
U-235	4.85E-05	2.63E-04	3.12E-04
PA-231	9.63E-08	2.29E-07	3.25E-07
AC-227	6.90E-08	1.64E-07	2.33E-07
U-234			
U-234	1.03E-03	2.38E-03	3.41E-03
TH-230	2.27E-07	5.23E-07	7.50E-07
RA-226	2.92E-10	6.38E-09	6.67E-09
PB-210	5.66E-12	1.43E-11	2.00E-11
CO-60			
CO-60	1.75E-09	4.02E-08	4.20E-08

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.22E-03	3.12E-03	4.34E-03
U-234	3.69E-08	8.49E-08	1.22E-07
TH-230	4.09E-12	9.39E-12	1.35E-11
RA-226	2.32E-15	3.52E-14	3.75E-14
PB-210	5.12E-17	1.19E-16	1.70E-16
U-235			
U-235	6.12E-05	2.24E-04	2.86E-04
PA-231	1.31E-07	3.04E-07	4.35E-07
AC-227	9.34E-08	2.14E-07	3.07E-07
U-234			
U-234	1.39E-03	3.20E-03	4.59E-03
TH-230	3.08E-07	7.07E-07	1.01E-06
RA-226	2.62E-10	3.98E-09	4.24E-09
PB-210	7.60E-12	1.76E-11	2.52E-11

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:11 Page: 2- 4 : 26 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 10.0000 years

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	7.27E-03	1.57E-02	2.30E-02
U-234	7.58E-08	4.72E-07	5.48E-07
TH-230	8.00E-12	5.23E-11	6.03E-11
RA-226	4.46E-13	3.30E-14	4.79E-13
PB-210	1.95E-16	6.40E-16	8.35E-16
U-235			
U-235	1.45E-03	7.95E-04	2.24E-03
PA-231	3.17E-07	1.67E-06	1.99E-06
AC-227	2.62E-07	1.17E-06	1.43E-06
U-234			
U-234	2.85E-03	1.78E-02	2.06E-02
TH-230	6.03E-07	3.94E-06	4.54E-06
RA-226	5.04E-08	3.72E-09	5.41E-08
PB-210	2.90E-11	9.50E-11	1.24E-10

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.20E-04	1.11E-02	1.20E-02
U-234	2.61E-08	1.81E-07	2.07E-07
TH-230	2.89E-12	1.96E-11	2.25E-11
RA-226	6.36E-15	4.81E-13	4.87E-13
PB-210	3.64E-17	3.46E-16	3.82E-16
U-235			
U-235	5.86E-05	1.72E-03	1.78E-03
PA-231	9.35E-08	6.97E-07	7.90E-07
AC-227	6.54E-08	5.30E-07	5.96E-07
U-234			
U-234	9.84E-04	6.81E-03	7.80E-03
TH-230	2.17E-07	1.48E-06	1.69E-06
RA-226	7.18E-10	5.43E-08	5.50E-08
PB-210	5.40E-12	5.13E-11	5.67E-11

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.41E-02	5.53E-02	7.94E-02
U-234	7.38E-07	1.69E-06	2.43E-06
TH-230	8.17E-11	1.88E-10	2.69E-10
RA-226	4.49E-15	2.04E-14	2.49E-14
PB-210	1.02E-15	2.27E-15	3.29E-15
U-235			
U-235	1.13E-03	2.62E-03	3.75E-03
PA-231	2.63E-06	6.03E-06	8.66E-06
AC-227	1.87E-06	4.18E-06	6.05E-06
U-234			
U-234	2.77E-02	6.36E-02	9.12E-02
TH-230	6.13E-06	1.41E-05	2.02E-05
RA-226	5.05E-10	2.30E-09	2.80E-09
PB-210	1.51E-10	3.36E-10	4.87E-10

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.69E-03	2.49E-02	2.76E-02
U-234	7.08E-08	4.83E-07	5.54E-07
TH-230	7.80E-12	5.27E-11	6.05E-11
RA-226	3.61E-14	8.49E-13	8.85E-13
PB-210	1.03E-16	8.36E-16	9.39E-16
U-235			
U-235	2.13E-04	3.25E-03	3.47E-03
PA-231	2.53E-07	1.79E-06	2.05E-06
AC-227	1.79E-07	1.33E-06	1.51E-06
U-234			
U-234	2.68E-03	1.83E-02	2.10E-02
TH-230	5.92E-07	4.00E-06	4.59E-06
RA-226	4.10E-09	9.65E-08	1.01E-07
PB-210	1.53E-11	1.25E-10	1.40E-10

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:13 Page: 3- 1 : 28 **
Title : GJO Bldg 2 Occupancy w/o Covering Mtl
Input File : C:\WINBLD\B2NOBAR.INEvaluation Time: 20.0000 years

```
=====
=====
Assessment for Time: 3
Time =2.00E+01 yr
=====
=====
```

===== Source Information =====

Source: 1
Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]
Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.801E+05
	U-235	1.301E+04
	U-234	2.990E+05
	PA-231	5.502E+00
	TH-230	5.386E+01
	AC-227	1.437E+00
	RA-226	2.328E-01
	PB-210	4.163E-02
	CO-60	7.146E-02

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:13 Page: 3- 1 : 29 **
Title : GJO Bldg 2 Occupancy w/o Covering Mt1
Input File : C:\WINBLD\B2NOBAR.INEvaluation Time: 20.0000 years

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.702E+05
	U-235	2.652E+04
	U-234	6.079E+05
	PA-231	1.121E+01
	TH-230	1.095E+02
	AC-227	2.928E+00
	RA-226	4.733E-01
	PB-210	8.464E-02

Source: 3

Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.533E+05
	U-235	2.573E+04
	U-234	5.900E+05
	PA-231	1.088E+01
	TH-230	1.063E+02
	AC-227	2.841E+00
	RA-226	4.594E-01
	PB-210	8.215E-02

Source: 4
 Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.679E+05
	U-235	7.847E+03
	U-234	1.788E+05
	PA-231	3.318E+00
	TH-230	3.221E+01
	AC-227	8.665E-01
	RA-226	1.392E-01
	PB-210	2.490E-02

Source: 5
 Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
 Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E+00
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.071E+04
	U-235	5.020E+02
	U-234	1.138E+04
	PA-231	2.123E-01
	TH-230	2.050E+00
	AC-227	5.543E-02
	RA-226	8.859E-03
	PB-210	1.584E-03

Source: 6

Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.073E+04
	U-235	1.887E+03
	U-234	4.371E+04
	PA-231	7.980E-01
	TH-230	7.873E+00
	AC-227	2.084E-01
	RA-226	3.403E-02
	PB-210	6.086E-03

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:13 Page: 3- 2 : 32 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 20.0000 years

RESRAD-BUILD Dose Tables

Receptor Point-Source Doses

		[mrem]						
		Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor	1	2.0E-03	2.7E-03	1.2E-02	2.0E-03	5.3E-02	5.6E-03	7.7E-02
Receptor	2	5.3E-03	6.5E-03	3.4E-02	2.0E-02	1.2E-01	4.6E-02	2.3E-01
Total		7.3E-03	9.2E-03	4.6E-02	2.2E-02	1.7E-01	5.2E-02	3.1E-01

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:13 Page: 3- 3 : 33 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 20.0000 years

Pathway Detail of Doses

[mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.56E-05	3.59E-08	2.27E-10	1.94E-03	8.88E-17	1.06E-05
2	8.19E-04	1.09E-07	5.22E-10	4.46E-03	4.73E-16	2.43E-05
Total	8.55E-04	1.45E-07	7.49E-10	6.40E-03	5.62E-16	3.48E-05

Source: 2						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.54E-05	4.87E-08	3.08E-10	2.64E-03	1.20E-16	1.43E-05
2	4.59E-04	1.48E-07	7.08E-10	6.05E-03	6.41E-16	3.29E-05
Total	4.84E-04	1.96E-07	1.02E-09	8.69E-03	7.61E-16	4.73E-05

Source: 3						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	6.50E-03	9.27E-08	5.87E-10	5.02E-03	5.32E-16	2.73E-05
2	3.81E-04	8.22E-07	3.94E-09	3.37E-02	3.21E-15	1.83E-04
Total	6.89E-03	9.15E-07	4.53E-09	3.87E-02	3.74E-15	2.11E-04

Source: 4						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	9.10E-05	3.44E-08	2.18E-10	1.86E-03	1.97E-16	1.01E-05
2	7.03E-03	3.05E-07	1.47E-09	1.25E-02	1.19E-15	6.80E-05
Total	7.12E-03	3.40E-07	1.68E-09	1.44E-02	1.39E-15	7.81E-05

Source: 5						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	3.32E-06	9.75E-07	6.18E-09	5.26E-02	2.40E-15	2.86E-04
2	8.15E-05	2.95E-06	1.42E-08	1.21E-01	1.28E-14	6.57E-04
Total	8.48E-05	3.93E-06	2.04E-08	1.73E-01	1.52E-14	9.43E-04

Source: 6						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	5.22E-04	9.28E-08	5.87E-10	5.04E-03	5.36E-16	2.74E-05
2	1.24E-02	8.22E-07	3.94E-09	3.38E-02	3.23E-15	1.84E-04
Total	1.29E-02	9.15E-07	4.53E-09	3.89E-02	3.76E-15	2.12E-04

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.14E-04	2.66E-03	3.57E-03
U-234	5.44E-08	1.26E-07	1.81E-07
TH-230	1.20E-11	2.78E-11	3.98E-11
RA-226	2.06E-14	4.49E-13	4.70E-13
PB-210	5.75E-16	1.45E-15	2.03E-15
U-235			
U-235	4.85E-05	2.63E-04	3.11E-04
PA-231	1.93E-07	4.58E-07	6.50E-07
AC-227	2.50E-07	5.94E-07	8.44E-07
U-234			
U-234	1.03E-03	2.38E-03	3.41E-03
TH-230	4.54E-07	1.05E-06	1.50E-06
RA-226	1.16E-09	2.54E-08	2.66E-08
PB-210	4.21E-11	1.07E-10	1.49E-10
CO-60			
CO-60	4.67E-10	1.07E-08	1.12E-08

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.22E-03	3.12E-03	4.34E-03
U-234	7.38E-08	1.70E-07	2.44E-07
TH-230	1.63E-11	3.75E-11	5.39E-11
RA-226	1.85E-14	2.80E-13	2.99E-13
PB-210	7.72E-16	1.79E-15	2.56E-15
U-235			
U-235	6.12E-05	2.24E-04	2.85E-04
PA-231	2.61E-07	6.08E-07	8.69E-07
AC-227	3.39E-07	7.76E-07	1.11E-06
U-234			
U-234	1.39E-03	3.20E-03	4.59E-03
TH-230	6.16E-07	1.41E-06	2.03E-06
RA-226	1.04E-09	1.58E-08	1.69E-08
PB-210	5.65E-11	1.31E-10	1.87E-10

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:13 Page: 3- 4 : 35 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 20.0000 years

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	7.25E-03	1.57E-02	2.29E-02
U-234	1.52E-07	9.44E-07	1.10E-06
TH-230	3.20E-11	2.09E-10	2.41E-10
RA-226	3.55E-12	2.63E-13	3.82E-12
PB-210	2.94E-15	9.65E-15	1.26E-14
U-235			
U-235	1.44E-03	7.95E-04	2.24E-03
PA-231	6.34E-07	3.34E-06	3.97E-06
AC-227	9.48E-07	4.23E-06	5.17E-06
U-234			
U-234	2.85E-03	1.78E-02	2.06E-02
TH-230	1.21E-06	7.87E-06	9.08E-06
RA-226	2.01E-07	1.48E-08	2.15E-07
PB-210	2.15E-10	7.06E-10	9.21E-10

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.20E-04	1.11E-02	1.20E-02
U-234	5.23E-08	3.62E-07	4.14E-07
TH-230	1.16E-11	7.85E-11	9.01E-11
RA-226	5.07E-14	3.83E-12	3.88E-12
PB-210	5.49E-16	5.21E-15	5.76E-15
U-235			
U-235	5.85E-05	1.72E-03	1.77E-03
PA-231	1.87E-07	1.39E-06	1.58E-06
AC-227	2.37E-07	1.92E-06	2.16E-06
U-234			
U-234	9.84E-04	6.81E-03	7.80E-03
TH-230	4.35E-07	2.95E-06	3.39E-06
RA-226	2.86E-09	2.16E-07	2.19E-07
PB-210	4.01E-11	3.81E-10	4.21E-10

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.41E-02	5.53E-02	7.93E-02
U-234	1.48E-06	3.39E-06	4.86E-06
TH-230	3.27E-10	7.50E-10	1.08E-09
RA-226	3.41E-14	1.19E-13	1.53E-13
PB-210	1.54E-14	3.43E-14	4.96E-14
U-235			
U-235	1.13E-03	2.61E-03	3.73E-03
PA-231	5.25E-06	1.21E-05	1.73E-05
AC-227	6.79E-06	1.51E-05	2.19E-05
U-234			
U-234	2.77E-02	6.35E-02	9.12E-02
TH-230	1.23E-05	2.81E-05	4.04E-05
RA-226	1.92E-09	6.69E-09	8.60E-09
PB-210	1.12E-09	2.50E-09	3.62E-09

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.69E-03	2.48E-02	2.75E-02
U-234	1.42E-07	9.66E-07	1.11E-06
TH-230	3.12E-11	2.11E-10	2.42E-10
RA-226	2.87E-13	6.76E-12	7.05E-12
PB-210	1.55E-15	1.26E-14	1.41E-14
U-235			
U-235	2.13E-04	3.25E-03	3.46E-03
PA-231	5.06E-07	3.59E-06	4.09E-06
AC-227	6.47E-07	4.81E-06	5.46E-06
U-234			
U-234	2.68E-03	1.83E-02	2.10E-02
TH-230	1.18E-06	7.99E-06	9.18E-06
RA-226	1.63E-08	3.84E-07	4.01E-07
PB-210	1.14E-10	9.27E-10	1.04E-09

Assessment for Time: 4
Time = 3.00E+01 yr

Source Information

Source: 1

Contamination::	Nuclide	Concentration [pCi/m ²]
	U-238	2.792E+05
	U-235	1.297E+04
	U-234	2.980E+05
	PA-231	8.224E+00
	TH-230	8.051E+01
	AC-227	2.935E+00
	RA-226	5.212E-01
	PB-210	1.305E-01
	CO-60	1.910E-02

Source: 2
 Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
 Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.683E+05
	U-235	2.643E+04
	U-234	6.059E+05
	PA-231	1.676E+01
	TH-230	1.637E+02
	AC-227	5.982E+00
	RA-226	1.060E+00
	PB-210	2.653E-01

Source: 3
 Location:: Room : 2 x: 0.00 y: 3.00 z: 1.00 [m]
 Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.514E+05
	U-235	2.564E+04
	U-234	5.881E+05
	PA-231	1.626E+01
	TH-230	1.589E+02
	AC-227	5.803E+00
	RA-226	1.029E+00
	PB-210	2.575E-01

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:14 Page: 4- 1 : 39 **
Title : GJO Bldg 2 Occupancy w/o Covering Mtl
Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 30.0000 years

Source: 4

Location:: Room : 2 x: 20.00 y: 5.80 z: 1.00 [m]
Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.673E+05
	U-235	7.821E+03
	U-234	1.782E+05
	PA-231	4.960E+00
	TH-230	4.815E+01
	AC-227	1.770E+00
	RA-226	3.117E-01
	PB-210	7.804E-02

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 1.000E-01
Removable fraction: 1.000E+00
Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	6.557E+01
	U-235	3.074E+00
	U-234	6.967E+01
	PA-231	1.949E-03
	TH-230	1.882E-02
	AC-227	6.956E-04
	RA-226	1.219E-04
	PB-210	3.051E-05

Source: 6
 Location:: Room : 2 x: 16.00 y: 3.00 z: 0.00 [m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.098E+04 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.059E+04
	U-235	1.881E+03
	U-234	4.356E+04
	PA-231	1.193E+00
	TH-230	1.177E+01
	AC-227	4.257E-01
	RA-226	7.619E-02
	PB-210	1.908E-02

** RESRAD-BUILD Program Output, Version 2.10 05/09/97 07:14 Page: 4- 2 : 41 **
 Title : GJO Bldg 2 Occupancy w/o Covering Mtl
 Input File : C:\WINBLD\B2NOBAR.IN Evaluation Time: 30.0000 years

RESRAD-BUILD Dose Tables

Receptor Point-Source Doses

[mrem]

		Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor	1	2.0E-03	2.7E-03	1.2E-02	2.0E-03	5.3E-02	5.6E-03	7.7E-02
Receptor	2	5.3E-03	6.5E-03	3.4E-02	2.0E-02	1.2E-01	4.6E-02	2.3E-01
Total		7.3E-03	9.2E-03	4.6E-02	2.2E-02	1.7E-01	5.2E-02	3.1E-01

Pathway Detail of Doses
 [mrem]

Source: 1	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor						
1	3.54E-05	3.59E-08	2.27E-10	1.94E-03	1.99E-16	1.06E-05
2	8.17E-04	1.09E-07	5.22E-10	4.46E-03	1.06E-15	2.43E-05
Total	8.52E-04	1.45E-07	7.49E-10	6.41E-03	1.26E-15	3.49E-05

Source: 2	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor						
1	2.53E-05	4.87E-08	3.08E-10	2.64E-03	2.70E-16	1.43E-05
2	4.57E-04	1.48E-07	7.08E-10	6.05E-03	1.44E-15	3.29E-05
Total	4.82E-04	1.96E-07	1.02E-09	8.69E-03	1.71E-15	4.73E-05

Source: 3	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor						
1	6.48E-03	9.27E-08	5.87E-10	5.02E-03	1.19E-15	2.73E-05
2	3.80E-04	8.22E-07	3.94E-09	3.37E-02	7.20E-15	1.83E-04
Total	6.86E-03	9.15E-07	4.53E-09	3.87E-02	8.40E-15	2.11E-04

Source: 4	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor						
1	9.07E-05	3.44E-08	2.18E-10	1.86E-03	4.43E-16	1.01E-05
2	7.00E-03	3.05E-07	1.47E-09	1.25E-02	2.67E-15	6.80E-05
Total	7.09E-03	3.40E-07	1.68E-09	1.44E-02	3.11E-15	7.82E-05

Source: 5	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor						
1	2.03E-08	9.75E-07	6.18E-09	5.26E-02	5.39E-15	2.86E-04
2	4.99E-07	2.95E-06	1.42E-08	1.21E-01	2.87E-14	6.57E-04
Total	5.19E-07	3.93E-06	2.04E-08	1.73E-01	3.41E-14	9.44E-04

Source: 6	External	Deposition	Immersion	Inhalation	Radon	Ingestion
Receptor						
1	5.20E-04	9.28E-08	5.87E-10	5.04E-03	1.20E-15	2.74E-05
2	1.23E-02	8.22E-07	3.94E-09	3.39E-02	7.25E-15	1.84E-04
Total	1.29E-02	9.15E-07	4.53E-09	3.89E-02	8.46E-15	2.12E-04

Nuclide Detail of Doses

[mrem]

Source: 1

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.14E-04	2.66E-03	3.57E-03
U-234	8.16E-08	1.89E-07	2.71E-07
TH-230	2.71E-11	6.24E-11	8.96E-11
RA-226	6.91E-14	1.51E-12	1.58E-12
PB-210	2.75E-15	6.95E-15	9.70E-15
U-235			
U-235	4.85E-05	2.62E-04	3.11E-04
PA-231	2.89E-07	6.86E-07	9.75E-07
AC-227	5.12E-07	1.22E-06	1.73E-06
U-234			
U-234	1.03E-03	2.38E-03	3.41E-03
TH-230	6.81E-07	1.57E-06	2.25E-06
RA-226	2.60E-09	5.69E-08	5.95E-08
PB-210	1.32E-10	3.35E-10	4.67E-10
CO-60			
CO-60	1.25E-10	2.87E-09	3.00E-09

Source: 2

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	1.22E-03	3.12E-03	4.34E-03
U-234	1.11E-07	2.55E-07	3.65E-07
TH-230	3.68E-11	8.45E-11	1.21E-10
RA-226	6.21E-14	9.42E-13	1.00E-12
PB-210	3.69E-15	8.56E-15	1.23E-14
U-235			
U-235	6.12E-05	2.24E-04	2.85E-04
PA-231	3.92E-07	9.12E-07	1.30E-06
AC-227	6.94E-07	1.59E-06	2.28E-06
U-234			
U-234	1.39E-03	3.20E-03	4.59E-03
TH-230	9.23E-07	2.12E-06	3.04E-06
RA-226	2.34E-09	3.54E-08	3.78E-08
PB-210	1.78E-10	4.12E-10	5.90E-10

Source: 3

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	7.23E-03	1.57E-02	2.29E-02
U-234	2.27E-07	1.42E-06	1.64E-06
TH-230	7.20E-11	4.70E-10	5.42E-10
RA-226	1.19E-11	8.83E-13	1.28E-11
PB-210	1.40E-14	4.62E-14	6.02E-14
U-235			
U-235	1.44E-03	7.95E-04	2.23E-03
PA-231	9.50E-07	5.01E-06	5.96E-06
AC-227	1.94E-06	8.66E-06	1.06E-05
U-234			
U-234	2.85E-03	1.78E-02	2.06E-02
TH-230	1.81E-06	1.18E-05	1.36E-05
RA-226	4.49E-07	3.32E-08	4.83E-07
PB-210	6.75E-10	2.22E-09	2.90E-09

Source: 4

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	9.19E-04	1.10E-02	1.20E-02
U-234	7.84E-08	5.43E-07	6.22E-07
TH-230	2.60E-11	1.77E-10	2.03E-10
RA-226	1.70E-13	1.29E-11	1.30E-11
PB-210	2.62E-15	2.49E-14	2.75E-14
U-235			
U-235	5.85E-05	1.71E-03	1.77E-03
PA-231	2.81E-07	2.09E-06	2.37E-06
AC-227	4.86E-07	3.93E-06	4.42E-06
U-234			
U-234	9.84E-04	6.81E-03	7.80E-03
TH-230	6.52E-07	4.43E-06	5.08E-06
RA-226	6.40E-09	4.84E-07	4.90E-07
PB-210	1.26E-10	1.20E-09	1.32E-09

Source: 5

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.41E-02	5.52E-02	7.93E-02
U-234	2.21E-06	5.08E-06	7.29E-06
TH-230	7.35E-10	1.69E-09	2.42E-09
RA-226	1.09E-13	2.52E-13	3.61E-13
PB-210	7.34E-14	1.64E-13	2.37E-13
U-235			
U-235	1.13E-03	2.59E-03	3.72E-03
PA-231	7.88E-06	1.81E-05	2.60E-05
AC-227	1.39E-05	3.10E-05	4.50E-05
U-234			
U-234	2.77E-02	6.35E-02	9.12E-02
TH-230	1.84E-05	4.22E-05	6.06E-05
RA-226	4.08E-09	9.44E-09	1.35E-08
PB-210	3.52E-09	7.85E-09	1.14E-08

Source: 6

Nuclide	Receptor 1	Receptor 2	Total
U-238			
U-238	2.69E-03	2.48E-02	2.75E-02
U-234	2.12E-07	1.45E-06	1.66E-06
TH-230	7.02E-11	4.74E-10	5.45E-10
RA-226	9.65E-13	2.27E-11	2.37E-11
PB-210	7.40E-15	6.02E-14	6.76E-14
U-235			
U-235	2.13E-04	3.24E-03	3.45E-03
PA-231	7.59E-07	5.38E-06	6.14E-06
AC-227	1.33E-06	9.86E-06	1.12E-05
U-234			
U-234	2.68E-03	1.83E-02	2.10E-02
TH-230	1.78E-06	1.20E-05	1.38E-05
RA-226	3.65E-08	8.60E-07	8.97E-07
PB-210	3.58E-10	2.91E-09	3.27E-09

RESRAD-BUILD Dose (Time) Tables

[mm]

Time [yr]

[mm/yr]

Time [yr]

4.72 E-01

RESRAD-BUILD Table of Contents

0-1I-1I-2

1-3 A

1
4

RESRAD-BUILD Input Parameters

```

Number of Sources      :      6
Number of Receptors    :      1
Total Time             : 1.000000E+01 days
Fraction Inside        : 3.000000E-01

```

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion (Dust) [m2/hr]
1	1	15.000	3.000	1.000	1.000	1.80E+01	1.00E-04

Receptor-Source Relationship

Recept	Source 1			Source 2			Source 3			Source 4			Source 5		
	Density [g/cm3]	Thickness [cm]	Or	Density [g/cm3]	Thickness [cm]	Or	Density [g/cm3]	Thickness [cm]	Or	Density [g/cm3]	Thickness [cm]	Or	Density [g/cm3]	Thickness [cm]	Or
1	5.00E-01	1.00E+00	RT	5.00E-01	2.00E+00	RT	5.00E-01	1.50E+00	RT	5.00E-01	2.00E+00	RT	2.00E+00	1.00E-02	RT

Recept	Source	6
	Density	Thickness Or
	[g/cm3]	[cm]
1	2.50E+00	1.00E+01 RT

===== Building Information =====

Building Air Exchange Rate: 1.50E+01 1/hr

Height[m]	Air Exchanges [m3/hr]	
Area [m2]	*****•*****	
	*	
	*	
	*	
H1: 3.000		<=Q01: 9.00E+03
	*	Q10 : 9.00E+03
	*	
	*	
Area 200.000		
	*	
	*****•*****	

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 1.00E-06 [1/s]

===== Source Information =====

Source: 1
 Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50[m]
 Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [l/hr]
 Fraction released to air: 2.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.100E+01 [day]

 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration		Dose Conversion Factors				
		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	2.820E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.310E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	3.010E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05
CO-60	1.000E+00	2.600E-05	1.500E-04	2.750E-04	1.020E-05	1.470E-02

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50[m]
 Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 2.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.100E+01 [day]

 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	5.740E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	2.670E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	6.120E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 3

Location:: Room : 1 x: 0.00 y: 3.00 z: 1.00[m]
 Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 2.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.100E+01 [day]

 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	5.570E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	2.590E+04	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	5.940E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 4

Location:: Room : 1 x: 20.00 y: 5.80 z: 1.00[m]
 Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
 Pathway ::

Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 2.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.100E+01 [day]

Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	1.690E+05	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	7.900E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	1.800E+05	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Title : GJO Bldg 2 Demolition
Input File : C:\WINBLD\B2DEM.INP

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20[m]
Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 2.000E-01
Removable fraction: 5.000E-01
Time to Remove: 1.100E+01 [day]
Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	3.200E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.500E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	3.400E+04	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

Source: 6

Location:: Room : 1 x: 16.00 y: 3.00 z: 0.00[m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 2.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.100E+01 [day]

 Radon Release Fraction: 0.000E+00

Contamination::

Nuclide Concentration

Dose Conversion Factors

		Ingestion	Inhalation	External (Surface)	External (Volume)	Submersion
	[pCi/m2]	[mrem/pCi]	[mrem/pCi]	[mrem/yr/ (pCi/m2)]	[mrem/yr/ (pCi/m3)]	[mrem/yr/ (pCi/m3)]
U-238	4.100E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	1.900E+03	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	4.400E+04	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
PA-231	0.000E+00	1.100E-02	1.300E+00	4.760E-06	1.190E-07	2.010E-04
TH-230	0.000E+00	5.300E-04	3.200E-01	8.780E-08	7.570E-10	2.040E-06
AC-227	0.000E+00	1.500E-02	6.700E+00	4.530E-05	1.260E-06	2.160E-03
RA-226	0.000E+00	1.100E-03	7.900E-03	1.940E-04	7.000E-06	1.040E-02
PB-210	0.000E+00	6.700E-03	2.100E-02	4.140E-07	3.820E-09	1.430E-05

** RESRAD-BUILD Program Output, Version 2.10 04/22/97 09:05 Page: 1- 1 : 10 **
Title : GJO Bldg 2 Demolition
Input File : C:\WINBLD\B2DEM.INP Evaluation Time: 0.000000 years

```
=====
=====
Assessment for Time: 1
Time =0.00E+00 yr
=====
=====
```

===== Source Information =====

Source: 1
Location:: Room : 1 x: 28.20 y: 0.00 z: 0.50 [m]
Geometry:: Type: Area Area:8.70E+00 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 2.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.100E+01 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	2.820E+05
	U-235	1.310E+04
	U-234	3.010E+05
	PA-231	0.000E+00
	TH-230	0.000E+00
	AC-227	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00
	CO-60	1.000E+00

** RESRAD-BUILD Program Output, Version 2.10 04/22/97 09:05 Page: 1- 1 : 11 **
Title : GJO Bldg 2 Demolition
Input File : C:\WINBLD\B2DEM.INP Evaluation Time: 0.000000 years

Source: 2

Location:: Room : 1 x: 32.50 y: 3.00 z: 0.50 [m]
Geometry:: Type: Area Area:5.80E+00 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 2.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.100E+01 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.740E+05
	U-235	2.670E+04
	U-234	6.120E+05
	PA-231	0.000E+00
	TH-230	0.000E+00
	AC-227	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

Source: 3

Location:: Room : 1 x: 0.00 y: 3.00 z: 1.00 [m]
Geometry:: Type: Area Area:1.39E+01 [m2] Direction: x
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 2.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.100E+01 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	5.570E+05
	U-235	2.590E+04
	U-234	5.940E+05
	PA-231	0.000E+00
	TH-230	0.000E+00
	AC-227	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

** RESRAD-BUILD Program Output, Version 2.10 04/22/97 09:05 Page: 1- 1 : 12 **
Title : GJO Bldg 2 Demolition
Input File : C:\WINBLD\B2DEM.INP Evaluation Time: 0.000000 years

Source: 4

Location:: Room : 1 x: 20.00 y: 5.80 z: 1.00 [m]
Geometry:: Type: Area Area:1.70E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 2.000E-01
Removable fraction: 1.000E-02
Time to Remove: 1.100E+01 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	1.690E+05
	U-235	7.900E+03
	U-234	1.800E+05
	PA-231	0.000E+00
	TH-230	0.000E+00
	AC-227	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

Source: 5

Location:: Room : 1 x: 28.00 y: 5.80 z: 1.20 [m]
Geometry:: Type: Area Area:2.08E+01 [m2] Direction: y
Pathway ::
Direct Ingestion Rate: 0.000E+00 [1/hr]
Fraction released to air: 2.000E-01
Removable fraction: 5.000E-01
Time to Remove: 1.100E+01 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	3.200E+04
	U-235	1.500E+03
	U-234	3.400E+04
	PA-231	0.000E+00
	TH-230	0.000E+00
	AC-227	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

Source: 6

Location:: Room : 1 x: 16.00 y: 3.00 z: 0.00 [m]
 Geometry:: Type: Area Area:1.89E+02 [m2] Direction: z
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 2.000E-01
 Removable fraction: 1.000E-02
 Time to Remove: 1.100E+01 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	U-238	4.100E+04
	U-235	1.900E+03
	U-234	4.400E+04
	PA-231	0.000E+00
	TH-230	0.000E+00
	AC-227	0.000E+00
	RA-226	0.000E+00
	PB-210	0.000E+00

** RESRAD-BUILD Program Output, Version 2.10 04/22/97 09:05 Page: 1- 2 : 14 **
 Title : GJO Bldg 2 Demolition
 Input File : C:\WINBLD\B2DEM.INP Evaluation Time: 0.000000 years

RESRAD-BUILD Dose Tables

Receptor Point-Source Doses

[mrem]							
	Source 1	Source 2	Source 3	Source 4	Source 5	Source 6	Total
Receptor 1	3.0E-02	4.0E-02	9.3E-02	3.5E-02	4.0E-01	9.4E-02	6.9E-01
Total	3.0E-02	4.0E-02	9.3E-02	3.5E-02	4.0E-01	9.4E-02	6.9E-01

Pathway Detail of Doses

[mrem]

Source: 1									
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion			
1	1.79E-05	3.91E-07	3.45E-09	2.95E-02	2.20E-29	8.02E-05			
Total	1.79E-05	3.91E-07	3.45E-09	2.95E-02	2.20E-29	8.02E-05			
Source: 2									
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion			
1	1.15E-05	5.31E-07	4.68E-09	4.00E-02	2.98E-29	1.09E-04			
Total	1.15E-05	5.31E-07	4.68E-09	4.00E-02	2.98E-29	1.09E-04			
Source: 3									
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion			
1	3.73E-05	1.23E-06	1.09E-08	9.30E-02	6.93E-29	2.53E-04			
Total	3.73E-05	1.23E-06	1.09E-08	9.30E-02	6.93E-29	2.53E-04			
Source: 4									
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion			
1	1.07E-04	4.58E-07	4.04E-09	3.45E-02	2.57E-29	9.38E-05			
Total	1.07E-04	4.58E-07	4.04E-09	3.45E-02	2.57E-29	9.38E-05			
Source: 5									
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion			
1	5.46E-06	5.31E-06	4.69E-08	3.99E-01	2.97E-28	1.09E-03			
Total	5.46E-06	5.31E-06	4.69E-08	3.99E-01	2.97E-28	1.09E-03			
Source: 6									
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion			
1	2.38E-05	1.23E-06	1.09E-08	9.34E-02	6.98E-29	2.54E-04			
Total	2.38E-05	1.23E-06	1.09E-08	9.34E-02	6.98E-29	2.54E-04			
				6.89E-01		1.88E-03			

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide Receptor		Total
1		
U-238		
U-238	1.34E-02	1.34E-02
U-235		
U-235	6.27E-04	6.27E-04
U-234		
U-234	1.55E-02	1.55E-02
CO-60		
CO-60	3.61E-09	3.61E-09

Source: 2

Nuclide Receptor		Total
1		
U-238		
U-238	1.82E-02	1.82E-02
U-235		
U-235	8.50E-04	8.50E-04
U-234		
U-234	2.10E-02	2.10E-02

Source: 3

Nuclide Receptor		Total
1		
U-238		
U-238	4.24E-02	4.24E-02
U-235		
U-235	1.98E-03	1.98E-03
U-234		
U-234	4.89E-02	4.89E-02

** RESRAD-BUILD Program Output, Version 2.10 04/22/97 09:05 Page: 1- 4 : 17 **
Title : GJO Bldg 2 Demolition
Input File : C:\WINBLD\B2DEM.INP Evaluation Time: 0.000000 years

Source: 4

Nuclide	Receptor 1	Total
U-238		
U-238	1.58E-02	1.58E-02
U-235		
U-235	7.57E-04	7.57E-04
U-234		
U-234	1.81E-02	1.81E-02

Source: 5

Nuclide	Receptor 1	Total
U-238		
U-238	1.82E-01	1.82E-01
U-235		
U-235	8.53E-03	8.53E-03
U-234		
U-234	2.10E-01	2.10E-01

Source: 6

Nuclide	Receptor 1	Total
U-238		
U-238	4.24E-02	4.24E-02
U-235		
U-235	1.97E-03	1.97E-03
U-234		
U-234	4.93E-02	4.93E-02

RESRAD-BUILD Dose (Time) Tables

Receptor Doses By Time

[mrem]

Time [yr]

1 0.00E+00
 6.91E-01

Receptor Doses Per Year

[mrem/yr]

Time [yr]

1 0.00E+00
 2.53E+01

Section 8.0

RESRAD Input Data

8.1 Mesa County Landfill Information

8.1.1 Discussion

Building 2 debris could be disposed in the future at the Orchard Mesa Landfill located in Mesa County, Colorado. Background information and parameter values for a radiological assessment to potential future residents of the landfill location were obtained mainly from a preliminary site compatibility study conducted on the landfill (ACZ Inc. 1992).

Approximately 100 cubic meters (m³) of building debris was assumed to be taken from Building 2 during demolition activities. This debris was assumed to be dumped into the landfill in a 10 meter (m) by 10 m by 1 m deep pile. This pile is subsequently covered with overburden.

The exposure scenario investigated for the landfill scenario involved the landfill being released to the public in 100 years. The most likely use of the landfill property would be for Mesa County to develop a park or sell for development of a farm. The following exposure pathways were investigated:

- external gamma
- inhalation
- drinking water
- soil ingestion
- radon

The radon pathway was included based upon the assumption that the park or farm may contain building facilities for maintenance crews or for visitors.

Since future use predictions are difficult to formulate and defend, a conservative dose estimate was based on the farming scenario with irrigation of crops and subsequent usage of crops and water by cows. The following exposure pathways were investigated:

- external gamma
- inhalation
- plant ingestion
- meat ingestion
- milk ingestion
- drinking water
- soil ingestion
- radon

RESRAD Version 5.61 (Argonne National Laboratory 1993) was used to assess the contaminant transport and exposure scenarios for the future use of the landfill site.

8.1.2 Background

The Orchard Mesa Landfill is on Bureau of Land Management property located in the Grand Valley of Mesa County, Colorado, 6.4 kilometers (km) or 4 miles south of the city of Grand Junction. The storage capacity of the current landfill was estimated at approximately 16 years based on remaining airspace. Mesa County intends to extend the landfill life to approximately 50 years through horizontal expansion.

The landfill is currently accepting municipal solid waste with some limited amounts of petroleum contaminated soils, asbestos, and wastewater treatment plant sludges.

This assessment assumed that the landfill area will not be released to the public until 50 years after closure of the facility. Therefore, the time from Building 2 debris disposal to occupancy by the public was assumed to be 100 years.

8.1.3 General Topography

The landfill is located approximately 8.1 km (5 miles) southeast of the confluence of the Colorado and Gunnison Rivers. Topography of the site consists of gentle to moderate slopes draining toward the Gunnison River and ranging in elevation from 1,420 to 1,508 meters (m) or 4,660 to 4,940 feet (ft) mean sea level (msl). The Gunnison River is approximately 305 m (1,000 ft) from the landfill at its nearest point and the Colorado River is 4 km (2.5 miles) to the north. A surface water divide, separating surface water flow from the Gunnison and Colorado Rivers, is located just north of the landfill.

Stream flow is intermittent, generally occurring in the spring and after summer thunderstorms. The sometimes violent summer storms cause larger flows which can erode the surface deposits.

8.1.4 Geology

According to published information, the geologic sequence beneath the site includes the entire stratigraphic column of the Grand Valley except for the Mesa Verde Group and the upper portions of the Mancos formation. The stratigraphic sequence ranges in age from Precambrian to Upper Cretaceous. A generalized stratigraphic section is presented in Figure 8-1.

Mancos Shale is exposed at the surface over a majority of the site. The Dakota Sandstone outcrops are located in the extreme west portion of the landfill area. Limited deposits of Quaternary Age alluvial gravels cap the Mancos on ridges and hills and also form colluvium in the lower areas of the landfill area.

A series of sedimentary bedrock units (see Figure 8-2) underlie the site. A description of the upper-most formations is as follows:

Mancos Shale—grey to olive-black marine shale with a few thin beds of sandstone near the base and containing a few thin beds of limestone. The thickness is variable extending from 914 to 1,829 m (3,000 to 6,000 ft) in some areas. However, at the landfill, the thickness varies between 0 to 600 ft because of erosion.

Dakota Sandstone and Burro Canyon Formations—consist of a coarse white basal conglomerate, lignite shales, buff sandstone, and thin beds of lignite. The thickness is approximately 31 to 91 m (100 to 300 ft). The Dakota contains the first potential water bearing zone beneath the landfill area.

Morrison and Summerville Formations—mainly red, green, brown, purple and grey-white siltstone and mudstone. They contain some bentonite beds and a few lenses of white to brown sandstone and limestone. The thickness is 122 to 183 m (400 to 600 ft). The Morrison and Summerville Formations are also low permeability formations that act as an aquiclude between the Dakota and Entrada Units. The saltwash member of the Morrison Formation is a permeable sandstone aquifer but in most places is discontinuous.

TIME	FORMATION	MEMBER	THICKNESS RANGE (Feet)	CHARACTER
Upper Cretaceous	Mesaverde Group		1,000 To 5,000	Buff Sandstone And Siltstone With Coal Beds - Cliff Former.
	Mancos		3,000 To 6,000	Gray Shales With Thinly Bedded Sandstone And Limestone.
	Dakota		150+	White, Coarse Basal Conglomerate With Overlying Sandstone Lignite And Lignitic Shale Layers,
L.K.	Burro Canyon		50-120	Basal Brown Sandstones And Conglomerates With Overlying Green Siltstone And Mudstone.
Upper Jurassic	Morrison	Brushy Basin	200 To 300	Varicolored Siltstone And Mudstone With Thin Interbeds And Lenses Of White To Brown Sandstone. Limestone And Bentonitic Beds.
		Salt Wash	190 To 300	Varicolored Siltstone And Mudstone With Interbedded White To Gray Thick Lenticular Sandstone Beds And Thin Gray Limestone Layers In Lower Part.
	Summerville		0-80	Varicolored Mudstone And Siltstone With Interbedded Sandstone.
	Entrada	Moab	60 To 200	White To Gray, Evenly Bedded Fine Grained Sandstone.
		Slick Rock	60 To 200	Pink To Buff, Fine-Grained Generally Cross Bedded Sandstone.
Tr. J	Kayenta		0 To 150	Red To Purple Lenticular Sandstone, Siltstone, Mudstone And Conglomerate.
Upper Triassic	Wingate		215 To 370	Salmon To Buff Colored, fine To Medium Grained Thick Bedded Sandstone, Cliff Former.
	Chinle		80 To 240	Red Siltstone With Lenses Of Conglomerate And Green Limestone.
L. Tr	Moenkopi		0 To 250	Red To Reddish Brown Arkosic Sandstone And Conglomerates.
Ip. P	Cutler		0 To 8,000	Red To Gray Conglomerates And Arkosic Sandstones.
	Precambrian		Base Not Exposed	Gneisses And Schists Of 1,700m.y. Intruded By Granitic Rocks Of 1,400 - 1,500m.y.

Note: Source (ACZ 1992)

DJT001

Figure 8-1. Generalized Stratigraphic Sequence

Figure 8-2. Sedimentary Bedrock Units

Entrada Sandstone—white to grey evenly bedded fine grained sandstone, with some ripple marks (Moab Member) and salmon to pink-colored fine grained generally cross bedded sandstone (Slick Rock Member). These generally contain scattered grains of medium to coarse grained sand. The thickness varies between 18 to 61 m (60 and 200 ft). This is the host aquifer for many of the water wells that have been drilled in areas surrounded the landfill.

8.1.5 Groundwater

Groundwater occurs in both confined and unconfined conditions in the Grand Junction area. The unconfined groundwater is primarily limited to Quaternary alluvial deposits along the Colorado and Gunnison Rivers and their tributaries. The Mancos Shale does not contain aquifers capable of transporting groundwater an appreciable distance. There are four aquifers in the Grand Junction area. The following aquifers are listed in order of importance and productivity:

- Entrada Sandstone
- Wingate Sandstone
- Salt Wash Sandstone Member of the Morrison Formation
- Dakota and Burro Canyon Sandstone

The shallowest regional aquifer beneath the landfill is the Dakota and Burro Canyon sandstone, generally indistinguishable. The aquifer is likely recharged from the Gunnison River south of the area. The groundwater flow direction is likely to be to the north-northeast into the Piceance Basin away from the Gunnison River.

Underlying the Dakota/Burro Canyon is the Moffison Formation. Because of the fine grained nature and abundant clay of the Morrison, it acts as an aquiclude between the water in the Dakota and the underlying Entrada. Therefore, the groundwater of importance in the radiological assessment is located in the Dakota Formation.

8.1.6 Surface Water

The landfill lies within the Gunnison River drainage. The floodplain for the Gunnison River in the vicinity of the site is confined to a narrow band immediately adjacent to the river channel. The current landfill location is not within the floodplain.

The ridge north of the existing landfill, capped by terrace gravels, forms an important surface water drainage divide. Surface waters north of the ridge will eventually drain into the Colorado River and those to the south, drain southwest to the Gunnison River.

Because of the low permeable nature of the upper weathered Mancos, during short duration thunderstorms, flash flooding and slope wash activity are expected. However, the surface of the Mancos is typically dry and cracked and absorbs small rainfalls with little to no runoff. In general, surface water runoff from the landfill is expected to reach the outcropping Dakota aquifer or the Gunnison River only during high-intensity storms. There are no perennial surface water sources located on the subject property in recent history. Some minor seeps have been observed within the main drainage just below the landfill. However, water quality samples obtained from the springs do not indicate leachate contamination. Therefore, based on limited sampling, the springs are believed to be related to rainfall and runoff at the site and not leachate migration from the landfill.

8.2 Source Inventory

Source inventories in picocuries per gram (pCi/g) used in this analysis were based on the same characterization data used in the RESRAD-Build models. They include

<u>Principal Radionuclide</u>	<u>Inventory</u>
U-238	15.0
U-234	15.0
U-235	0.6

8.3 Dose Conversion Factors

RESRAD default dose conversion factors for inhalation and ingestion were used in the assessment.

8.4 Food Transfer Factors

RESRAD default transfer factors were used in the assessment.

8.5 Landfill Cover Parameters

The Orchard Mesa Landfill will be covered with 45.72 centimeters (cm) (18 inches [in]) of soil with a permeability of 10^{-5} centimeters per second (cm/s) and capped with 15.24 cm (6 in) of native soil (Edminston 1997).

The cover soil is assumed to have a density of approximately 1.2 grams per cubic centimeters (g/cm^3).

The erosion rate for the cover was taken as the RESRAD default value of $1.00\text{E-}3$ meters per year (m/yr), however, this parameter value was varied to ensure a conservative dose estimate was obtained for the landfill scenario.

8.6 Contaminated Zone Parameters

The density of the contaminated zone was assumed to be equivalent to the native shale soil (1.2 g/cm^3).

The total porosity was assumed to be 0.5 based upon table values for typical shales.

The effective porosity was assumed to be equal to the total porosity.

The hydrologic parameters for the contaminated zone were based on typical values for various soil types.

The saturated hydrologic conductivity of the contaminated zone was assumed to be equivalent to unconsolidated deposits of silty sand and was assigned a value of 10 m/yr based upon the assumption that the waste will be compacted with a bulldozer and interstitial areas will be somewhat filled with the shale/clay overburden.

The hydraulic conductivity is considered to be conservative for the contaminated zone.

The soil-specific exponential b parameter is one of several hydrological parameters used to calculate the radionuclide leaching rate of the contaminated zone.

The soil-specific b parameter is an empirical and dimensionless parameter that is used to evaluate the saturation ratio (or the volumetric water saturation), R_s , of the soil, according to a soil characteristic function called the conductivity function (i.e., the relationship between the unsaturated hydraulic conductivity, K , and the saturation ratio, R_s). The value of the soil-specific b parameter was taken to be equivalent to a silty loam with a value of 5.3.

8.7 Infiltration Parameters

An evapotranspiration coefficient of 0.68 was calculated based on the following:

The evapotranspiration coefficient, C_e , is the ratio of the total volume of water leaving the ground as the result of evapotranspiration, ET_r , to the total volume of water available within the root zone $[(1-C_r)P_r + IR_r]$ of the soil during a fixed period of time. It can be expressed as follows:

$$C_e = \frac{ET_r}{(1-C_r)P_r + IR_r}$$

where: P_r = precipitation rate (m/yr)
 IR_r = irrigation rate (m/yr)
 C_r = the runoff coefficient

The annual average precipitation rate for the Grand Junction area is 0.22 m/yr (8.5 in/yr) (ACZ Inc. 1992).

The irrigation rate was assumed to be 1 m/yr for an arid region (Van der Leeden et al., 1990).

The runoff coefficient was chosen as 0.5 based upon an agricultural environment with rolling land, tight clay, and woodlands.

The watershed area was determined by measurements from maps of the landfill area and surrounding rivers as was determined to be 1.1×10^7 square meters (m^2).

8.8 Unsaturated Zone Parameters

The unsaturated zone is the portion of the uncontaminated zone that lies below the bottom of the contaminated zone and above the water table.

Each stratum is characterized in RESRAD by the following six parameters: (1) thickness of the layer, (2) soil density, (3) total porosity, (4) effective porosity, (5) soil-specific b parameter, and (6) hydraulic conductivity.

The Orchard Mesa Landfill contains the following three unsaturated zones: (1) the Mancos Shale and landfill debris which underlie the Building 2 debris, (2) low permeable liner, and (3) thick layer of Mancos Shale extending to the water table.

At the present time, the use of the low permeable liner is questionable. The data for this liner is presented, however, the liner was not used in the dose assessment RESRAD runs.

Site-specific data was used where available, however, several parameter values have not been measured at the landfill. Therefore, suitable soil and sedimentary material values were used when site-specific data was not available. Table 8-1 presents the parameter values chosen for the three unsaturated zones below the Orchard Mesa Landfill.

Table 8-1. Unsaturated Zone Parameters Used in the Landfill Scenarios

Parameter	Zone 1	Zone 2	Zone 3
Thickness (m) ^a	15	0.3	150
Soil Density (g/cm ³)	1.2 ^b	1.7 ^a	1.7 ^a
Total Porosity	0.5 ^b	0.2 ^a	0.1 ^b
Effective Porosity	0.5 ^c	0.1 ^d	0.05 ^d
Soil b parameter	5.3 ^b	10 ^b	10 ^b
Hydraulic Conductivity (m/yr)	10 ^b	0.03 ^a	0.003 ^b

^a(ACZ Inc. 1992)

^b(Van der Leeden, et al., 1990)

^cassumed equal to total porosity

^dassumed to be one-half of the total porosity

8.9 Saturated Zone Parameters

The saturated zone is characterized in RESRAD by the following seven parameters: (1) soil density, (2) total porosity, (3) effective porosity, (4) soil-specific b parameter, (5) hydraulic conductivity, (6) hydraulic gradient, and (7) water table drop rate.

The saturated zone beneath the landfill is in the Dakota Sandstone. Aquifers which underlie the Dakota Sandstone are separated by an aquitard. Therefore, only one aquifer was considered in this analysis (i.e., Dakota Sandstone). Table 8-2 presents the parameter values used for the saturated zone.

Table 8-2. Saturated Zone Parameters Used in the Landfill Scenarios

Parameter	Value	Reference
Density (g/cm ³)	1.5	Yu et al. 1993
Total Porosity	0.34	Yu et al. 1993
Effective Porosity	0.27	Yu et al. 1993
Hydraulic Conductivity (m/yr)	1	Yu et al. 1993
Hydraulic Gradient	0.1	ACZ Inc. 1992
Specific b Parameter	4	Yu et al. 1993
Water Table Drop Rate (m/yr)	0.0	No drop-low usage

8.10 Distribution Coefficients

The distribution coefficient represents the partition of the solute in the soil matrix and soil water, assuming that equilibrium conditions exist between the soil and solution phases.

The distribution coefficient is used in the calculation of the retardation factor for contaminant transport in the groundwater and also for the leach rate calculation in the contaminated zone.

RESRAD default distribution coefficients were used for most of the radionuclides in this assessment since they were conservative for the sedimentary and soil types considered (i.e., clay, shale, sand). However, the thorium default values were not conservative for the soil types considered and the uranium default value for sand was nonconservative, therefore, defaults were not used for these elements. Instead sedimentary or soil type values were provided (Van der Leeden et al., 1990).

The thorium distribution coefficients were taken as 3,200 cubic centimeters per gram (cm³/g) for sand and 5,800 cm³/g for clay and/or shale. The uranium distribution coefficient for sand was assigned a value of 35 cm³/g.

8.11 Exposure Parameters

Default values were utilized for the majority of these parameters. These parameters include inhalation rates, mass loading, shielding factors, food type consumption rates, livestock feed and water intake rates, and storage times for contaminated foodstuffs. Parameters which were given site-specific or scenario-specific values include the following:

- Indoor time:
 - 0.046 (park scenario)
 - 0.5 (farm scenario)
- Outdoor time:
 - 0.183 (park scenario)
 - 0.2 (farm scenario)
- Root Depth:
 - 2 m (common area fruit trees)

8.12 Radon Pathway Parameters

Default RESRAD parameter values were used for the radon pathway scenario.

The only site-specific value used was the average annual windspeed of 3.6 meters per second (m/s).

9.1 Park Scenario

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Time = 0.000E+00	11
Time = 1.000E+00	12
Time = 1.000E+02	13
Time = 2.000E+02	14
Time = 4.000E+02	15
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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(2)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(3)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	U-234	1.320E-01	1.320E-01	DCF2(6)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(2)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(3)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	U-234	2.830E-04	2.830E-04	DCF3(6)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: DOSFAC.BIN

0 Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	1.000E+02	3.000E+00	---	T(3)
R011	Times for calculations (yr)	2.000E+02	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E+02	3.000E+01	---	T(5)
R011	Times for calculations (yr)	6.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	8.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	6.000E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	6.100E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.200E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.200E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	5.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	5.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.800E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	2.200E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.000E+00	2.000E-01	---	RI
R013	Irrigation mode	ditch	overhead	---	IDITCH
R013	Runoff coefficient	5.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.100E+07	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.400E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.700E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+00	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.000E-01	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.000E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Number of unsaturated zone strata	3	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.500E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.200E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	5.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	0.000E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.700E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	2.000E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	1.000E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	1.000E+01	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	3.000E-02	1.000E+01	---	HCUZ(2)
R015	Unsat. zone 3, thickness (m)	1.500E+02	0.000E+00	---	H(3)
R015	Unsat. zone 3, soil density (g/cm**3)	1.700E+00	1.500E+00	---	DENSUZ(3)
R015	Unsat. zone 3, total porosity	1.000E-01	4.000E-01	---	TPUZ(3)
R015	Unsat. zone 3, effective porosity	5.000E-02	2.000E-01	---	EPUZ(3)
R015	Unsat. zone 3, soil-specific b parameter	1.000E+01	5.300E+00	---	BUZ(3)
R015	Unsat. zone 3, hydraulic conductivity (m/yr)	3.000E-03	1.000E+01	---	HCUZ(3)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,3)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,3)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,3)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,2)
R016	Unsaturated zone 3 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,3)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.456E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,3)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,3)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.950E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,1)
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,2)
R016	Unsaturated zone 3 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.209E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,1)
R016	Unsaturated zone 2 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,2)
R016	Unsaturated zone 3 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,3)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.103E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	ED

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fraction of time spent indoors	4.600E-02	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.830E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	1 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	1.000E+00	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LW15

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	not used	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	not used	1.000E+00	---	STOR_T(2)
STOR	Milk	not used	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	not used	2.000E+01	---	STOR_T(4)
STOR	Fish	not used	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	not used	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	not used	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	4.000E-01	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	5.000E-02	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	2.000E-06	2.000E-06	---	DIFCV
R021	in foundation material	3.000E-07	3.000E-07	---	DIFFL
R021	in contaminated zone soil	2.000E-06	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	3.600E+00	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	5.000E-01	5.000E-01	---	REXG
R021	Height of the building (room) (m)	2.500E+00	2.500E+00	---	HRM
R021	Building interior area factor	0.000E+00	0.000E+00	code computed (time dependent)	FAI
R021	Building depth below ground surface (m)	-1.000E+00	-1.000E+00	code computed (time dependent)	DMFL
R021	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	active

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area: 100.00 square meters
Thickness: 1.00 meters
Cover Depth: 0.61 meters

U-234 1.500E+01
U-235 6.000E-01
U-238 1.500E+01

0

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 30 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years): 0.000E+00 1.000E+00 1.000E+02 2.000E+02 4.000E+02 6.000E+02 8.000E+02 1.000E+03
TDOSE(t): 4.588E-04 4.613E-04 1.440E-03 3.245E-03 8.388E-03 4.988E-02 2.469E-02 1.565E-02
M(t): 1.529E-05 1.538E-05 4.802E-05 1.082E-04 2.796E-04 1.663E-03 8.231E-04 5.218E-04

0Maximum TDOSE(t): 5.102E-02 mrem/yr at t = 609.2 ± 0.6 years

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 609.2 years

Water Independent Pathways (Inhalation excludes radon)

0

0

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.375E-03	0.0661	1.607E-02	0.3149	5.557E-03	0.1089	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.190E-04	0.0023
U-235	2.301E-03	0.0451	8.819E-04	0.0173	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.565E-06	0.0001
U-238	9.858E-03	0.1932	1.276E-02	0.2501	2.089E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.340E-05	0.0018
Total	1.553E-02	0.3045	2.971E-02	0.5823	5.559E-03	0.1090	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.200E-04	0.0043

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 609.2 years

Water Dependent Pathways

0

0

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.512E-02	0.4923
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.190E-03	0.0625
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.271E-02	0.4452
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.102E-02	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	6.382E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.724E-06	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.551E-04	0.9919	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.588E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.382E-10	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.724E-06	0.0081
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.551E-04	0.9919
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.588E-04	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	8.006E-10	0.0000	0.000E+00	0.0000	9.357E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.764E-06	0.0082	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.574E-04	0.9916	0.000E+00	0.0000	8.837E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	4.612E-04	0.9998	0.000E+00	0.0000	9.357E-08	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.437E-08	0.0002
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.764E-06	0.0082
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.574E-04	0.9916
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.613E-04	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	2.884E-06	0.0020	0.000E+00	0.0000	6.652E-04	0.4618	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.099E-05	0.0076	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	7.614E-04	0.5286	0.000E+00	0.0000	5.914E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	7.753E-04	0.5382	0.000E+00	0.0000	6.652E-04	0.4618	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.680E-04	0.4638
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.099E-05	0.0076
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.615E-04	0.5286
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.440E-03	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDose(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 2.000E+02 years

	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Radio- Nuclide	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
fract.	fract.	fract.	fract.	fract.	fract.	fract.	fract.
U-234	2.248E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	3.230E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	1.274E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.329E-03	0.000E+00	1.916E-03	0.5906	0.000E+00	0.000E+00	0.000E+00

Total Dose Contributions TDose(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As mrem/yr and Fraction of Total Dose At t = 2.000E+02 years

	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*
Radio- Nuclide	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
fract.	fract.	fract.	fract.	fract.	fract.	fract.	fract.
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.938E-03
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.230E-05
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.274E-03
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.245E-03

*Sum of all water independent and dependent pathways.

As mrem/yr and Fraction of Total Dose At $t = 4.000E+02$ years

Water independent pathways (inhalation excludes radon)

Meat
Milk

[illegible][illegible][illegible]

Contributions $\text{DOSE}(i, p, t)$ for Individual Radionuclides (i) and

As mrem/yr and fraction of total dose At $t = 4.000E+02$ ye

Water Dependent Pathways

Meat	Milk
------	------

[illegible][illegible][illegible]

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 6.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.180E-03	0.0637	1.581E-02	0.3170	5.515E-03	0.1106	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.167E-04	0.0023
U-235	2.169E-03	0.0435	8.681E-04	0.0174	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.434E-06	0.0001
U-238	9.478E-03	0.1900	1.264E-02	0.2534	2.057E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.251E-05	0.0019
Total	1.483E-02	0.2972	2.932E-02	0.5878	5.517E-03	0.1106	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.166E-04	0.0043

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 6.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.463E-02	0.4937
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.045E-03	0.0610
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.221E-02	0.4453
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.988E-02	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 8.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.660E-03	0.1482	6.523E-03	0.2642	5.972E-03	0.2418	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.467E-05	0.0022
U-235	7.570E-04	0.0307	3.255E-04	0.0132	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.877E-06	0.0001
U-238	3.184E-03	0.1290	4.179E-03	0.1693	2.539E-06	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.060E-05	0.0012
Total	7.602E-03	0.3079	1.103E-02	0.4466	5.974E-03	0.2420	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.814E-05	0.0036

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 8.000E+02 years

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.621E-02	0.6565
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.085E-03	0.0440
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.397E-03	0.2995
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.469E-02	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	3.792E-03	0.2422	3.296E-03	0.2106	5.899E-03	0.3768	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.304E-05	0.0021
U-235	2.356E-04	0.0151	1.123E-04	0.0072	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.017E-06	0.0001
U-238	9.824E-04	0.0628	1.290E-03	0.0824	2.686E-06	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.449E-06	0.0006
Total	5.010E-03	0.3200	4.699E-03	0.3002	5.902E-03	0.3770	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.351E-05	0.0028

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.302E-02	0.8318
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.489E-04	0.0223
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.285E-03	0.1460
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.565E-02	1.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		4.255E-11	4.329E-11	2.423E-10	1.380E-09	4.475E-08	9.469E-04	3.129E-04	9.645E-05
U-234	Th-230	1.000E+00		0.000E+00	2.342E-15	1.632E-12	2.385E-11	2.750E-09	1.153E-04	1.248E-04	1.241E-04
U-234	Ra-226	1.000E+00		0.000E+00	6.248E-09	4.454E-05	1.292E-04	3.030E-04	5.783E-04	6.415E-04	6.458E-04
U-234	Pb-210	1.000E+00		0.000E+00	5.509E-20	1.700E-13	5.262E-12	8.875E-10	1.230E-06	1.521E-06	1.593E-06
U-234	ΣDSR(j)			4.255E-11	6.292E-09	4.454E-05	1.292E-04	3.030E-04	1.642E-03	1.081E-03	8.680E-04
OU-235	U-235	1.000E+00		6.207E-06	6.274E-06	1.806E-05	5.253E-05	4.445E-04	4.396E-03	1.508E-03	4.650E-04
U-235	Pa-231	1.000E+00		0.000E+00	1.674E-10	3.705E-08	1.654E-07	1.647E-06	1.295E-04	5.705E-05	2.195E-05
U-235	Ac-227	1.000E+00		0.000E+00	2.552E-11	2.167E-07	1.133E-06	1.237E-05	5.485E-04	2.442E-04	9.453E-05
U-235	ΣDSR(j)			6.207E-06	6.274E-06	1.831E-05	5.383E-05	4.586E-04	5.074E-03	1.809E-03	5.814E-04
OU-238	U-238	1.000E+00		3.034E-05	3.050E-05	5.076E-05	8.492E-05	2.377E-04	1.479E-03	4.921E-04	1.517E-04
U-238	U-234	1.000E+00		0.000E+00	1.227E-16	6.870E-14	7.826E-13	5.077E-11	1.612E-06	7.105E-07	2.738E-07
U-238	Th-230	1.000E+00		0.000E+00	3.317E-21	2.090E-16	5.478E-15	1.002E-12	5.002E-08	5.806E-08	5.939E-08
U-238	Ra-226	1.000E+00		0.000E+00	5.901E-15	3.960E-09	2.153E-08	8.770E-08	2.157E-07	2.728E-07	2.941E-07
U-238	Pb-210	1.000E+00		0.000E+00	3.919E-26	1.277E-17	7.879E-16	2.440E-13	4.463E-10	6.372E-10	7.197E-10
U-238	ΣDSR(j)			3.034E-05	3.050E-05	5.076E-05	8.494E-05	2.378E-04	1.481E-03	4.931E-04	1.523E-04

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 Basic Radiation Dose Limit = 30 mrem/yr

ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	*6.245E+09		4.768E+09	6.736E+05	2.321E+05	9.900E+04	1.827E+04	2.776E+04	3.456E+04
U-235	*2.160E+06	*2.160E+06	1.638E+06	5.573E+05	6.542E+04	5.912E+03	1.658E+04	5.160E+04	
U-238	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	1.262E+05	2.026E+04	6.084E+04	1.969E+05	

*At specific activity limit

0

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 at tmin = time of minimum single radionuclide soil guideline
 and at tmax = time of maximum total dose = 609.2 ± 0.6 years

ONuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
U-234	1.500E+01	609.0 ± 0.6	1.675E-03	1.791E+04	1.674E-03	1.792E+04
U-235	6.000E-01	608.9 ± 0.6	5.317E-03	5.642E+03	5.317E-03	5.642E+03
U-238	1.500E+01	608.8 ± 0.6	1.516E-03	1.979E+04	1.514E-03	1.981E+04

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

ONuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		6.382E-10	6.494E-10	3.635E-09	2.070E-08	6.712E-07	1.420E-02	4.694E-03	1.447E-03
U-234	U-238	1.000E+00		0.000E+00	1.841E-15	1.031E-12	1.174E-11	7.616E-10	2.418E-05	1.066E-05	4.107E-06
U-234	ΣDOSE(j):			6.382E-10	6.494E-10	3.636E-09	2.071E-08	6.720E-07	1.423E-02	4.704E-03	1.451E-03
Th-230	U-234	1.000E+00		0.000E+00	3.513E-14	2.448E-11	3.577E-10	4.124E-08	1.730E-03	1.872E-03	1.862E-03
Th-230	U-238	1.000E+00		0.000E+00	4.975E-20	3.136E-15	8.217E-14	1.504E-11	7.503E-07	8.709E-07	8.909E-07
Th-230	ΣDOSE(j):			0.000E+00	3.513E-14	2.449E-11	3.578E-10	4.126E-08	1.731E-03	1.873E-03	1.863E-03
ORa-226	U-234	1.000E+00		0.000E+00	9.372E-08	6.680E-04	1.938E-03	4.545E-03	8.675E-03	9.622E-03	9.688E-03
Ra-226	U-238	1.000E+00		0.000E+00	8.852E-14	5.940E-08	3.230E-07	1.315E-06	3.236E-06	4.092E-06	4.412E-06
Ra-226	ΣDOSE(j):			0.000E+00	9.372E-08	6.681E-04	1.939E-03	4.546E-03	8.678E-03	9.626E-03	9.692E-03
OPb-210	U-234	1.000E+00		0.000E+00	8.263E-19	2.550E-12	7.892E-11	1.331E-08	1.845E-05	2.281E-05	2.389E-05
Pb-210	U-238	1.000E+00		0.000E+00	5.878E-25	1.916E-16	1.182E-14	3.660E-12	6.695E-09	9.558E-09	1.080E-08
Pb-210	ΣDOSE(j):			0.000E+00	8.263E-19	2.550E-12	7.894E-11	1.332E-08	1.846E-05	2.282E-05	2.390E-05
OU-235	U-235	1.000E+00		3.724E-06	3.764E-06	1.083E-05	3.152E-05	2.667E-04	2.638E-03	9.046E-04	2.790E-04
OPa-231	U-235	1.000E+00		0.000E+00	1.004E-10	2.223E-08	9.923E-08	9.884E-07	7.772E-05	3.423E-05	1.317E-05
OAc-227	U-235	1.000E+00		0.000E+00	1.531E-11	1.300E-07	6.797E-07	7.423E-06	3.291E-04	1.465E-04	5.672E-05
OU-238	U-238	1.000E+00		4.551E-04	4.574E-04	7.614E-04	1.274E-03	3.565E-03	2.218E-02	7.381E-03	2.275E-03

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

ONuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	1.500E+01	1.491E+01	8.328E+00	4.624E+00	1.425E+00	4.393E-01	1.354E-01	4.173E-02
U-234	U-238	1.000E+00	0.000E+00	4.227E-05	2.361E-03	2.622E-03	1.617E-03	7.478E-04	3.074E-04	1.185E-04
U-234	ΣS(j):		1.500E+01	1.491E+01	8.330E+00	4.626E+00	1.427E+00	4.400E-01	1.357E-01	4.185E-02
0Th-230	U-234	1.000E+00	0.000E+00	1.346E-04	1.017E-02	1.576E-02	2.043E-02	2.168E-02	2.189E-02	2.177E-02
Th-230	U-238	1.000E+00	0.000E+00	1.906E-10	1.303E-06	3.620E-06	7.449E-06	9.403E-06	1.018E-05	1.042E-05
Th-230	ΣS(j):		0.000E+00	1.346E-04	1.017E-02	1.576E-02	2.044E-02	2.169E-02	2.190E-02	2.178E-02
ORa-226	U-234	1.000E+00	0.000E+00	2.915E-08	2.072E-04	5.967E-04	1.303E-03	1.717E-03	1.911E-03	1.988E-03
Ra-226	U-238	1.000E+00	0.000E+00	2.753E-14	1.842E-08	9.943E-08	3.772E-07	6.404E-07	8.128E-07	9.051E-07
Ra-226	ΣS(j):		0.000E+00	2.915E-08	2.072E-04	5.968E-04	1.304E-03	1.718E-03	1.912E-03	1.988E-03
OPb-210	U-234	1.000E+00	0.000E+00	2.997E-10	1.157E-04	4.384E-04	1.109E-03	1.525E-03	1.727E-03	1.809E-03
Pb-210	U-238	1.000E+00	0.000E+00	2.132E-16	8.691E-09	6.564E-08	3.048E-07	5.535E-07	7.235E-07	8.172E-07
Pb-210	ΣS(j):		0.000E+00	2.997E-10	1.157E-04	4.384E-04	1.109E-03	1.526E-03	1.728E-03	1.809E-03
OU-235	U-235	1.000E+00	6.000E-01	5.965E-01	3.332E-01	1.850E-01	5.707E-02	1.760E-02	5.428E-03	1.674E-03
OPa-231	U-235	1.000E+00	0.000E+00	1.262E-05	7.043E-04	7.814E-04	4.810E-04	2.220E-04	9.111E-05	3.505E-05
OAc-227	U-235	1.000E+00	0.000E+00	1.982E-07	4.192E-04	5.383E-04	3.547E-04	1.673E-04	6.940E-05	2.687E-05
OU-238	U-238	1.000E+00	1.500E+01	1.491E+01	8.330E+00	4.626E+00	1.427E+00	4.400E-01	1.357E-01	4.185E-02

BRF(i) is the branch fraction of the parent nuclide.

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Iteration Log for Computation of the Time of Maximum U-234 Dose/Source Ratio
0 Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	6.00000E+02	1.64177E-03		
1	6.47155E+02	1.50038E-03	4.71551E+01	parabolic
2	6.11550E+02	1.66537E-03	1.15502E+01	parabolic
3	6.16075E+02	1.64241E-03	4.52495E+00	parabolic
4	6.08083E+02	1.67178E-03	-3.46742E+00	parabolic
5	6.07475E+02	1.66994E-03	-5.55715E-01	parabolic
6	6.09045E+02	1.67469E-03	9.62482E-01	parabolic
7	6.10002E+02	1.67337E-03	9.56803E-01	golden section
8	6.09045E+02	1.67469E-03	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \cdot (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum U-235 Dose/Source Ratio
Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	6.00000E+02	5.07429E-03		
1	6.51240E+02	4.20229E-03	5.12396E+01	parabolic
2	6.14369E+02	5.17772E-03	1.43693E+01	parabolic
3	6.11208E+02	5.27120E-03	-3.16124E+00	parabolic
4	6.08282E+02	5.29730E-03	-2.92638E+00	parabolic
5	6.08890E+02	5.31684E-03	1.48224E-01	parabolic
6	6.09499E+02	5.31324E-03	6.08890E-01	parabolic
7	6.08890E+02	5.31684E-03	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \cdot (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum U-238 Dose/Source Ratio
 Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	0	6.0000E+02	1.48065E-03	
1	6.34082E+02	1.30751E-03	3.40818E+01	parabolic
2	6.04523E+02	1.50369E-03	4.52312E+00	parabolic
3	6.15814E+02	1.45574E-03	1.12904E+01	golden section
4	6.06573E+02	1.50933E-03	2.05017E+00	parabolic
5	6.09396E+02	1.51251E-03	2.82316E+00	parabolic
6	6.10006E+02	1.50630E-03	2.83714E-01	parabolic
7	6.08156E+02	1.51355E-03	-1.24071E+00	parabolic
8	6.07548E+02	1.51171E-03	-6.04445E-01	golden section
9	6.08764E+02	1.51571E-03	6.08156E-01	parabolic

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \cdot (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose
Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDose(t) (mrem/yr)	Step Size (years)	Step Type
0	6.00000E+02	4.98808E-02		
1	6.40941E+02	4.44112E-02	4.09407E+01	parabolic
2	6.07920E+02	5.09334E-02	7.92006E+00	parabolic
3	6.20533E+02	4.85446E-02	1.26128E+01	golden section
4	6.08528E+02	5.10033E-02	2.73212E-01	parabolic
5	6.13113E+02	5.01748E-02	4.58543E+00	golden section
6	6.09234E+02	5.10192E-02	7.06216E-01	parabolic
7	6.09843E+02	5.09081E-02	6.09234E-01	parabolic
8	6.09234E+02	5.10192E-02	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest TDose(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \times (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDose(t) was smaller than the previous value.

Source Factors for Ingrowth and Decay

Radioactivity Factors Only

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
ID(j,t) = CUMBRF(j)*S1(j,t)/S1(i,0)											
U-234	U-234	1.000E+00	1.000E+00	1.000E+00	9.997E-01	9.994E-01	9.989E-01	9.983E-01	9.977E-01	9.972E-01	
U-234	Th-230	1.000E+00	0.000E+00	9.002E-06	8.997E-04	1.798E-03	3.592E-03	5.382E-03	7.168E-03	8.949E-03	
U-234	Ra-226	1.000E+00	0.000E+00	1.950E-09	1.921E-05	7.573E-05	2.942E-04	6.433E-04	1.112E-03	1.689E-03	
U-234	Pb-210	1.000E+00	0.000E+00	2.004E-11	1.068E-05	5.546E-05	2.517E-04	5.804E-04	1.030E-03	1.591E-03	
OU-235	U-235	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
U-235	Pa-231	1.000E+00	0.000E+00	2.116E-05	2.114E-03	4.223E-03	8.428E-03	1.261E-02	1.678E-02	2.094E-02	
U-235	Ac-227	1.000E+00	0.000E+00	3.332E-07	1.477E-03	3.562E-03	7.768E-03	1.196E-02	1.613E-02	2.028E-02	
OU-238	U-238	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	
U-238	U-234	1.000E+00	0.000E+00	2.835E-06	2.835E-04	5.668E-04	1.133E-03	1.700E-03	2.265E-03	2.831E-03	
U-238	Th-230	1.000E+00	0.000E+00	1.276E-11	1.275E-07	5.100E-07	2.038E-06	4.583E-06	8.141E-06	1.271E-05	
U-238	Ra-226	1.000E+00	0.000E+00	1.652E-15	1.822E-09	1.442E-08	1.129E-07	3.728E-07	8.649E-07	1.654E-06	
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	8.486E-10	9.360E-09	8.990E-08	3.198E-07	7.710E-07	1.509E-06	

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

0

Source Factors for Ingrowth and Decay

Combined Radioactivity and Leaching Factors

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
SF(j,t) = BRF(i)*S1(j,t)/S1(i,0)											
U-234	U-234	1.000E+00	1.000E+00	9.941E-01	5.552E-01	3.082E-01	9.501E-02	2.928E-02	9.027E-03	2.782E-03	
U-234	Th-230	1.000E+00	0.000E+00	8.975E-06	6.782E-04	1.051E-03	1.362E-03	1.446E-03	1.459E-03	1.451E-03	
U-234	Ra-226	1.000E+00	0.000E+00	1.943E-09	1.381E-05	3.978E-05	8.688E-05	1.145E-04	1.274E-04	1.325E-04	
U-234	Pb-210	1.000E+00	0.000E+00	1.998E-11	7.710E-06	2.922E-05	7.392E-05	1.017E-04	1.151E-04	1.206E-04	
OU-235	U-235	1.000E+00	1.000E+00	9.941E-01	5.553E-01	3.084E-01	9.512E-02	2.933E-02	9.047E-03	2.790E-03	
U-235	Pa-231	1.000E+00	0.000E+00	2.103E-05	1.174E-03	1.302E-03	8.016E-04	3.700E-04	1.518E-04	5.842E-05	
U-235	Ac-227	1.000E+00	0.000E+00	3.303E-07	6.987E-04	8.972E-04	5.911E-04	2.789E-04	1.157E-04	4.478E-05	
OU-238	U-238	1.000E+00	1.000E+00	9.941E-01	5.553E-01	3.084E-01	9.512E-02	2.933E-02	9.047E-03	2.790E-03	
U-238	U-234	1.000E+00	0.000E+00	2.818E-06	1.574E-04	1.748E-04	1.078E-04	4.985E-05	2.050E-05	7.899E-06	
U-238	Th-230	1.000E+00	0.000E+00	1.271E-11	8.686E-08	2.413E-07	4.966E-07	6.269E-07	6.789E-07	6.945E-07	
U-238	Ra-226	1.000E+00	0.000E+00	1.835E-15	1.228E-09	6.629E-09	2.515E-08	4.269E-08	5.419E-08	6.034E-08	
U-238	Pb-210	1.000E+00	0.000E+00	1.421E-17	5.794E-10	4.376E-09	2.032E-08	3.690E-08	4.824E-08	5.448E-08	

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The effect of volatilization was also considered when computing the source factors for H-3 and C-14.

Parameters Used for Calculating Cover Depth and Contaminated Zone Thicknesses

0 Cover Erosion rate (vcv): 0.001000 m/yr
Contaminated Zone Erosion rate (vcz): 0.001000 m/yr
Water Table Drop rate (vwt): 0.000000 m/yr
Precipitation rate (Pr): 0.220000 m/yr
Cover Removal Time (Tc): 6.100E+02 yr
Overhead irrigation rate (Irr): 1.000 m/yr Runoff coefficient (Cr): 0.500
Evapotranspiration coeff. (Ce): 0.680 Infiltration rate (In): 0.355 m/yr
Bulk soil density (rhob): 1.200 g/cm**3 Effective porosity (pe): 0.500

Radio-nuclide (i)	Distribution Coefficient Kd(i),cm**3/g	Leaching Ratio q(i)
Ac-227	2.000000E+01	1.604E-02
Pa-231	5.000000E+01	6.478E-03
Pb-210	1.000000E+02	3.249E-03
Ra-226	7.000000E+01	4.635E-03
Th-230	5.800000E+03	5.620E-05
U-234	5.000000E+01	6.478E-03
U-235	5.000000E+01	6.478E-03
U-238	5.000000E+01	6.478E-03

0

Time Dependence of Source Geometry

Time Dependence of Cover Depth [Cd(i,t)]

Nuclide (i)	t=	Cd(i,t) (meters)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
Pa-231	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
Pb-210	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
Ra-226	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
Th-230	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
U-234	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
U-235	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00
U-238	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	0.0000E+00

Time Dependence of Contaminated Zone Thicknesses $[T(i,t)]$

Nuclide (i)	t=	T(i,t) (meters)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Pa-231	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Pb-210	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Ra-226	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Th-230	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
U-234	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
U-235	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
U-238	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01

Occupancy, Cover/Depth, and Area Factors for Ground Pathway

Occupancy Factor (FO1): 0.215
 Area (A): 100. sq. meters
 Initial cover depth (Cd): 0.610 meters
 Initial contaminated zone thickness (T): 1.000 meters

Time Dependence of Cover/Depth Factor [FCTR_COV_DEPTH(i,t)]

Nuclide (i)	FCTR_COV_DEPTH(i,t) (dimensionless)					
	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02
Ac-227	1.761E-04	1.786E-04	7.169E-04	2.919E-03	4.839E-02	8.147E-01
Pa-231	1.909E-04	1.936E-04	7.680E-04	3.089E-03	5.000E-02	8.154E-01
Pb-210	2.050E-06	2.093E-06	1.674E-05	1.367E-04	9.116E-03	6.258E-01
Ra-226	2.130E-03	2.152E-03	5.768E-03	1.562E-02	1.145E-01	8.541E-01
Th-230	9.800E-07	1.002E-06	9.242E-06	8.716E-05	7.752E-03	6.906E-01
U-234	4.918E-07	5.034E-07	5.045E-06	5.175E-05	5.445E-03	5.729E-01
U-235	3.810E-05	3.874E-05	1.996E-04	1.046E-03	2.869E-02	7.953E-01
U-238	1.029E-03	1.040E-03	3.100E-03	9.340E-03	8.476E-02	8.065E-01

0

Time Dependence of Area Factor [FCTR_AREA(i,t)]

Nuclide (i)	FCTR_AREA(i,t) (dimensionless)					
	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02
Ac-227	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.161E-01
Pa-231	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.197E-01
Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.574E-01
Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	8.925E-01
Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.491E-01
U-234	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.557E-01
U-235	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.245E-01
U-238	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.057E-01

Dose Conversion and Environmental Transport Factors for the Ground Pathway (p=1)

OParent (i)	Product (j)	DCF(j,1)*	ETF(j,1,t) (dimensionless)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	4.020E-04	1.058E-07	1.083E-07	1.086E-06	1.114E-05	1.172E-03	1.178E-01	1.822E-01	1.822E-01
U-234	Th-230	1.210E-03	2.109E-07	2.157E-07	1.989E-06	1.876E-05	1.668E-03	1.411E-01	1.795E-01	1.795E-01
U-234	Ra-226	1.120E+01	4.585E-04	4.630E-04	1.241E-03	3.361E-03	2.463E-02	1.640E-01	1.702E-01	1.699E-01
U-234	Pb-210	6.120E-03	4.412E-07	4.505E-07	3.603E-06	2.942E-05	1.962E-03	1.289E-01	1.789E-01	1.789E-01
OU-235	U-235	7.570E-01	8.200E-06	8.336E-06	4.295E-05	2.250E-04	6.174E-03	1.582E-01	1.776E-01	1.776E-01
U-235	Pa-231	1.910E-01	4.108E-05	4.166E-05	1.653E-04	6.648E-04	1.076E-02	1.614E-01	1.763E-01	1.763E-01
U-235	Ac-227	2.010E+00	3.789E-05	3.843E-05	1.543E-04	6.282E-04	1.041E-02	1.606E-01	1.740E-01	1.739E-01
OU-238	U-238	1.370E-01	2.215E-04	2.239E-04	6.672E-04	2.010E-03	1.824E-02	1.572E-01	1.712E-01	1.710E-01
U-238	U-234	4.020E-04	1.058E-07	1.083E-07	1.086E-06	1.114E-05	1.172E-03	1.178E-01	1.822E-01	1.822E-01
U-238	Th-230	1.210E-03	2.109E-07	2.157E-07	1.989E-06	1.876E-05	1.668E-03	1.411E-01	1.795E-01	1.795E-01
U-238	Ra-226	1.120E+01	4.585E-04	4.630E-04	1.241E-03	3.361E-03	2.463E-02	1.640E-01	1.702E-01	1.699E-01
U-238	Pb-210	6.120E-03	4.412E-07	4.505E-07	3.603E-06	2.942E-05	1.962E-03	1.289E-01	1.789E-01	1.789E-01

* - The dose conversion factor units are (mrem/yr)/(pCi/g) at infinite depth and area.

0

Dose/Source Ratios for External Radiation from the Ground (p=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,1,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	4.255E-11	4.329E-11	2.423E-10	1.380E-09	4.475E-08	1.387E-06	6.611E-07	2.038E-07
U-234	Th-230	1.000E+00	0.000E+00	2.342E-15	1.632E-12	2.385E-11	2.750E-09	2.467E-07	3.169E-07	3.151E-07
U-234	Ra-226	1.000E+00	0.000E+00	1.008E-11	1.920E-07	1.497E-06	2.397E-05	2.103E-04	2.429E-04	2.521E-04
U-234	Pb-210	1.000E+00	0.000E+00	5.509E-20	1.700E-13	5.262E-12	8.875E-10	8.023E-08	1.260E-07	1.320E-07
U-234	ΣDSR(j)		4.255E-11	5.337E-11	1.922E-07	1.499E-06	2.402E-05	2.120E-04	2.440E-04	2.528E-04
OU-235	U-235	1.000E+00	6.207E-06	6.274E-06	1.806E-05	5.253E-05	4.445E-04	3.514E-03	1.216E-03	3.750E-04
U-235	Pa-231	1.000E+00	0.000E+00	1.674E-10	3.705E-08	1.654E-07	1.647E-06	1.141E-05	5.114E-06	1.967E-06
U-235	Ac-227	1.000E+00	0.000E+00	2.552E-11	2.167E-07	1.133E-06	1.237E-05	9.003E-05	4.044E-05	1.566E-05
U-235	ΣDSR(j)		6.207E-06	6.274E-06	1.831E-05	5.383E-05	4.586E-04	3.615E-03	1.262E-03	3.927E-04
OU-238	U-238	1.000E+00	3.034E-05	3.050E-05	5.076E-05	8.492E-05	2.377E-04	6.318E-04	2.122E-04	6.538E-05
U-238	U-234	1.000E+00	0.000E+00	1.227E-16	6.870E-14	7.826E-13	5.077E-11	2.361E-09	1.501E-09	5.785E-10
U-238	Th-230	1.000E+00	0.000E+00	3.317E-21	2.090E-16	5.478E-15	1.002E-12	1.070E-10	1.474E-10	1.508E-10
U-238	Ra-226	1.000E+00	0.000E+00	9.517E-18	1.707E-11	2.495E-10	6.938E-09	7.843E-08	1.033E-07	1.148E-07
U-238	Pb-210	1.000E+00	0.000E+00	3.919E-26	1.277E-17	7.879E-16	2.440E-13	2.911E-11	5.281E-11	5.965E-11
U-238	ΣDSR(j)		3.034E-05	3.050E-05	5.076E-05	8.492E-05	2.377E-04	6.318E-04	2.123E-04	6.549E-05

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Inhalation Pathway, Excluding Radon (p=2)
 Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,2,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.390E-04	3.101E-04	9.559E-05
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.145E-04	1.238E-04	1.231E-04
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.391E-07	2.852E-07	2.966E-07
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.730E-07	6.952E-07	7.281E-07
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.054E-03	4.349E-04	2.197E-04
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.765E-04	2.896E-04	8.932E-05
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.151E-04	5.059E-05	1.946E-05
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.552E-04	2.023E-04	7.832E-05
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.447E-03	5.425E-04	1.871E-04
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.409E-04	2.779E-04	8.569E-05
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.599E-06	7.041E-07	2.714E-07
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.964E-08	5.760E-08	5.892E-08
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.919E-11	1.213E-10	1.351E-10
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.079E-10	2.913E-10	3.290E-10
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.425E-04	2.786E-04	8.602E-05

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Pathway Factors for the Inhalation Pathway (radon excluded)

Area (A): 1.0000E+02 m**2 Occupancy Factor (FO2): 2.0140E-01
 Area Factor (FA2): 7.6923E-01 Annual Air Intake (F12): 8.4000E+03 m**3/yr
 Cover Depth [Cd(0)]: 6.1000E-01 m Mass Loading (ASR2): 2.0000E-04 g/m**3
 Contaminated Zone Thickness [T(0)]: 1.0000E+00 m FA2 * FO2 * F12 * ASR2: 2.6027E-01 g/yr

Nuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-235 +D		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-238 +D		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00

Dose Conversion and Environmental Transport Factors for the Inhalation Pathway, Excluding Radon (p=2)

Parent Product		DCF(j,2)*	ETF(j,2,t) (g/yr)								
(i)	(j)		t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.320E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-234	Th-230	3.260E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-234	Ra-226	8.600E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-234	Pb-210	2.320E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
OU-235	U-235	1.230E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-235	Pa-231	1.280E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-235	Ac-227	6.720E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
OU-238	U-238	1.180E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-238	U-234	1.320E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-238	Th-230	3.260E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-238	Ra-226	8.600E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01
U-238	Pb-210	2.320E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.429E-01	2.603E-01	2.603E-01

* - The dose conversion factor units are mrem/pCi.

Parameters Used for Calculating Indoor and Outdoor Radon Flux

	*Floor Material	Cover Material	Contaminated Zone
Radon Diffusion Coefficient (m**2/s)	3.000E-07	2.000E-06	2.000E-06
Total Porosity	1.000E-01	4.000E-01	5.000E-01
Volumetric Water Content	3.000E-02	5.000E-02	3.912E-01
Bulk Density (g/cm**3)	2.400E+00	1.200E+00	1.200E+00
Rn-222 Emanation Coefficient	2.500E-01	2.500E-01	2.500E-01
Initial Thickness (m)	1.500E-01	6.100E-01	1.000E+00

Building Depth Below Ground Surface *(DMFL): -1.000E+00 (m)

Negative DMFL shows building depth adjusted (if necessary) for no penetration of contaminated zone. Actual values used *(DMFLACT), m:

t= 0.0000E+00 1.0000E+00 1.0000E+02 2.0000E+02 4.0000E+02 6.0000E+02 8.0000E+02 1.0000E+03
DMFLACT= 6.1000E-01 6.0900E-01 5.1000E-01 4.1000E-01 2.1000E-01 1.0000E-02 0.0000E+00 0.0000E+00
Building indoor area factor *(FAI): 0.000E+00
FAI <= 0.0 shows calculated time-dependent value based on amount of wall area extending into the contaminated zone. Actual values used *(FAIACT):

t= 0.0000E+00 1.0000E+00 1.0000E+02 2.0000E+02 4.0000E+02 6.0000E+02 8.0000E+02 1.0000E+03
FAIACT = 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00

0* - Parameters are used only for indoor radon flux

0

Time Dependence of Outdoor Radon Flux [FLUXO(i,t)]

ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	7.4958E-09	5.8899E-05	1.8767E-04	5.0108E-04	8.0541E-04	7.9884E-04	6.7735E-04	
U-238	0.0000E+00	7.0792E-15	5.2369E-09	3.1274E-08	1.4504E-07	3.0041E-07	3.3970E-07	3.0846E-07	

0

Time Dependence of Indoor Radon Flux [FLUXI(i,t)]

ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	2.6902E-09	1.9121E-05	5.5075E-05	1.2028E-04	1.5847E-04	1.7161E-04	1.6954E-04	
U-238	0.0000E+00	2.5406E-15	1.7002E-09	9.1776E-09	3.4816E-08	5.9107E-08	7.2973E-08	7.7206E-08	

Parameters Used for Calculating Indoor and Outdoor Radon Concentration

Radon Vertical Dimension of Mixing (HMIX): 2.000E+00 (m)
Average Annual Wind Speed (WIND): 3.600E+00 (m/sec)
Building Room Height (HRM): 2.500E+00 (m)
Building Air Exchange Rate (REXG): 5.000E-01 (1/hr)

0		Time Dependence of Outdoor Radon Concentration [CRNO(i,t)]							
ONuclide		CRNO(i,t) (pCi/m**3)							
(i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	5.2054E-09	4.0902E-05	1.3033E-04	3.4797E-04	5.5931E-04	5.5475E-04	4.7038E-04	
U-238	0.0000E+00	4.9161E-15	3.6368E-09	2.1718E-08	1.0072E-07	2.0862E-07	2.3590E-07	2.1421E-07	

0		Time Dependence of Indoor Radon Concentration [HCONC(i,r)]							
ONuclide		HCONC(i,t) (pCi/m**3)							
(i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	7.6374E-06	5.4290E-02	1.5638E-01	3.4160E-01	4.5015E-01	4.8741E-01	4.8146E-01	
U-238	0.0000E+00	7.2129E-12	4.8272E-06	2.6059E-05	9.8876E-05	1.6790E-04	2.0726E-04	2.1925E-04	

Outdoor Working Levels of Radon [WLOTD(i,t)]									
ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	1.4092E-17	1.1073E-13	3.5282E-13	9.4201E-13	1.5141E-12	1.5018E-12	1.2734E-12	
U-238	0.0000E+00	1.3309E-23	9.8452E-18	5.8793E-17	2.7266E-16	5.6475E-16	6.3862E-16	5.7989E-16	

0

Indoor Working Levels of Radon [WLIND(i,t)]									
ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	5.2664E-11	3.7436E-07	1.0783E-06	2.3556E-06	3.1041E-06	3.3610E-06	3.3200E-06	
U-238	0.0000E+00	4.9737E-17	3.3286E-11	1.7969E-10	6.8181E-10	1.1578E-09	1.4292E-09	1.5119E-09	

0

0 Fraction of Time Spent Outdoors (FOTD): 1.830E-01
 Fraction of Time Spent Indoors (FIND): 4.600E-02

Dose/Source Ratios for Radon Pathway (p=9)

Subpathway: Outdoor and Indoor Radon Flux

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t =	DSR(j,9,t)	DSRRNW(j,t)	(mrem/yr)/(pCi/g)	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	6.238E-09	4.434E-05	1.277E-04	2.790E-04	3.677E-04	3.981E-04	3.933E-04	3.933E-04	3.933E-04	3.933E-04
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	6.238E-09	4.434E-05	1.277E-04	2.790E-04	3.677E-04	3.981E-04	3.933E-04	3.933E-04	3.933E-04	3.933E-04
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	5.892E-15	3.943E-09	2.129E-08	8.076E-08	1.371E-07	1.693E-07	1.791E-07	1.791E-07	1.791E-07	1.791E-07
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	5.892E-15	3.943E-09	2.129E-08	8.076E-08	1.371E-07	1.693E-07	1.791E-07	1.791E-07	1.791E-07	1.791E-07

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Radon Pathway (p=9)

Subpathway: Indoor Radon from Water Usage

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t =	DSR(j,9,t)	DSRRNW(j,t)	(mrem/yr)/(pCi/g)	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Transport Time Parameters for Unsaturated Zone Stratum No. 1

Stratum thickness [h(1)]: 15.000000 m
Bulk soil material density [rhob(1)]: 1.200000 g/cm**3
Effective porosity [peuz(1)]: 0.500000
Hydraulic conductivity [Khuz(1)]: 10.000000 m/yr
Total porosity [ptuz(1)]: 0.500000
Soil specific b parameter [buz(1)]: 5.300000
Saturation ratio [sruz(1)]: 0.782379

Radio-nuclide (i)	Distribution Coefficient Kduz(i,1), cm**3/g	Retardation Factor Rduz(i,1)	Transport Time Dtuz(i,1), yr
Ac-227	2.0000E+01	6.2351E+01	1.0300E+03
Pa-231	5.0000E+01	1.5438E+02	2.5503E+03
Pb-210	1.0000E+02	3.0776E+02	5.0841E+03
Ra-226	7.0000E+01	2.1573E+02	3.5638E+03
Th-230	5.8000E+03	1.7793E+04	2.9394E+05
U-234	5.0000E+01	1.5438E+02	2.5503E+03
U-235	5.0000E+01	1.5438E+02	2.5503E+03
U-238	5.0000E+01	1.5438E+02	2.5503E+03

0

Transport Time Parameters for Unsaturated Zone Stratum No. 2

Stratum thickness [h(2)]: 0.000000 m
Bulk soil material density [rhob(2)]: 1.700000 g/cm**3
Effective porosity [peuz(2)]: 0.100000
Hydraulic conductivity [Khuz(2)]: 0.030000 m/yr
Total porosity [ptuz(2)]: 0.200000
Soil specific b parameter [buz(2)]: 10.000000
Saturation ratio [sruz(2)]: 1.000000

Radio-nuclide (i)	Distribution Coefficient Kduz(i,2), cm**3/g	Retardation Factor Rduz(i,2)	Transport Time Dtuz(i,2), yr
Ac-227	2.0000E+01	1.7100E+02	0.0000E+00
Pa-231	5.0000E+01	4.2600E+02	0.0000E+00
Pb-210	1.0000E+02	8.5100E+02	0.0000E+00
Ra-226	7.0000E+01	5.9600E+02	0.0000E+00
Th-230	5.8000E+03	4.9301E+04	0.0000E+00
U-234	5.0000E+01	4.2600E+02	0.0000E+00
U-235	5.0000E+01	4.2600E+02	0.0000E+00
U-238	5.0000E+01	4.2600E+02	0.0000E+00

Transport Time Parameters for Unsaturated Zone Stratum No. 3

Stratum thickness [h(3)]: 150.000000 m
Bulk soil material density [rhob(3)]: 1.700000 g/cm**3
Effective porosity [peuz(3)]: 0.050000
Hydraulic conductivity [Khuz(3)]: 0.003000 m/yr
Total porosity [ptuz(3)]: 0.100000
Soil specific b parameter [buz(3)]: 10.000000
Saturation ratio [sruez(3)]: 1.000000

Radio- nuclide (i)	Distribution Coefficient Kd _{uz} (i,3), cm**3/g	Retardation Factor R _d _{uz} (i,3)	Transport Time Dt _{uz} (i,3), yr
Ac-227	2.0000E+01	3.4100E+02	7.2002E+03
Pa-231	5.0000E+01	8.5100E+02	1.7969E+04
Pb-210	1.0000E+02	1.7010E+03	3.5916E+04
Ra-226	7.0000E+01	1.1910E+03	2.5148E+04
Th-230	5.8000E+03	9.8601E+04	2.0819E+06
U-234	5.0000E+01	8.5100E+02	1.7969E+04
U-235	5.0000E+01	8.5100E+02	1.7969E+04
U-238	5.0000E+01	8.5100E+02	1.7969E+04

Dilution Factor Parameters for Mass-Balance (MB) Model

0 Contaminated zone area (A): 100.000000 m**2
Infiltration rate (In): 0.355200 m/yr
Evapotranspiration coefficient (Ce): 0.680000
Runoff coefficient (Cr): 0.500000
Precipitation rate (Pr): 0.220000 m/yr
Overhead irrigation rate (Irr): 1.000000 m/yr
Well pumping rate (Uw): 250.000000 m**3/yr
Dilution factor (fi, all i): 0.040000

Primary Parameters Used for Calculating Water/Soil
Concentration Ratios for Groundwater Pathway Segment

Model used: Nondispersion (ND)

Bulk soil density in contaminated zone (rhob): 1.200 g/cm**3

0 Radio-nuclide (i)	Dilution Factor f(i)	Retardation Factor Rdcz(i)	Breakthrough Time Chain year	Single Nuclide Dt(i), yr	Rise Time dt(i), yr
Ac-227	4.000E-02	6.235E+01	8.230E+03	8.230E+03	1.520E+02
Pa-231	4.000E-02	1.544E+02	2.052E+04	2.052E+04	1.540E+02
Pb-210	4.000E-02	3.078E+02	2.052E+04	4.100E+04	1.550E+02
Ra-226	4.000E-02	2.157E+02	2.052E+04	2.871E+04	5.496E+01
Th-230	4.000E-02	1.779E+04	2.052E+04	2.376E+06	1.520E+02
U-234	4.000E-02	1.544E+02	2.052E+04	2.052E+04	1.530E+02
U-235	4.000E-02	1.544E+02	2.052E+04	2.052E+04	6.795E+01
U-238	4.000E-02	1.544E+02	2.052E+04	2.052E+04	3.017E+00

[illegible]

Q

Water/Soil Concentration Ratios [WSR(j,2,t)] for Surface Water Pathway Segment

0

Watershed Area (A_w) = $1.1000E+07$ m**2

Contaminated Zone Area (A) = 1.0000E+02 m**2

Dilution Factor (f') = 9.0909E-06

Soil Density (rhob) = 1.2000E+00 kg/m**3

[illegible]

Storage Times For Contaminated Foodstuffs

k	Food Item	STOR_T(k), days
1	non-leafy plants	14
2	leafy plants	1
3	milk	1
4	meat	20
5	fish	7
6	crustacea	7
7	well water	1
8	surface water	1
9	livestock fodder	45

0

Storage Time Ingrowth and Decay Factors
Storage Time for k'th Foodstuff: t = STOR_T(k), days

Parent (i)	Product (j)	Branch Fraction	STOR_ID(i,j,t) = CONCE(i,j,t)/CONCE(i,i,0)									
			t=	1.400E+01	1.000E+00	1.000E+00	2.000E+01	7.000E+00	7.000E+00	1.000E+00	1.000E+00	4.500E+01
Ac-227	Ac-227	1.000E+00	9.988E-01	9.999E-01	9.999E-01	9.983E-01	9.994E-01	9.994E-01	9.999E-01	9.999E-01	9.999E-01	9.961E-01
Pa-231	Pa-231	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Pa-231	Ac-227	1.000E+00	1.219E-03	8.716E-05	8.716E-05	1.742E-03	6.099E-04	6.099E-04	8.716E-05	8.716E-05	8.716E-05	3.915E-03
Pb-210	Pb-210	1.000E+00	9.988E-01	9.999E-01	9.999E-01	9.983E-01	9.994E-01	9.994E-01	9.999E-01	9.999E-01	9.999E-01	9.962E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01
Ra-226	Pb-210	1.000E+00	1.191E-03	8.510E-05	8.510E-05	1.701E-03	5.955E-04	5.955E-04	8.510E-05	8.510E-05	8.510E-05	3.822E-03
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.661E-05	1.186E-06	1.186E-06	2.372E-05	8.303E-06	8.303E-06	1.186E-06	1.186E-06	1.186E-06	5.337E-05
Th-230	Pb-210	1.000E+00	9.888E-09	5.047E-11	5.047E-11	2.018E-08	2.472E-09	2.472E-09	5.047E-11	5.047E-11	5.047E-11	1.021E-07
U-234	U-234	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-234	Th-230	1.000E+00	3.450E-07	2.465E-08	2.465E-08	4.929E-07	1.725E-07	1.725E-07	2.465E-08	2.465E-08	2.465E-08	1.109E-06
U-234	Ra-226	1.000E+00	2.865E-12	1.444E-14	1.444E-14	5.846E-12	7.160E-13	7.160E-13	1.444E-14	1.444E-14	1.444E-14	2.960E-11
U-234	Pb-210	1.000E+00	1.064E-15	2.613E-17	2.613E-17	3.205E-15	2.317E-17	2.317E-17	2.613E-17	2.613E-17	2.613E-17	3.761E-14
U-235	U-235	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-235	Pa-231	1.000E+00	8.110E-07	5.793E-08	5.793E-08	1.159E-06	4.055E-07	4.055E-07	5.793E-08	5.793E-08	5.793E-08	2.607E-06
U-235	Ac-227	1.000E+00	4.946E-10	2.524E-12	2.524E-12	1.009E-09	1.237E-10	1.237E-10	2.524E-12	2.524E-12	2.524E-12	5.105E-09
U-238	U-238	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-238	U-234	1.000E+00	1.087E-07	7.762E-09	7.762E-09	1.552E-07	5.433E-08	5.433E-08	7.762E-09	7.762E-09	7.762E-09	3.493E-07
U-238	Th-230	1.000E+00	1.876E-14	1.746E-16	1.746E-16	3.828E-14	4.731E-15	4.731E-15	1.746E-16	1.746E-16	1.746E-16	1.936E-13
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONCE(i,j,t)/CONCE(i,i,0) is the concentration ratio of Product(j) at time t to Parent(i) at start of storage time.

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
 Root Uptake from Contaminated Soil (q=1)

Area Factor for Plant Foods [FA(3)] = 0.05

Nuclide (i)	t=	Depth Factor FD(i,1,t) (dimensionless)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Pa-231	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Pb-210	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Ra-226	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Th-230	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
U-234	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
U-235	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
U-238	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01

0

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
 Foliar Uptake from Contaminated Dust (q=2)

Area Factor for Plant Foods [FA(3)] = 0.05

Nuclide (i)	t=	Depth Factor FD(i,2,t) (dimensionless)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Pa-231	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Pb-210	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Ra-226	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Th-230	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-234	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-235	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-238	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
Ditch Irrigation (q=3)

Area Factor for Plant Foods [FA(3)] = 0.05

Nuclide (i)	t=	Depth Factor FD(i,3,t) (dimensionless)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Pa-231		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Pb-210		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Ra-226		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Th-230		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
U-234		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
U-235		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
U-238		1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00

0

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
Overhead Irrigation (q=4)

Area Factor for Plant Foods [FA(3)] = 0.05

The Depth Factor Value

FD(i,p,q,t) = 1.0000E+00

is applicable for all radionuclides(i) and times(t).

0

Area and Depth Factors for Meat (p=4) and Milk (p=5) Pathways
Transfer from Livestock Water (q=5) and Soil (q=6) Intake

Area Factor for Meat and Milk [FA(p),p=4,5] = 0.00

The livestock water subpathway (q=5) and livestock soil intake subpathway (q=6)
occur only for the meat (p=4) and milk (p=5) pathways.

Area and Depth Factors for Meat (p=4) and Milk (p=5) Pathways
Transfer from Livestock Water (q=5) and Soil (q=6) Intake

Area Factor for Meat and Milk [FA(p),p=4,5] = 0.00

The livestock water subpathway (q=5) and livestock soil intake subpathway (q=6)
occur only for the meat (p=4) and milk (p=5) pathways.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)

Subpathway: Root Uptake from Contaminated Soil (q=1)

OParent (i)	Product (j)	DCF(j,3)*	ETF(j,3,1,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	1.087E+01	1.087E+01	1.087E+01	1.087E+01	1.087E+01	1.087E+01	8.809E+00	6.634E+00
U-234	Th-230	5.480E-04	4.350E+00	4.735E+00	4.353E+00	4.351E+00	4.350E+00	4.350E+00	3.524E+00	2.654E+00
U-234	Ra-226	1.330E-03	1.740E+02	1.743E+02	1.740E+02	1.740E+02	1.740E+02	1.740E+02	1.409E+02	1.061E+02
U-234	Pb-210	7.270E-03	4.350E+01	6.211E+01	4.380E+01	4.371E+01	4.368E+01	4.367E+01	3.537E+01	2.663E+01
OU-235	U-235	2.670E-04	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	8.809E+00	6.634E+00
U-235	Pa-231	1.060E-02	4.350E+01	4.389E+01	4.350E+01	4.350E+01	4.350E+01	4.350E+01	3.524E+01	2.654E+01
U-235	Ac-227	1.480E-02	1.088E+01	1.400E+01	1.095E+01	1.093E+01	1.093E+01	1.093E+01	8.851E+00	6.665E+00
OU-238	U-238	2.690E-04	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	8.809E+00	6.634E+00
U-238	U-234	2.830E-04	1.088E+01	1.126E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	8.809E+00	6.634E+00
U-238	Th-230	5.480E-04	4.350E+00	5.135E+00	4.356E+00	4.353E+00	4.351E+00	4.350E+00	3.524E+00	2.654E+00
U-238	Ra-226	1.330E-03	1.740E+02	1.745E+02	1.740E+02	1.740E+02	1.740E+02	1.740E+02	1.409E+02	1.061E+02
U-238	Pb-210	7.270E-03	4.350E+01	6.820E+01	4.386E+01	4.374E+01	4.369E+01	4.367E+01	3.537E+01	2.664E+01

* - The dose conversion factor units are mrem/pCi.

0

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)

Subpathway: Foliar Uptake from Contaminated Dust (q=2)

OParent (i)	Product (j)	DCF(j,3)*	ETF(j,3,2,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.461E-02	4.779E-02	4.779E-02
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.464E-02	4.783E-02	4.783E-02
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.448E-02	4.765E-02	4.765E-02
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.448E-02	4.765E-02	4.765E-02
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.461E-02	4.779E-02	4.779E-02

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)

Subpathway: Ditch Irrigation (q=3)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,3,t) * SF(j,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)

Subpathway: Overhead Irrigation (q=4)

Parent (i)	Product (j)	DCF(j,3)*	ETF(j,3,4,t) * SF(j,t) (g/yr)								
			t = 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)
Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

OParent (i)	Product (j)	DCF(j,4)*	ETF(j,4,1,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)
Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

OParent (i)	Product (j)	DCF(j,4)*	ETF(j,4,2,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Ditch Irrigation (q=3)

OParent (i)	Product (j)	DCF(j,4)*	ETF(j,4,3,t) * SF(j,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Overhead Irrigation (q=4)

OParent (i)	Product (j)	DCF(j,4)*	ETF(j,4,4,t) * SF(j,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)
 Subpathway: Livestock Water (q=5)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,5,t) * SF(j,t) (g/yr)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)
 Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,1,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)
 Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,2,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Subpathway: Ditch Irrigation (q=3)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,3,t) * SF(j,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Subpathway: Overhead Irrigation (q=4)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,4,t) * SF(j,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)
 Subpathway: Livestock Water (q=5)

Parent (i)	Product (j)	DCF(j,5)*	ETF(j,5,5,t) * SF(j,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Fish Pathway (p=6)

OParent (i)	Product (j)	DCF(j,6)*	ETF(j,6,t) * SF(j,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Drinking Water Pathway (p=7)

Parent (i)	Product (j)	DCF(j,7)*	ETF(j,7,t) * SF(j,t) (g/yr)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

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Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,3,3,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,3,4,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)
Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated											
OParent (i)	Product (j)	Branch Fraction	DSR(j,3,t) (mrem/yr)/(pCi/g)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)
 Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,1,t) (mrem/yr)/(pCi/g)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life < 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)
 Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,2,t) (mrem/yr)/(pCi/g)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Livestock Water (q=5)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,1,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,2,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,3,t) (mrem/yr)/(pCi/g)									
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03		
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life < 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,4,t) (mrem/yr)/(pCi/g)									
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03		
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Livestock Water (q=5)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from the Ingestion of Fish (p=6)

Parent and Progeny Principal Radionuclide Contributions Indicated

0Parent (i)	Product (j)	Branch Fraction	DSR(j,6,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from the Ingestion of Drinking Water (p=7)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,7,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life < 0.5 yr) daughters.

Plant/Air and Plant/Water Concentration Ratios						
Mass loading [ASR(3)]: 1.000E-04 g/m**3						
Area Factor for Mass Loading [FA(2)]: 7.692E-01						
0 Nuclide (i)	FAR(i,3,2,1) m**3/g	FAR(i,3,2,2) m**3/g	FWR(i,3,3,1) L/g	FWR(i,3,3,2) L/g	FWR(i,3,4,1) L/g	FWR(i,3,4,2) L/g
Ac-227	5.4545E-02	2.6156E-01	1.7686E-06	2.5994E-06	1.7274E-03	8.2791E-03
Pa-231	5.4545E-02	2.6156E-01	7.0798E-06	1.0409E-05	1.7314E-03	8.2850E-03
Pb-210	5.4545E-02	2.6156E-01	7.0816E-06	1.0413E-05	1.7314E-03	8.2850E-03
Ra-226	5.4545E-02	2.6156E-01	2.8323E-05	4.1645E-05	1.7474E-03	8.3084E-03
Th-230	5.4545E-02	2.6156E-01	7.0833E-07	1.0417E-06	1.7267E-03	8.2780E-03
U-234	5.4545E-02	2.6156E-01	1.7699E-06	2.6023E-06	1.7274E-03	8.2791E-03
U-235	5.4545E-02	2.6156E-01	1.7699E-06	2.6023E-06	1.7274E-03	8.2791E-03
U-238	5.4545E-02	2.6156E-01	1.7699E-06	2.6023E-06	1.7274E-03	8.2791E-03

FAR(i,p,q,k) is the plant/air concentration ratio for airborne contaminated dust,
 and FWR(i,p,q,k) is the plant/water concentration ratio. See groundwater displays
 for water/soil concentration ratios.

Plant/Soil Concentration Ratios, FSR(i,3,q,k,t)						
Root Uptake (q=1) and Foliar Dust Deposition (q=2)						
Nonleafy (k=1) and/or Leafy (k=2) Vegetables						
Nuclide(i)						
0 Parent Product	FSR(i,3,1,k)	FSR(i,3,2,1)	FSR(i,3,2,2)			
U-234	U-234	2.5000E-03	4.1958E-06	2.0120E-05		
U-234	Th-230	1.0000E-03	4.1958E-06	2.0120E-05		
U-234	Ra-226	4.0000E-02	4.1958E-06	2.0120E-05		
U-234	Pb-210	1.0000E-02	4.1958E-06	2.0120E-05		
U-235	U-235	2.5000E-03	4.1958E-06	2.0120E-05		
U-235	Pa-231	1.0000E-02	4.1958E-06	2.0120E-05		
U-235	Ac-227	2.5000E-03	4.1958E-06	2.0120E-05		
U-238	U-238	2.5000E-03	4.1958E-06	2.0120E-05		
U-238	U-234	2.5000E-03	4.1958E-06	2.0120E-05		
U-238	Th-230	1.0000E-03	4.1958E-06	2.0120E-05		
U-238	Ra-226	4.0000E-02	4.1958E-06	2.0120E-05		
U-238	Pb-210	1.0000E-02	4.1958E-06	2.0120E-05		

Plant/Soil Concentration Ratio, FSR(j,3,q,k,t)

Ditch Irrigation ($q=3$)

```
FSR(i,3,3,k,t)
```

[illegible]

0

Plant/Soil Concentration Ratio, FSR(j,3,q,k,t)

Overhead Irrigation ($q=4$) and Nonleafy Vegetables ($k=1$)
$$\text{FSR}(j, 3, 4, 1, t) * \text{SF}(j, t)$$
[illegible]

Overhead Irrigation ($q=4$) and Leafy Vegetables ($k=2$)[illegible]

Meat/Fodder, Milk/Fodder, Fodder/Air and Fodder/Water Concentration Ratios

0 FI(4,q): 68.0 kg/day FI(5,q): 55.0 kg/day q=1,2,3,4
 FI(4,q): 50.0 L/day FI(5,q): 160.0 L/day q=5

FI(4,q): 0.5 kg/day FI(5,q):

ONuclide FOR(i,4) FOR(i,5) FAR(i,3,2,3) FWR(i,3,3,3) FWR(i,3,4,3)
 (i) d/kg d/kg m**3/g L/g L/g

Ac-227	2.0000E-05	2.0000E-05	2.8659E-01	8.8837E-07	9.0700E-03
Pa-231	5.0000E-03	5.0000E-06	2.8659E-01	3.5547E-06	9.0720E-03
Pb-210	8.0000E-04	3.0000E-04	2.8659E-01	3.5551E-06	9.0720E-03
Ra-226	1.0000E-03	1.0000E-03	2.8659E-01	1.4220E-05	9.0800E-03
Th-230	1.0000E-04	5.0000E-06	2.8659E-01	3.5555E-07	9.0696E-03
U-234	3.4000E-04	6.0000E-04	2.8659E-01	8.8868E-07	9.0700E-03
U-235	3.4000E-04	6.0000E-04	2.8659E-01	8.8868E-07	9.0700E-03
U-238	3.4000E-04	6.0000E-04	2.8659E-01	8.8868E-07	9.0700E-03

FI(p,q) are the fodder (q=1,2,3,4), livestock water (q=5) and soil (q=6) intake rates;
 FOR(i,p) are the transfer coefficients from contaminated fodder of livestock
 water to meat (p=4) or milk (p=5). FAR(i,3,2,3) are the fodder/air
 concentration ratios, and FWR(i,3,3,3) and FWR(i,3,4,3) are the fodder/
 water concentration ratios for ditch and overhead irrigation, respectively.

1

0

1

[illegible]

Overhead Irrigation (q=4)

[illegible]

0

Livestock Water (q=5)

[illegible]

Nuclide(i)			
Parent	Product	FSR(i,4,1)	FSR(i,4,2)

U-234	U-234	5.7800E-05	5.0969E-07
U-234	Th-230	6.8000E-06	1.4991E-07
U-234	Ra-226	2.7200E-03	1.4991E-06
U-234	Pb-210	5.4400E-04	1.1993E-06
U-235	U-235	5.7800E-05	5.0969E-07
U-235	Pa-231	3.4000E-03	7.4955E-06
U-235	Ac-227	3.4000E-06	2.9982E-08
U-238	U-238	5.7800E-05	5.0969E-07
U-238	U-234	5.7800E-05	5.0969E-07
U-238	Th-230	6.8000E-06	1.4991E-07
U-238	Ra-226	2.7200E-03	1.4991E-06
U-238	Pb-210	5.4400E-04	1.1993E-06

$$\text{FSR}(j, 4, 3, t) * \text{SF}(j, t)$$
[illegible]

[illegible][illegible]

Nuclide(i)		FSR(i,5,1)	FSR(i,5,2)
Parent	Product		
U-234	U-234	8.2500E-05	7.2750E-07
U-234	Th-230	2.7500E-07	6.0625E-09
U-234	Ra-226	2.2000E-03	1.2125E-06
U-234	Pb-210	1.6500E-04	3.6375E-07
U-235	U-235	8.2500E-05	7.2750E-07
U-235	Pa-231	2.7500E-06	6.0625E-09
U-235	Ac-227	2.7500E-06	2.4250E-08
U-238	U-238	8.2500E-05	7.2750E-07
U-238	U-234	8.2500E-05	7.2750E-07
U-238	Th-230	2.7500E-07	6.0625E-09
U-238	Ra-226	2.2000E-03	1.2125E-06
U-238	Pb-210	1.6500E-04	3.6375E-07

[illegible]

Milk/Soil Concentration Ratio, FSR(j,5,q,t)
Overhead Irrigation (q=4)

[illegible]

0

Milk/Soil Concentration Ratio, FSR(j,5,q,t)
Livestock Water (q=5)

[illegible]

Dose/Source Ratios for Soil Ingestion Pathway (p=8)
Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,8,t) (mrem/yr)/(pCi/g)								
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.465E-06	2.135E-06	6.581E-07	
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.180E-07	6.683E-07	6.647E-07	
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.188E-07	1.417E-07	1.473E-07	
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.767E-07	6.996E-07	7.327E-07	
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.779E-06	3.645E-06	2.203E-06	
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.110E-06	2.019E-06	6.227E-07	
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.060E-06	1.345E-06	5.176E-07	
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.220E-06	1.431E-06	5.539E-07	
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.239E-05	4.795E-06	1.694E-06	
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.156E-06	2.034E-06	6.274E-07	
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.101E-08	4.848E-09	1.868E-09	
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.680E-10	3.109E-10	3.181E-10	
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.430E-11	6.024E-11	6.708E-11	
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.093E-10	2.931E-10	3.311E-10	
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.167E-06	2.040E-06	6.299E-07	

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life < 0.5 yr) daughters.

0

Dose Conversion and Environmental Transport Factors for the Soil Ingestion Pathway (p=8)

OParent (i)	Product (j)	DCF(j,8)*	ETF(j,8,t) (g/yr)								
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.801E-01	8.359E-01	8.359E-01	

* - The dose conversion factor units are mrem/pCi.

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Time= 1.000E+02	9
Time= 2.000E+02	12
Time= 4.000E+02	15
Time= 6.000E+02	18
Time= 8.000E+02	21
Time= 1.000E+03	24

Cancer Risk Slope Factors Summary Table
 File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	6.00E-07	6.00E-07	SLPF(1,1)
Sf-1	Pa-231	2.70E-08	2.70E-08	SLPF(2,1)
Sf-1	Pb-210+D	1.50E-10	1.50E-10	SLPF(3,1)
Sf-1	Ra-226+D	6.70E-06	6.70E-06	SLPF(4,1)
Sf-1	Th-230	4.40E-11	4.40E-11	SLPF(5,1)
Sf-1	U-234	2.10E-11	2.10E-11	SLPF(6,1)
Sf-1	U-235+D	2.70E-07	2.70E-07	SLPF(7,1)
Sf-1	U-238+D	5.70E-08	5.70E-08	SLPF(8,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	7.90E-08	7.90E-08	SLPF(1,2)
Sf-2	Pa-231	2.40E-08	2.40E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.90E-09	3.90E-09	SLPF(3,2)
Sf-2	Ra-226+D	2.70E-09	2.70E-09	SLPF(4,2)
Sf-2	Th-230	1.70E-08	1.70E-08	SLPF(5,2)
Sf-2	U-234	1.40E-08	1.40E-08	SLPF(6,2)
Sf-2	U-235+D	1.30E-08	1.30E-08	SLPF(7,2)
Sf-2	U-238+D	1.20E-08	1.20E-08	SLPF(8,2)
Sf-3	Ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.30E-10	6.30E-10	SLPF(1,3)
Sf-3	Pa-231	1.50E-10	1.50E-10	SLPF(2,3)
Sf-3	Pb-210+D	1.00E-09	1.00E-09	SLPF(3,3)
Sf-3	Ra-226+D	3.00E-10	3.00E-10	SLPF(4,3)
Sf-3	Th-230	3.80E-11	3.80E-11	SLPF(5,3)
Sf-3	U-234	4.40E-11	4.40E-11	SLPF(6,3)
Sf-3	U-235+D	4.70E-11	4.70E-11	SLPF(7,3)
Sf-3	U-238+D	6.20E-11	6.20E-11	SLPF(8,3)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12\$	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)

Note: Default values followed by '*' were derived by multiplying the dose conversion factors with 7.6E-7 (risk/mrem). For external radiation, the dose conversion factors used for this derivation were obtained from the EPA's Federal Guidance Report No.12, and for inhalation and ingestion, the dose conversion factors were the ones used in RESRAD default database.

Default values followed by '\$' were obtained from 'Estimating Radiogenic Cancer Risks', EPA 402-R-93-076, June, 1994.

Default values followed by '#' were taken from individual radionuclides given in HEAST.

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irm,i,t) and QINT9W(irm,i,t) for Inhalation of
 Radon and its Decay Products as pci/yr at t= 0.000E+00 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CHRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Radio- Nuclide	Water Independent Pathways (Inhalation excludes radon)				Soil			
	Ground	Inhalation	Plant	Meat	Milk	risk	fract.	risk fract.
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
U-234	1.000E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
U-235	3.985E-11	0.0070	0.000E+00	0.0000	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
U-238	5.680E-09	0.9930	0.000E+00	0.0000	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000
Total	5.720E-09	1.0000	0.000E+00	0.0000	0.000E+00	0.000E+00	0.0000	0.000E+00 0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways												
Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-15	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.985E-11	0.0070
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.680E-09	0.9930
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.720E-09	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
and water dependent water, fish, plant, meat, milk pathways

0 Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
0 Radon and its Decay Products at t= 0.000E+00 years
Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.000E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.985E-11	0.0070	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	5.680E-09	0.9930	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	5.720E-09	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.000E-15	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.985E-11	0.0070
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.680E-09	0.9930
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.720E-09	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+00 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+00 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	2.959E-03	2.847E-03	2.154E-03	1.741E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.959E-03	2.847E-03	2.154E-03	1.741E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.371E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	4.258E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	6.076E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	2.713E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	3.833E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	1.018E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	4.028E-11	0.0070	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	5.710E-09	0.9930	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	5.750E-09	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.371E-16	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.258E-16	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.076E-25	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.713E-15	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.833E-20	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E-15	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.028E-11	0.0070
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.710E-09	0.9930
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.750E-09	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+00 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.598E-13	3.160E-13	4.007E-13	7.837E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.598E-13	3.160E-13	4.007E-13	7.837E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years
 Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	3.730E-15	0.0000	0.000E+00	0.0000	1.660E-12	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	4.028E-11	0.0070	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	5.710E-09	0.9927	0.000E+00	0.0000	1.568E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	5.750E-09	0.9997	0.000E+00	0.0000	1.660E-12	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years
 Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
Radio-Nuclide	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.664E-12	0.0003
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.028E-11	0.0070
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.710E-09	0.9927
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.752E-09	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	2.104E+01	2.024E+01	1.531E+01	1.238E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.104E+01	2.024E+01	1.531E+01	1.238E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years
 Water Independent Pathways (Inhalation excludes radon)

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.164E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	9.428E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	1.875E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	5.169E-11	0.0053	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	2.671E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	5.697E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.159E-10	0.0120	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.504E-09	0.9825	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	9.672E-09	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.164E-12	0.0001
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.428E-14	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.875E-18	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.169E-11	0.0053
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.671E-17	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.697E-15	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.159E-10	0.0120
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.504E-09	0.9825
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.672E-09	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+02 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.136E-09	2.246E-09	2.848E-09	5.571E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.136E-09	2.246E-09	2.848E-09	5.571E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	5.169E-11	0.0024	0.000E+00	0.0000	1.180E-08	0.5495	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	1.172E-10	0.0055	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.504E-09	0.4425	0.000E+00	0.0000	1.049E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	9.672E-09	0.4504	0.000E+00	0.0000	1.180E-08	0.5496	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.185E-08	0.5519
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.172E-10	0.0055
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.505E-09	0.4426
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.147E-08	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 2.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 2.000E+02 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	6.064E+01	5.830E+01	4.412E+01	3.566E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	6.064E+01	5.830E+01	4.412E+01	3.566E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 2.000E+02 years

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.087E-12	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	4.208E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	5.804E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	4.031E-10	0.0242	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	3.903E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	3.246E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.372E-10	0.0203	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.590E-08	0.9551	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.665E-08	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 2.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.087E-12	0.0004
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.208E-13	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.804E-17	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.031E-10	0.0242
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.903E-16	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.246E-14	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.372E-10	0.0203
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.590E-08	0.9551
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.665E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 2.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	3.274E-09	6.471E-09	8.206E-09	1.605E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	3.274E-09	6.471E-09	8.206E-09	1.605E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 2.00E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	4.031E-10	0.0080	0.000E+00	0.0000	3.399E-08	0.6712	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.437E-10	0.0068	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.590E-08	0.3139	0.000E+00	0.0000	5.665E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.665E-08	0.3287	0.000E+00	0.0000	3.400E-08	0.6713	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
and Fraction of Total Risk at t= 2.00E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.440E-08	0.6792
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.437E-10	0.0068
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.591E-08	0.3140
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.065E-08	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 4.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 4.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.326E+02	1.274E+02	9.638E+01	7.791E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.326E+02	1.274E+02	9.638E+01	7.791E+01	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

0

Water Independent Pathways (Inhalation excludes radon)												
Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.648E-11	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	4.192E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	9.792E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	6.454E-09	0.1198	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	4.501E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	1.053E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.854E-09	0.0530	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.450E-08	0.8259	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	5.388E-08	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.648E-11	0.0012
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.192E-12	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.792E-15	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.454E-09	0.1198
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.501E-14	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.053E-12	0.0000
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.854E-09	0.0530
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.450E-08	0.8259
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.388E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 4.000E+02 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	7.159E-09	1.414E-08	1.793E-08	3.506E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	7.159E-09	1.414E-08	1.793E-08	3.506E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	6.454E-09	0.0504	0.000E+00	0.0000	7.426E-08	0.5794	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	2.925E-09	0.0228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	4.451E-08	0.3472	0.000E+00	0.0000	2.150E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	5.388E-08	0.4204	0.000E+00	0.0000	7.428E-08	0.5796	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.072E-08	0.6298
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.925E-09	0.0228
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.453E-08	0.3474
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.282E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 6.000E+02 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	4.065E-05	0.000E+00	0.000E+00	0.000E+00	1.305E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.305E-04
Pa-231	5.394E-05	0.000E+00	0.000E+00	0.000E+00	1.732E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.732E-04
Pb-210	3.706E-04	0.000E+00	0.000E+00	0.000E+00	1.190E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.190E-03
Ra-226	4.172E-04	0.000E+00	0.000E+00	0.000E+00	1.340E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.340E-03
Th-230	5.270E-03	0.000E+00	0.000E+00	0.000E+00	1.692E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.692E-02
U-234	1.069E-01	0.000E+00	0.000E+00	0.000E+00	3.433E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.433E-01
U-235	4.276E-03	0.000E+00	0.000E+00	0.000E+00	1.373E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.373E-02
U-238	1.069E-01	0.000E+00	0.000E+00	0.000E+00	3.433E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.433E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 6.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.749E+02	1.679E+02	1.270E+02	1.027E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.749E+02	1.679E+02	1.270E+02	1.027E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

0

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	4.837E-10	0.0017	9.633E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.467E-12	0.0000
Pa-231	2.903E-11	0.0001	3.883E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.794E-13	0.0000
Pb-210	8.852E-13	0.0000	4.336E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.571E-11	0.0001
Ra-226	5.663E-08	0.1972	3.379E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.206E-11	0.0000
Th-230	4.039E-12	0.0000	2.688E-09	0.0094	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.929E-11	0.0001
U-234	3.266E-11	0.0001	4.489E-08	0.1563	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.531E-10	0.0016
U-235	2.256E-08	0.0786	1.667E-09	0.0058	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.936E-11	0.0001
U-238	1.183E-07	0.4119	3.848E-08	0.1340	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.385E-10	0.0022
Total	1.980E-07	0.6896	8.794E-08	0.3063	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.181E-09	0.0041

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.825E-10	0.0020
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.864E-11	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.996E-11	0.0003
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.667E-08	0.1974
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.711E-09	0.0094
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.538E-08	0.1580
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.424E-08	0.0844
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.574E-07	0.5482
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.871E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 6.000E+02 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	9.443E-09	1.863E-08	2.363E-08	4.621E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	9.443E-09	1.863E-08	2.363E-08	4.621E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	5.664E-08	0.1471	4.758E-08	0.1236	9.787E-08	0.2542	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.194E-10	0.0013
U-235	2.307E-08	0.0599	1.803E-09	0.0047	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.261E-11	0.0001
U-238	1.183E-07	0.3072	3.856E-08	0.1001	3.650E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.393E-10	0.0017
Total	1.980E-07	0.5143	8.794E-08	0.2284	9.791E-08	0.2543	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.181E-09	0.0031

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

Water Dependent Pathways														
Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.026E-07	0.5262
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.490E-08	0.0647
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.575E-07	0.4091
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.850E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 8.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	1.806E-05	0.000E+00	0.000E+00	0.000E+00	5.800E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.800E-05
Pa-231	2.371E-05	0.000E+00	0.000E+00	0.000E+00	7.615E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.615E-05
Pb-210	4.496E-04	0.000E+00	0.000E+00	0.000E+00	1.444E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.444E-03
Ra-226	4.977E-04	0.000E+00	0.000E+00	0.000E+00	1.598E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.598E-03
Th-230	5.699E-03	0.000E+00	0.000E+00	0.000E+00	1.830E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.830E-02
U-234	3.532E-02	0.000E+00	0.000E+00	0.000E+00	1.134E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.134E-01
U-235	1.413E-03	0.000E+00	0.000E+00	0.000E+00	4.537E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.537E-03
U-238	3.532E-02	0.000E+00	0.000E+00	0.000E+00	1.134E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.134E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 8.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.893E+02	1.818E+02	1.375E+02	1.112E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.893E+02	1.818E+02	1.375E+02	1.112E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.173E-10	0.0015	4.281E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-12	0.0000
Pa-231	1.301E-11	0.0001	1.707E-11	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.427E-13	0.0000
Pb-210	1.391E-12	0.0000	5.261E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.332E-11	0.0003
Ra-226	6.542E-08	0.4518	4.031E-11	0.0003	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.439E-11	0.0001
Th-230	5.187E-12	0.0000	2.907E-09	0.0201	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.086E-11	0.0001
U-234	1.558E-11	0.0001	1.483E-08	0.1024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.497E-10	0.0010
U-235	7.807E-09	0.0539	5.510E-10	0.0038	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.397E-12	0.0000
U-238	3.972E-08	0.2743	1.272E-08	0.0878	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.110E-10	0.0015
Total	1.132E-07	0.7817	3.116E-08	0.2152	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.471E-10	0.0031

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.612E-10	0.0018
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.043E-11	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.732E-11	0.0007
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.548E-08	0.4521
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.933E-09	0.0203
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.500E-08	0.1036
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.365E-09	0.0578
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.265E-08	0.3636
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.448E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 8.000E+02 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.022E-08	2.017E-08	2.558E-08	5.003E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.022E-08	2.017E-08	2.558E-08	5.003E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	6.542E-08	0.2608	1.780E-08	0.0710	1.060E-07	0.4225	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.279E-10	0.0009
U-235	8.038E-09	0.0320	6.109E-10	0.0024	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.836E-12	0.0000
U-238	3.975E-08	0.1585	1.275E-08	0.0508	4.506E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.114E-10	0.0008
Total	1.132E-07	0.4513	3.116E-08	0.1242	1.060E-07	0.4226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.471E-10	0.0018

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.894E-07	0.7551
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.656E-09	0.0345
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.276E-08	0.2103
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.508E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+03 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	6.993E-06	0.000E+00	0.000E+00	0.000E+00	2.246E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.246E-05
Pa-231	9.122E-06	0.000E+00	0.000E+00	0.000E+00	2.930E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.930E-05
Pb-210	4.709E-04	0.000E+00	0.000E+00	0.000E+00	1.512E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.512E-03
Ra-226	5.175E-04	0.000E+00	0.000E+00	0.000E+00	1.662E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.662E-03
Th-230	5.668E-03	0.000E+00	0.000E+00	0.000E+00	1.820E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.820E-02
U-234	1.089E-02	0.000E+00	0.000E+00	0.000E+00	3.498E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.498E-02
U-235	4.357E-04	0.000E+00	0.000E+00	0.000E+00	1.399E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.399E-03
U-238	1.089E-02	0.000E+00	0.000E+00	0.000E+00	3.498E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.498E-02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+03 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.868E+02	1.795E+02	1.359E+02	1.098E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.868E+02	1.795E+02	1.359E+02	1.098E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

0

Water Independent Pathways (Inhalation excludes radon)												
Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	8.412E-11	0.0009	1.657E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.244E-13	0.0000
Pa-231	5.005E-12	0.0001	6.568E-12	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.318E-13	0.0000
Pb-210	1.457E-12	0.0000	5.510E-11	0.0006	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.537E-11	0.0005
Ra-226	6.791E-08	0.7184	4.192E-11	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.496E-11	0.0002
Th-230	5.159E-12	0.0001	2.891E-09	0.0306	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.075E-11	0.0002
U-234	4.804E-12	0.0001	4.575E-09	0.0484	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.618E-11	0.0005
U-235	2.408E-09	0.0255	1.699E-10	0.0018	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.973E-12	0.0000
U-238	1.224E-08	0.1295	3.921E-09	0.0415	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.507E-11	0.0007
Total	8.266E-08	0.8744	1.168E-08	0.1235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-10	0.0021

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.011E-10	0.0011
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.170E-11	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.019E-10	0.0011
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.796E-08	0.7190
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.917E-09	0.0309
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.626E-09	0.0489
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.580E-09	0.0273
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.623E-08	0.1717
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.453E-08	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+03 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.009E-08	1.993E-08	2.527E-08	4.942E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.009E-08	1.993E-08	2.527E-08	4.942E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	6.789E-08	0.3407	7.548E-09	0.0379	1.047E-07	0.5253	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.271E-10	0.0006
U-235	2.497E-09	0.0125	1.931E-10	0.0010	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.529E-12	0.0000
U-238	1.227E-08	0.0616	3.936E-09	0.0198	4.766E-11	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.524E-11	0.0003
Total	8.266E-08	0.4149	1.168E-08	0.0586	1.047E-07	0.5256	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E-10	0.0010

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.802E-07	0.9046
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.692E-09	0.0135
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.632E-08	0.0819
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.992E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Part IV: Concentration of Radionuclides

Concentration of radionuclides in different media	
Time= 0.000E+00	2
Time= 1.000E+00	3
Time= 1.000E+02	4
Time= 2.000E+02	5
Time= 4.000E+02	6
Time= 6.000E+02	7
Time= 8.000E+02	8
Time= 1.000E+03	9

Concentration of radionuclides in different media
 at t = 0.000E+00 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- tificate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pa-231	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb-210	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ra-226	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Th-230	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
U-234	1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E+01	1.87E+01	1.87E+01	4.33E-01	6.19E-01	0.00E+00	0.00E+00
U-235	6.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.50E-01	7.50E-01	7.50E-01	1.73E-02	2.48E-02	0.00E+00	0.00E+00
U-238	1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E+01	1.87E+01	1.87E+01	4.34E-01	6.19E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 1.000E+00 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	1.98E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.25E-07	2.53E-07	4.98E-07	6.77E-10	5.49E-10	0.00E+00	0.00E+00
Pa-231	1.26E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.37E-05	6.31E-05	6.50E-05	2.21E-05	1.93E-08	0.00E+00	0.00E+00
Pb-210	3.00E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E-09	1.55E-09	3.73E-09	2.70E-10	6.43E-11	0.00E+00	0.00E+00
Ra-226	2.91E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.84E-07	5.83E-07	5.87E-07	3.99E-08	3.23E-08	0.00E+00	0.00E+00
Th-230	1.35E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.37E-05	6.78E-05	8.80E-05	8.11E-07	3.94E-08	0.00E+00	0.00E+00
U-234	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E+01	1.86E+01	1.86E+01	4.31E-01	6.15E-01	0.00E+00	0.00E+00
U-235	5.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.46E-01	7.46E-01	7.46E-01	1.72E-02	2.46E-02	0.00E+00	0.00E+00
U-238	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E+01	1.86E+01	1.86E+01	4.31E-01	6.15E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.
 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
 The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 1.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	4.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.28E-04	5.24E-04	5.36E-04	2.81E-06	5.89E-07	0.00E+00	0.00E+00
Pa-231	7.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-03	3.52E-03	3.52E-03	1.20E-03	9.69E-07	0.00E+00	0.00E+00
Pb-210	1.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.83E-04	5.79E-04	5.92E-04	3.26E-05	9.79E-06	0.00E+00	0.00E+00
Ra-226	2.07E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.14E-03	4.14E-03	4.14E-03	2.82E-04	2.28E-04	0.00E+00	0.00E+00
Th-230	1.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-03	5.09E-03	5.10E-03	3.48E-05	1.41E-06	0.00E+00	0.00E+00
U-234	8.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E+01	1.04E+01	1.04E+01	2.41E-01	3.44E-01	0.00E+00	0.00E+00
U-235	3.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E-01	4.17E-01	4.17E-01	9.63E-03	1.37E-02	0.00E+00	0.00E+00
U-238	8.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E+01	1.04E+01	1.04E+01	2.41E-01	3.44E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 2.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	5.38E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-04	6.73E-04	6.86E-04	3.24E-06	7.54E-07	0.00E+00	0.00E+00
Pa-231	7.81E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.91E-03	3.91E-03	3.91E-03	1.33E-03	1.08E-06	0.00E+00	0.00E+00
Pb-210	4.38E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E-03	2.19E-03	2.23E-03	1.22E-04	3.68E-05	0.00E+00	0.00E+00
Ra-226	5.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02	1.19E-02	1.19E-02	8.12E-04	6.56E-04	0.00E+00	0.00E+00
Th-230	1.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.88E-03	7.88E-03	7.89E-03	5.37E-05	2.17E-06	0.00E+00	0.00E+00
U-234	4.63E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E+00	5.78E+00	5.78E+00	1.34E-01	1.91E-01	0.00E+00	0.00E+00
U-235	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-01	2.31E-01	2.31E-01	5.35E-03	7.63E-03	0.00E+00	0.00E+00
U-238	4.63E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E+00	5.78E+00	5.78E+00	1.34E-01	1.91E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 4.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	3.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.46E-04	4.44E-04	4.51E-04	2.04E-06	4.96E-07	0.00E+00	0.00E+00
Pa-231	4.81E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-03	2.40E-03	2.40E-03	8.18E-04	6.62E-07	0.00E+00	0.00E+00
Pb-210	1.11E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.57E-03	5.55E-03	5.62E-03	3.08E-04	9.29E-05	0.00E+00	0.00E+00
Ra-226	1.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-02	2.61E-02	2.61E-02	1.77E-03	1.43E-03	0.00E+00	0.00E+00
Th-230	2.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-02	1.02E-02	1.02E-02	6.95E-05	2.81E-06	0.00E+00	0.00E+00
U-234	1.43E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E+00	1.78E+00	1.78E+00	4.12E-02	5.89E-02	0.00E+00	0.00E+00
U-235	5.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.13E-02	7.13E-02	7.13E-02	1.65E-03	2.35E-03	0.00E+00	0.00E+00
U-238	1.43E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E+00	1.78E+00	1.78E+00	4.12E-02	5.89E-02	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 6.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	1.67E-04	1.56E-04	2.40E-08	0.00E+00	0.00E+00	2.11E-04	2.12E-04	2.16E-04	3.41E-06	1.80E-06	0.00E+00	0.00E+00
Pa-231	2.22E-04	2.07E-04	3.19E-08	0.00E+00	0.00E+00	1.11E-03	1.11E-03	1.11E-03	8.97E-04	8.25E-07	0.00E+00	0.00E+00
Pb-210	1.53E-03	1.42E-03	2.19E-07	0.00E+00	0.00E+00	7.67E-03	7.66E-03	7.76E-03	9.96E-04	3.42E-04	0.00E+00	0.00E+00
Ra-226	1.72E-03	1.60E-03	2.47E-07	0.00E+00	0.00E+00	3.44E-02	3.44E-02	3.44E-02	3.14E-03	2.69E-03	0.00E+00	0.00E+00
Th-230	2.17E-02	2.02E-02	3.11E-06	0.00E+00	0.00E+00	1.09E-02	1.13E-02	1.13E-02	1.09E-03	5.37E-05	0.00E+00	0.00E+00
U-234	4.40E-01	4.11E-01	6.32E-05	0.00E+00	0.00E+00	5.52E-01	5.58E-01	5.59E-01	8.27E-02	1.42E-01	0.00E+00	0.00E+00
U-235	1.76E-02	1.64E-02	2.53E-06	0.00E+00	0.00E+00	2.21E-02	2.23E-02	2.24E-02	3.31E-03	5.67E-03	0.00E+00	0.00E+00
U-238	4.40E-01	4.11E-01	6.32E-05	0.00E+00	0.00E+00	5.52E-01	5.58E-01	5.59E-01	8.27E-02	1.42E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 8.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	6.94E-05	6.94E-05	1.07E-08	0.00E+00	0.00E+00	7.09E-05	7.17E-05	7.30E-05	1.41E-06	7.74E-07	0.00E+00	0.00E+00
Pa-231	9.11E-05	9.11E-05	1.40E-08	0.00E+00	0.00E+00	3.69E-04	3.71E-04	3.71E-04	3.54E-04	3.30E-07	0.00E+00	0.00E+00
Pb-210	1.73E-03	1.73E-03	2.66E-07	0.00E+00	0.00E+00	7.03E-03	7.03E-03	7.13E-03	1.08E-03	3.77E-04	0.00E+00	0.00E+00
Ra-226	1.91E-03	1.91E-03	2.94E-07	0.00E+00	0.00E+00	3.10E-02	3.10E-02	3.10E-02	3.07E-03	2.66E-03	0.00E+00	0.00E+00
Th-230	2.19E-02	2.19E-02	3.37E-06	0.00E+00	0.00E+00	8.96E-03	9.31E-03	9.35E-03	1.16E-03	5.73E-05	0.00E+00	0.00E+00
U-234	1.36E-01	1.36E-01	2.09E-05	0.00E+00	0.00E+00	1.38E-01	1.40E-01	1.40E-01	2.63E-02	4.53E-02	0.00E+00	0.00E+00
U-235	5.43E-03	5.43E-03	8.35E-07	0.00E+00	0.00E+00	5.52E-03	5.61E-03	5.62E-03	1.05E-03	1.81E-03	0.00E+00	0.00E+00
U-238	1.36E-01	1.36E-01	2.09E-05	0.00E+00	0.00E+00	1.38E-01	1.40E-01	1.40E-01	2.63E-02	4.53E-02	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters, i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 1.000E+03 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	2.69E-05	2.69E-05	4.13E-09	0.00E+00	0.00E+00	2.07E-05	2.10E-05	2.14E-05	5.14E-07	2.92E-07	0.00E+00	0.00E+00
Pa-231	3.50E-05	3.50E-05	5.39E-09	0.00E+00	0.00E+00	1.07E-04	1.08E-04	1.08E-04	1.24E-04	1.17E-07	0.00E+00	0.00E+00
Pb-210	1.81E-03	1.81E-03	2.78E-07	0.00E+00	0.00E+00	5.55E-03	5.56E-03	5.63E-03	1.03E-03	3.64E-04	0.00E+00	0.00E+00
Ra-226	1.99E-03	1.99E-03	3.06E-07	0.00E+00	0.00E+00	2.43E-02	2.43E-02	2.43E-02	2.65E-03	2.33E-03	0.00E+00	0.00E+00
Th-230	2.18E-02	2.18E-02	3.35E-06	0.00E+00	0.00E+00	6.73E-03	7.08E-03	7.12E-03	1.14E-03	5.64E-05	0.00E+00	0.00E+00
U-234	4.19E-02	4.19E-02	6.44E-06	0.00E+00	0.00E+00	3.21E-02	3.28E-02	3.28E-02	7.87E-03	1.36E-02	0.00E+00	0.00E+00
U-235	1.67E-03	1.67E-03	2.58E-07	0.00E+00	0.00E+00	1.28E-03	1.31E-03	1.31E-03	3.15E-04	5.46E-04	0.00E+00	0.00E+00
U-238	4.19E-02	4.19E-02	6.44E-06	0.00E+00	0.00E+00	3.21E-02	3.28E-02	3.28E-02	7.87E-03	1.36E-02	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

OC:\WINRES\RESMAIN3.EXE execution time = 29.55 seconds

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Part V: Dose from Radionuclide at point of action

Total Dose Components summed to daughter	
Time = 609.2 years	2
Time = 0.000E+00 years	3
Time = 1.000E+00 years	4
Time = 1.000E+02 years	5
Time = 2.000E+02 years	6
Time = 4.000E+02 years	7
Time = 6.000E+02 years	8
Time = 8.000E+02 years	9
Time = 1.000E+03 years	10

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 609.2 years

0 ORadio- Nuc- lide	Water Independent Pathways								Water Dependent Pathways					
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	5.67E-05	2.80E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.98E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.39E-04
Pa-231	7.19E-06	7.08E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.88E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.98E-05
Pb-210	1.69E-06	9.25E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.30E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.02E-05
Ra-226	3.34E-03	3.85E-06	5.56E-03	0.00E+00	0.00E+00	0.00E+00	1.91E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.91E-03
Th-230	4.56E-06	1.83E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.90E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-03
U-234	2.69E-05	1.42E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.81E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-02
U-235	2.24E-03	5.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.70E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.77E-03
U-238	9.86E-03	1.27E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.32E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-02
Total	1.55E-02	2.97E-02	5.56E-03	0.00E+00	0.00E+00	0.00E+00	2.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.10E-02

0*Sum of all water independent and dependent pathways.

Total Dose Contributions IDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 0.000E+00 years

0 Radio- Nuc- lide	Water Independent Pathways								Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL	
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	
Ac-227	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Pa-231	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Pb-210	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Ra-226	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
Th-230	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
U-234	6.38E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.38E-10	
U-235	3.72E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.72E-06	
U-238	4.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.55E-04	
Total	4.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.59E-04	
0*Sum of all water independent and dependent pathways.															

0*Sum of all water independent and dependent pathways.

Total Dose Contributions IDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 1.000E+00 years

0 Radio- Nuc- lide	Water Independent Pathways								Water Dependent Pathways					
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	1.53E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E-11
Pa-231	1.00E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-10
Pb-210	8.26E-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.26E-19
Ra-226	1.51E-10	0.00E+00	9.36E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.37E-08
Th-230	3.51E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.51E-14
U-234	6.49E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.49E-10
U-235	3.76E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-06
U-238	4.57E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.57E-04
Total	4.61E-04	0.00E+00	9.36E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.61E-04

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 1.000E+02 years

0 Radio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	1.30E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.30E-07
Pa-231	2.22E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.22E-08
Pb-210	2.55E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.55E-12
Ra-226	2.88E-06	0.00E+00	6.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.68E-04
Th-230	2.45E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.45E-11
U-234	3.64E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.64E-09
U-235	1.08E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.08E-05
U-238	7.61E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.61E-04
Total	7.75E-04	0.00E+00	6.65E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.44E-03

0*Sum of all water independent and dependent pathways.

Total Dose Contributions IDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 2.000E+02 years

ORadio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	6.80E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.80E-07
Pa-231	9.92E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.92E-08
Pb-210	7.89E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.89E-11
Ra-226	2.25E-05	0.00E+00	1.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.94E-03
Th-230	3.58E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.58E-10
U-234	2.07E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.07E-08
U-235	3.15E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.15E-05
U-238	1.27E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-03
Total	1.33E-03	0.00E+00	1.92E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.24E-03

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 4.000E+02 years

0 ORadio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	7.42E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.42E-06
Pa-231	9.88E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.88E-07
Pb-210	1.33E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.33E-08
Ra-226	3.60E-04	0.00E+00	4.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.55E-03
Th-230	4.13E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.13E-08
U-234	6.72E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.72E-07
U-235	2.67E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.67E-04
U-238	3.57E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.57E-03
Total	4.20E-03	0.00E+00	4.19E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.39E-03

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 6.000E+02 years

ORadio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	5.40E-05	2.73E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.93E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-04
Pa-231	6.84E-06	6.90E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.84E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.77E-05
Pb-210	1.20E-06	8.60E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.65E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.85E-05
Ra-226	3.16E-03	3.59E-06	5.52E-03	0.00E+00	0.00E+00	0.00E+00	1.78E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.68E-03
Th-230	3.70E-06	1.72E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.27E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.73E-03
U-234	2.08E-05	1.41E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.71E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.42E-02
U-235	2.11E-03	5.26E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.67E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.64E-03
U-238	9.48E-03	1.26E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.23E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.22E-02
Total	1.48E-02	2.93E-02	5.52E-03	0.00E+00	0.00E+00	0.00E+00	2.17E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.99E-02

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 8.000E+02 years

In mrem/yr at t = 0.000E+00 years														
0	Water Independent Pathways							Water Dependent Pathways						
ORadio- Nuc- lide	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	2.43E-05	1.21E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.58E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.47E-04
Pa-231	3.07E-06	3.04E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.07E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.42E-05
Pb-210	1.89E-06	1.04E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.05E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-05
Ra-226	3.65E-03	4.28E-06	5.97E-03	0.00E+00	0.00E+00	0.00E+00	2.13E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.63E-03
Th-230	4.75E-06	1.86E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E-03
U-234	9.94E-06	4.66E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.70E-03
U-235	7.30E-04	1.74E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.21E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.05E-04
U-238	3.18E-03	4.17E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.05E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E-03
Total	7.60E-03	1.10E-02	5.97E-03	0.00E+00	0.00E+00	0.00E+00	8.81E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.47E-02
0*Sum of all water independent and dependent pathways.														

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 1.000E+03 years

O Radio- Nuc- lide	Water Independent Pathways								Water Dependent Pathways						ALL
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk		
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr		
Ac-227	9.39E-06	4.70E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.32E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.67E-05	
Pa-231	1.18E-06	1.17E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.11E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.32E-05	
Pb-210	1.98E-06	1.09E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.10E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.39E-05	
Ra-226	3.78E-03	4.45E-06	5.90E-03	0.00E+00	0.00E+00	0.00E+00	2.21E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.69E-03	
Th-230	4.73E-06	1.85E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.98E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-03	
U-234	3.07E-06	1.44E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.90E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.45E-03	
U-235	2.25E-04	5.36E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.74E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.79E-04	
U-238	9.81E-04	1.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.41E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.28E-03	
Total	5.01E-03	4.70E-03	5.90E-03	0.00E+00	0.00E+00	0.00E+00	4.35E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.57E-02	

0*Sum of all water independent and dependent pathways.

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9.2 Farm Scenario

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Dose Conversion Factor (and Related) Parameter Summary
File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2(1)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(2)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(3)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	U-234	1.320E-01	1.320E-01	DCF2(6)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(7)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(2)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(3)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	U-234	2.830E-04	2.830E-04	DCF3(6)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(7)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(8)
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.400E-04	2.400E-04	RTF(7,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D, fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Pa-231, fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231, crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D, fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Ra-226+D, fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230, fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234, fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D, fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D, fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

Site-Specific Parameter Summary					
Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	1.000E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	3.000E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	T1
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	1.000E+02	3.000E+00	---	T(3)
R011	Times for calculations (yr)	2.000E+02	1.000E+01	---	T(4)
R011	Times for calculations (yr)	4.000E+02	3.000E+01	---	T(5)
R011	Times for calculations (yr)	6.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	8.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): U-234	1.500E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): U-235	6.000E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	1.500E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	6.100E-01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.200E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.200E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	5.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	5.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.800E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	2.200E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.000E+00	2.000E-01	---	RI
R013	Irrigation mode	ditch	overhead	---	IDITCH
R013	Runoff coefficient	5.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.100E+07	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.400E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.700E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.000E+00	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.000E-01	2.000E-02	---	HGWT
R014	Saturated zone b parameter	4.000E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MNDP1

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Number of unsaturated zone strata	3	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.500E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.200E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	5.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	5.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.000E+01	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	0.000E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.700E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	2.000E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	1.000E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	1.000E+01	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	3.000E-02	1.000E+01	---	HCUZ(2)
R015	Unsat. zone 3, thickness (m)	1.500E+02	0.000E+00	---	H(3)
R015	Unsat. zone 3, soil density (g/cm**3)	1.700E+00	1.500E+00	---	DENSUZ(3)
R015	Unsat. zone 3, total porosity	1.000E-01	4.000E-01	---	TPUZ(3)
R015	Unsat. zone 3, effective porosity	5.000E-02	2.000E-01	---	EPUZ(3)
R015	Unsat. zone 3, soil-specific b parameter	1.000E+01	5.300E+00	---	BUZ(3)
R015	Unsat. zone 3, hydraulic conductivity (m/yr)	3.000E-03	1.000E+01	---	HCUZ(3)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,3)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(7,3)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,3)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Unsaturated zone 2 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,2)
R016	Unsaturated zone 3 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,3)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.456E-02	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,3)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.882E-03	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,3)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.950E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,1)
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,2)
R016	Unsaturated zone 3 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,3)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.209E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,1)
R016	Unsaturated zone 2 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,2)
R016	Unsaturated zone 3 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,3)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.103E-05	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
R017	Exposure duration	3.000E+01	3.000E+01	---	FD

Site-Specific Parameter Summary (continued)

0 Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	1 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	1.000E+00	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E-01	FPLANT
R018	Contamination fraction of meat	-1	-1	0.500E-02	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E-02	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LW15

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	2.000E+00	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	not used	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	not used	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	4.000E-01	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	5.000E-02	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	2.000E-06	2.000E-06	---	DIFCV
R021	in foundation material	3.000E-07	3.000E-07	---	DIFFL
R021	in contaminated zone soil	2.000E-06	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	3.600E+00	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	5.000E-01	5.000E-01	---	REXG
R021	Height of the building (room) (m)	2.500E+00	2.500E+00	---	HRM
R021	Building interior area factor	0.000E+00	0.000E+00	code computed (time dependent)	FAI
R021	Building depth below ground surface (m)	-1.000E+00	-1.000E+00	code computed (time dependent)	DMFL
R021	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	active

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	100.00 square meters	U-234	1.500E+01
Thickness:	1.00 meters	U-235	6.000E-01
Cover Depth:	0.61 meters	U-238	1.500E+01

0

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 30 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
TDOSE(t):	9.330E-02	9.278E-02	6.100E-02	5.368E-02	6.696E-02	1.714E-01	1.127E-01	8.960E-02
M(t):	3.110E-03	3.093E-03	2.033E-03	1.789E-03	2.232E-03	5.712E-03	3.755E-03	2.987E-03

0Maximum TDOSE(t): 1.745E-01 mrem/yr at t = 608.7 ± 0.6 years

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 608.7 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	9.424E-03	0.0540	3.587E-02	0.2055	6.037E-02	0.3459	2.231E-03	0.0128	1.129E-05	0.0001	2.134E-05	0.0001	3.894E-04	0.0022
U-235	6.406E-03	0.0367	1.969E-03	0.0113	0.000E+00	0.0000	1.738E-04	0.0010	3.285E-06	0.0000	7.135E-07	0.0000	2.475E-05	0.0001
U-238	2.755E-02	0.1579	2.850E-02	0.1633	2.269E-05	0.0001	1.231E-03	0.0071	7.026E-06	0.0000	1.759E-05	0.0001	3.058E-04	0.0018
Total	4.338E-02	0.2486	6.633E-02	0.3801	6.040E-02	0.3461	3.636E-03	0.0208	2.160E-05	0.0001	3.964E-05	0.0002	7.199E-04	0.0041

0

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 608.7 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.083E-01	0.6206
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.577E-03	0.0491
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.764E-02	0.3302
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.745E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.779E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.616E-02	0.4948	3.864E-05	0.0004	8.055E-05	0.0009	0.000E+00	0.0000
U-235	1.038E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.742E-03	0.0187	1.458E-06	0.0000	3.040E-06	0.0000	0.000E+00	0.0000
U-238	1.269E-03	0.0136	0.000E+00	0.0000	0.000E+00	0.0000	4.388E-02	0.4703	3.673E-05	0.0004	7.656E-05	0.0008	0.000E+00	0.0000
Total	1.279E-03	0.0137	0.000E+00	0.0000	0.000E+00	0.0000	9.179E-02	0.9837	7.684E-05	0.0008	1.602E-04	0.0017	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.628E-02	0.4961
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.757E-03	0.0188
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.526E-02	0.4851
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.330E-02	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

0	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
0	Radio-	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
	U-234		2.232E-09	0.0000	0.000E+00	0.0000	1.017E-06	0.0000	4.589E-02	0.4947	3.842E-05	0.0004	8.008E-05	0.0009
	U-235		1.050E-05	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	1.738E-03	0.0187	1.524E-06	0.0000	3.022E-06	0.0000
	U-238		1.275E-03	0.0137	0.000E+00	0.0000	9.606E-13	0.0000	4.362E-02	0.4702	3.652E-05	0.0004	7.612E-05	0.0008
	Total		1.286E-03	0.0139	0.000E+00	0.0000	1.017E-06	0.0000	9.126E-02	0.9836	7.646E-05	0.0008	1.592E-04	0.0017

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

0	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
0	Radio-	Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
	U-234		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.601E-02	0.4960
	U-235		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.753E-03	0.0189
	U-238		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.501E-02	0.4852
	Total		0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.278E-02	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	8.040E-06	0.0001	0.000E+00	0.0000	7.230E-03	0.1185	2.574E-02	0.4219	2.165E-05	0.0004	4.489E-05	0.0007	0.000E+00	0.0000
U-235	3.063E-05	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	1.360E-03	0.0223	4.822E-06	0.0001	1.697E-06	0.0000	0.000E+00	0.0000
U-238	2.123E-03	0.0348	0.000E+00	0.0000	6.429E-07	0.0000	2.438E-02	0.3996	2.041E-05	0.0003	4.253E-05	0.0007	0.000E+00	0.0000
Total	2.162E-03	0.0354	0.000E+00	0.0000	7.231E-03	0.1185	5.148E-02	0.8438	4.688E-05	0.0008	8.912E-05	0.0015	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.304E-02	0.5417
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.397E-03	0.0229
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.656E-02	0.4354
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.100E-02	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 2.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	6.268E-05	0.0012	0.000E+00	0.0000	2.083E-02	0.3879	1.454E-02	0.2709	1.254E-05	0.0002	2.535E-05	0.0005	0.000E+00	0.0000
U-235	9.004E-05	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	9.847E-04	0.0183	4.901E-06	0.0001	9.479E-07	0.0000	0.000E+00	0.0000
U-238	3.552E-03	0.0662	0.000E+00	0.0000	3.470E-06	0.0001	1.354E-02	0.2522	1.134E-05	0.0002	2.363E-05	0.0004	0.000E+00	0.0000
Total	3.704E-03	0.0690	0.000E+00	0.0000	2.083E-02	0.3880	2.907E-02	0.5415	2.878E-05	0.0005	4.993E-05	0.0009	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 2.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.547E-02	0.6607
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.081E-03	0.0201
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.713E-02	0.3191
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.368E-02	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 4.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.004E-03	0.0150	0.000E+00	0.0000	4.549E-02	0.6794	5.088E-03	0.0760	5.132E-06	0.0001	8.841E-06	0.0001	0.000E+00	0.0000
U-235	7.671E-04	0.0115	0.000E+00	0.0000	0.000E+00	0.0000	4.449E-04	0.0066	2.878E-06	0.0000	2.957E-07	0.0000	0.000E+00	0.0000
U-238	9.941E-03	0.1485	0.000E+00	0.0000	1.317E-05	0.0002	4.179E-03	0.0624	3.498E-06	0.0001	7.291E-06	0.0001	0.000E+00	0.0000
Total	1.171E-02	0.1749	0.000E+00	0.0000	4.551E-02	0.6796	9.712E-03	0.1450	1.151E-05	0.0002	1.643E-05	0.0002	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 4.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.160E-02	0.7706
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.215E-03	0.0181
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.414E-02	0.2112
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.696E-02	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 6.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	8.866E-03	0.0517	3.534E-02	0.2062	5.995E-02	0.3498	2.292E-03	0.0134	1.115E-05	0.0001	2.121E-05	0.0001	3.821E-04	0.0022
U-235	6.048E-03	0.0353	1.940E-03	0.0113	0.000E+00	0.0000	1.810E-04	0.0011	3.290E-06	0.0000	7.122E-07	0.0000	2.435E-05	0.0001
U-238	2.642E-02	0.1542	2.824E-02	0.1648	2.236E-05	0.0001	1.295E-03	0.0076	7.025E-06	0.0000	1.756E-05	0.0001	3.030E-04	0.0018
Total	4.134E-02	0.2412	6.551E-02	0.3823	5.997E-02	0.3500	3.768E-03	0.0220	2.146E-05	0.0001	3.949E-05	0.0002	7.095E-04	0.0041

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 6.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.069E-01	0.6236
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.196E-03	0.0478
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.631E-02	0.3286
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.714E-01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 8.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.021E-02	0.0906	1.458E-02	0.1294	6.491E-02	0.5762	1.185E-03	0.0105	6.301E-06	0.0001	8.792E-06	0.0001	1.791E-04	0.0016
U-235	2.111E-03	0.0187	7.273E-04	0.0065	0.000E+00	0.0000	5.605E-05	0.0005	1.277E-06	0.0000	2.296E-07	0.0000	9.423E-06	0.0001
U-238	8.878E-03	0.0788	9.338E-03	0.0829	2.760E-05	0.0002	3.244E-04	0.0029	2.237E-06	0.0000	5.626E-06	0.0000	1.002E-04	0.0009
Total	2.119E-02	0.1881	2.464E-02	0.2187	6.494E-02	0.5764	1.566E-03	0.0139	9.815E-06	0.0001	1.465E-05	0.0001	2.887E-04	0.0026

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 8.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.107E-02	0.8084
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.905E-03	0.0258
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.868E-02	0.1658
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.127E-01	1.0000

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	1.057E-02	0.1180	7.365E-03	0.0822	6.412E-02	0.7156	7.427E-04	0.0083	4.369E-06	0.0000	4.428E-06	0.0000	1.082E-04	0.0012
U-235	6.569E-04	0.0073	2.508E-04	0.0028	0.000E+00	0.0000	1.553E-05	0.0002	4.437E-07	0.0000	6.957E-08	0.0000	3.329E-06	0.0000
U-238	2.739E-03	0.0306	2.883E-03	0.0322	2.920E-05	0.0003	7.575E-05	0.0008	6.709E-07	0.0000	1.694E-06	0.0000	3.095E-05	0.0003
Total	1.397E-02	0.1559	1.050E-02	0.1172	6.415E-02	0.7159	8.339E-04	0.0093	5.483E-06	0.0001	6.192E-06	0.0001	1.425E-04	0.0016

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.292E-02	0.9254
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.271E-04	0.0103
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.760E-03	0.0643
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.960E-02	1.0000

0*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways											
Parent and Progeny Principal Radionuclide Contributions Indicated											
OParent (i)	Product (j)	Branch Fraction	DSR(j,t) (mrem/yr)/(pCi/g)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		3.086E-03	3.067E-03	1.713E-03	9.511E-04	2.933E-04	2.215E-03	7.249E-04	2.217E-04
U-234	Th-230	1.000E+00		0.000E+00	2.330E-08	1.618E-06	2.506E-06	3.255E-06	2.620E-04	2.826E-04	2.803E-04
U-234	Ra-226	1.000E+00		0.000E+00	6.829E-08	4.857E-04	1.402E-03	3.120E-03	4.610E-03	5.030E-03	4.998E-03
U-234	Pb-210	1.000E+00		0.000E+00	9.077E-12	2.462E-06	9.314E-06	2.354E-05	3.593E-05	3.409E-05	2.802E-05
U-234	ΣDSR(j)			3.086E-03	3.068E-03	2.203E-03	2.365E-03	3.440E-03	7.124E-03	6.071E-03	5.528E-03
OU-235	U-235	1.000E+00		2.928E-03	2.912E-03	1.667E-03	1.044E-03	1.516E-03	1.186E-02	4.066E-03	1.252E-03
U-235	Pa-231	1.000E+00		0.000E+00	9.909E-06	5.481E-04	6.084E-04	3.788E-04	4.747E-04	1.905E-04	6.781E-05
U-235	Ac-227	1.000E+00		0.000E+00	6.854E-08	1.138E-04	1.484E-04	1.301E-04	1.324E-03	5.847E-04	2.249E-04
U-235	ΣDSR(j)			2.928E-03	2.922E-03	2.329E-03	1.801E-03	2.025E-03	1.366E-02	4.841E-03	1.545E-03
OU-238	U-238	1.000E+00		3.018E-03	3.001E-03	1.770E-03	1.141E-03	9.417E-04	3.748E-03	1.241E-03	3.810E-04
U-238	U-234	1.000E+00		0.000E+00	9.007E-09	4.859E-07	5.395E-07	3.328E-07	3.772E-06	1.646E-06	6.295E-07
U-238	Th-230	1.000E+00		0.000E+00	3.578E-14	2.074E-10	5.758E-10	1.187E-09	1.136E-07	1.315E-07	1.342E-07
U-238	Ra-226	1.000E+00		0.000E+00	6.449E-14	4.319E-08	2.336E-07	9.030E-07	1.720E-06	2.139E-06	2.276E-06
U-238	Pb-210	1.000E+00		0.000E+00	7.095E-18	1.853E-10	1.396E-09	6.474E-09	1.304E-08	1.428E-08	1.266E-08
U-238	ΣDSR(j)			3.018E-03	3.001E-03	1.771E-03	1.142E-03	9.429E-04	3.754E-03	1.245E-03	3.840E-04

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 Basic Radiation Dose Limit = 30 mrem/yr

ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234		9.723E+03	9.780E+03	1.362E+04	1.269E+04	8.721E+03	4.211E+03	4.941E+03	5.427E+03
U-235		1.024E+04	1.027E+04	1.288E+04	1.666E+04	1.481E+04	2.196E+03	6.197E+03	1.942E+04
U-238		9.942E+03	9.997E+03	1.694E+04	2.627E+04	3.182E+04	7.992E+03	2.410E+04	7.812E+04

0

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 at tmin = time of minimum single radionuclide soil guideline
 and at tmax = time of maximum total dose = 608.7 ± 0.6 years

ONuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
U-234	1.500E+01	609.0 ± 0.6	7.224E-03	4.153E+03	7.221E-03	4.154E+03
U-235	6.000E-01	608.8 ± 0.6	1.431E-02	2.097E+03	1.430E-02	2.099E+03
U-238	1.500E+01	608.8 ± 0.6	3.843E-03	7.806E+03	3.842E-03	7.808E+03

Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

ONuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		4.628E-02	4.601E-02	2.570E-02	1.427E-02	4.399E-03	3.323E-02	1.087E-02	3.326E-03
U-234	U-238	1.000E+00		0.000E+00	1.351E-07	7.288E-06	8.093E-06	4.992E-06	5.657E-05	2.469E-05	9.442E-06
U-234	ΣDOSE(j):			4.628E-02	4.601E-02	2.570E-02	1.427E-02	4.404E-03	3.329E-02	1.090E-02	3.335E-03
Th-230	U-234	1.000E+00		0.000E+00	3.494E-07	2.427E-05	3.759E-05	4.883E-05	3.930E-03	4.238E-03	4.205E-03
Th-230	U-238	1.000E+00		0.000E+00	5.368E-13	3.111E-09	8.637E-09	1.781E-08	1.704E-06	1.972E-06	2.012E-06
Th-230	ΣDOSE(j):			0.000E+00	3.494E-07	2.428E-05	3.760E-05	4.885E-05	3.932E-03	4.240E-03	4.207E-03
ORa-226	U-234	1.000E+00		0.000E+00	1.024E-06	7.286E-03	2.103E-02	4.680E-02	6.916E-02	7.545E-02	7.496E-02
Ra-226	U-238	1.000E+00		0.000E+00	9.674E-13	6.479E-07	3.504E-06	1.355E-05	2.579E-05	3.208E-05	3.414E-05
Ra-226	ΣDOSE(j):			0.000E+00	1.024E-06	7.287E-03	2.103E-02	4.681E-02	6.918E-02	7.548E-02	7.500E-02
OPb-210	U-234	1.000E+00		0.000E+00	1.362E-10	3.693E-05	1.397E-04	3.531E-04	5.390E-04	5.113E-04	4.203E-04
Pb-210	U-238	1.000E+00		0.000E+00	1.064E-16	2.779E-09	2.093E-08	9.710E-08	1.956E-07	2.142E-07	1.899E-07
Pb-210	ΣDOSE(j):			0.000E+00	1.362E-10	3.693E-05	1.397E-04	3.532E-04	5.392E-04	5.115E-04	4.205E-04
OU-235	U-235	1.000E+00		1.757E-03	1.747E-03	1.000E-03	6.266E-04	9.098E-04	7.117E-03	2.440E-03	7.514E-04
OPa-231	U-235	1.000E+00		0.000E+00	5.945E-06	3.288E-04	3.650E-04	2.273E-04	2.848E-04	1.143E-04	4.069E-05
OAc-227	U-235	1.000E+00		0.000E+00	4.113E-08	6.829E-05	8.903E-05	7.808E-05	7.944E-04	3.508E-04	1.349E-04
OU-238	U-238	1.000E+00		4.526E-02	4.501E-02	2.655E-02	1.712E-02	1.413E-02	5.622E-02	1.862E-02	5.715E-03

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

ONuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		1.500E+01	1.491E+01	8.328E+00	4.624E+00	1.425E+00	4.393E-01	1.354E-01	4.173E-02
U-234	U-238	1.000E+00		0.000E+00	4.227E-05	2.361E-03	2.622E-03	1.617E-03	7.478E-04	3.074E-04	1.185E-04
U-234	ΣS(j):			1.500E+01	1.491E+01	8.330E+00	4.626E+00	1.427E+00	4.400E-01	1.357E-01	4.185E-02
Th-230	U-234	1.000E+00		0.000E+00	1.346E-04	1.017E-02	1.576E-02	2.043E-02	2.168E-02	2.189E-02	2.177E-02
Th-230	U-238	1.000E+00		0.000E+00	1.906E-10	1.303E-06	3.620E-06	7.449E-06	9.403E-06	1.018E-05	1.042E-05
Th-230	ΣS(j):			0.000E+00	1.346E-04	1.017E-02	1.576E-02	2.044E-02	2.169E-02	2.190E-02	2.178E-02
ORa-226	U-234	1.000E+00		0.000E+00	2.915E-08	2.072E-04	5.967E-04	1.303E-03	1.717E-03	1.911E-03	1.988E-03
Ra-226	U-238	1.000E+00		0.000E+00	2.753E-14	1.842E-08	9.943E-08	3.772E-07	6.404E-07	8.128E-07	9.051E-07
Ra-226	ΣS(j):			0.000E+00	2.915E-08	2.072E-04	5.968E-04	1.304E-03	1.718E-03	1.912E-03	1.988E-03
OPb-210	U-234	1.000E+00		0.000E+00	2.997E-10	1.157E-04	4.384E-04	1.109E-03	1.525E-03	1.727E-03	1.809E-03
Pb-210	U-238	1.000E+00		0.000E+00	2.132E-16	8.691E-09	6.564E-08	3.048E-07	5.535E-07	7.235E-07	8.172E-07
Pb-210	ΣS(j):			0.000E+00	2.997E-10	1.157E-04	4.384E-04	1.109E-03	1.526E-03	1.728E-03	1.809E-03
OU-235	U-235	1.000E+00		6.000E-01	5.965E-01	3.332E-01	1.850E-01	5.707E-02	1.760E-02	5.428E-03	1.674E-03
OPa-231	U-235	1.000E+00		0.000E+00	1.262E-05	7.043E-04	7.814E-04	4.810E-04	2.220E-04	9.111E-05	3.505E-05
OAc-227	U-235	1.000E+00		0.000E+00	1.982E-07	4.192E-04	5.383E-04	3.547E-04	1.673E-04	6.940E-05	2.687E-05
OU-238	U-238	1.000E+00		1.500E+01	1.491E+01	8.330E+00	4.626E+00	1.427E+00	4.400E-01	1.357E-01	4.185E-02

BRF(i) is the branch fraction of the parent nuclide.

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Iteration Log for Computation of the Time of Maximum U-234 Dose/Source Ratio
0 Tolerance for tmax = 1.0E-03 (fractional accuracy)

0 Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	6.00000E+02	7.12375E-03		
1	6.56636E+02	6.81637E-03	5.66362E+01	parabolic
2	6.18197E+02	7.14183E-03	1.81974E+01	parabolic
3	6.10353E+02	7.21813E-03	-7.84422E+00	parabolic
4	6.09578E+02	7.22272E-03	-7.74756E-01	parabolic
5	6.05920E+02	7.19556E-03	-3.65861E+00	golden section
6	6.08969E+02	7.22410E-03	-5.95782E-01	parabolic
7	6.08360E+02	7.21789E-03	-6.08969E-01	parabolic
8	6.08969E+02	7.22410E-03	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \cdot (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum U-235 Dose/Source Ratio
0 Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	6.00000E+02	1.36608E-02		
1	6.51102E+02	1.13058E-02	5.11021E+01	parabolic
2	6.14260E+02	1.39415E-02	1.42604E+01	parabolic
3	6.11235E+02	1.41833E-02	-3.02499E+00	parabolic
4	6.08240E+02	1.42563E-02	-2.99566E+00	parabolic
5	6.08848E+02	1.43087E-02	1.78999E-01	parabolic
6	6.09474E+02	1.43020E-02	6.26397E-01	parabolic
7	6.08848E+02	1.43087E-02	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \times (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum U-238 Dose/Source Ratio
0 Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	DSR(t) (mrem/yr)/(pCi/g)	Step Size (years)	Step Type
0	6.00000E+02	3.75377E-03		
1	6.33697E+02	3.31811E-03	3.36967E+01	parabolic
2	6.04327E+02	3.81010E-03	4.32747E+00	parabolic
3	6.15545E+02	3.69300E-03	1.12180E+01	golden section
4	6.06477E+02	3.82664E-03	2.14988E+00	parabolic
5	6.10080E+02	3.81397E-03	3.60298E+00	parabolic
6	6.07376E+02	3.83170E-03	8.98791E-01	parabolic
7	6.07984E+02	3.83607E-03	3.82478E-01	parabolic
8	6.08784E+02	3.84312E-03	8.00907E-01	golden section
9	6.09393E+02	3.83356E-03	4.94989E-01	golden section
10	6.08784E+02	3.84312E-03	0.00000E+00	direct

Notes:

- 1) Step size always from t with current largest DSR(t) .
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \cdot (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but DSR(t) was smaller than the previous value.

Iteration Log for Computation of the Time of Maximum Total Dose
Tolerance for tmax = 1.0E-03 (fractional accuracy)

Iteration Number	t (years)	TDose(t) (mrem/yr)	Step Size (years)	Step Type
0	6.00000E+02	1.71359E-01		
1	6.44465E+02	1.57424E-01	4.44653E+01	parabolic
2	6.09904E+02	1.74178E-01	9.90411E+00	parabolic
3	6.30698E+02	1.63691E-01	2.07937E+01	parabolic
4	6.17847E+02	1.70021E-01	7.94249E+00	golden section
5	6.08095E+02	1.74331E-01	-1.80867E+00	parabolic
6	6.07487E+02	1.74150E-01	-2.15616E-02	parabolic
7	6.08704E+02	1.74533E-01	6.08095E-01	parabolic

Notes:

- 1) Step size always from t with current largest TDose(t).
- 2) Parabolic step based on parabola maximum through the current best triplet.
- 3) Golden section step, $0.5 \times (3 - \sqrt{5})$ of larger interval bracketing maximum, taken only if trial parabolic step fails.
- 4) Direct step to a previous t only on last iteration and only if prior iteration met convergence test but TDose(t) was smaller than the previous value.

Source Factors for Ingrowth and Decay

Radioactivity Factors Only

Parent and Progeny Principal Radionuclide Contributions Indicated

$$ID(j,t) = CUMBRF(j) * S1(j,t) / S1(i,0)$$

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		1.000E+00	1.000E+00	9.997E-01	9.994E-01	9.989E-01	9.983E-01	9.977E-01	9.972E-01
U-234	Th-230	1.000E+00		0.000E+00	9.002E-06	8.997E-04	1.798E-03	3.592E-03	5.382E-03	7.168E-03	8.949E-03
U-234	Ra-226	1.000E+00		0.000E+00	1.950E-09	1.921E-05	7.573E-05	2.942E-04	6.433E-04	1.112E-03	1.689E-03
U-234	Pb-210	1.000E+00		0.000E+00	2.004E-11	1.068E-05	5.546E-05	2.517E-04	5.804E-04	1.030E-03	1.591E-03
OU-235	U-235	1.000E+00		1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	2.116E-05	2.114E-03	4.223E-03	8.428E-03	1.261E-02	1.678E-02	2.094E-02
U-235	Ac-227	1.000E+00		0.000E+00	3.332E-07	1.477E-03	3.562E-03	7.768E-03	1.196E-02	1.613E-02	2.028E-02
OU-238	U-238	1.000E+00		1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-238	U-234	1.000E+00		0.000E+00	2.835E-06	2.835E-04	5.668E-04	1.133E-03	1.700E-03	2.265E-03	2.831E-03
U-238	Th-230	1.000E+00		0.000E+00	1.276E-11	1.275E-07	5.100E-07	2.038E-06	4.583E-06	8.141E-06	1.271E-05
U-238	Ra-226	1.000E+00		0.000E+00	1.652E-15	1.822E-09	1.442E-08	1.129E-07	3.728E-07	8.649E-07	1.654E-06
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	8.486E-10	9.360E-09	8.990E-08	3.198E-07	7.710E-07	1.509E-06

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: $CUMBRF(j) = BRF(1) * BRF(2) * \dots BRF(j)$.

0

Source Factors for Ingrowth and Decay

Combined Radioactivity and Leaching Factors

Parent and Progeny Principal Radionuclide Contributions Indicated

$$SF(j,t) = BRF(i) * S1(j,t) / S1(i,0)$$

OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00		1.000E+00	9.941E-01	5.552E-01	3.082E-01	9.501E-02	2.928E-02	9.027E-03	2.782E-03
U-234	Th-230	1.000E+00		0.000E+00	8.975E-06	6.782E-04	1.051E-03	1.362E-03	1.446E-03	1.459E-03	1.451E-03
U-234	Ra-226	1.000E+00		0.000E+00	1.943E-09	1.381E-05	3.978E-05	8.688E-05	1.145E-04	1.274E-04	1.325E-04
U-234	Pb-210	1.000E+00		0.000E+00	1.998E-11	7.710E-06	2.922E-05	7.392E-05	1.017E-04	1.151E-04	1.206E-04
OU-235	U-235	1.000E+00		1.000E+00	9.941E-01	5.553E-01	3.084E-01	9.512E-02	2.933E-02	9.047E-03	2.790E-03
U-235	Pa-231	1.000E+00		0.000E+00	2.103E-05	1.174E-03	1.302E-03	8.016E-04	3.700E-04	1.518E-04	5.842E-05
U-235	Ac-227	1.000E+00		0.000E+00	3.303E-07	6.987E-04	8.972E-04	5.911E-04	2.789E-04	1.157E-04	4.478E-05
OU-238	U-238	1.000E+00		1.000E+00	9.941E-01	5.553E-01	3.084E-01	9.512E-02	2.933E-02	9.047E-03	2.790E-03
U-238	U-234	1.000E+00		0.000E+00	2.818E-06	1.574E-04	1.748E-04	1.078E-04	4.985E-05	2.050E-05	7.899E-06
U-238	Th-230	1.000E+00		0.000E+00	1.271E-11	8.686E-08	2.413E-07	4.966E-07	6.269E-07	6.789E-07	6.945E-07
U-238	Ra-226	1.000E+00		0.000E+00	1.835E-15	1.228E-09	6.629E-09	2.515E-08	4.269E-08	5.419E-08	6.034E-08
U-238	Pb-210	1.000E+00		0.000E+00	1.421E-17	5.794E-10	4.376E-09	2.032E-08	3.690E-08	4.824E-08	5.448E-08

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: $CUMBRF(j) = BRF(1) * BRF(2) * \dots BRF(j)$.

The effect of volatilization was also considered when computing the source factors for H-3 and C-14.

Parameters Used for Calculating Cover Depth and Contaminated Zone Thicknesses

0 Cover Erosion rate (vcv): 0.001000 m/yr
Contaminated Zone Erosion rate (vcz): 0.001000 m/yr
Water Table Drop rate (vwt): 0.000000 m/yr
Precipitation rate (Pr): 0.220000 m/yr
Cover Removal Time (Tc): 6.100E+02 yr
Overhead irrigation rate (Irr): 1.000 m/yr Runoff coefficient (Cr): 0.500
Evapotranspiration coeff. (Ce): 0.680 Infiltration rate (In): 0.355 m/yr
Bulk soil density (rhob): 1.200 g/cm**3 Effective porosity (pe): 0.500

ORadio- nuclide (i)	Distribution Coefficient Kd(i),cm**3/g	Leaching Ratio q(i)
Ac-227	2.000000E+01	1.604E-02
Pa-231	5.000000E+01	6.478E-03
Pb-210	1.000000E+02	3.249E-03
Ra-226	7.000000E+01	4.635E-03
Th-230	5.800000E+03	5.620E-05
U-234	5.000000E+01	6.478E-03
U-235	5.000000E+01	6.478E-03
U-238	5.000000E+01	6.478E-03

0

Time Dependence of Source Geometry

Time Dependence of Cover Depth [Cd(i,t)]

Nuclide (i)	t=	Cd(i,t) (meters)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
Pa-231	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
Pb-210	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
Ra-226	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
Th-230	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
U-234	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
U-235	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	
U-238	6.1000E-01	6.0900E-01	5.1000E-01	4.1000E-01	2.1000E-01	1.0000E-02	0.0000E+00	0.0000E+00	

Time Dependence of Contaminated Zone Thicknesses [T(i,t)]

Nuclide (i)	t=	T(i,t) (meters)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Pa-231	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Pb-210	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Ra-226	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
Th-230	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
U-234	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
U-235	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01
U-238	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	8.1000E-01	6.1000E-01

Occupancy, Cover/Depth, and Area Factors for Ground Pathway

Occupancy Factor (FO1): 0.600
Area (A): 100. sq. meters
Initial cover depth (Cd): 0.610 meters
Initial contaminated zone thickness (T): 1.000 meters

Time Dependence of Cover/Depth Factor [FCTR_COV_DEPTH(i,t)]

Nuclide (i)	FCTR_COV_DEPTH(i,t) (dimensionless)							
	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	1.761E-04	1.786E-04	7.169E-04	2.919E-03	4.839E-02	8.147E-01	1.000E+00	9.998E-01
Pa-231	1.909E-04	1.936E-04	7.680E-04	3.089E-03	5.000E-02	8.154E-01	1.000E+00	9.998E-01
Pb-210	2.050E-06	2.093E-06	1.674E-05	1.367E-04	9.116E-03	6.258E-01	1.000E+00	1.000E+00
Ra-226	2.130E-03	2.152E-03	5.768E-03	1.562E-02	1.145E-01	8.541E-01	9.997E-01	9.979E-01
Th-230	9.800E-07	1.002E-06	9.242E-06	8.716E-05	7.752E-03	6.906E-01	1.000E+00	1.000E+00
U-234	4.918E-07	5.034E-07	5.045E-06	5.175E-05	5.445E-03	5.729E-01	1.000E+00	1.000E+00
U-235	3.810E-05	3.874E-05	1.996E-04	1.046E-03	2.869E-02	7.953E-01	1.000E+00	1.000E+00
U-238	1.029E-03	1.040E-03	3.100E-03	9.340E-03	8.476E-02	8.065E-01	9.999E-01	9.990E-01

0

Time Dependence of Area Factor [FCTR_AREA(i,t)]

Nuclide (i)	FCTR_AREA(i,t) (dimensionless)							
	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.161E-01	8.084E-01	8.084E-01
Pa-231	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.197E-01	8.193E-01	8.193E-01
Pb-210	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.574E-01	8.313E-01	8.313E-01
Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	8.925E-01	7.912E-01	7.912E-01
Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.491E-01	8.340E-01	8.340E-01
U-234	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.557E-01	8.466E-01	8.466E-01
U-235	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.245E-01	8.251E-01	8.251E-01
U-238	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.057E-01	7.956E-01	7.956E-01

Dose Conversion and Environmental Transport Factors for the Ground Pathway (p=1)

OParent (i)	Product (j)	DCF(j,1)* (j)	ETF(j,1,t) (dimensionless)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	4.020E-04	2.951E-07	3.020E-07	3.027E-06	3.105E-05	3.267E-03	3.285E-01	5.080E-01	5.080E-01
U-234	Th-230	1.210E-03	5.880E-07	6.013E-07	5.545E-06	5.230E-05	4.651E-03	3.933E-01	5.004E-01	5.004E-01
U-234	Ra-226	1.120E+01	1.278E-03	1.291E-03	3.461E-03	9.370E-03	6.868E-02	4.573E-01	4.746E-01	4.737E-01
U-234	Pb-210	6.120E-03	1.230E-06	1.256E-06	1.004E-05	8.202E-05	5.470E-03	3.595E-01	4.988E-01	4.988E-01
OU-235	U-235	7.570E-01	2.286E-05	2.324E-05	1.198E-04	6.273E-04	1.721E-02	4.412E-01	4.951E-01	4.951E-01
U-235	Pa-231	1.910E-01	1.145E-04	1.161E-04	4.608E-04	1.854E-03	3.000E-02	4.500E-01	4.916E-01	4.915E-01
U-235	Ac-227	2.010E+00	1.057E-04	1.071E-04	4.302E-04	1.751E-03	2.903E-02	4.478E-01	4.850E-01	4.850E-01
OU-238	U-238	1.370E-01	6.175E-04	6.243E-04	1.860E-03	5.604E-03	5.086E-02	4.383E-01	4.773E-01	4.769E-01
U-238	U-234	4.020E-04	2.951E-07	3.020E-07	3.027E-06	3.105E-05	3.267E-03	3.285E-01	5.080E-01	5.080E-01
U-238	Th-230	1.210E-03	5.880E-07	6.013E-07	5.545E-06	5.230E-05	4.651E-03	3.933E-01	5.004E-01	5.004E-01
U-238	Ra-226	1.120E+01	1.278E-03	1.291E-03	3.461E-03	9.370E-03	6.868E-02	4.573E-01	4.746E-01	4.737E-01
U-238	Pb-210	6.120E-03	1.230E-06	1.256E-06	1.004E-05	8.202E-05	5.470E-03	3.595E-01	4.988E-01	4.988E-01

* - The dose conversion factor units are (mrem/yr)/(pCi/g) at infinite depth and area.

0

Dose/Source Ratios for External Radiation from the Ground (p=1)
 Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,1,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	1.186E-10	1.207E-10	6.756E-10	3.847E-09	1.248E-07	3.867E-06	1.843E-06	5.681E-07
U-234	Th-230	1.000E+00	0.000E+00	6.530E-15	4.551E-12	6.649E-11	7.666E-09	6.879E-07	8.834E-07	8.786E-07
U-234	Ra-226	1.000E+00	0.000E+00	2.810E-11	5.353E-07	4.174E-06	6.683E-05	5.863E-04	6.773E-04	7.030E-04
U-234	Pb-210	1.000E+00	0.000E+00	1.536E-19	4.740E-13	1.467E-11	2.475E-09	2.237E-07	3.514E-07	3.681E-07
U-234	ΣDSR(j)		1.186E-10	1.488E-10	5.360E-07	4.178E-06	6.696E-05	5.911E-04	6.804E-04	7.048E-04
OU-235	U-235	1.000E+00	1.731E-05	1.749E-05	5.034E-05	1.465E-04	1.239E-03	9.797E-03	3.391E-03	1.046E-03
U-235	Pa-231	1.000E+00	0.000E+00	4.666E-10	1.033E-07	4.611E-07	4.593E-06	3.180E-05	1.426E-05	5.484E-06
U-235	Ac-227	1.000E+00	0.000E+00	7.114E-11	6.041E-07	3.159E-06	3.450E-05	2.510E-04	1.128E-04	4.365E-05
U-235	ΣDSR(j)		1.731E-05	1.749E-05	5.105E-05	1.501E-04	1.278E-03	1.008E-02	3.518E-03	1.095E-03
OU-238	U-238	1.000E+00	8.459E-05	8.503E-05	1.415E-04	2.368E-04	6.627E-04	1.761E-03	5.916E-04	1.823E-04
U-238	U-234	1.000E+00	0.000E+00	3.422E-16	1.915E-13	2.182E-12	1.416E-10	6.584E-09	4.185E-09	1.613E-09
U-238	Th-230	1.000E+00	0.000E+00	9.248E-21	5.828E-16	1.527E-14	2.795E-12	2.983E-10	4.110E-10	4.205E-10
U-238	Ra-226	1.000E+00	0.000E+00	2.653E-17	4.760E-11	6.956E-10	1.934E-08	2.187E-07	2.880E-07	3.201E-07
U-238	Pb-210	1.000E+00	0.000E+00	1.093E-25	3.562E-17	2.197E-15	6.802E-13	8.117E-11	1.472E-10	1.663E-10
U-238	ΣDSR(j)		8.459E-05	8.503E-05	1.415E-04	2.368E-04	6.627E-04	1.762E-03	5.919E-04	1.826E-04

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Inhalation Pathway, Excluding Radon (p=2)											
Parent and Progeny Principal Radionuclide Contributions Indicated											
OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
DSR(j,2,t) (mrem/yr)/(pCi/g)											
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.098E-03	6.929E-04	2.136E-04
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.558E-04	2.766E-04	2.751E-04
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.343E-07	6.373E-07	6.627E-07
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.280E-06	1.553E-06	1.627E-06
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.356E-03	9.717E-04	4.910E-04
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.958E-03	6.471E-04	1.996E-04
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.571E-04	1.130E-04	4.348E-05
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.017E-03	4.520E-04	1.750E-04
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.233E-03	1.212E-03	4.180E-04
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.879E-03	6.208E-04	1.915E-04
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.572E-06	1.573E-06	6.063E-07
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.109E-07	1.287E-07	1.317E-07
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.993E-10	2.710E-10	3.018E-10
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.646E-10	6.508E-10	7.351E-10
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.882E-03	6.225E-04	1.922E-04

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Pathway Factors for the Inhalation Pathway (radon excluded)

Area (A):	1.0000E+02 m**2	Occupancy Factor (FO2):	4.5000E-01
Area Factor (FA2):	7.6923E-01	Annual Air Intake (F12):	8.4000E+03 m**3/yr
Cover Depth [Cd(0)]:	6.1000E-01 m	Mass Loading (ASR2):	2.0000E-04 g/m**3
Contaminated Zone Thickness [T(0)]:	1.0000E+00 m	FA2 * FO2 * F12 * ASR2:	5.8154E-01 g/yr

Nuclide (i)		Depth Factor [FD(i,2,t)] (dimensionless)								
t=		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00	
U-235 +D		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00	
U-238 +D		0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00	

Dose Conversion and Environmental Transport Factors for the Inhalation Pathway, Excluding Radon (p=2)											
Parent Product		DCF(j,2)*	ETF(j,2,t) (g/yr)								
(i)	(j)		t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.320E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-234	Th-230	3.260E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-234	Ra-226	8.600E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-234	Pb-210	2.320E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
OU-235	U-235	1.230E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-235	Pa-231	1.280E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-235	Ac-227	6.720E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
OU-238	U-238	1.180E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-238	U-234	1.320E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-238	Th-230	3.260E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-238	Ra-226	8.600E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01
U-238	Pb-210	2.320E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.428E-01	5.815E-01	5.815E-01

* - The dose conversion factor units are mrem/pCi.

Parameters Used for Calculating Indoor and Outdoor Radon Flux

	*Floor Material	Cover Material	Contaminated Zone
Radon Diffusion Coefficient (m**2/s)	3.000E-07	2.000E-06	2.000E-06
Total Porosity	1.000E-01	4.000E-01	5.000E-01
Volumetric Water Content	3.000E-02	5.000E-02	3.912E-01
Bulk Density (g/cm**3)	2.400E+00	1.200E+00	1.200E+00
Rn-222 Emanation Coefficient	2.500E-01	2.500E-01	2.500E-01
Initial Thickness (m)	1.500E-01	6.100E-01	1.000E+00

Building Depth Below Ground Surface *(DMFL): -1.000E+00 (m)
Negative DMFL shows building depth adjusted (if necessary) for no penetration
of contaminated zone. Actual values used *(DMFLACT), m:

t= 0.0000E+00 1.0000E+00 1.0000E+02 2.0000E+02 4.0000E+02 6.0000E+02 8.0000E+02 1.0000E+03
DMFLACT= 6.1000E-01 6.0900E-01 5.1000E-01 4.1000E-01 2.1000E-01 1.0000E-02 0.0000E+00 0.0000E+00
Building indoor area factor *(FAI): 0.000E+00
FAI <= 0.0 shows calculated time-dependent value based on amount of wall area
extending into the contaminated zone. Actual values used *(FAIACT):

t= 0.0000E+00 1.0000E+00 1.0000E+02 2.0000E+02 4.0000E+02 6.0000E+02 8.0000E+02 1.0000E+03
FAIACT = 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00 1.0000E+00
0* - Parameters are used only for indoor radon flux

Time Dependence of Outdoor Radon Flux [FLUXO(i,t)]

ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	7.4958E-09	5.8899E-05	1.8767E-04	5.0108E-04	8.0541E-04	7.9884E-04	6.7735E-04	
U-238	0.0000E+00	7.0792E-15	5.2369E-09	3.1274E-08	1.4504E-07	3.0041E-07	3.3970E-07	3.0846E-07	

Time Dependence of Indoor Radon Flux [FLUXI(i,t)]

ONuclide (i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	2.6902E-09	1.9121E-05	5.5075E-05	1.2028E-04	1.5847E-04	1.7161E-04	1.6954E-04	
U-238	0.0000E+00	2.5406E-15	1.7002E-09	9.1776E-09	3.4816E-08	5.9107E-08	7.2973E-08	7.7206E-08	

Parameters Used for Calculating Indoor and Outdoor Radon Concentration

Radon Vertical Dimension of Mixing (HMIX): 2.000E+00 (m)
Average Annual Wind Speed (WIND): 3.600E+00 (m/sec)
Building Room Height (HRM): 2.500E+00 (m)
Building Air Exchange Rate (REXG): 5.000E-01 (1/hr)

		Time Dependence of Outdoor Radon Concentration [CRNO(i,t)]							
ONuclide		CRNO(i,t) (pCi/m**3)							
(i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	5.2054E-09	4.0902E-05	1.3033E-04	3.4797E-04	5.5931E-04	5.5475E-04	4.7038E-04	
U-238	0.0000E+00	4.9161E-15	3.6368E-09	2.1718E-08	1.0072E-07	2.0862E-07	2.3590E-07	2.1421E-07	

		Time Dependence of Indoor Radon Concentration [HCONC(i,r)]							
ONuclide		HCONC(i,t) (pCi/m**3)							
(i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	0.0000E+00	7.6374E-06	5.4290E-02	1.5638E-01	3.4160E-01	4.5015E-01	4.8741E-01	4.8146E-01	
U-238	0.0000E+00	7.2129E-12	4.8272E-06	2.6059E-05	9.8876E-05	1.6790E-04	2.0726E-04	2.1925E-04	

Outdoor Working Levels of Radon [WLOTD(i,t)]									
ONuclide		WLOTD(i,t) (WL)							
(i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234		0.0000E+00	1.4092E-17	1.1073E-13	3.5282E-13	9.4201E-13	1.5141E-12	1.5018E-12	1.2734E-12
U-238		0.0000E+00	1.3309E-23	9.8452E-18	5.8793E-17	2.7266E-16	5.6475E-16	6.3862E-16	5.7989E-16

Indoor Working Levels of Radon [WLIND(i,t)]									
ONuclide		WLIND(i,t) (WL)							
(i)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234		0.0000E+00	5.2664E-11	3.7436E-07	1.0783E-06	2.3556E-06	3.1041E-06	3.3610E-06	3.3200E-06
U-238		0.0000E+00	4.9737E-17	3.3286E-11	1.7969E-10	6.8181E-10	1.1578E-09	1.4292E-09	1.5119E-09

0

0 Fraction of Time Spent Outdoors (FOTD): 2.500E-01
Fraction of Time Spent Indoors (FIND): 5.000E-01

Dose/Source Ratios for Radon Pathway (p=9)										
Subpathway: Outdoor and Indoor Radon Flux										
Parent and Progeny Principal Radionuclide Contributions Indicated										
OParent	Product	Branch	DSR(j,9,t) - DSRNW(j,t) (mrem/yr)/(pCi/g)							
(i)	(j)	Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	6.781E-08	4.820E-04	1.388E-03	3.033E-03	3.997E-03	4.327E-03 4.275E-03
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	6.781E-08	4.820E-04	1.388E-03	3.033E-03	3.997E-03	4.327E-03 4.275E-03
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	6.404E-14	4.286E-08	2.314E-07	8.778E-07	1.491E-06	1.840E-06 1.947E-06
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	6.404E-14	4.286E-08	2.314E-07	8.778E-07	1.491E-06	1.840E-06 1.947E-06

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Radon Pathway (p=9)										
Subpathway: Indoor Radon from Water Usage										
Parent and Progeny Principal Radionuclide Contributions Indicated										
OParent	Product	Branch	DSR(j,t) (mrem/yr)/(pCi/g)							
(i)	(j)	Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Transport Time Parameters for Unsaturated Zone Stratum No. 1

Stratum thickness [h(1)]: 15.000000 m
Bulk soil material density [rhob(1)]: 1.200000 g/cm**3
Effective porosity [peuz(1)]: 0.500000
Hydraulic conductivity [Khuz(1)]: 10.000000 m/yr
Total porosity [ptuz(1)]: 0.500000
Soil specific b parameter [buz(1)]: 5.300000
Saturation ratio [sruz(1)]: 0.782379

Radio-nuclide (i)	Distribution Coefficient Kduz(i,1), cm**3/g	Retardation Factor Rduz(i,1)	Transport Time Dtuz(i,1), yr
Ac-227	2.0000E+01	6.2351E+01	1.0300E+03
Pa-231	5.0000E+01	1.5438E+02	2.5503E+03
Pb-210	1.0000E+02	3.0776E+02	5.0841E+03
Ra-226	7.0000E+01	2.1573E+02	3.5638E+03
Th-230	5.8000E+03	1.7793E+04	2.9394E+05
U-234	5.0000E+01	1.5438E+02	2.5503E+03
U-235	5.0000E+01	1.5438E+02	2.5503E+03
U-238	5.0000E+01	1.5438E+02	2.5503E+03

0

Transport Time Parameters for Unsaturated Zone Stratum No. 2

Stratum thickness [h(2)]: 0.000000 m
Bulk soil material density [rhob(2)]: 1.700000 g/cm**3
Effective porosity [peuz(2)]: 0.100000
Hydraulic conductivity [Khuz(2)]: 0.030000 m/yr
Total porosity [ptuz(2)]: 0.200000
Soil specific b parameter [buz(2)]: 10.000000
Saturation ratio [sruz(2)]: 1.000000

Radio-nuclide (i)	Distribution Coefficient Kduz(i,2), cm**3/g	Retardation Factor Rduz(i,2)	Transport Time Dtuz(i,2), yr
Ac-227	2.0000E+01	1.7100E+02	0.0000E+00
Pa-231	5.0000E+01	4.2600E+02	0.0000E+00
Pb-210	1.0000E+02	8.5100E+02	0.0000E+00
Ra-226	7.0000E+01	5.9600E+02	0.0000E+00
Th-230	5.8000E+03	4.9301E+04	0.0000E+00
U-234	5.0000E+01	4.2600E+02	0.0000E+00
U-235	5.0000E+01	4.2600E+02	0.0000E+00
U-238	5.0000E+01	4.2600E+02	0.0000E+00

Transport Time Parameters for Unsaturated Zone Stratium No. 3

Stratum thickness [h(3)]: 150.000000 m
Bulk soil material density [rhob(3)]: 1.700000 g/cm**3
Effective porosity [peuz(3)]: 0.050000
Hydraulic conductivity [khuz(3)]: 0.003000 m/yr
Total porosity [ptuz(3)]: 0.100000
Soil specific b parameter [buz(3)]: 10.000000
Saturation ratio [sruz(3)]: 1.000000

Radio-nuclide (i)	Distribution Coefficient Kduz(i,3), cm**3/g	Retardation Factor Rduz(1,3)	Transport Time Dtuz(1,3), yr
Ac-227	2.0000E+01	3.4100E+02	7.2002E+03
Pa-231	5.0000E+01	8.5100E+02	1.7969E+04
Pb-210	1.0000E+02	1.7010E+03	3.5916E+04
Ra-226	7.0000E+01	1.1910E+03	2.5148E+04
Th-230	5.8000E+03	9.8601E+04	2.0819E+06
U-234	5.0000E+01	8.5100E+02	1.7969E+04
U-235	5.0000E+01	8.5100E+02	1.7969E+04
U-238	5.0000E+01	8.5100E+02	1.7969E+04

Dilution Factor Parameters for Mass-Balance (MB) Model

0 Contaminated zone area (A): 100.000000 m**2
Infiltration rate (In): 0.355200 m/yr
Evapotranspiration coefficient (Ce): 0.680000
Runoff coefficient (Cr): 0.500000
Precipitation rate (Pr): 0.220000 m/yr
Overhead irrigation rate (Irr): 1.000000 m/yr
Well pumping rate (Uw): 250.000000 m**3/yr
Dilution factor (fi, all i): 0.040000

0

Primary Parameters Used for Calculating Water/Soil
Concentration Ratios for Groundwater Pathway Segment

0 Model used: Nondispersion (ND)

Bulk soil density in contaminated zone (rhob): 1.200 g/cm**3

0 Radio- nuclide (i)	Dilution Factor f(i)	Retardation Factor Rdcz(i)	Breakthrough Time Chain year	Single Nuclide Dt(i), yr	Rise Time dt(i), yr
Ac-227	4.000E-02	6.235E+01	8.230E+03	8.230E+03	1.520E+02
Pa-231	4.000E-02	1.544E+02	2.052E+04	2.052E+04	1.540E+02
Pb-210	4.000E-02	3.078E+02	2.052E+04	4.100E+04	1.550E+02
Ra-226	4.000E-02	2.157E+02	2.052E+04	2.871E+04	5.496E+01
Th-230	4.000E-02	1.779E+04	2.052E+04	2.376E+06	1.520E+02
U-234	4.000E-02	1.544E+02	2.052E+04	2.052E+04	1.530E+02
U-235	4.000E-02	1.544E+02	2.052E+04	2.052E+04	6.795E+01
U-238	4.000E-02	1.544E+02	2.052E+04	2.052E+04	3.017E+00

Storage Times For Contaminated Foodstuffs

k	Food Item	STOR_T(k), days
1	non-leafy plants	14
2	leafy plants	1
3	milk	1
4	meat	20
5	fish	7
6	crustacea	7
7	well water	1
8	surface water	1
9	livestock fodder	45

0

Storage Time Ingrowth and Decay Factors
Storage Time for k'th Foodstuff: $t = \text{STOR_T}(k)$, days

Parent (i)	Product (j)	Branch Fraction	STOR_ID(i,j,t) = CONCE(i,j,t)/CONCE(i,i,0)									
			t= 1.400E+01	1.000E+00	1.000E+00	2.000E+01	7.000E+00	7.000E+00	1.000E+00	1.000E+00	1.000E+00	4.500E+01
Ac-227	Ac-227	1.000E+00	9.988E-01	9.999E-01	9.999E-01	9.983E-01	9.994E-01	9.994E-01	9.999E-01	9.999E-01	9.999E-01	9.961E-01
Pa-231	Pa-231	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Pa-231	Ac-227	1.000E+00	1.219E-03	8.716E-05	8.716E-05	1.742E-03	6.099E-04	6.099E-04	8.716E-05	8.716E-05	8.716E-05	3.915E-03
Pb-210	Pb-210	1.000E+00	9.988E-01	9.999E-01	9.999E-01	9.983E-01	9.994E-01	9.994E-01	9.999E-01	9.999E-01	9.999E-01	9.962E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	9.999E-01
Ra-226	Pb-210	1.000E+00	1.191E-03	8.510E-05	8.510E-05	1.701E-03	5.955E-04	5.955E-04	8.510E-05	8.510E-05	8.510E-05	3.822E-03
Th-230	Th-230	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
Th-230	Ra-226	1.000E+00	1.661E-05	1.186E-06	1.186E-06	2.372E-05	8.303E-06	8.303E-06	1.186E-06	1.186E-06	1.186E-06	5.337E-05
Th-230	Pb-210	1.000E+00	9.888E-09	5.047E-11	5.047E-11	2.018E-08	2.472E-09	2.472E-09	5.047E-11	5.047E-11	5.047E-11	1.021E-07
U-234	U-234	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-234	Th-230	1.000E+00	3.450E-07	2.465E-08	2.465E-08	4.929E-07	1.725E-07	1.725E-07	2.465E-08	2.465E-08	2.465E-08	1.109E-06
U-234	Ra-226	1.000E+00	2.865E-12	1.444E-14	1.444E-14	5.846E-12	7.160E-13	7.160E-13	1.444E-14	1.444E-14	1.444E-14	2.960E-11
U-234	Pb-210	1.000E+00	1.064E-15	2.613E-17	2.613E-17	3.205E-15	2.317E-17	2.317E-17	2.613E-17	2.613E-17	2.613E-17	3.761E-14
U-235	U-235	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-235	Pa-231	1.000E+00	8.110E-07	5.793E-08	5.793E-08	1.159E-06	4.055E-07	4.055E-07	5.793E-08	5.793E-08	5.793E-08	2.607E-06
U-235	Ac-227	1.000E+00	4.946E-10	2.524E-12	2.524E-12	1.009E-09	1.237E-10	1.237E-10	2.524E-12	2.524E-12	2.524E-12	5.105E-09
U-238	U-238	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00	1.000E+00
U-238	U-234	1.000E+00	1.087E-07	7.762E-09	7.762E-09	1.552E-07	5.433E-08	5.433E-08	7.762E-09	7.762E-09	7.762E-09	3.493E-07
U-238	Th-230	1.000E+00	1.876E-14	1.746E-16	1.746E-16	3.828E-14	4.731E-15	4.731E-15	1.746E-16	1.746E-16	1.746E-16	1.936E-13
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

CONCE(i,j,t)/CONCE(i,i,0) is the concentration ratio of Product(j) at time t to Parent(i) at start of storage time.

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
Root Uptake from Contaminated Soil (q=1)

Area Factor for Plant Foods [FA(3)] = 0.05

Nuclide (i)	t=	Depth Factor FD(i,1,t) (dimensionless)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Pa-231	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Pb-210	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Ra-226	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
Th-230	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
U-234	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
U-235	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01
U-238	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	5.0000E-01	4.0500E-01	3.0500E-01

0

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
Foliar Uptake from Contaminated Dust (q=2)

Area Factor for Plant Foods [FA(3)] = 0.05

Nuclide (i)	t=	Depth Factor FD(i,2,t) (dimensionless)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Pa-231	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Pb-210	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Ra-226	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
Th-230	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-234	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-235	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00
U-238	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.3333E-01	1.0000E+00	1.0000E+00

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
Ditch Irrigation (q=3)

Area Factor for Plant Foods [FA(3)] = 0.05

Nuclide (i)	t=	Depth Factor FD(i,3,t) (dimensionless)							
		0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
Ac-227	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Pa-231	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Pb-210	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Ra-226	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
Th-230	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
U-234	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
U-235	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00
U-238	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00	1.0000E+00

0

Area and Depth Factors for Plant (p=3), Meat (p=4), and Milk (p=5) Pathways
Overhead Irrigation (q=4)

Area Factor for Plant Foods [FA(3)] = 0.05

The Depth Factor Value
FD(i,p,q,t) = 1.0000E+00

is applicable for all radionuclides(i) and times(t).

0

Area and Depth Factors for Meat (p=4) and Milk (p=5) Pathways
Transfer from Livestock Water (q=5) and Soil (q=6) Intake

Area Factor for Meat and Milk [FA(p),p=4,5] = 0.00

The livestock water subpathway (q=5) and livestock soil intake subpathway (q=6)
occur only for the meat (p=4) and milk (p=5) pathways.

Area and Depth Factors for Meat (p=4) and Milk (p=5) Pathways
Transfer from Livestock Water (q=5) and Soil (q=6) Intake

Area Factor for Meat and Milk [FA(p),p=4,5] = 0.00

The livestock water subpathway (q=5) and livestock soil intake subpathway (q=6)
occur only for the meat (p=4) and milk (p=5) pathways.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)
 Subpathway: Root Uptake from Contaminated Soil (q=1)

OParent (i)	Product (j)	DCF(j,3)*	ETF(j,3,1,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	1.087E+01	1.087E+01	1.087E+01	1.087E+01	1.087E+01	1.087E+01	1.087E+01	8.809E+00	6.634E+00
U-234	Th-230	5.480E-04	4.350E+00	4.735E+00	4.353E+00	4.351E+00	4.350E+00	4.350E+00	4.350E+00	3.524E+00	2.654E+00
U-234	Ra-226	1.330E-03	1.740E+02	1.743E+02	1.740E+02	1.740E+02	1.740E+02	1.740E+02	1.740E+02	1.409E+02	1.061E+02
U-234	Pb-210	7.270E-03	4.350E+01	6.211E+01	4.380E+01	4.371E+01	4.368E+01	4.367E+01	4.367E+01	3.537E+01	2.663E+01
OU-235	U-235	2.670E-04	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	8.809E+00	6.634E+00
U-235	Pa-231	1.060E-02	4.350E+01	4.389E+01	4.350E+01	4.350E+01	4.350E+01	4.350E+01	4.350E+01	3.524E+01	2.654E+01
U-235	Ac-227	1.480E-02	1.088E+01	1.400E+01	1.095E+01	1.093E+01	1.093E+01	1.093E+01	1.093E+01	8.851E+00	6.665E+00
OU-238	U-238	2.690E-04	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	8.809E+00	6.634E+00
U-238	U-234	2.830E-04	1.088E+01	1.126E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	1.088E+01	8.809E+00	6.634E+00
U-238	Th-230	5.480E-04	4.350E+00	5.135E+00	4.356E+00	4.353E+00	4.351E+00	4.350E+00	4.350E+00	3.524E+00	2.654E+00
U-238	Ra-226	1.330E-03	1.740E+02	1.745E+02	1.740E+02	1.740E+02	1.740E+02	1.740E+02	1.740E+02	1.409E+02	1.061E+02
U-238	Pb-210	7.270E-03	4.350E+01	6.820E+01	4.386E+01	4.374E+01	4.369E+01	4.367E+01	4.367E+01	3.537E+01	2.664E+01

* - The dose conversion factor units are mrem/pCi.

0

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)
 Subpathway: Foliar Uptake from Contaminated Dust (q=2)

OParent (i)	Product (j)	DCF(j,3)*	ETF(j,3,2,t) (g/yr)								
			t = 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.461E-02	4.779E-02	4.779E-02	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.464E-02	4.783E-02	4.783E-02	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.448E-02	4.765E-02	4.765E-02	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.448E-02	4.765E-02	4.765E-02	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.447E-02	4.765E-02	4.765E-02	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.461E-02	4.779E-02	4.779E-02	

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)

Subpathway: Ditch Irrigation (q=3)

OParent (i)	Product (j)	DCF(j,3)*	ETF(j,3,3,t) * SF(j,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Plant Food Pathway (p=3)

Subpathway: Overhead Irrigation (q=4)

OParent (i)	Product (j)	DCF(j,3)*	ETF(j,3,4,t) * SF(j,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

OParent (i)	Product (j)	DCF(j,4)*	ETF(j,4,1,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	9.103E-03	9.103E-03	9.103E-03	9.103E-03	9.103E-03	9.103E-03	7.374E-03	5.553E-03
U-234	Th-230	5.480E-04	1.071E-03	1.897E-03	1.077E-03	1.073E-03	1.072E-03	1.071E-03	8.675E-04	6.533E-04
U-234	Ra-226	1.330E-03	4.284E-01	4.316E-01	4.284E-01	4.284E-01	4.284E-01	4.284E-01	3.470E-01	2.613E-01
U-234	Pb-210	7.270E-03	8.568E-02	2.842E-01	8.885E-02	8.798E-02	8.760E-02	8.714E-02	7.053E-02	5.308E-02
OU-235	U-235	2.670E-04	9.103E-03	9.103E-03	9.103E-03	9.103E-03	9.103E-03	9.103E-03	7.374E-03	5.553E-03
U-235	Pa-231	1.060E-02	5.355E-01	5.525E-01	5.357E-01	5.356E-01	5.355E-01	5.355E-01	4.338E-01	3.267E-01
U-235	Ac-227	1.480E-02	5.355E-04	1.076E-03	2.114E-03	1.899E-03	1.809E-03	1.002E-03	7.826E-04	5.725E-04
OU-238	U-238	2.690E-04	9.103E-03	9.103E-03	9.103E-03	9.103E-03	9.103E-03	9.103E-03	7.374E-03	5.553E-03
U-238	U-234	2.830E-04	9.103E-03	1.072E-02	9.120E-03	9.112E-03	9.108E-03	9.106E-03	7.375E-03	5.554E-03
U-238	Th-230	5.480E-04	1.071E-03	2.915E-03	1.085E-03	1.076E-03	1.073E-03	1.071E-03	8.676E-04	6.533E-04
U-238	Ra-226	1.330E-03	4.284E-01	4.338E-01	4.284E-01	4.284E-01	4.284E-01	4.284E-01	3.470E-01	2.613E-01
U-238	Pb-210	7.270E-03	8.568E-02	3.492E-01	8.952E-02	8.829E-02	8.773E-02	8.720E-02	7.055E-02	5.309E-02

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

OParent (i)	Product (j)	DCF(j,4)*	ETF(j,4,2,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.498E-04	1.606E-04	1.606E-04
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.408E-05	4.722E-05	4.722E-05
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.407E-04	4.722E-04	4.722E-04
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.586E-04	3.839E-04	3.837E-04
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.498E-04	1.606E-04	1.606E-04
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.204E-03	2.361E-03	2.361E-03
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.649E-05	1.704E-05	1.655E-05
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.498E-04	1.606E-04	1.606E-04
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.499E-04	1.606E-04	1.606E-04
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.409E-05	4.723E-05	4.722E-05
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.407E-04	4.722E-04	4.722E-04
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.588E-04	3.840E-04	3.837E-04

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Ditch Irrigation (q=3)

OParent Product (i)	DCF(j,4)* (j)	ETF(j,4,3,t) * SF(j,t) (g/yr) t= 0.000E+00 1.000E+00 1.000E+02 2.000E+02 4.000E+02 6.000E+02 8.000E+02 1.000E+03
U-234	U-234	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-234	Th-230	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-234	Ra-226	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-234	Pb-210	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
OU-235	U-235	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-235	Pa-231	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-235	Ac-227	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
OU-238	U-238	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	U-234	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	Th-230	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	Ra-226	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	Pb-210	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Overhead Irrigation (q=4)

OParent Product (i)	DCF(j,4)* (j)	ETF(j,4,4,t) * SF(j,t) (g/yr) t= 0.000E+00 1.000E+00 1.000E+02 2.000E+02 4.000E+02 6.000E+02 8.000E+02 1.000E+03
U-234	U-234	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-234	Th-230	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-234	Ra-226	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-234	Pb-210	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
OU-235	U-235	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-235	Pa-231	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-235	Ac-227	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
OU-238	U-238	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	U-234	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	Th-230	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	Ra-226	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00
U-238	Pb-210	0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Meat Pathway (p=4)

Subpathway: Livestock Water (q=5)

Parent (i)	Product (j)	DCF(j,4)*	ETF(j,4,5,t) * SF(j,t) (g/yr)								
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,1,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	1.897E-02	1.897E-02	1.897E-02	1.897E-02	1.897E-02	1.897E-02	1.537E-02	1.157E-02
U-234	Th-230	5.480E-04	6.325E-05	1.345E-04	6.378E-05	6.344E-05	6.329E-05	6.326E-05	5.123E-05	3.858E-05
U-234	Ra-226	1.330E-03	5.060E-01	5.096E-01	5.060E-01	5.060E-01	5.060E-01	5.060E-01	4.098E-01	3.086E-01
U-234	Pb-210	7.270E-03	3.795E-02	9.863E-02	3.892E-02	3.865E-02	3.853E-02	3.848E-02	3.116E-02	2.346E-02
OU-235	U-235	2.670E-04	1.898E-02	1.898E-02	1.898E-02	1.898E-02	1.898E-02	1.898E-02	1.537E-02	1.157E-02
U-235	Pa-231	1.060E-02	6.325E-04	7.039E-04	6.332E-04	6.329E-04	6.327E-04	6.328E-04	5.125E-04	3.859E-04
U-235	Ac-227	1.480E-02	6.325E-04	1.274E-03	6.467E-04	6.444E-04	6.435E-04	6.430E-04	5.207E-04	3.920E-04
OU-238	U-238	2.690E-04	1.898E-02	1.898E-02	1.898E-02	1.898E-02	1.898E-02	1.898E-02	1.537E-02	1.157E-02
U-238	U-234	2.830E-04	1.898E-02	2.136E-02	1.900E-02	1.899E-02	1.898E-02	1.898E-02	1.537E-02	1.158E-02
U-238	Th-230	5.480E-04	6.325E-05	2.213E-04	6.442E-05	6.372E-05	6.339E-05	6.328E-05	5.124E-05	3.858E-05
U-238	Ra-226	1.330E-03	5.060E-01	5.121E-01	5.060E-01	5.060E-01	5.060E-01	5.060E-01	4.098E-01	3.086E-01
U-238	Pb-210	7.270E-03	3.795E-02	1.127E-01	3.912E-02	3.875E-02	3.857E-02	3.850E-02	3.116E-02	2.346E-02

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,2,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.123E-04	3.347E-04	3.347E-04
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.603E-06	2.789E-06	2.789E-06
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.205E-04	5.577E-04	5.577E-04
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.583E-04	1.696E-04	1.696E-04
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.123E-04	3.347E-04	3.347E-04
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.604E-06	2.790E-06	2.790E-06
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.058E-05	1.134E-05	1.133E-05
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.123E-04	3.347E-04	3.347E-04
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.124E-04	3.347E-04	3.347E-04
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.604E-06	2.789E-06	2.789E-06
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.206E-04	5.577E-04	5.577E-04
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.584E-04	1.696E-04	1.696E-04

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Subpathway: Ditch Irrigation (q=3)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,3,t) * SF(j,t) (g/yr)								
			t = 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* - The dose conversion factor units are mrem/pCi.

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Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Subpathway: Overhead Irrigation (q=4)

OParent (i)	Product (j)	DCF(j,5)*	ETF(j,5,4,t) * SF(j,t) (g/yr)								
			t = 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	

* - The dose conversion factor units are mrem/pCi.

Dose Conversion and Environmental Transport Factors for the Milk Pathway (p=5)

Parent Product		DCF(j,5)*		ETFC(j,5,t)		SF(j,t) (g/yr)	
(i)	(j)	t=	0.000E+00	1.000E+00	2.000E+02	4.000E+02	6.000E+02
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

		Dose Conversion and Environmental Transport Factors for the Fish Pathway (p=6)								
Parent (i)	Product (j)	DCF(j,6)*	ETF(j,6,t) * SF(j,t) (g/yr)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

		Dose Conversion and Environmental Transport Factors for the Drinking Water Pathway (p=7)								
Parent (i)	Product (j)	DCF(j,7)*	ETF(j,7,t) * SF(j,t) (g/yr)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	2.670E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.060E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.480E-02		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	2.690E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	2.830E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	5.480E-04		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.330E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	7.270E-03		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

* - The dose conversion factor units are mrem/pCi.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,3,1,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	3.078E-03	3.060E-03	1.709E-03	9.486E-04	2.924E-04	9.013E-05	2.250E-05	5.223E-06
U-234	Th-230	1.000E+00	0.000E+00	2.329E-08	1.618E-06	2.505E-06	3.247E-06	3.446E-06	2.817E-06	2.110E-06
U-234	Ra-226	1.000E+00	0.000E+00	4.505E-10	3.196E-06	9.206E-06	2.011E-05	2.649E-05	2.389E-05	1.871E-05
U-234	Pb-210	1.000E+00	0.000E+00	9.022E-12	2.455E-06	9.287E-06	2.347E-05	3.228E-05	2.960E-05	2.335E-05
U-234	ΣDSR(j)		3.078E-03	3.060E-03	1.716E-03	9.696E-04	3.392E-04	1.523E-04	7.881E-05	4.939E-05
OU-235	U-235	1.000E+00	2.904E-03	2.887E-03	1.613E-03	8.955E-04	2.762E-04	8.518E-05	2.128E-05	4.942E-06
U-235	Pa-231	1.000E+00	0.000E+00	9.785E-06	5.413E-04	6.005E-04	3.696E-04	1.706E-04	5.671E-05	1.643E-05
U-235	Ac-227	1.000E+00	0.000E+00	6.846E-08	1.132E-04	1.452E-04	9.562E-05	4.510E-05	1.515E-05	4.417E-06
U-235	ΣDSR(j)		2.904E-03	2.896E-03	2.267E-03	1.641E-03	7.414E-04	3.009E-04	9.314E-05	2.579E-05
OU-238	U-238	1.000E+00	2.925E-03	2.908E-03	1.625E-03	9.022E-04	2.782E-04	8.581E-05	2.144E-05	4.979E-06
U-238	U-234	1.000E+00	0.000E+00	8.981E-09	4.846E-07	5.381E-07	3.318E-07	1.534E-07	5.109E-08	1.483E-08
U-238	Th-230	1.000E+00	0.000E+00	3.576E-14	2.074E-10	5.757E-10	1.184E-09	1.494E-09	1.311E-09	1.010E-09
U-238	Ra-226	1.000E+00	0.000E+00	4.259E-16	2.842E-10	1.534E-09	5.819E-09	9.880E-09	1.016E-08	8.518E-09
U-238	Pb-210	1.000E+00	0.000E+00	7.047E-18	1.847E-10	1.392E-09	6.454E-09	1.172E-08	1.240E-08	1.055E-08
U-238	ΣDSR(j)		2.925E-03	2.908E-03	1.625E-03	9.028E-04	2.786E-04	8.599E-05	2.151E-05	5.014E-06

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

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Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,3,2,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.686E-07	1.217E-07	3.752E-08
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.523E-08	3.810E-08	3.789E-08
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.770E-09	8.076E-09	8.397E-09
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.297E-08	4.000E-08	4.189E-08
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.436E-07	2.079E-07	1.257E-07
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.483E-07	1.151E-07	3.550E-08
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.744E-07	7.670E-08	2.951E-08
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.843E-07	8.187E-08	3.170E-08
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.070E-07	2.737E-07	9.670E-08
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.509E-07	1.160E-07	3.576E-08
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.275E-10	2.764E-10	1.065E-10
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.528E-11	1.773E-11	1.813E-11
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.525E-12	3.434E-12	3.824E-12
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.197E-11	1.676E-11	1.893E-11
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.516E-07	1.163E-07	3.591E-08

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	DSR(j,3,3,t) (mrem/yr)/(pCi/g)						
				0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	t=	DSR(j,3,4,t) (mrem/yr)/(pCi/g)						
				0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Plant Foods (p=3)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction	DSR(j,3,t) (mrem/yr)/(pCi/g)								
		t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03	
U-234	U-234	1.000E+00	3.078E-03	3.060E-03	1.709E-03	9.486E-04	2.924E-04	9.050E-05	2.262E-05	5.261E-06	
U-234	Th-230	1.000E+00	0.000E+00	2.329E-08	1.618E-06	2.505E-06	3.247E-06	3.481E-06	2.855E-06	2.148E-06	
U-234	Ra-226	1.000E+00	0.000E+00	4.505E-10	3.196E-06	9.206E-06	2.011E-05	2.649E-05	2.389E-05	1.871E-05	
U-234	Pb-210	1.000E+00	0.000E+00	9.022E-12	2.455E-06	9.287E-06	2.347E-05	3.231E-05	2.964E-05	2.339E-05	
U-234	ΣDSR(j)		3.078E-03	3.060E-03	1.716E-03	9.696E-04	3.392E-04	1.528E-04	7.902E-05	4.951E-05	
OU-235	U-235	1.000E+00	2.904E-03	2.887E-03	1.613E-03	8.955E-04	2.762E-04	8.552E-05	2.139E-05	4.977E-06	
U-235	Pa-231	1.000E+00	0.000E+00	9.785E-06	5.413E-04	6.005E-04	3.696E-04	1.708E-04	5.679E-05	1.646E-05	
U-235	Ac-227	1.000E+00	0.000E+00	6.846E-08	1.132E-04	1.452E-04	9.562E-05	4.529E-05	1.523E-05	4.449E-06	
U-235	ΣDSR(j)		2.904E-03	2.896E-03	2.267E-03	1.641E-03	7.414E-04	3.016E-04	9.342E-05	2.589E-05	
OU-238	U-238	1.000E+00	2.925E-03	2.908E-03	1.625E-03	9.022E-04	2.782E-04	8.617E-05	2.155E-05	5.015E-06	
U-238	U-234	1.000E+00	0.000E+00	8.981E-09	4.846E-07	5.381E-07	3.318E-07	1.541E-07	5.137E-08	1.494E-08	
U-238	Th-230	1.000E+00	0.000E+00	3.576E-14	2.074E-10	5.757E-10	1.184E-09	1.510E-09	1.329E-09	1.028E-09	
U-238	Ra-226	1.000E+00	0.000E+00	4.259E-16	2.842E-10	1.534E-09	5.819E-09	9.882E-09	1.016E-08	8.522E-09	
U-238	Pb-210	1.000E+00	0.000E+00	7.047E-18	1.847E-10	1.392E-09	6.454E-09	1.173E-08	1.242E-08	1.057E-08	
U-238	ΣDSR(j)		2.925E-03	2.908E-03	1.625E-03	9.028E-04	2.786E-04	8.634E-05	2.163E-05	5.050E-06	

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,1,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	2.576E-06	2.561E-06	1.430E-06	7.941E-07	2.448E-07	7.545E-08	1.884E-08	4.372E-09
U-234	Th-230	1.000E+00	0.000E+00	9.330E-12	4.003E-10	6.179E-10	7.998E-10	8.485E-10	6.937E-10	5.195E-10
U-234	Ra-226	1.000E+00	0.000E+00	1.115E-12	7.869E-09	2.266E-08	4.950E-08	6.521E-08	5.881E-08	4.605E-08
U-234	Pb-210	1.000E+00	0.000E+00	4.128E-14	4.981E-09	1.869E-08	4.708E-08	6.442E-08	5.903E-08	4.653E-08
U-234	ΣDSR(j)		2.576E-06	2.561E-06	1.444E-06	8.361E-07	3.421E-07	2.059E-07	1.374E-07	9.747E-08
OU-235	U-235	1.000E+00	2.431E-06	2.416E-06	1.350E-06	7.496E-07	2.312E-07	7.130E-08	1.781E-08	4.137E-09
U-235	Pa-231	1.000E+00	0.000E+00	1.232E-07	6.665E-06	7.394E-06	4.550E-06	2.101E-06	6.982E-07	2.023E-07
U-235	Ac-227	1.000E+00	0.000E+00	5.258E-12	2.186E-08	2.521E-08	1.582E-08	4.135E-09	1.340E-09	3.794E-10
U-235	ΣDSR(j)		2.431E-06	2.540E-06	8.036E-06	8.168E-06	4.797E-06	2.176E-06	7.173E-07	2.068E-07
OU-238	U-238	1.000E+00	2.449E-06	2.434E-06	1.360E-06	7.552E-07	2.329E-07	7.184E-08	1.795E-08	4.168E-09
U-238	U-234	1.000E+00	0.000E+00	8.553E-12	4.063E-10	4.508E-10	2.778E-10	1.285E-10	4.278E-11	1.242E-11
U-238	Th-230	1.000E+00	0.000E+00	2.030E-17	5.163E-14	1.424E-13	2.919E-13	3.680E-13	3.228E-13	2.486E-13
U-238	Ra-226	1.000E+00	0.000E+00	1.059E-18	6.997E-13	3.777E-12	1.433E-11	2.432E-11	2.501E-11	2.097E-11
U-238	Pb-210	1.000E+00	0.000E+00	3.609E-20	3.771E-13	2.809E-12	1.296E-11	2.339E-11	2.474E-11	2.103E-11
U-238	ΣDSR(j)		2.449E-06	2.434E-06	1.360E-06	7.557E-07	2.332E-07	7.201E-08	1.804E-08	4.223E-09

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,2,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.242E-09	4.101E-10	1.264E-10
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.492E-11	3.776E-11	3.755E-11
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.709E-11	8.003E-11	8.322E-11
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.651E-10	3.213E-10	3.363E-10
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.609E-09	8.492E-10	5.835E-10
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.174E-09	3.878E-10	1.196E-10
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.644E-09	3.800E-09	1.462E-09
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.806E-11	2.917E-11	1.097E-11
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.886E-09	4.217E-09	1.593E-09
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.182E-09	3.907E-10	1.205E-10
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.115E-12	9.314E-13	3.590E-13
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.515E-14	1.757E-14	1.797E-14
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.502E-14	3.403E-14	3.790E-14
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.625E-14	1.347E-13	1.520E-13
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.185E-09	3.918E-10	1.211E-10

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,3,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,4,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Subpathway: Livestock Water (q=5)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,5,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Meat (p=4)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,4,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	2.576E-06	2.561E-06	1.430E-06	7.941E-07	2.448E-07	4.909E-07	1.560E-07	4.666E-08
U-234	Th-230	1.000E+00	0.000E+00	9.330E-12	4.003E-10	6.179E-10	7.998E-10	1.253E-08	1.333E-08	1.308E-08
U-234	Ra-226	1.000E+00	0.000E+00	1.115E-12	7.869E-09	2.266E-08	4.950E-08	8.766E-08	8.558E-08	7.389E-08
U-234	Pb-210	1.000E+00	0.000E+00	4.128E-14	4.981E-09	1.869E-08	4.708E-08	1.519E-07	1.651E-07	1.576E-07
U-234	ΣDSR(j)		2.576E-06	2.561E-06	1.444E-06	8.361E-07	3.421E-07	7.430E-07	4.201E-07	2.912E-07
OU-235	U-235	1.000E+00	2.431E-06	2.416E-06	1.350E-06	7.496E-07	2.312E-07	4.639E-07	1.476E-07	4.415E-08
U-235	Pa-231	1.000E+00	0.000E+00	1.232E-07	6.665E-06	7.394E-06	4.550E-06	4.992E-06	1.970E-06	6.914E-07
U-235	Ac-227	1.000E+00	0.000E+00	5.258E-12	2.186E-08	2.521E-08	1.582E-08	2.653E-08	1.094E-08	3.991E-09
U-235	ΣDSR(j)		2.431E-06	2.540E-06	8.036E-06	8.168E-06	4.797E-06	5.483E-06	2.128E-06	7.395E-07
OU-238	U-238	1.000E+00	2.449E-06	2.434E-06	1.360E-06	7.552E-07	2.329E-07	4.674E-07	1.487E-07	4.448E-08
U-238	U-234	1.000E+00	0.000E+00	8.553E-12	4.063E-10	4.508E-10	2.778E-10	8.358E-10	3.543E-10	1.325E-10
U-238	Th-230	1.000E+00	0.000E+00	2.030E-17	5.163E-14	1.424E-13	2.919E-13	5.434E-12	6.200E-12	6.261E-12
U-238	Ra-226	1.000E+00	0.000E+00	1.059E-18	6.997E-13	3.777E-12	1.433E-11	3.269E-11	3.639E-11	3.365E-11
U-238	Pb-210	1.000E+00	0.000E+00	3.609E-20	3.771E-13	2.809E-12	1.296E-11	5.515E-11	6.920E-11	7.122E-11
U-238	ΣDSR(j)		2.449E-06	2.434E-06	1.360E-06	7.557E-07	2.332E-07	4.683E-07	1.491E-07	4.472E-08

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Fodder Root Uptake from Contaminated Soil (q=1)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,1,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	5.370E-06	5.338E-06	2.981E-06	1.655E-06	5.102E-07	1.573E-07	3.926E-08	9.114E-09	
U-234	Th-230	1.000E+00	0.000E+00	6.614E-13	2.370E-11	3.653E-11	4.724E-11	5.011E-11	4.097E-11	3.068E-11	
U-234	Ra-226	1.000E+00	0.000E+00	1.317E-12	9.295E-09	2.677E-08	5.847E-08	7.703E-08	6.946E-08	5.439E-08	
U-234	Pb-210	1.000E+00	0.000E+00	1.433E-14	2.182E-09	8.211E-09	2.071E-08	2.844E-08	2.608E-08	2.056E-08	
U-234	ΣDSR(j)		5.370E-06	5.338E-06	2.993E-06	1.690E-06	5.894E-07	2.628E-07	1.348E-07	8.410E-08	
OU-235	U-235	1.000E+00	5.066E-06	5.037E-06	2.835E-06	1.562E-06	4.819E-07	1.486E-07	3.713E-08	8.623E-09	
U-235	Pa-231	1.000E+00	0.000E+00	1.569E-10	7.878E-09	8.736E-09	5.376E-09	2.482E-09	8.249E-10	2.390E-10	
U-235	Ac-227	1.000E+00	0.000E+00	6.229E-12	6.688E-09	8.557E-09	5.630E-09	2.654E-09	8.912E-10	2.598E-10	
U-235	ΣDSR(j)		5.066E-06	5.037E-06	2.828E-06	1.580E-06	4.929E-07	1.538E-07	3.884E-08	9.122E-09	
OU-238	U-238	1.000E+00	5.104E-06	5.074E-06	2.835E-06	1.574E-06	4.855E-07	1.497E-07	3.740E-08	8.687E-09	
U-238	U-234	1.000E+00	0.000E+00	1.704E-11	8.464E-10	9.393E-10	5.791E-10	2.678E-10	8.916E-11	2.588E-11	
U-238	Th-230	1.000E+00	0.000E+00	1.541E-18	3.066E-15	8.427E-15	1.725E-14	2.174E-14	1.906E-14	1.468E-14	
U-238	Ra-226	1.000E+00	0.000E+00	1.250E-18	8.264E-13	4.461E-12	1.692E-11	2.873E-11	2.954E-11	2.477E-11	
U-238	Pb-210	1.000E+00	0.000E+00	1.165E-20	1.648E-13	1.233E-12	5.698E-12	1.033E-11	1.093E-11	9.293E-12	
U-238	ΣDSR(j)		5.104E-06	5.074E-06	2.835E-06	1.575E-06	4.861E-07	1.500E-07	3.753E-08	8.747E-09	

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Fodder Foliar Uptake from Contaminated Dust (q=2)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,2,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.589E-09	8.549E-10	2.635E-10
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.062E-12	2.230E-12	2.218E-12
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.924E-11	9.452E-11	9.829E-11
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.171E-10	1.419E-10	1.486E-10
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.787E-09	1.094E-09	5.126E-10
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.446E-09	8.084E-10	2.493E-10
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.021E-11	4.490E-12	1.727E-12
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.368E-11	1.941E-11	7.511E-12
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.500E-09	8.323E-10	2.585E-10
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.465E-09	8.144E-10	2.512E-10
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.408E-12	1.941E-12	7.482E-13
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.946E-16	1.038E-15	1.061E-15
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.956E-14	4.020E-14	4.476E-14
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.250E-14	5.949E-14	6.717E-14
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.469E-09	8.165E-10	2.520E-10

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)
 Subpathway: Ditch Irrigation (q=3)

Parent and Progeny Principal Radionuclide Contributions Indicated										
OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)
 Subpathway: Overhead Irrigation (q=4)

Parent and Progeny Principal Radionuclide Contributions Indicated										
OParent (i)	Product (j)	Branch Fraction	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02 1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Subpathway: Livestock Water (q=5)

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose/Source Ratios for Internal Radiation from Ingestion of Milk (p=5)

Total for All Subpathways

Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,5,t) (mrem/yr)/(pCi/g)	t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	5.370E-06	5.338E-06	2.981E-06	1.655E-06	5.102E-07	1.227E-06	3.926E-07	1.180E-07	
U-234	Th-230	1.000E+00	0.000E+00	6.614E-13	2.370E-11	3.653E-11	4.724E-11	9.025E-10	9.627E-10	9.474E-10	
U-234	Ra-226	1.000E+00	0.000E+00	1.317E-12	9.295E-09	2.677E-08	5.847E-08	1.098E-07	1.085E-07	9.503E-08	
U-234	Pb-210	1.000E+00	0.000E+00	1.433E-14	2.182E-09	8.211E-09	2.071E-08	7.619E-08	8.400E-08	8.122E-08	
U-234	ΣDSR(j)		5.370E-06	5.338E-06	2.993E-06	1.690E-06	5.894E-07	1.414E-06	5.861E-07	2.952E-07	
OU-235	U-235	1.000E+00	5.066E-06	5.037E-06	2.814E-06	1.562E-06	4.819E-07	1.160E-06	3.713E-07	1.117E-07	
U-235	Pa-231	1.000E+00	0.000E+00	1.569E-10	7.878E-09	8.736E-09	5.376E-09	6.704E-09	2.681E-09	9.530E-10	
U-235	Ac-227	1.000E+00	0.000E+00	6.229E-12	6.688E-09	8.557E-09	5.630E-09	2.042E-08	8.784E-09	3.316E-09	
U-235	ΣDSR(j)		5.066E-06	5.037E-06	2.828E-06	1.580E-06	4.929E-07	1.187E-06	3.827E-07	1.159E-07	
OU-238	U-238	1.000E+00	5.104E-06	5.074E-06	2.835E-06	1.574E-06	4.855E-07	1.169E-06	3.741E-07	1.125E-07	
U-238	U-234	1.000E+00	0.000E+00	1.704E-11	8.464E-10	9.393E-10	5.791E-10	2.089E-09	8.915E-10	3.351E-10	
U-238	Th-230	1.000E+00	0.000E+00	1.541E-18	3.066E-15	8.427E-15	1.725E-14	3.914E-13	4.480E-13	4.534E-13	
U-238	Ra-226	1.000E+00	0.000E+00	1.250E-18	8.264E-13	4.461E-12	1.692E-11	4.095E-11	4.615E-11	4.327E-11	
U-238	Pb-210	1.000E+00	0.000E+00	1.165E-20	1.648E-13	1.233E-12	5.698E-12	2.765E-11	3.520E-11	3.670E-11	
U-238	ΣDSR(j)		5.104E-06	5.074E-06	2.835E-06	1.575E-06	4.861E-07	1.171E-06	3.750E-07	1.129E-07	

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).

The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from the Ingestion of Fish (p=6)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction	DSR(j,6,t) (mrem/yr)/(pCi/g)	t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Dose/Source Ratios for Internal Radiation from the Ingestion of Drinking Water (p=7)

Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction	DSR(j,7,t) (mrem/yr)/(pCi/g)							
			t=	0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	1.000E+03
U-234	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-235	U-235	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Pa-231	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	Ac-227	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OU-238	U-238	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	U-234	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Pb-210	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Plant/Air and Plant/Water Concentration Ratios						
Mass loading [ASR(3)]: 1.000E-04 g/m**3						
Area Factor for Mass Loading [FA(2)]: 7.692E-01						
ONuclide (i)	FAR(i,3,2,1) m**3/g	FAR(i,3,2,2) m**3/g	FWR(i,3,3,1) L/g	FWR(i,3,3,2) L/g	FWR(i,3,4,1) L/g	FWR(i,3,4,2) L/g
Ac-227	5.4545E-02	2.6156E-01	1.7686E-06	2.5994E-06	1.7274E-03	8.2791E-03
Pa-231	5.4545E-02	2.6156E-01	7.0798E-06	1.0409E-05	1.7314E-03	8.2850E-03
Pb-210	5.4545E-02	2.6156E-01	7.0816E-06	1.0413E-05	1.7314E-03	8.2850E-03
Ra-226	5.4545E-02	2.6156E-01	2.8323E-05	4.1645E-05	1.7474E-03	8.3084E-03
Th-230	5.4545E-02	2.6156E-01	7.0833E-07	1.0417E-06	1.7267E-03	8.2780E-03
U-234	5.4545E-02	2.6156E-01	1.7699E-06	2.6023E-06	1.7274E-03	8.2791E-03
U-235	5.4545E-02	2.6156E-01	1.7699E-06	2.6023E-06	1.7274E-03	8.2791E-03
U-238	5.4545E-02	2.6156E-01	1.7699E-06	2.6023E-06	1.7274E-03	8.2791E-03

FAR(i,p,q,k) is the plant/air concentration ratio for airborne contaminated dust,
 and FWR(i,p,q,k) is the plant/water concentration ratio. See groundwater displays
 for water/soil concentration ratios.

Plant/Soil Concentration Ratios, FSR(i,3,q,k,t)					
Root Uptake (q=1) and Foliar Dust Deposition (q=2)					
Nonleafy (k=1) and/or Leafy (k=2) Vegetables					
Nuclide(i)					
Parent	Product	FSR(i,3,1,k)	FSR(i,3,2,1)	FSR(i,3,2,2)	
U-234	U-234	2.5000E-03	4.1958E-06	2.0120E-05	
U-234	Th-230	1.0000E-03	4.1958E-06	2.0120E-05	
U-234	Ra-226	4.0000E-02	4.1958E-06	2.0120E-05	
U-234	Pb-210	1.0000E-02	4.1958E-06	2.0120E-05	
U-235	U-235	2.5000E-03	4.1958E-06	2.0120E-05	
U-235	Pa-231	1.0000E-02	4.1958E-06	2.0120E-05	
U-235	Ac-227	2.5000E-03	4.1958E-06	2.0120E-05	
U-238	U-238	2.5000E-03	4.1958E-06	2.0120E-05	
U-238	U-234	2.5000E-03	4.1958E-06	2.0120E-05	
U-238	Th-230	1.0000E-03	4.1958E-06	2.0120E-05	
U-238	Ra-226	4.0000E-02	4.1958E-06	2.0120E-05	
U-238	Pb-210	1.0000E-02	4.1958E-06	2.0120E-05	

[illegible]

0

[illegible]

[illegible]

Meat/Fodder, Milk/Fodder, Fodder/Air and Fodder/Water Concentration Ratios

0 FI(4,q): 68.0 kg/day FI(5,q): 55.0 kg/day q=1,2,3,4
FI(4,q): 50.0 L/day FI(5,q): 160.0 L/day q=5
FI(4,q): 0.5 kg/day FI(5,q):

ONuclide (i)	FQR(i,4) d/kg	FQR(i,5) d/kg	FAR(i,3,2,3) m**3/g	FWR(i,3,3,3) L/g	FWR(i,3,4,3) L/g
Ac-227	2.0000E-05	2.0000E-05	2.8659E-01	8.8837E-07	9.0700E-03
Pa-231	5.0000E-03	5.0000E-06	2.8659E-01	3.5547E-06	9.0720E-03
Pb-210	8.0000E-04	3.0000E-04	2.8659E-01	3.5551E-06	9.0720E-03
Ra-226	1.0000E-03	1.0000E-03	2.8659E-01	1.4220E-05	9.0800E-03
Th-230	1.0000E-04	5.0000E-06	2.8659E-01	3.5555E-07	9.0696E-03
U-234	3.4000E-04	6.0000E-04	2.8659E-01	8.8868E-07	9.0700E-03
U-235	3.4000E-04	6.0000E-04	2.8659E-01	8.8868E-07	9.0700E-03
U-238	3.4000E-04	6.0000E-04	2.8659E-01	8.8868E-07	9.0700E-03

FI(p,q) are the fodder (q=1,2,3,4), livestock water (q=5) and soil (q=6) intake rates;
FQR(i,p) are the transfer coefficients from contaminated fodder of livestock
water to meat (p=4) or milk (p=5). FAR(i,3,2,3) are the fodder/air
concentration ratios, and FWR(i,3,3,3) and FWR(i,3,4,3) are the fodder/
water concentration ratios for ditch and overhead irrigation, respectively.

Fodder/Soil Concentration Ratios, QSR(i,p,q,t), for Meat and Milk Pathways
Root Uptake (q=1) and Foliar Dust Deposition (q=2)

Nuclide(i)		QSR(i,p,1)	QSR(i,p,2)
Parent	Product		
U-234	U-234	2.5000E-03	2.2046E-05
U-234	Th-230	1.0000E-03	2.2046E-05
U-234	Ra-226	4.0000E-02	2.2046E-05
U-234	Pb-210	1.0000E-02	2.2046E-05
U-235	U-235	2.5000E-03	2.2046E-05
U-235	Pa-231	1.0000E-02	2.2046E-05
U-235	Ac-227	2.5000E-03	2.2046E-05
U-238	U-238	2.5000E-03	2.2046E-05
U-238	U-234	2.5000E-03	2.2046E-05
U-238	Th-230	1.0000E-03	2.2046E-05
U-238	Ra-226	4.0000E-02	2.2046E-05
U-238	Pb-210	1.0000E-02	2.2046E-05

Fodder/Soil Concentration Ratio, QSR(j,p,q,t), for Meat and Milk Pathways
Ditch Irrigation (q=3)

[illegible]

Meat/Soil Concentration Ratios, FSR(i,4,q,t)
Root Uptake (q=1) and Foliar Dust Deposition (q=2)

Nuclide(i)			
Parent	Product	FSR(i,4,1)	FSR(i,4,2)
U-234	U-234	5.7800E-05	5.0969E-07
U-234	Th-230	6.8000E-06	1.4991E-07
U-234	Ra-226	2.7200E-03	1.4991E-06
U-234	Pb-210	5.4400E-04	1.1993E-06
U-235	U-235	5.7800E-05	5.0969E-07
U-235	Pa-231	3.4000E-03	7.4955E-06
U-235	Ac-227	3.4000E-06	2.9982E-08
U-238	U-238	5.7800E-05	5.0969E-07
U-238	U-234	5.7800E-05	5.0969E-07
U-238	Th-230	6.8000E-06	1.4991E-07
U-238	Ra-226	2.7200E-03	1.4991E-06
U-238	Pb-210	5.4400E-04	1.1993E-06

Meat/Soil Concentration Ratio, FSR(j,4,q,t)

Ditch Irrigation ($q=3$)

```
FSR(j,4,3,t) * SF(j,t)
```

[illegible]

0[illegible]

Milk/Soil Concentration Ratios, FSR(i,5,q,t)
Root Uptake (q=1) and Foliar Dust Deposition (q=2)

Nuclide(i)		FSR(i,5,1)	FSR(i,5,2)
Parent	Product		
U-234	U-234	8.2500E-05	7.2750E-07
U-234	Th-230	2.7500E-07	6.0625E-09
U-234	Ra-226	2.2000E-03	1.2125E-06
U-234	Pb-210	1.6500E-04	3.6375E-07
U-235	U-235	8.2500E-05	7.2750E-07
U-235	Pa-231	2.7500E-06	6.0625E-09
U-235	Ac-227	2.7500E-06	2.4250E-08
U-238	U-238	8.2500E-05	7.2750E-07
U-238	U-234	8.2500E-05	7.2750E-07
U-238	Th-230	2.7500E-07	6.0625E-09
U-238	Ra-226	2.2000E-03	1.2125E-06
U-238	Pb-210	1.6500E-04	3.6375E-07

Milk/Soil Concentration Ratio, FSR(j,5,q,t)

Ditch Irrigation ($q=3$)
$$\text{FSR}(j, 5, 3, t) * \text{SF}(j, t)$$
[illegible]

[illegible]

0

[illegible]

Dose/Source Ratios for Soil Ingestion Pathway (p=8)
 Parent and Progeny Principal Radionuclide Contributions Indicated

OParent (i)	Product (j)	Branch Fraction	DSR(j,8,t) (mrem/yr)/(pCi/g)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.117E-05	6.993E-06
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.024E-06	2.189E-06
U-234	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.889E-07	4.640E-07
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.889E-06	2.291E-06
U-234	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.548E-05	1.194E-05
OU-235	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.001E-05	6.613E-06
U-235	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.002E-05	4.406E-06
U-235	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.055E-05	4.686E-06
U-235	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.058E-05	1.570E-05
OU-238	U-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.016E-05	6.662E-06
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.605E-08	1.588E-08
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.777E-10	1.018E-09
U-238	Ra-226	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.451E-10	1.973E-10
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.854E-10	9.600E-10
U-238	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.020E-05	6.680E-06

Branch Fraction is the cumulative factor for the j'th principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

0

Dose Conversion and Environmental Transport Factors for the Soil Ingestion Pathway (p=8)

OParent (i)	Product (j)	DCF(j,8)*	ETF(j,8,t) (g/yr)							
			t= 0.000E+00	1.000E+00	1.000E+02	2.000E+02	4.000E+02	6.000E+02	8.000E+02	1.000E+03
U-234	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-234	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-234	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-234	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
OU-235	U-235	2.670E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-235	Pa-231	1.060E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-235	Ac-227	1.480E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
OU-238	U-238	2.690E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-238	U-234	2.830E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-238	Th-230	5.480E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-238	Ra-226	1.330E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00
U-238	Pb-210	7.270E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.555E+00	2.737E+00	2.737E+00

* - The dose conversion factor units are mrem/pCi.

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Cancer Risk Slope Factors Summary Table
 File: DOSFAC.BIN

0 Menu	Parameter	Current Value	Default	Parameter Name
Sf-1	Ground external radiation slope factors, 1/yr per (pCi/g):			
Sf-1	Ac-227+D	6.00E-07	6.00E-07	SLPF(1,1)
Sf-1	Pa-231	2.70E-08	2.70E-08	SLPF(2,1)
Sf-1	Pb-210+D	1.50E-10	1.50E-10	SLPF(3,1)
Sf-1	Ra-226+D	6.70E-06	6.70E-06	SLPF(4,1)
Sf-1	Th-230	4.40E-11	4.40E-11	SLPF(5,1)
Sf-1	U-234	2.10E-11	2.10E-11	SLPF(6,1)
Sf-1	U-235+D	2.70E-07	2.70E-07	SLPF(7,1)
Sf-1	U-238+D	5.70E-08	5.70E-08	SLPF(8,1)
Sf-2	Inhalation, slope factors, 1/(pCi):			
Sf-2	Ac-227+D	7.90E-08	7.90E-08	SLPF(1,2)
Sf-2	Pa-231	2.40E-08	2.40E-08	SLPF(2,2)
Sf-2	Pb-210+D	3.90E-09	3.90E-09	SLPF(3,2)
Sf-2	Ra-226+D	2.70E-09	2.70E-09	SLPF(4,2)
Sf-2	Th-230	1.70E-08	1.70E-08	SLPF(5,2)
Sf-2	U-234	1.40E-08	1.40E-08	SLPF(6,2)
Sf-2	U-235+D	1.30E-08	1.30E-08	SLPF(7,2)
Sf-2	U-238+D	1.20E-08	1.20E-08	SLPF(8,2)
Sf-3	Ingestion, slope factors, 1/(pCi):			
Sf-3	Ac-227+D	6.30E-10	6.30E-10	SLPF(1,3)
Sf-3	Pa-231	1.50E-10	1.50E-10	SLPF(2,3)
Sf-3	Pb-210+D	1.00E-09	1.00E-09	SLPF(3,3)
Sf-3	Ra-226+D	3.00E-10	3.00E-10	SLPF(4,3)
Sf-3	Th-230	3.80E-11	3.80E-11	SLPF(5,3)
Sf-3	U-234	4.40E-11	4.40E-11	SLPF(6,3)
Sf-3	U-235+D	4.70E-11	4.70E-11	SLPF(7,3)
Sf-3	U-238+D	6.20E-11	6.20E-11	SLPF(8,3)
Sf-Rn	Radon Inhalation slope factors, 1/(pCi):			
Sf-Rn	Rn-222	1.80E-12	1.80E-12\$	SLPFRN(1,1)
Sf-Rn	Po-218	3.70E-12	3.70E-12	SLPFRN(1,2)
Sf-Rn	Pb-214	6.20E-12	6.20E-12	SLPFRN(1,3)
Sf-Rn	Bi-214	1.50E-11	1.50E-11	SLPFRN(1,4)

Note: Default values followed by '*' were derived by multiplying the dose conversion factors with 7.6E-7 (risk/mrem). For external radiation, the dose conversion factors used for this derivation were obtained from the EPA's Federal Guidance Report No.12, and for inhalation and ingestion, the dose conversion factors were the ones used in RESRAD default database.

Default values followed by '\$' were obtained from 'Estimating Radiogenic Cancer Risks', EPA 402-R-93-076, June, 1994.

Default values followed by '#' were taken from individual radionuclides given in HEAST.

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 0.000E+00 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pa-231	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pb-210	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	0.000E+00	1.631E+02	1.366E-01	2.846E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.635E+02
U-235	0.000E+00	6.525E+00	5.462E-03	1.139E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.542E+00
U-238	0.000E+00	1.631E+02	1.366E-01	2.846E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.635E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of Radon and its Decay Products as pCi/yr at t= 0.000E+00 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p) and Fraction of Total Risk at t= 0.000E+00 years

0

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	2.789E-15	0.0000	0.000E+00	0.0000	2.153E-07	0.3949	1.802E-10	0.0003	3.757E-10	0.0007	0.000E+00	0.0000
U-235	1.111E-10	0.0002	0.000E+00	0.0000	9.200E-09	0.0169	7.702E-12	0.0000	1.605E-11	0.0000	0.000E+00	0.0000
U-238	1.584E-08	0.0290	0.000E+00	0.0000	3.034E-07	0.5565	2.540E-10	0.0005	5.294E-10	0.0010	0.000E+00	0.0000
Total	1.595E-08	0.0293	0.000E+00	0.0000	5.279E-07	0.9682	4.419E-10	0.0008	9.212E-10	0.0017	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.159E-07	0.3959
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.335E-09	0.0171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-07	0.5869
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.452E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 0.000E+00 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	2.789E-15	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.153E-07	0.3949	1.802E-10	0.0003	3.757E-10	0.0007	0.000E+00	0.0000
U-235	1.111E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	9.200E-09	0.0169	7.702E-12	0.0000	1.605E-11	0.0000	0.000E+00	0.0000
U-238	1.584E-08	0.0290	0.000E+00	0.0000	0.000E+00	0.0000	3.034E-07	0.5565	2.540E-10	0.0005	5.294E-10	0.0010	0.000E+00	0.0000
Total	1.595E-08	0.0293	0.000E+00	0.0000	0.000E+00	0.0000	5.279E-07	0.9682	4.419E-10	0.0008	9.212E-10	0.0017	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 0.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.159E-07	0.3959
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.335E-09	0.0171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.200E-07	0.5869
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.452E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+00 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	2.775E-06	2.132E-10	2.525E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.776E-06
Pa-231	0.000E+00	5.539E-04	6.973E-06	8.884E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.608E-04
Pb-210	0.000E+00	1.861E-08	8.516E-11	2.956E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.873E-08
Ra-226	0.000E+00	5.081E-06	1.258E-08	1.485E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.108E-06
Th-230	0.000E+00	6.374E-04	2.554E-07	1.810E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.377E-04
U-234	0.000E+00	1.622E+02	1.358E-01	2.830E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.626E+02
U-235	0.000E+00	6.487E+00	5.430E-03	1.132E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.503E+00
U-238	0.000E+00	1.622E+02	1.358E-01	2.830E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.626E+02

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+00 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	3.209E-02	3.094E-02	2.342E-02	1.893E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	3.209E-02	3.094E-02	2.342E-02	1.893E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.823E-16	0.0000	0.000E+00	0.0000	5.246E-14	0.0000	4.029E-18	0.0000	4.772E-18	0.0000	0.000E+00	0.0000
Pa-231	1.187E-15	0.0000	0.000E+00	0.0000	2.492E-12	0.0000	3.138E-14	0.0000	3.998E-17	0.0000	0.000E+00	0.0000
Pb-210	1.694E-24	0.0000	0.000E+00	0.0000	5.584E-16	0.0000	2.555E-18	0.0000	8.868E-19	0.0000	0.000E+00	0.0000
Ra-226	7.563E-15	0.0000	0.000E+00	0.0000	4.573E-14	0.0000	1.132E-16	0.0000	1.337E-16	0.0000	0.000E+00	0.0000
Th-230	1.069E-19	0.0000	0.000E+00	0.0000	7.266E-13	0.0000	2.911E-16	0.0000	2.064E-17	0.0000	0.000E+00	0.0000
U-234	2.838E-15	0.0000	0.000E+00	0.0000	2.141E-07	0.3948	1.792E-10	0.0003	3.735E-10	0.0007	0.000E+00	0.0000
U-235	1.123E-10	0.0002	0.000E+00	0.0000	9.146E-09	0.0169	7.656E-12	0.0000	1.596E-11	0.0000	0.000E+00	0.0000
U-238	1.592E-08	0.0294	0.000E+00	0.0000	3.016E-07	0.5563	2.525E-10	0.0005	5.263E-10	0.0010	0.000E+00	0.0000
Total	1.603E-08	0.0296	0.000E+00	0.0000	5.248E-07	0.9679	4.394E-10	0.0008	9.158E-10	0.0017	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.285E-14	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.525E-12	0.0000
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.619E-16	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.354E-14	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.270E-13	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-07	0.3958
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.282E-09	0.0171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.183E-07	0.5871
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.422E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+00 years

0

Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.733E-12	3.435E-12	4.355E-12	8.518E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.733E-12	3.435E-12	4.355E-12	8.518E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.040E-14	0.0000	0.000E+00	0.0000	1.804E-11	0.0000	2.141E-07	0.3948	1.792E-10	0.0003	3.735E-10	0.0007	0.000E+00	0.0000
U-235	1.123E-10	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	9.149E-09	0.0169	7.688E-12	0.0000	1.596E-11	0.0000	0.000E+00	0.0000
U-238	1.592E-08	0.0294	0.000E+00	0.0000	1.704E-17	0.0000	3.016E-07	0.5563	2.525E-10	0.0005	5.263E-10	0.0010	0.000E+00	0.0000
Total	1.603E-08	0.0296	0.000E+00	0.0000	1.804E-11	0.0000	5.248E-07	0.9679	4.394E-10	0.0008	9.158E-10	0.0017	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.146E-07	0.3958
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.285E-09	0.0171
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.183E-07	0.5871
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.422E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	4.589E-03	8.862E-07	2.711E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.590E-03
Pa-231	0.000E+00	3.064E-02	3.773E-04	4.460E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.102E-02
Pb-210	0.000E+00	5.066E-03	1.028E-05	4.501E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.080E-03
Ra-226	0.000E+00	3.605E-02	8.876E-05	1.048E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.624E-02
Th-230	0.000E+00	4.429E-02	1.096E-05	6.489E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.430E-02
U-234	0.000E+00	9.059E+01	7.583E-02	1.581E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.082E+01
U-235	0.000E+00	3.624E+00	3.033E-03	6.323E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.633E+00
U-238	0.000E+00	9.059E+01	7.583E-02	1.581E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.082E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	2.281E+02	2.200E+02	1.665E+02	1.346E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.281E+02	2.200E+02	1.665E+02	1.346E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

0

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	3.246E-12	0.0000	0.000E+00	0.0000	8.673E-11	0.0003	1.675E-14	0.0000	5.124E-15	0.0000	0.000E+00	0.0000
Pa-231	2.629E-13	0.0000	0.000E+00	0.0000	1.379E-10	0.0004	1.698E-12	0.0000	2.007E-15	0.0000	0.000E+00	0.0000
Pb-210	5.228E-18	0.0000	0.000E+00	0.0000	1.520E-10	0.0005	3.083E-13	0.0000	1.350E-13	0.0000	0.000E+00	0.0000
Ra-226	1.441E-10	0.0004	0.000E+00	0.0000	3.244E-10	0.0010	7.988E-13	0.0000	9.435E-13	0.0000	0.000E+00	0.0000
Th-230	7.448E-17	0.0000	0.000E+00	0.0000	5.049E-11	0.0002	1.249E-14	0.0000	7.397E-16	0.0000	0.000E+00	0.0000
U-234	1.589E-14	0.0000	0.000E+00	0.0000	1.196E-07	0.3717	1.001E-10	0.0003	2.086E-10	0.0006	0.000E+00	0.0000
U-235	3.232E-10	0.0010	0.000E+00	0.0000	5.109E-09	0.0159	4.277E-12	0.0000	8.915E-12	0.0000	0.000E+00	0.0000
U-238	2.650E-08	0.0824	0.000E+00	0.0000	1.685E-07	0.5238	1.411E-10	0.0004	2.940E-10	0.0009	0.000E+00	0.0000
Total	2.697E-08	0.0838	0.000E+00	0.0000	2.939E-07	0.9138	2.483E-10	0.0008	5.126E-10	0.0016	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.999E-11	0.0003
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.398E-10	0.0004
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.524E-10	0.0005
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.703E-10	0.0015
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.050E-11	0.0002
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.199E-07	0.3727
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.446E-09	0.0169
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.954E-07	0.6076
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.217E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+02 years
 Radionuclides

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.232E-08	2.442E-08	3.096E-08	6.055E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.232E-08	2.442E-08	3.096E-08	6.055E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.441E-10	0.0003	0.000E+00	0.0000	1.282E-07	0.2850	1.201E-07	0.2669	1.012E-10	0.0002	2.097E-10	0.0005	0.000E+00	0.0000
U-235	3.267E-10	0.0007	0.000E+00	0.0000	0.000E+00	0.0000	5.334E-09	0.0119	5.991E-12	0.0000	8.922E-12	0.0000	0.000E+00	0.0000
U-238	2.650E-08	0.0589	0.000E+00	0.0000	1.140E-11	0.0000	1.685E-07	0.3746	1.411E-10	0.0003	2.941E-10	0.0007	0.000E+00	0.0000
Total	2.697E-08	0.0599	0.000E+00	0.0000	1.283E-07	0.2851	2.939E-07	0.6533	2.483E-10	0.0006	5.126E-10	0.0011	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.488E-07	0.5529
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.676E-09	0.0126
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.955E-07	0.4345
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.499E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 2.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	5.886E-03	1.022E-06	3.469E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.888E-03
Pa-231	0.000E+00	3.399E-02	4.185E-04	4.945E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.441E-02
Pb-210	0.000E+00	1.916E-02	3.857E-05	1.695E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.922E-02
Ra-226	0.000E+00	1.038E-01	2.557E-04	3.020E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.044E-01
Th-230	0.000E+00	6.859E-02	1.692E-05	1.000E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.861E-02
U-234	0.000E+00	5.031E+01	4.211E-02	8.778E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.044E+01
U-235	0.000E+00	2.012E+00	1.685E-03	3.511E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.018E+00
U-238	0.000E+00	5.031E+01	4.211E-02	8.778E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.044E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 2.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	6.572E+02	6.337E+02	4.795E+02	3.876E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	6.572E+02	6.337E+02	4.795E+02	3.876E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 2.000E+02 years

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.697E-11	0.0001	0.000E+00	0.0000	1.113E-10	0.0005	1.932E-14	0.0000	6.557E-15	0.0000	0.000E+00	0.0000
Pa-231	1.173E-12	0.0000	0.000E+00	0.0000	1.530E-10	0.0007	1.883E-12	0.0000	2.225E-15	0.0000	0.000E+00	0.0000
Pb-210	1.618E-16	0.0000	0.000E+00	0.0000	5.749E-10	0.0027	1.157E-12	0.0000	5.084E-13	0.0000	0.000E+00	0.0000
Ra-226	1.124E-09	0.0053	0.000E+00	0.0000	9.346E-10	0.0044	2.301E-12	0.0000	2.718E-12	0.0000	0.000E+00	0.0000
Th-230	1.088E-15	0.0000	0.000E+00	0.0000	7.819E-11	0.0004	1.929E-14	0.0000	1.140E-15	0.0000	0.000E+00	0.0000
U-234	9.049E-14	0.0000	0.000E+00	0.0000	6.641E-08	0.3140	5.559E-11	0.0003	1.159E-10	0.0005	0.000E+00	0.0000
U-235	9.403E-10	0.0044	0.000E+00	0.0000	2.837E-09	0.0134	2.375E-12	0.0000	4.951E-12	0.0000	0.000E+00	0.0000
U-238	4.433E-08	0.2096	0.000E+00	0.0000	9.357E-08	0.4424	7.833E-11	0.0004	1.633E-10	0.0008	0.000E+00	0.0000
Total	4.641E-08	0.2194	0.000E+00	0.0000	1.647E-07	0.7785	1.417E-10	0.0007	2.873E-10	0.0014	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 2.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.282E-10	0.0006
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.560E-10	0.0007
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.766E-10	0.0027
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.064E-09	0.0098
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.821E-11	0.0004
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.658E-08	0.3148
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.785E-09	0.0179
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.381E-07	0.6531
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.115E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 2.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	3.549E-08	7.034E-08	8.919E-08	1.744E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	3.549E-08	7.034E-08	8.919E-08	1.744E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 2.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.124E-09	0.0019	0.000E+00	0.0000	3.694E-07	0.6358	6.796E-08	0.1170	5.904E-11	0.0001	1.190E-10	0.0002	0.000E+00	0.0000
U-235	9.584E-10	0.0016	0.000E+00	0.0000	0.000E+00	0.0000	3.102E-09	0.0053	4.278E-12	0.0000	4.960E-12	0.0000	0.000E+00	0.0000
U-238	4.433E-08	0.0763	0.000E+00	0.0000	6.156E-11	0.0001	9.361E-08	0.1611	7.836E-11	0.0001	1.633E-10	0.0003	0.000E+00	0.0000
Total	4.641E-08	0.0799	0.000E+00	0.0000	3.695E-07	0.6359	1.647E-07	0.2834	1.417E-10	0.0002	2.873E-10	0.0005	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 2.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.387E-07	0.7550
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.069E-09	0.0070
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.382E-07	0.2380
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.810E-07	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 4.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	0.000E+00	3.876E-03	6.415E-07	2.282E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.877E-03
Pa-231	0.000E+00	2.092E-02	2.576E-04	3.043E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.118E-02
Pb-210	0.000E+00	4.844E-02	9.716E-05	4.274E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.858E-02
Ra-226	0.000E+00	2.268E-01	5.584E-04	6.596E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.280E-01
Th-230	0.000E+00	8.891E-02	2.190E-05	1.294E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.893E-02
U-234	0.000E+00	1.552E+01	1.299E-02	2.707E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.556E+01
U-235	0.000E+00	6.206E-01	5.195E-04	1.083E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.222E-01
U-238	0.000E+00	1.552E+01	1.299E-02	2.707E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.556E+01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 4.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.436E+03	1.384E+03	1.048E+03	8.469E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.436E+03	1.384E+03	1.048E+03	8.469E+02	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

0

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.853E-10	0.0009	0.000E+00	0.0000	7.326E-11	0.0004	1.212E-14	0.0000	4.313E-15	0.0000	0.000E+00	0.0000
Pa-231	1.169E-11	0.0001	0.000E+00	0.0000	9.415E-11	0.0005	1.159E-12	0.0000	1.369E-15	0.0000	0.000E+00	0.0000
Pb-210	2.730E-14	0.0000	0.000E+00	0.0000	1.453E-09	0.0071	2.915E-12	0.0000	1.282E-12	0.0000	0.000E+00	0.0000
Ra-226	1.800E-08	0.0881	0.000E+00	0.0000	2.041E-09	0.0100	5.026E-12	0.0000	5.936E-12	0.0000	0.000E+00	0.0000
Th-230	1.255E-13	0.0000	0.000E+00	0.0000	1.014E-10	0.0005	2.497E-14	0.0000	1.475E-15	0.0000	0.000E+00	0.0000
U-234	2.936E-12	0.0000	0.000E+00	0.0000	2.048E-08	0.1002	1.714E-11	0.0001	3.574E-11	0.0002	0.000E+00	0.0000
U-235	7.957E-09	0.0389	0.000E+00	0.0000	8.751E-10	0.0043	7.325E-13	0.0000	1.527E-12	0.0000	0.000E+00	0.0000
U-238	1.241E-07	0.6072	0.000E+00	0.0000	2.886E-08	0.1412	2.416E-11	0.0001	5.035E-11	0.0002	0.000E+00	0.0000
Total	1.502E-07	0.7351	0.000E+00	0.0000	5.398E-08	0.2641	5.117E-11	0.0003	9.484E-11	0.0005	0.000E+00	0.0000

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.586E-10	0.0013
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.070E-10	0.0005
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.458E-09	0.0071
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.005E-08	0.0981
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.015E-10	0.0005
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.054E-08	0.1005
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.834E-09	0.0432
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.530E-07	0.7488
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.044E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 4.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	7.754E-08	1.537E-07	1.949E-07	3.811E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	7.754E-08	1.537E-07	1.949E-07	3.811E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.799E-08	0.0178	0.000E+00	0.0000	8.069E-07	0.7977	2.405E-08	0.0238	2.509E-11	0.0000	4.291E-11	0.0000	0.000E+00	0.0000
U-235	8.154E-09	0.0081	0.000E+00	0.0000	0.000E+00	0.0000	1.043E-09	0.0010	1.904E-12	0.0000	1.533E-12	0.0000	0.000E+00	0.0000
U-238	1.241E-07	0.1227	0.000E+00	0.0000	2.336E-10	0.0002	2.888E-08	0.0286	2.418E-11	0.0000	5.040E-11	0.0000	0.000E+00	0.0000
Total	1.502E-07	0.1485	0.000E+00	0.0000	8.072E-07	0.7980	5.398E-08	0.0534	5.117E-11	0.0001	9.484E-11	0.0001	0.000E+00	0.0000

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 4.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.490E-07	0.8394
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.200E-09	0.0091
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.533E-07	0.1515
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.012E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 6.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	9.082E-05	1.836E-03	1.076E-06	8.277E-07	4.275E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.265E-03
Pa-231	1.205E-04	9.668E-03	2.826E-04	3.795E-07	5.673E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.052E-02
Pb-210	8.281E-04	6.669E-02	3.136E-04	1.573E-04	3.898E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.106E-02
Ra-226	9.322E-04	2.989E-01	9.890E-04	1.239E-03	4.388E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.055E-01
Th-230	1.177E-02	9.533E-02	3.431E-04	2.471E-05	5.543E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.511E-01
U-234	2.388E-01	4.805E+00	2.606E-02	6.516E-02	1.124E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.020E+00
U-235	9.553E-03	1.922E-01	1.043E-03	2.606E-03	4.497E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.408E-01
U-238	2.388E-01	4.805E+00	2.606E-02	6.516E-02	1.124E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.020E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 6.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.893E+03	1.824E+03	1.381E+03	1.116E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.893E+03	1.824E+03	1.381E+03	1.116E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years
 Water Independent Pathways (Inhalation excludes radon)

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	1.349E-09	0.0017	2.152E-10	0.0003	3.470E-11	0.0000	2.033E-14	0.0000	1.564E-14	0.0000	8.080E-12	0.0000
Pa-231	8.093E-11	0.0001	8.677E-11	0.0001	4.351E-11	0.0001	1.272E-12	0.0000	1.708E-15	0.0000	2.553E-12	0.0000
Pb-210	2.468E-12	0.0000	9.689E-11	0.0001	2.001E-09	0.0026	9.408E-12	0.0000	4.718E-12	0.0000	1.169E-10	0.0002
Ra-226	1.579E-07	0.2042	7.551E-11	0.0001	2.690E-09	0.0035	8.901E-12	0.0000	1.115E-11	0.0000	3.949E-11	0.0001
Th-230	1.126E-11	0.0000	6.005E-09	0.0078	1.087E-10	0.0001	3.911E-13	0.0000	2.817E-14	0.0000	6.319E-11	0.0001
U-234	9.106E-11	0.0001	1.003E-07	0.1297	6.342E-09	0.0082	3.440E-11	0.0000	8.601E-11	0.0001	1.484E-09	0.0019
U-235	6.289E-08	0.0813	3.726E-09	0.0048	2.710E-10	0.0004	1.470E-12	0.0000	3.675E-12	0.0000	6.341E-11	0.0001
U-238	3.298E-07	0.4265	8.598E-08	0.1112	8.937E-09	0.0116	4.848E-11	0.0001	1.212E-10	0.0002	2.091E-09	0.0027
Total	5.521E-07	0.7140	1.965E-07	0.2541	2.043E-08	0.0264	1.043E-10	0.0001	2.268E-10	0.0003	3.869E-09	0.0050

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-09	0.0021
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.150E-10	0.0003
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.231E-09	0.0029
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.607E-07	0.2078
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.189E-09	0.0080
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.083E-07	0.1401
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.696E-08	0.0866
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.270E-07	0.5522
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.732E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 6.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.022E-07	2.025E-07	2.568E-07	5.022E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.022E-07	2.025E-07	2.568E-07	5.022E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.579E-07	0.0860	1.063E-07	0.0579	1.063E-06	0.5789	1.113E-08	0.0061	5.304E-11	0.0000	1.018E-10	0.0001	1.701E-09	0.0009
U-235	6.432E-08	0.0350	4.028E-09	0.0022	0.000E+00	0.0000	3.492E-10	0.0002	2.762E-12	0.0000	3.692E-12	0.0000	7.404E-11	0.0000
U-238	3.298E-07	0.1796	8.615E-08	0.0469	3.966E-10	0.0002	8.949E-09	0.0049	4.854E-11	0.0000	1.214E-10	0.0001	2.094E-09	0.0011
Total	5.521E-07	0.3005	1.965E-07	0.1070	1.064E-06	0.5791	2.043E-08	0.0111	1.043E-10	0.0001	2.268E-10	0.0001	3.869E-09	0.0021

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 6.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.341E-06	0.7298
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.878E-08	0.0374
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.276E-07	0.2328
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.837E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 8.000E+02 years

Radio- Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	4.036E-05	6.175E-04	4.436E-07	3.561E-07	1.900E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.083E-04
Pa-231	5.298E-05	3.215E-03	1.115E-04	1.518E-07	2.494E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.576E-03
Pb-210	1.005E-03	6.118E-02	3.409E-04	1.734E-04	4.729E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.643E-02
Ra-226	1.112E-03	2.696E-01	9.656E-04	1.225E-03	5.235E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.770E-01
Th-230	1.273E-02	7.820E-02	3.649E-04	2.636E-05	5.994E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.385E-01
U-234	7.892E-02	1.202E+00	8.289E-03	2.086E-02	3.715E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.602E+00
U-235	3.157E-03	4.807E-02	3.316E-04	8.343E-04	1.486E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.410E-02
U-238	7.892E-02	1.202E+00	8.289E-03	2.086E-02	3.715E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.602E+00

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 8.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	2.049E+03	1.976E+03	1.495E+03	1.209E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.049E+03	1.976E+03	1.495E+03	1.209E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

0

0

Radio- Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	6.059E-10	0.0015	9.565E-11	0.0002	1.167E-11	0.0000	8.384E-15	0.0000	6.731E-15	0.0000	3.590E-12	0.0000
Pa-231	3.628E-11	0.0001	3.815E-11	0.0001	1.447E-11	0.0000	5.017E-13	0.0000	6.829E-16	0.0000	1.122E-12	0.0000
Pb-210	3.878E-12	0.0000	1.175E-10	0.0003	1.836E-09	0.0046	1.023E-11	0.0000	5.202E-12	0.0000	1.419E-10	0.0004
Ra-226	1.824E-07	0.4616	9.008E-11	0.0002	2.426E-09	0.0061	8.690E-12	0.0000	1.102E-11	0.0000	4.711E-11	0.0001
Th-230	1.446E-11	0.0000	6.494E-09	0.0164	8.915E-11	0.0002	4.160E-13	0.0000	3.006E-14	0.0000	6.833E-11	0.0002
U-234	4.343E-11	0.0001	3.315E-08	0.0839	1.586E-09	0.0040	1.094E-11	0.0000	2.753E-11	0.0001	4.904E-10	0.0012
U-235	2.177E-08	0.0551	1.231E-09	0.0031	6.778E-11	0.0002	4.675E-13	0.0000	1.176E-12	0.0000	2.095E-11	0.0001
U-238	1.108E-07	0.2803	2.841E-08	0.0719	2.235E-09	0.0057	1.542E-11	0.0000	3.880E-11	0.0001	6.910E-10	0.0017
Total	3.156E-07	0.7988	6.962E-08	0.1762	8.267E-09	0.0209	4.667E-11	0.0001	8.377E-11	0.0002	1.464E-09	0.0037

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.168E-10	0.0018
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.052E-11	0.0002
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.114E-09	0.0054
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.850E-07	0.4682
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.667E-09	0.0169
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.530E-08	0.0894
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.309E-08	0.0584
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.421E-07	0.3598
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.951E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

0

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 8.000E+02 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	1.107E-07	2.193E-07	2.781E-07	5.438E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.107E-07	2.193E-07	2.781E-07	5.438E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.824E-07	0.1179	3.977E-08	0.0257	1.151E-06	0.7443	5.932E-09	0.0038	3.024E-11	0.0000	4.372E-11	0.0000	7.465E-10	0.0005
U-235	2.241E-08	0.0145	1.365E-09	0.0009	0.000E+00	0.0000	9.392E-11	0.0001	9.776E-13	0.0000	1.184E-12	0.0000	2.566E-11	0.0000
U-238	1.108E-07	0.0716	2.849E-08	0.0184	4.896E-10	0.0003	2.241E-09	0.0014	1.545E-11	0.0000	3.887E-11	0.0000	6.922E-10	0.0004
Total	3.156E-07	0.2040	6.962E-08	0.0450	1.152E-06	0.7446	8.267E-09	0.0053	4.667E-11	0.0000	8.377E-11	0.0001	1.464E-09	0.0009

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 8.000E+02 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.380E-06	0.8922
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.390E-08	0.0154
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.428E-07	0.0923
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.547E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

Amount of Intake Quantities QINT(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 As pCi/yr at t= 1.000E+03 years

Radio-Nuclide	Water Independent Pathways (Inhalation w/o radon)					Water Dependent Pathways					Total Ingestion*
	Inhalation	Plant	Meat	Milk	Soil	Water	Fish	Plant	Meat	Milk	
Ac-227	1.562E-05	1.804E-04	1.618E-07	1.344E-07	7.355E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.542E-04
Pa-231	2.038E-05	9.317E-04	3.913E-05	5.394E-08	9.595E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.067E-03
Pb-210	1.052E-03	4.828E-02	3.253E-04	1.677E-04	4.953E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.373E-02
Ra-226	1.156E-03	2.112E-01	8.337E-04	1.072E-03	5.443E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.185E-01
Th-230	1.266E-02	5.883E-02	3.583E-04	2.595E-05	5.962E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.188E-01
U-234	2.434E-02	2.796E-01	2.480E-03	6.274E-03	1.146E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.030E-01
U-235	9.736E-04	1.119E-02	9.921E-05	2.510E-04	4.583E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.612E-02
U-238	2.434E-02	2.796E-01	2.480E-03	6.274E-03	1.146E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.030E-01

* Sum of all ingestion pathways, i.e. water independent plant, meat, milk, soil
 and water-dependent water, fish, plant, meat, milk pathways

0

Amount of Intake Quantities QINT9(irn,i,t) and QINT9W(irn,i,t) for Inhalation of
 Radon and its Decay Products as pCi/yr at t= 1.000E+03 years
 Radionuclides

0

Radon Pathway	Rn-222	Po-218	Pb-214	Bi-214	Rn-220	Po-216	Pb-212	Bi-212
Water-ind.	2.024E+03	1.952E+03	1.477E+03	1.194E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water-dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.024E+03	1.952E+03	1.477E+03	1.194E+03	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water-ind. == Water-independent Water-dep. == Water-dependent

0

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

0

Radio-Nuclide	Ground		Inhalation		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	2.345E-10	0.0009	3.703E-11	0.0001	3.409E-12	0.0000	3.058E-15	0.0000	2.540E-15	0.0000	1.390E-12	0.0000
Pa-231	1.395E-11	0.0001	1.468E-11	0.0001	4.193E-12	0.0000	1.761E-13	0.0000	2.427E-16	0.0000	4.318E-13	0.0000
Pb-210	4.061E-12	0.0000	1.231E-10	0.0005	1.448E-09	0.0055	9.760E-12	0.0000	5.030E-12	0.0000	1.486E-10	0.0006
Ra-226	1.893E-07	0.7238	9.367E-11	0.0004	1.900E-09	0.0073	7.504E-12	0.0000	9.650E-12	0.0000	4.899E-11	0.0002
Th-230	1.438E-11	0.0001	6.459E-09	0.0247	6.706E-11	0.0003	4.084E-13	0.0000	2.958E-14	0.0000	6.796E-11	0.0003
U-234	1.339E-11	0.0001	1.022E-08	0.0391	3.691E-10	0.0014	3.274E-12	0.0000	8.282E-12	0.0000	1.512E-10	0.0006
U-235	6.713E-09	0.0257	3.797E-10	0.0015	1.577E-11	0.0001	1.399E-13	0.0000	3.539E-13	0.0000	6.462E-12	0.0000
U-238	3.413E-08	0.1305	8.762E-09	0.0335	5.201E-10	0.0020	4.613E-12	0.0000	1.167E-11	0.0000	2.131E-10	0.0008
Total	2.305E-07	0.8810	2.609E-08	0.0997	4.328E-09	0.0165	2.588E-11	0.0001	3.502E-11	0.0001	6.382E-10	0.0024

Excess Cancer Risks CNRS(i,p,t) for Individual Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Plant		Meat		Milk		All Pathways**	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.764E-10	0.0011
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.343E-11	0.0001
Pb-210	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.739E-09	0.0066
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.914E-07	0.7317
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.609E-09	0.0253
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.077E-08	0.0412
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.115E-09	0.0272
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.364E-08	0.1668
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.616E-07	1.0000

** Sum of water independent ground, inhalation, plant, meat, milk, soil
 and water dependent water, fish, plant, meat, milk pathways

Excess Cancer Risks CNRS9(irn,i,t) and CNRS9W(irn,i,t) for Inhalation of
 Radon and its Decay Products at t= 1.000E+03 years
 Radionuclides

Radon Pathway	Rn-222		Po-218		Pb-214		Bi-214		Rn-220		Po-216		Pb-212		Bi-212	
	Water- ind.	Water- dep.	Water- ind.	Water- dep.	Water- ind.	Water- dep.	Water- ind.	Water- dep.	Water- ind.	Water- dep.	Water- ind.	Water- dep.	Water- ind.	Water- dep.	Water- ind.	Water- dep.
Water- ind.	1.093E-07	2.166E-07	2.747E-07	5.372E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Water- dep.	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.093E-07	2.166E-07	2.747E-07	5.372E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water- ind. == Water- independent Water- dep. == Water-dependent

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	1.893E-07	0.1353	1.687E-08	0.0121	1.137E-06	0.8127	3.782E-09	0.0027	2.093E-11	0.0000	2.296E-11	0.0000	4.162E-10	0.0003
U-235	6.961E-09	0.0050	4.314E-10	0.0003	0.000E+00	0.0000	2.337E-11	0.0000	3.190E-13	0.0000	3.566E-13	0.0000	8.284E-12	0.0000
U-238	3.421E-08	0.0244	8.794E-09	0.0063	5.179E-10	0.0004	5.227E-10	0.0004	4.631E-12	0.0000	1.170E-11	0.0000	2.137E-10	0.0002
Total	2.305E-07	0.1647	2.609E-08	0.0186	1.138E-06	0.8131	4.328E-09	0.0031	2.588E-11	0.0000	3.502E-11	0.0000	6.382E-10	0.0005

Total Excess Cancer Risk CNRSI(i,p,t)*** for Initially Existent Radionuclides (i) and Pathways (p)
 and Fraction of Total Risk at t= 1.000E+03 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All pathways	
	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.	risk	fract.
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.348E-06	0.9631
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.425E-09	0.0053
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.428E-08	0.0316
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.399E-06	1.0000

***CNRSI(i,p,t) includes contribution from decay daughter radionuclides

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Part IV: Concentration of Radionuclides

Concentration of radionuclides in different media	
Time= 0.000E+00	2
Time= 1.000E+00	3
Time= 1.000E+02	4
Time= 2.000E+02	5
Time= 4.000E+02	6
Time= 6.000E+02	7
Time= 8.000E+02	8
Time= 1.000E+03	9

Concentration of radionuclides in different media
 at t = 0.000E+00 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pa-231	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pb-210	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ra-226	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Th-230	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
U-234	1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E+01	1.87E+01	1.87E+01	4.33E-01	6.19E-01	0.00E+00	0.00E+00
U-235	6.00E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.50E-01	7.50E-01	7.50E-01	1.73E-02	2.48E-02	0.00E+00	0.00E+00
U-238	1.50E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.87E+01	1.87E+01	1.87E+01	4.34E-01	6.19E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 1.000E+00 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	1.98E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.25E-07	2.53E-07	4.98E-07	6.77E-10	5.49E-10	0.00E+00	0.00E+00
Pa-231	1.26E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.37E-05	6.31E-05	6.50E-05	2.21E-05	1.93E-08	0.00E+00	0.00E+00
Pb-210	3.00E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.19E-09	1.55E-09	3.73E-09	2.70E-10	6.43E-11	0.00E+00	0.00E+00
Ra-226	2.91E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.84E-07	5.83E-07	5.87E-07	3.99E-08	3.23E-08	0.00E+00	0.00E+00
Th-230	1.35E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.37E-05	6.78E-05	8.80E-05	8.11E-07	3.94E-08	0.00E+00	0.00E+00
U-234	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E+01	1.86E+01	1.86E+01	4.31E-01	6.15E-01	0.00E+00	0.00E+00
U-235	5.96E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.46E-01	7.46E-01	7.46E-01	1.72E-02	2.46E-02	0.00E+00	0.00E+00
U-238	1.49E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E+01	1.86E+01	1.86E+01	4.31E-01	6.15E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.
 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
 The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 1.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	4.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.28E-04	5.24E-04	5.36E-04	2.81E-06	5.89E-07	0.00E+00	0.00E+00
Pa-231	7.04E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.52E-03	3.52E-03	3.52E-03	1.20E-03	9.69E-07	0.00E+00	0.00E+00
Pb-210	1.16E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.83E-04	5.79E-04	5.92E-04	3.26E-05	9.79E-06	0.00E+00	0.00E+00
Ra-226	2.07E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.14E-03	4.14E-03	4.14E-03	2.82E-04	2.28E-04	0.00E+00	0.00E+00
Th-230	1.02E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.09E-03	5.09E-03	5.10E-03	3.48E-05	1.41E-06	0.00E+00	0.00E+00
U-234	8.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E+01	1.04E+01	1.04E+01	2.41E-01	3.44E-01	0.00E+00	0.00E+00
U-235	3.33E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.17E-01	4.17E-01	4.17E-01	9.63E-03	1.37E-02	0.00E+00	0.00E+00
U-238	8.33E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.04E+01	1.04E+01	1.04E+01	2.41E-01	3.44E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 2.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	5.38E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.77E-04	6.73E-04	6.86E-04	3.24E-06	7.54E-07	0.00E+00	0.00E+00
Pa-231	7.81E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.91E-03	3.91E-03	3.91E-03	1.33E-03	1.08E-06	0.00E+00	0.00E+00
Pb-210	4.38E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.20E-03	2.19E-03	2.23E-03	1.22E-04	3.68E-05	0.00E+00	0.00E+00
Ra-226	5.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.19E-02	1.19E-02	1.19E-02	8.12E-04	6.56E-04	0.00E+00	0.00E+00
Th-230	1.58E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.88E-03	7.88E-03	7.89E-03	5.37E-05	2.17E-06	0.00E+00	0.00E+00
U-234	4.63E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E+00	5.78E+00	5.78E+00	1.34E-01	1.91E-01	0.00E+00	0.00E+00
U-235	1.85E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-01	2.31E-01	2.31E-01	5.35E-03	7.63E-03	0.00E+00	0.00E+00
U-238	4.63E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.78E+00	5.78E+00	5.78E+00	1.34E-01	1.91E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.
 Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.
 The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 4.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	3.55E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.46E-04	4.44E-04	4.51E-04	2.04E-06	4.96E-07	0.00E+00	0.00E+00
Pa-231	4.81E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.40E-03	2.40E-03	2.40E-03	8.18E-04	6.62E-07	0.00E+00	0.00E+00
Pb-210	1.11E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.57E-03	5.55E-03	5.62E-03	3.08E-04	9.29E-05	0.00E+00	0.00E+00
Ra-226	1.30E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.61E-02	2.61E-02	2.61E-02	1.77E-03	1.43E-03	0.00E+00	0.00E+00
Th-230	2.04E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-02	1.02E-02	1.02E-02	6.95E-05	2.81E-06	0.00E+00	0.00E+00
U-234	1.43E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E+00	1.78E+00	1.78E+00	4.12E-02	5.89E-02	0.00E+00	0.00E+00
U-235	5.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.13E-02	7.13E-02	7.13E-02	1.65E-03	2.35E-03	0.00E+00	0.00E+00
U-238	1.43E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.78E+00	1.78E+00	1.78E+00	4.12E-02	5.89E-02	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 6.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	1.67E-04	1.56E-04	2.40E-08	0.00E+00	0.00E+00	2.11E-04	2.12E-04	2.16E-04	3.41E-06	1.80E-06	0.00E+00	0.00E+00
Pa-231	2.22E-04	2.07E-04	3.19E-08	0.00E+00	0.00E+00	1.11E-03	1.11E-03	1.11E-03	8.97E-04	8.25E-07	0.00E+00	0.00E+00
Pb-210	1.53E-03	1.42E-03	2.19E-07	0.00E+00	0.00E+00	7.67E-03	7.66E-03	7.76E-03	9.96E-04	3.42E-04	0.00E+00	0.00E+00
Ra-226	1.72E-03	1.60E-03	2.47E-07	0.00E+00	0.00E+00	3.44E-02	3.44E-02	3.44E-02	3.14E-03	2.69E-03	0.00E+00	0.00E+00
Th-230	2.17E-02	2.02E-02	3.11E-06	0.00E+00	0.00E+00	1.09E-02	1.13E-02	1.13E-02	1.09E-03	5.37E-05	0.00E+00	0.00E+00
U-234	4.40E-01	4.11E-01	6.32E-05	0.00E+00	0.00E+00	5.52E-01	5.58E-01	5.59E-01	8.27E-02	1.42E-01	0.00E+00	0.00E+00
U-235	1.76E-02	1.64E-02	2.53E-06	0.00E+00	0.00E+00	2.21E-02	2.23E-02	2.24E-02	3.31E-03	5.67E-03	0.00E+00	0.00E+00
U-238	4.40E-01	4.11E-01	6.32E-05	0.00E+00	0.00E+00	5.52E-01	5.58E-01	5.59E-01	8.27E-02	1.42E-01	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 8.000E+02 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticulate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	6.94E-05	6.94E-05	1.07E-08	0.00E+00	0.00E+00	7.09E-05	7.17E-05	7.30E-05	1.41E-06	7.74E-07	0.00E+00	0.00E+00
Pa-231	9.11E-05	9.11E-05	1.40E-08	0.00E+00	0.00E+00	3.69E-04	3.71E-04	3.71E-04	3.54E-04	3.30E-07	0.00E+00	0.00E+00
Pb-210	1.73E-03	1.73E-03	2.66E-07	0.00E+00	0.00E+00	7.03E-03	7.03E-03	7.13E-03	1.08E-03	3.77E-04	0.00E+00	0.00E+00
Ra-226	1.91E-03	1.91E-03	2.94E-07	0.00E+00	0.00E+00	3.10E-02	3.10E-02	3.10E-02	3.07E-03	2.66E-03	0.00E+00	0.00E+00
Th-230	2.19E-02	2.19E-02	3.37E-06	0.00E+00	0.00E+00	8.96E-03	9.31E-03	9.35E-03	1.16E-03	5.73E-05	0.00E+00	0.00E+00
U-234	1.36E-01	1.36E-01	2.09E-05	0.00E+00	0.00E+00	1.38E-01	1.40E-01	1.40E-01	2.63E-02	4.53E-02	0.00E+00	0.00E+00
U-235	5.43E-03	5.43E-03	8.35E-07	0.00E+00	0.00E+00	5.52E-03	5.61E-03	5.62E-03	1.05E-03	1.81E-03	0.00E+00	0.00E+00
U-238	1.36E-01	1.36E-01	2.09E-05	0.00E+00	0.00E+00	1.38E-01	1.40E-01	1.40E-01	2.63E-02	4.53E-02	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

Concentration of radionuclides in different media
 at t = 1.000E+03 years*

Radio- Nuclide	Contamina- ted Zone	Surface Soil	Air Par- ticate	Well Water	Surface Water	Nonleafy Vegetable	Leafy Vegetable	Fodder	Meat	Milk	Fish	Crustacea
	pCi/g	pCi/g	pCi/m**3	pCi/l	pCi/l	pCi/kg	pCi/kg	pCi/kg	pCi/kg	pCi/l	pCi/kg	pCi/kg
Ac-227	2.69E-05	2.69E-05	4.13E-09	0.00E+00	0.00E+00	2.07E-05	2.10E-05	2.14E-05	5.14E-07	2.92E-07	0.00E+00	0.00E+00
Pa-231	3.50E-05	3.50E-05	5.39E-09	0.00E+00	0.00E+00	1.07E-04	1.08E-04	1.08E-04	1.24E-04	1.17E-07	0.00E+00	0.00E+00
Pb-210	1.81E-03	1.81E-03	2.78E-07	0.00E+00	0.00E+00	5.55E-03	5.56E-03	5.63E-03	1.03E-03	3.64E-04	0.00E+00	0.00E+00
Ra-226	1.99E-03	1.99E-03	3.06E-07	0.00E+00	0.00E+00	2.43E-02	2.43E-02	2.43E-02	2.65E-03	2.33E-03	0.00E+00	0.00E+00
Th-230	2.18E-02	2.18E-02	3.35E-06	0.00E+00	0.00E+00	6.73E-03	7.08E-03	7.12E-03	1.14E-03	5.64E-05	0.00E+00	0.00E+00
U-234	4.19E-02	4.19E-02	6.44E-06	0.00E+00	0.00E+00	3.21E-02	3.28E-02	3.28E-02	7.87E-03	1.36E-02	0.00E+00	0.00E+00
U-235	1.67E-03	1.67E-03	2.58E-07	0.00E+00	0.00E+00	1.28E-03	1.31E-03	1.31E-03	3.15E-04	5.46E-04	0.00E+00	0.00E+00
U-238	4.19E-02	4.19E-02	6.44E-06	0.00E+00	0.00E+00	3.21E-02	3.28E-02	3.28E-02	7.87E-03	1.36E-02	0.00E+00	0.00E+00

*For all foodstuff media, concentrations are adjusted for storage time before use.

Concentrations in the media occurring in pathways that are suppressed are calculated using the current input parameters,
 i.e. using parameters appearing in the input screen when the pathways are active.

The Surface soil is the top layer of soil within the user specified mixing zone/depth.

OC:\WINRES\RESMAIN3.EXE execution time = 29.11 seconds

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Part V: Dose from Radionuclide at point of action

Total Dose Components summed to daughter

Time = 608.7 years	2
Time = 0.000E+00 years	3
Time = 1.000E+00 years	4
Time = 1.000E+02 years	5
Time = 2.000E+02 years	6
Time = 4.000E+02 years	7
Time = 6.000E+02 years	8
Time @ 8.000E+02 years	9
Time @ 1.000E+03 years	10

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 608.7 years

0 ORadio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	1.58E-04	6.25E-04	0.00E+00	2.62E-05	1.60E-08	1.25E-08	6.48E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.16E-04
Pa-231	2.00E-05	1.58E-04	0.00E+00	9.88E-05	2.99E-06	4.03E-09	6.16E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.86E-04
Pb-210	4.63E-06	2.06E-05	0.00E+00	4.89E-04	2.38E-06	1.20E-06	3.03E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.48E-04
Ra-226	9.34E-03	8.58E-06	6.04E-02	4.00E-04	1.35E-06	1.69E-06	6.24E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.02E-02
Th-230	1.24E-05	4.08E-03	0.00E+00	5.23E-05	1.99E-07	1.44E-08	3.23E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.18E-03
U-234	7.06E-05	3.18E-02	0.00E+00	1.29E-03	7.38E-06	1.85E-05	3.21E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.35E-02
U-235	6.23E-03	1.19E-03	0.00E+00	4.88E-05	2.78E-07	6.97E-07	1.21E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.48E-03
U-238	2.76E-02	2.84E-02	0.00E+00	1.23E-03	7.01E-06	1.76E-05	3.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.75E-02
Total	4.34E-02	6.63E-02	6.04E-02	3.64E-03	2.16E-05	3.96E-05	7.20E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-01

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 0.000E+00 years

[illegible]

Total Dose Contributions TDose('p,t') for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 1.00E+00 years

0	Water Independent Pathways										Water Dependent Pathways									
	Radionuclide	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL					
Ac-227	4.27E-11	0.00E+00	0.00E+00	4.11E-08	3.15E-12	3.74E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.11E-08					
Pb-210	2.80E-10	0.00E+00	0.00E+00	5.87E-06	7.39E-08	9.42E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.95E-06					
Pb-210	2.30E-18	0.00E+00	0.00E+00	1.35E-10	6.19E-13	2.15E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.36E-10					
Ra-226	4.21E-10	0.00E+00	1.02E-06	6.76E-09	1.67E-11	1.98E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.02E-06					
Th-230	9.80E-14	0.00E+00	0.00E+00	3.49E-07	1.40E-10	9.92E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-07					
U-234	1.81E-09	0.00E+00	0.00E+00	4.59E-02	3.84E-05	8.01E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.60E-02					
U-235	1.05E-05	0.00E+00	0.00E+00	1.73E-03	1.45E-06	3.02E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.75E-03					
U-238	1.28E-03	0.00E+00	0.00E+00	4.36E-02	3.65E-05	7.61E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.50E-02					
Total	1.29E-03	0.00E+00	1.02E-06	9.13E-02	7.65E-05	1.59E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.28E-02					

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 1.000E+02 years

ORadio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	3.62E-07	0.00E+00	0.00E+00	6.79E-05	1.31E-08	4.01E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.83E-05
Pa-231	6.20E-08	0.00E+00	0.00E+00	3.25E-04	4.00E-06	4.73E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.29E-04
Pb-210	7.11E-12	0.00E+00	0.00E+00	3.68E-05	7.47E-08	3.27E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.69E-05
Ra-226	8.03E-06	0.00E+00	7.23E-03	4.79E-05	1.18E-07	1.39E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.29E-03
Th-230	6.83E-11	0.00E+00	0.00E+00	2.43E-05	6.01E-09	3.56E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.43E-05
U-234	1.01E-08	0.00E+00	0.00E+00	2.56E-02	2.15E-05	4.47E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.57E-02
U-235	3.02E-05	0.00E+00	0.00E+00	9.68E-04	8.10E-07	1.69E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-03
U-238	2.12E-03	0.00E+00	0.00E+00	2.44E-02	2.04E-05	4.25E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.66E-02
Total	2.16E-03	0.00E+00	7.23E-03	5.15E-02	4.69E-05	8.91E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.10E-02

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 2.000E+02 years

Radio- Nuc- lide	Water Independent Pathways								Water Dependent Pathways					
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	1.90E-06	0.00E+00	0.00E+00	8.71E-05	1.51E-08	5.13E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.90E-05
Pa-231	2.77E-07	0.00E+00	0.00E+00	3.60E-04	4.44E-06	5.24E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.65E-04
Pb-210	2.20E-10	0.00E+00	0.00E+00	1.39E-04	2.80E-07	1.23E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.40E-04
Ra-226	6.26E-05	0.00E+00	2.08E-02	1.38E-04	3.40E-07	4.02E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E-02
Th-230	9.98E-10	0.00E+00	0.00E+00	3.76E-05	9.27E-09	5.48E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.76E-05
U-234	5.77E-08	0.00E+00	0.00E+00	1.42E-02	1.19E-05	2.48E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.43E-02
U-235	8.79E-05	0.00E+00	0.00E+00	5.37E-04	4.50E-07	9.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.27E-04
U-238	3.55E-03	0.00E+00	0.00E+00	1.35E-02	1.13E-05	2.36E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.71E-02
Total	3.70E-03	0.00E+00	2.08E-02	2.91E-02	2.88E-05	4.99E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.37E-02

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p) in mrem/yr at t = 4.000E+02 years														
0 Radio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	2.07E-05	0.00E+00	0.00E+00	5.74E-05	9.49E-09	3.38E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.81E-05
Pa-231	2.76E-06	0.00E+00	0.00E+00	2.22E-04	2.73E-06	3.23E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-04
Pb-210	3.71E-08	0.00E+00	0.00E+00	3.52E-04	7.06E-07	3.11E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.53E-04
Ra-226	1.00E-03	0.00E+00	4.55E-02	3.02E-04	7.43E-07	8.77E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.68E-02
Th-230	1.15E-07	0.00E+00	0.00E+00	4.87E-05	1.20E-08	7.09E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.89E-05
U-234	1.87E-06	0.00E+00	0.00E+00	4.39E-03	3.68E-06	7.66E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.40E-03
U-235	7.44E-04	0.00E+00	0.00E+00	1.66E-04	1.39E-07	2.89E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	9.10E-04
U-238	9.94E-03	0.00E+00	0.00E+00	4.17E-03	3.49E-06	7.28E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.41E-02
Total	1.17E-02	0.00E+00	4.55E-02	9.71E-03	1.15E-05	1.64E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.70E-02

0*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)

in mrem/yr at t = 6.000E+02 years

[illegible]

Total Dose Contributions TDose(i,p,t) for Individual Radionuclides (i) and Pathways (p)
in mrem/yr at t = 8.000E+02 years

O Radio- Nuc- lide	Water Independent Pathways							Water Dependent Pathways						
	Ground	Dust	Radon	Plant	Meat	Milk	Soil	Water	Fish	Radon	Plant	Meat	Milk	ALL
	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Ac-227	6.77E-05	2.71E-04	0.00E+00	9.14E-06	6.57E-09	5.27E-09	2.81E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.51E-04
Pa-231	8.55E-06	6.78E-05	0.00E+00	3.41E-05	1.18E-06	1.61E-09	2.64E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.14E-04
Pb-210	5.27E-06	2.33E-05	0.00E+00	4.45E-04	2.48E-06	1.26E-06	3.44E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.12E-04
Ra-226	1.02E-02	9.56E-06	6.49E-02	3.59E-04	1.28E-06	1.63E-06	6.96E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.55E-02
Th-230	1.33E-05	4.15E-03	0.00E+00	4.29E-05	2.00E-07	1.44E-08	3.28E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.24E-03
U-234	2.77E-05	1.04E-02	0.00E+00	3.40E-04	2.35E-06	5.90E-06	1.05E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.09E-02
U-235	2.03E-03	3.88E-04	0.00E+00	1.28E-05	8.85E-08	2.23E-07	3.97E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.44E-03
U-238	8.87E-03	9.31E-03	0.00E+00	3.23E-04	2.23E-06	5.61E-06	9.99E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.86E-02
Total	2.12E-02	2.46E-02	6.49E-02	1.57E-03	9.81E-06	1.46E-05	2.89E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E-01

*Sum of all water independent and dependent pathways.

Total Dose Contributions $TD_{DOSE}(i,p,t)$ for Individual Radionuclides (i) and Pathways (p)

in mrem/yr at t = 1.000E+03 years

[illegible]

0*Sum of all water independent and dependent pathways.

1

Section 10.0
ALARA Cost/Benefit Analysis
Reference Information

Introduction

This section presents copies of Rust Geotech memorandums with subjects regarding remediation information on Grand Junction Office Building 2. These memorandum subjects are as follows:

1. GJPORAP dose modeling of Building 2 and results in cost savings (Estimate Master Summary included)
2. Building 12A and relocation of all telecommunication equipment (tables listing manhours and total costs included)
3. Building 2 remediation options
4. The evaluation of remediation options of Building 2 and the telephone and communications equipment
5. Building 2 telephone equipment relocation options.

RUST GEOTECH INC.

MEMO TO: Distribution

FROM: C. L. Jacobson *CLJ*

DATE: June 4, 1996

SUBJECT: GJPORAP Dose Modeling of Building 2 Results in Cost Savings

The GJPO was included in the Small Site Completion Strategy (SSCS) in March 1995. This EM-40 strategy as presented to Congress requires that the GJPO facility be released for unrestricted use by the end of FY 2000. GJPORAP has removed all exterior contamination and is remediating contaminated buildings to meet the goals of the SSCS and DOE Order 5400.5. Eight contaminated buildings have been demolished because their values were less than the cost of decontaminating them. However, buildings that are in critical service and/or are not heavily contaminated are being remediated to be releasable to the public free of any restrictions.

Building 2, the communication center and copy center, was radioactively contaminated while it was used as a shower facility and office building supporting the uranium mill pilot operations. Large contaminant deposits were not known or suspected, but the contamination was pervasive throughout the building. Much of the suspected material was in inaccessible areas such as in drains under the communications equipment and on the concrete stem walls behind electrical gear. An engineering assessment determined that it was not possible to remove the contamination without shutting down communication services. A decision was made to relocate the current users and demolish the building. To maintain communication service, new equipment was to be purchased and installed in another building before the equipment in Building 2 could be taken out of service. This \$2,020K approach was accepted by DOE and included in FY 1997 funding request.

During early FY 1996, an innovative approach to releasing Building 2 was proposed to DOE. DOE agreed that the proposal had merit, and an extensive characterization of Building 2 was authorized to determine the extent of contamination. Sufficient data was obtained to calculate the dose using the new risk model, RESRAD-Build. The dose to a member of the public occupying the building as an office was found to be approximately 2 mrem per year which is almost an order of magnitude less than the DOE standard of 15 mrem per year. Preliminary ALARA analysis on the basis of the RESRAD-Build model suggests that Building 2 may be released without additional cleanup, although limited remediation may be considered to remove yellowcake that was found under the west grade beam. The FY 1996 cost for performing the additional characterization and modeling the dose was \$84K. Carrying out the recommended remediation in FY 1997 will cost about \$36K. Total cost of releasing the building for unrestricted use will thus be \$120K.

Since the release of a building through dose modeling may be unprecedented, Bob Morris of Rust stayed in close contact with DOE-AL and DOE-HQ EH personnel to obtain their guidance and support for the application of the RESRAD-Build model. Results were presented for formal

Distribution
Page 2
June 4, 1996

review and approval in the document *Grand Junction Projects Office Remedial Action Project Building 2 Dose Evaluation*, May 1996, to the DOE-AL Environmental Protection Division and the IVC. DOE-GJPO is expected to approve use of the document since DOE-AL concurred with releasing the building for unrestricted use. Use of this approach at GJPO is expected to help RESRAD-Build gain wide acceptance in the DOE complex.

Savings to GJPORAP are estimated to be \$1,900K. G2 estimates to demolish the building after relocating the current users and to remediate the contaminated soils under the west grade beam are enclosed for reference.

clj/sn
Enclosure

Distribution

T. L Best
M C Butherus
S G Corle
D A Gehring
R L Morris
D L Renberger
D E White w/c ncl.
GJPORAP File
CLJ LB

Sheet	Operation	FTE COUNT	LABOR HOURS	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIRECT COSTS	INDIRECT COSTS	TOTAL COST
17101	PRELIMINARY EVALUATION			3,359					3,359
17102	ENGINEERING DESIGN			7,337					7,337
17104	REMEDIATION			11,110					11,110
17105	CLOSEOUT			3,547					3,547
012010	REMOVE MATL. UNCONT. 10-50		.2			82			82
013020	REMOVE/HAND-EX/HAUL/CONTAMINAT	0.03	53			2,288			2,288
030000	EXTERIOR BACKFILL		8			390			390
052420	PLACE BULK CONCRETE-LARGE>20	0.03	64			3,818			3,818
072010	SHORE/SUPPORT WALLS-LD. BRG.	0.02	38			1,404			1,404
169000	DEMOBILIZATION	0.01	16			785			785
169010	MOBILIZATION	0.02	32			2,125			2,125
Grand Total:		0.11	212	25,352		10,892			36,244

CONCEPTUAL

ESTIMATOR: J. K. BRISCOE
 Reviewer: _____

SUMMARY INCLUDES ALL APPLICABLE
 MARKUPS UNLESS NOTED OTHERWISE

DATE: 05/14/96
 TIME: 10:31 am

Number: 17101 Operation: PRELIMINARY EVALUATION	
Quantity: 1.00	Unit: LS
Prod: 1.000 LS/	Dura: 1.000
Estimator: JKB	Revised: / / Rev. Num:

Field	Code	WORK CODE Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117101	BLD 2 PRELIMINARY EVALUATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	00	RESOURCE HOLDING CODE
WORKSHEET #:	01	PRELIMINARY EVALUATION

Notes
COST BASED ON ACTUALS FOR BLDG. 36.

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		GEOTECH SUPPORT :									
2.00	GEOT /GEOTECH	GEOTECH SUPPORT	3,359.00	L/S		1.000 3,359.000					1.000 3,359.000
3.00		(1.00)									
	(1.00)					3,359.000					3,359.000
		Worksheet Totals:	=====	=====	=====	=====	=====	=====	=====	=====	=====
			1.00	LS		3,359					3,359

Number: 17102 Operation: ENGINEERING DESIGN
 Quantity: 1.00 Unit: LS
 Prod: 1.000 LS/ Dura: 1.000
 Estimator: JKB Revised: 05/14/96 Rev. Num:

Notes

COST BASED ON ACTUALS FOR BLDG. 36.

Field	Code	WORK CODE Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117102	BLD 2 DESIGN
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	00	RESOURCE HOLDING CODE
WORKSHEET #:	02	ENGINEERING DESIGN

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		GEOTECH SUPPORT :									
2.00	GEOT /GEOTECH	GEOTECH SUPPORT	7,337.00	L/S		1.000 7,337.000					1.000 7,337.000
3.00	(1.00)	(1.00)				7,337.000					7,337.000
Worksheet Totals:			1.00	LS		7,337					7,337

Number: 17104 Operation: REMEDIATION
 Quantity: 1.00 Unit: LS
 Prod: 1.000 LS/ Dura: 1 000
 Estimator: JKB Revised: 05/14/96 Rev. Num:

Field	Code	Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	00	RESOURCE HOLDING CODE
WORKSHEET #:	04	REMEDICATION

Notes

COSTS BASED ON ACTUALS FOR BLDG. 36 WHICH HAD A FACTOR OF 102% OF SUBCONTRACT COSTS.

Field	Description	Value
PR	PRODUCTION RATE	0.000000
WQ	WORKSHEET QUANTITY	1.000000

==== End of Formula Variables =====

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		GEOTECH SUPPORT :									
2.00	GEOT /GEOTECH	GEOTECH SUPPORT	11,109.84	L/S		1.000 11,109.840					1.000 11,109.840
3.00		(1.00)									
	(1.00)					11,109.840					11,109.840
		Worksheet Totals:	1.00	LS		11,110					11,110

Number: 17105 Operation: CLOSEOUT
 Quantity: 1.00 Unit: LS
 Prod: 1.000 LS/ Dura: 1.000
 Estimator: JKB Revised: / / Rev. Num:

Notes

COST BASED ON ACTUALS FROM BLDG. 36.

Field	Code	WORK CODE Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117105	BLD 2 CLOSEOUT
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	00	RESOURCE HOLDING CODE
WORKSHEET #:	05	CLOSEOUT

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		GEOTECH SUPPORT :									
2.00	GEOT /GEOTECH	GEOTECH SUPPORT	3,546.50	L/S		1.000 3,546.500					1.000 3,546.500
3.00	(1.00)	(1.00)				3,546.500					3,546.500
		Worksheet Totals:	1.00	LS		3,547					3,547

Number: 012010 Operation: REMOVE MATL. UNCONT. 10-50	
Quantity: 49.00	Unit: TN
Prod: 1.000 TN/	Dura: 49.000
Estimator: JKB	Revised: 07/20/95 Rev. Num:

Field	Code	Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	01	EXTERIOR EXCAVATION
WORKSHEET #:	012010	REMOVE UNCONT. MATL. 10-50

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		REMOVE UNCONTAMINATED MATERIAL & STOCKPILE :									
2.00	0022 /2380310	Excavating, backhoe, hyd, wheel mounted, 1/2 c.y cap = 30 C.Y./hr	30.00	C.Y.	0.066 1.980			2.289 68.670			2.289 68.670
3.00	(1.00)	(1.00)			1.980			68.670			68.670
4.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA. 13.730			13.730
5.00	(1.00)	(1.00)			1.980			82.400			82.400
Worksheet Totals:			49.00	TN	0.040 2			1.682 82			1.682 82

Number: 013020 Operation: REMOVE/HAND-EX/HAUL/CONTAMINAT
 Quantity: 37.00 Unit: TN
 Prod: 1.000 TN/ Dura: 37.000
 Estimator: JKB Revised: 07/20/95 Rev. Num:

Notes

Assumes:
 Hauling quantity assumes a 25% expansion rate.

Field	Code	WORK CODE Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	01	EXTERIOR EXCAVATION
WORKSHEET #:	013020	REMOVE/HAND-EX/HAUL/CONTAMIN.

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		HAND-EX CONTAMINATED MATERIAL :									
2.00	0022 /2500100	Excavating, structural, hand, heavy soil	23.00	C.Y.	2.000			38.800			38.800
	Factors	or clay						1.500			
		PPE'S, TIGHT CONDIT.			46.000			1,338.600			1,338.600
3.00		SUBTOTAL HAND EXCAVATION									
	(1.00)	(2 (1.00))			46.000			1,338.600			1,338.600
4.00		LOAD CONTAMINATED MATERIAL :									
5.00	0022 /2380310	Excavating, backhoe, hyd, wheel mounted,	23.00	C.Y.	0.066			2.289			2.289
		1/2 c.y cap = 30 C.Y./hr			1.520			52.650			52.650
6.00		SUBTOTAL LOAD CONTAMINATED									
	(4.00)	MATERI (4.00)			1.520			52.650			52.650
7.00		HAUL CONTAMINATED MATERIAL .									
8.00	0022 /2660560	Hauling, bank measure, 12 c.y dump truck	23.00	C.Y.	0.250			17.931			17.931
	Factors	40 MI RT						1.250			
		SWELL FACTOR			5.750			515.520			515.520
9.00		SUBTOTAL HAUL CONTAMINATED									
	(7.00)	MATERI (7.00)			5.750			515.520			515.520
10.00		(1.00)									
	(1.00)				53.270			1,906.770			1,906.770
11.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA.			
								381.350			381.350
12.00		(2.00)									
	(2.00)				53.270			2,288.120			2,288.120

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
Worksheet Totals:											
			37.00	TN	1.440			61.841			61.841
					53			2,288			2,288

Number: 030000 Operation: EXTERIOR BACKFILL
 Quantity: 49.00 Unit: TN
 Prod: 1.000 TN/ Dura: 49.000
 Estimator: JKB Revised: 07/20/95 Rev. Num:

Notes

Assumes:
 Backfill quantity assumes a 25% compaction rate.

Field	Code	WORK CODE Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	03	EXTERIOR BACKFILL
WORKSHEET #:	030000	EXTERIOR BACKFILL

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		PLACE & COMPACT PREVIOUSLY REMOVED FILL									
2.00	0022 /2082000	Backfill, Backhoe, w/compaction, sand & gravel	30.00	C.Y.	0.250			8.669			8.669
	Factors	COMPACTION			7.500			1.250			
								325.090			325.090
3.00		(2.00)									
	(2.00)				7.500			325.090			325.090
4.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA. 65.020			65.020
5.00		(2.00)									
	(2.00)				7.500			390.110			390.110
Worksheet Totals:			49.00	TN	0.153 8			7.961 390			7.961 390

Number: 052420 Operation: PLACE BULK CONCRETE-LARGE>20	
Quantity: 23.00 Unit: CY	
Prod: 1.000 CY/	Dura: 23.000
Estimator: JKB	Revised: 07/20/95 Rev. Num:

Field	Code	Description
FISCAL YEAR: 1996 FISCAL YEAR 1996		
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	03	EXTERIOR BACKFILL
WORKSHEET #:	052420	PLACE BULK CONCRETE-LARGE>20

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		PLACE AND COMPACT CONCRETE :									
2.00	0031 /1660120	Forms in place, mat foundation, 4 use	200.00	SFCA	0.137 27.400			3.907 781.400			3.907 781.400
3.00	0033 /1720050	Placing conc & vibrating, labor & equip, small beams, pumped	23.00	C.Y.	1.600 36.800			104.346 2,399.960			104.346 2,399.960
4.00		SUBTOTAL PLACE & COMPACT FLOWABLE (1.00)									
	(1.00)				64.200			3,181.360			3,181.360
5.00		(1.00)									
	(1.00)				64.200			3,181.360			3,181.360
6.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA. 636.270			636.270
7.00		(1.00)									
	(1.00)				64.200			3,817.630			3,817.630
		Worksheet Totals:	23.00	CY	2.791 64			165.984 3,818			165.984 3,818

Number: 072010 Operation: SHORE/SUPPORT WALLS-LD. BRG.

Quantity: 50.00 Unit: LF
 Prod: 1.000 LF/ Dura: 50.000
 Estimator: JKB Revised: 07/20/95 Rev. Num:

Field	Code	WORK CODE Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	07	UNDERMINE / SHORE
WORKSHEET #:	072010	SHORE/SUPPORT WALLS-LD. BRG.

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		SHORE/SUPPORT WALLS-LOAD BEARING :									
2.00	0021 /5241000	Shoring, with 35 ton screw jacks	50.00	LF	0.750 37.500			23.398 1,169.900			23.398 1,169.900
3.00		(1.00)									
	(1.00)				37.500			1,169.900			1,169.900
4.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA. 233.980			233.980
5.00		(1.00)									
	(1.00)				37.500			1,403.880			1,403.880
		Worksheet Totals	50.00	LF	0.750 38			28.078 1,404			28.078 1,404

Number: 169000 Operation: DEMOBILIZATION
Quantity: 1.00 Unit: LS
Prod: 1.000 LS/ Dura: 1.000.
Estimator: JKB Revised: 07/19/95 Rev. Num:

Field	Code	Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	17	MOB/DEMOB
WORKSHEET #:	DEMOB	PROJECT DEMOBILIZATION

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		LABOR FOR DEMOBILIZATION:									
2.00	9011 /CLAB	Common Building Laborers	4.00	HR	1.000 4.000			19.400 77.600			19.400 77.600
3.00	9011 /CLAB-FORO	Common Building Laborers - Foreman, Outdoor	4.00	HR	1.000 4.000			21.400 85.600			21.400 85.600
4.00	9011 /TRHV	Truck Drivers, Heavy	4.00	HR	1.000 4.000			20.350 81.400			20.350 81.400
5.00	9011 /EQMD	Equipment Operators, Medium Equipment	4.00	HR	1.000 4.000			25.150 100.600			25.150 100.600
6.00		TOTAL DEMOBILIZATION LABOR (1.00)									
	(1.00)				16.000			345.200			345.200
7.00		EQUIPMENT DEMOBILIZATION :									
8.00	9020 /05040	BACKHOE LOADR WHEEL TYP40-45HP5/8CY	0.50	DAY				188.000 94.000			188.000 94.000
9.00	0016 /4081300C Factors	RENT VIBRATORY PLATE COMPACTOR GAS 13" PLATE 1000 LB BLOW 1/2 of 1 day	1.00	WK.				92.000 0.100 9.200			92.000 9.200
10.00	9020 /05530	TRUCK DUMP 3 AXLE 16 TON PAYLOAD	0.50	DAY				411.000 205.500			411.000 205.500
11.00		TOTAL EQUIPMENT DEMOBILIZATION (8.00)									
	(8.00)							308.700			308.700
12.00		TOTAL DEMOBILIZATION (1.00)									
	(1.00)				16.000			653.900			653.900
13.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA. 130.780			130.780

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
14.00	(2.00)	(2.00)			16.000			784.680			784.680
Worksheet Totals:											
			1.00	LS	16			785			785

Number: 169010 Operation: MOBILIZATION
Quantity: 1.00 Unit: LS
Prod: 1.000 LS/ Dura: 1.000
Estimator: JKB Revised: 07/20/95 Rev. Num:

Notes

Assumes: One person requires OSHA and RAD training.

Field	Code	Description
FISCAL YEAR:	1996	FISCAL YEAR 1996
WBS LEVEL 3:	14105	GJPORAP REMEDIAL ACTION
WBS LEVEL 4:	141051	GJPORAP REMEDIAL ACTION
WBS LEVEL 5:	1410511	GJPORAP REMEDIAL ACTION
WBS LEVEL 6:	141051117	BUILDING 2
WBS LEVEL 7:	1410511171	BUILDING 2
WBS LEVEL 8:	141051117104	BLD 2 REMEDIATION
COST ELEMENT:	0	WORKSHEET HOLDING CODE
BID FORM:	01	EXTERIOR EXCAVATION
WORKSHEET #:	169010	MOBILIZATION

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
1.00		MOBILIZATION CREW (SUBCONTRACT LABOR) :									
2.00	9011 /CLAB	Common Building Laborers	4.00	HR	1.000 4.000			19.400 77.600			19.400 77.600
3.00	9011 /CLAB-FORO	Common Building Laborers - Foreman, Outdoor	4.00	HR	1.000 4.000			21.400 85.600			21.400 85.600
4.00	9011 /EQMD	Equipment Operators, Medium Equipment	4.00	HR	1.000 4.000			25.150 100.600			25.150 100.600
5.00	9011 /TRHV	Truck Drivers, Heavy	4.00	HR	1.000 4.000			20.350 81.400			20.350 81.400
6.00		TOTAL MOBILIZATION CREW : (1.00)									
	(1.00)				16.000			345.200			345.200
7.00		EQUIPMENT MOBILIZATION :									
8.00	016E /4206410C	RENT TOILET PORTABLE CHEMICAL	1.00	WK.				27.000 27.000			27.000 27.000
9.00	9020 /05530	TRUCK DUMP 3 AXLE 16 TON PAYLOAD	0.50	DAY				411.000 205.500			411.000 205.500
10.00	9020 /05040	BACKHOE LOADR WHEEL TYP40-45HP5/8CY	0.50	DAY				188.000 94.000			188.000 94.000
11.00	0016 /4081300C	RENT VIBRATORY PLATE COMPACTOR GAS 13" PLATE 1000 LB BLOW Factors 1/2 DAY	1.00	WK.				92.000 0.100 9.200			92.000 9.200
12.00		TOTAL EQUIPMENT MOBILIZATION : (7.00)									
	(7.00)							335.700			335.700
13.00		REQUIRED TRAINING :									
14.00	0001 /019516211H	HTW-40 Hour Site Specific Training (Cost Per Student)	1.00	EA				750.000			750.000

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL COST
15.00	0001 /019516312R	RAD-Fundamentals Of Radiation Safety(16 Hours)	1.00	EA	15.960			339.890			339.890
16.00	(14.00)	TOTAL REQUIRED TRAINING : (14.00)			15.960			1,089.890			1,089.890
17.00	(1.00)	TOTAL MOBILIZATION (1.00)			31.960			1,770.790			1,770.790
18.00	MKUR /25	SUBCONTRACT OH&P AT 20%	20.00	% of:				SUBCONTRA. 354.160			354.160
19.00	(8.00)	(8.00)			31.960			2,124.950			2,124.950
Worksheet Totals:			1.00	LS	32			2,125			2,125

RUST Geotech Inc.
GJPORAP BUILDING 2 ALTERNATIVE
MASTER - ESTIMATE MASTER SUMMARY BY WORKSHEET

PAGE

Sheet Operation	FTE COUNT	LABOR HOURS	MATERIALS	SUB- CONTRACTS	OTHER DIR- ECT COSTS	INDIRECT COSTS	TOTAL
=====	=====	=====	=====	=====	=====	=====	=====
[WBS LEVEL 6: 141051117 - BUILDING 2]	=====	=====	=====	=====	=====	=====	=====
=====	=====	=====	=====	=====	=====	=====	=====
150 PLAN/DESIGN NEW COM CENTER		44,640				18,557	63,
310 PREP RFP FOR NEW COM EQUIP.		1,661				690	2,
320 BID PREP FOR NEW COM CTR.		2,518				1,047	3,
410 CONSTRUCT NEW BUILDING 2				178,560		37,498	216,
530 INSTALL NEW COMMUNICATION EQUIP				1,339,200		281,232	1,620,
605 PROCUREMENT FOR REMEDIATION		2,491				1,035	3,
610 REMEDIATION OF BUILDING 2		8,276		82,039		20,669	110,
*Subtotal, WBS LEVEL 6 141051117:		59,585		1,599,799		360,728	2,020,

RUST GEOTECH INC.

MEMO TO: A. Garcia

FROM: L. T. Pound and R. W. Leigh

DATE: November 14, 1995

SUBJECT: Building 12A, Relocation of Telecommunications

SCOPE OF WORK

This project consists of the transfer and cut over of the existing telecommunications and Uninterruptible Power Sources in Buildings 2 and 12A. Work will be accomplished by Rust Geotech, AT&T, U.S. West Communications, ROLM, and a qualified cable splicing subcontractor. The relocation of Telecommunications from Building 2 to Building 12A will include the Computer Based Exchange (CBX) telephone switching equipment, voice mail system, inside and outside cable system, central office access trunks/equipment, automated fire and security data bridge, video switching multiplexor, emergency public address distribution system, facility local area fiber optic distribution system, and direct current power and battery system.

Additionally, the central office access trunks include 20 bidirectional trunks, 3 outgoing only trunks, 17 direct inward dial trunks, and 5 T1 trunks (120 circuits that provide FTS access, data communications, Monticello tie trunks and video-conference capabilities). Associated equipment with these access lines include circuit protection blocks, electronic repeaters, and distribution frames. These accesses, provided by U.S. West Communications, must be duplicated in Building 12A prior to cut over.

ASSUMPTIONS

The following criteria is the basis for the development of the cost estimate to accomplish this task.

- All work will be supervised by Telecommunications and Site Management supervisory personnel
- Subcontractor teams will be required to complete General Employee Radiological Training only
- Establishment of new facility telecommunication equipment, cable distribution panels, etc will be completed during normal working hours
- Cut over from the existing system to the new system will be accomplished during off hours and weekend time periods to minimize communication encumbrances (Anticipated downtime is approximately 4 days)
- All preparatory work will be completed prior to initiation of data link transfers

CLARIFICATIONS AND QUALIFICATIONS

This work package is based on current information and requirements. No engineering design, drawings, technical specifications, or associated engineering costs are included in this work scope. Therefore, should a design be completed that is significantly different than the identified work tasks, a new work package will be required.

It is necessary to duplicate major components of the CBX, i.e., cabinets, central processors, all trunk accesses, cable runs, and distribution frames, in Building 12A prior to cut over. Existing CBX components will be used to the maximum in the most cost-effective manner possible. These components include expensive analog line interface cards, digital line interface cards, etc.

It is recommended that a detailed radiological assessment be conducted in Building 12A prior to initiation of this task.

COST SUMMARY

	<u>1995 Dollars</u>
Rust Labor	\$ 66,000
Common Support @ 17%	11,200
Rust Materials	42,900
Subcontractor Costs	345,500
G & A @ 21%	<u>97,800</u>
Work Package Total	\$563,300

This work package was prepared by T. Pound and R. Leigh.

ltp:jd

Attachment

cc att: J. A. Finlayson
D. A. Gehring
R. L. Wilbert
File/LTP LB RWL LB

Sheet	Operation	Quantity	Units	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1000	PREPLANNING TASKS	1.00	LS	80	2004					2004
2000	CONSTRUCTABILITY REVIEW	1.00	LS	120	4578					4578
3000	PROCUREMENT CYCLE	1.00	LS							
3500	RELOCATE COMPUTERS	1.00	LS	18	515					515
3600	RELOCATE TELECOMMUNICATIONS	1.00	LS	284	8906					8906
3700	TRENCH & WALL PENETRATIONS	1.00	LS	90	1832	5020				6852
3800	TRENCH BLDG 12 TO LOG CABIN	1.00	LS	54	2045	8080			400	10525
3900	U.S. WEST QUOTE	1.00	LS	18	568				40000	40568
4000	RELOCATE BLDG 12 OCCUPANTS	1.00	LS	4	100				1500	1600
4100	TELECOMMUNICAITONS TRANSFER	1.00	LS						196000	196000
4200	RECYCLING	1.00	LS						106000	106000
4300	GEOTECH CROSSOVERS	1.00	LS	960	30190	21273				51464
5000	MOVE PARTITIONS	1.00	LS	76	1580					1580
6000	MOVE UPS & A/C	1.00	LS	380	8014	5000				13014
7000	CONSTRUCT OFFICES	1.00	LS	140	3058	2916				5974
8000	CONSTRUCT NEW FIRE DOOR	1.00	LS	16	360	193				553
9000	REMOVE & REPLACE RAMP	1.00	LS	32	683	400				1083
10000	REMOVE EXISTING FIRE DOOR	1.00	LS	15	322					322
11000	REPLACE TELECOMMUNICATIONS	1.00	LS	18	553					553
12000	REPLACE COMPUTER SERVICE	1.00	LS	18	515					515
13000	MOVE OCCUPANTS TO NEW OFFICES	1.00	LS	5	125				1500	1625
14000	FINAL INSPECTION & ACCEPTANCE	1.00	LS	4	100					100

Grand Sub-Total:

2332

66049

42882

345400

454331

Sheet	Operation	Quantity	Units	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
	Global Markups Common Support @ 17%				11228					11228
	Subtotal	2332			77277	42882			345100	465559
	G & A @ 21%				16228	9005			72534	97767
	Grand Total:	2332			93505	51888			417934	563327

Prepared by: SP [Signature]

Reviewed by: SP [Signature]

11/08/95

Number: 1000 Operation: PREPLAINING TANKS	
Quantity: 1.000 LS/	Unit: LS 1.000
Prod: 1.000 LS/	Date: 11/04/95
Estimator: LTP	Start Date: 01/01/96 End Date: 01/22/96
Field Code	WORK CODE Description
WORK PACKAGE: 1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	OPC	CONTRACTS	SUB	TOTAL COST
1.00	272	/1110 EXCHPT LABOR	80.00	HR	1.000 80.000	25.050 2,004.000						25.050 2,004.000
Worksheet Totals:						2,004						2,004

Prepared by: RLT

Reviewed by: RLT

11/08/95

Number: 2000 Operation CONSTRUCTABILITY REVIEW

Quantity: 1.000 LS/ 1.00 Unit: LS 1.000
 Prod: 10/11/95
 Estimator: LTP Start Date: 01/01/96 Rev. Num: 01/01/96
 WORK CODE Description

Field Code Description

WORK PACKAGE: 1 Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	20.00	HR	1.000	25.050					25.050
					20.000	501.000					501.000
2.00	461 /1110	EXEMPT LABOR	20.00	HR	1.000	54.233					54.233
					20.000	1,084.660					1,084.660
3.00	464 /1110	EXEMPT LABOR	20.00	HR	1.000	31.448					31.448
					20.000	624.960					624.960
4.00	481 /1110	EXEMPT LABOR	20.00	HR	1.000	41.603					41.603
					20.000	832.060					832.060
5.00	482 /1110	EXEMPT LABOR	20.00	HR	1.000	29.067					29.067
					20.000	581.340					581.340
6.00	523 /1110	EXEMPT LABOR	10.00	HR	1.000	32.472					32.472
					10.000	324.720					324.720
7.00	533 /1110	EXEMPT LABOR	10.00	HR	1.000	62.499					62.499
					10.000	624.990					624.990
Worksheet Totals:						4,578					4,578
						1.00 LS					
						120					

Prepared by: *[Signature]*

Reviewed by: *[Signature]*

11/09/95

Number: 3000 Operation: PROCUREMENT CYCLE	
Quantity: 1.000 L.S./	Unit: L.S.
Prod: 1.000 L.S./	Unit: L.S.
Estimator: LTP	Revised: 01/01/96
Start Date: 01/01/96	Rev. Num: 02/14/96
Field Code	WORK CODE
Code	Description
WORK PACKAGE: 1	Work Package Cost Summary

Notes
This is a procurement cycle only. All Subcontract Administration activities are accounted for in the Common Support funding pools.

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
Worksheet Totals:											
			1.00	L.S.							

Prepared by:

Reviewed by:

11/04/95

Number: 3500 Operation - RELOCATE COMPUTERS	
Quantity: 1.000 LS/	Unit: LS 1.000
Prod: LTP	Revised: 10/25/95
Estimator: LTP	Rev. Num: 01/01/96
Start Date: 01/01/96	End Date: 01/01/96
Field	Code
WORK PACKAGE: 1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	2.00	HR	1.000	25.050					25.050
					2.000	50.100					50.100
2.00	482 /1110	EXEMPT LABOR	16.00	HR	1.000	29.067					29.067
					16.000	465.070					465.070
Worksheet Totals:						515					515

Prepared by: *[Signature]*

Reviewed by: *[Signature]*

11/08/95

Number: 3600 Operation: RELOCATE TELECOMMUNICATIONS	
Quantity: 1.00	Unit: LS
Prod: 1.000 LS/	Dura: 1.000
Estimator: LTP	Revised: / / Rev. Num:
Start Date: 01/01/96	End Date: 01/01/96
Field	Code Description
WORK PACKAGE: 1	Work Package Cost Summary

<u>Notes</u>	
Labor for relocating telecommunications from Bldg 2 over to Bldg 12:	
Automated fire and security data bridge - 40 hrs,	
Video switching multiplexor - 40 hrs,	
Emergency public address system - 20 hrs,	
Fiber optic distribution system - 80 hrs,	
Direct Current power & battery - 120 hrs.	

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	464 /1110	EXEMPT LABOR	280.00	HR	1.000 280.000	31.448 8,805.440					31.448 8,805.440
2.00	272 /1110	EXEMPT LABOR	4.00	HR	1.000 4.000	25.050 100.200					25.050 100.200
Worksheet Totals:			1.00	LS	284	8,906					8,906

Prepared by:

Reviewed by:

11/08/95

Number: 3700 Operation: TRENCH & WALL PENETRATIONS

Quantity: 1.000 L.S/ Unit: L.S 1.000

Prod: 1.000 L.S/ Dura: 1.000

Estimator: LTP Start Date: 01/01/96 Rev. Num: 01/05/96

Field Code Description

WORK PACKAGE: 1 Work Package Cost Summary

NOTES

This item includes cutting and replacing asphalt along with 6-4" PVC buried conduits

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	20.00	HR	1.000	25.050					25.050
					20.000	501.000					501.000
2.00	272 /1A3	LABORER FOREMAN - FY95	60.00	HR	1.000	18.180					18.180
					60.000	1,090.800					1,090.800
3.00	025 /104	MATERIAL COVES for replacing subsurface and asphaltic covering	1.00	L.S			400.000				400.000
4.00	151 /5514180	4" PVC Pipe Conduit	600.00	LF			7.700				7.700
							4,620.000				4,620.000
5.00	272 /PL1	PLUMBER JOURNEYMAN - FY95	10.00	HR	1.000	24.030					24.030
					10.000	240.300					240.300
Worksheet Totals:						1.832	5,020				6,852

Prepared by: *[Signature]*

Reviewed by: *[Signature]*

11/08/95

Number: 3800 Operation: TRENCH BLM: 12 TO LOW CABIN	
Quantity: 1.000 LS/	Unit: LS
Prod: 1.000 LS/	Unit: LS
Estimator: LTP	Revised: 11/08/95
Start Date: 01/01/96	End Date: 01/01/96
Field	Code
Description	
WORK PACKAGE: 1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	OPC	SUB CONTRACTS	TOTAL COST
1.00	022 /2540060	EXCAVATING, TRENCH, 1' TO 4' DEPTH, 1/8 CY TRACTOR/PACKHOE	1.00	DAY							
2.00	MIS /CABLE	2400 pairs cable, to be identified.	1.00	LS			5,000.000			400.000	400.000
3.00	151 /5514480	4" PVC Pipe Conduit	400.00	LF			7.700			400.000	400.000
4.00	272 /1110	EXEMPT LABOR	10.00	HR		1.000					5,000.000
						25.050					7.700
5.00	481 /1110	EXEMPT LABOR	40.00	HR		1.000					3,080.000
						41.603					25.050
6.00	523 /1110	EXEMPT LABOR	4.00	HR		1.000					41.603
						32.472					32.472
						129.890					129.890
Worksheet Totals:					54	2,045	8,080			400	10,525

Prepared by: *[Signature]*

Reviewed by: *[Signature]* 11/08/95

Number: 3900 Operation: U.S. WEST QUOTE:	
Quantity: 1.000 LS/	Unit: LS
Prod: 1.000 LS/	Dura: 1.000
Estimator: LTP	Revised: / /
Start Date: 01/01/96	Rev. Num: 01/03/96
Field	Code
WORK PACKAGE: 1 Work Package Cost Summary	

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	USN /QUOTE	QUOTE FOR MOVING TEL:COMMUNICATIONS	1.00	LS							
2.00	464 /1110	EXEMPT LABOR	16.00	HR	1.000 16.000	31.448 503.170				40,000.000	40,000.000
3.00	523 /1110	EXEMPT LABOR	2.00	HR	1.000 2.000	32.472 64.940					31.448 503.170
Worksheet Totals:						568				40,000	40,568

Prepared by: Reviewed by: 11/08/95

Number:		4000 Operation: RELOCATE BLDG 12 OCCUPANTS	
Quantity:	1.00	Unit:	LS
Prod:	1.000 LS/	Revised:	1.000
Estimator:	LTP	Start Date:	01/01/96
		End Date:	01/01/96
Field	Code	Description	
WORK PACKAGE: 1 Work Package Cost Summary			

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /110	EXEMPT LABOR	4.00	HR	1.000	25.050					25.050
					4.000	100.200					100.200
2.00	SUB /MOVERS	Office Moving Tasks	1.00	LS						1,500.000	1,500.000
		Worksheet Totals:	1.00	LS	4	100				1,500	1,600

Prepared by: *[Signature]*

Reviewed by: *[Signature]*

11/04/96

Number: 4100 Operation: TELICOMMUNICATIONS TRANSFER

Quantity: 1.00 Unit: LS

Prod: 1.000 LS/ Revised: 11/07/95 Rev. Num: 1.000

Estimator: LTP Start Date: 01/01/96 End Date: 01/15/96

Field Code Description

WORK PACKAGE: 1 Work Package Cost Summary

NOTES

ROLM SYSTEM	
9005 Model 50 Cabinet 1 (DC) -	\$56,000
(incl. 2 central processing units)	
9005 Model 50 Cabinet 1 (DC) -	\$21,000
Redundant Power Package -	\$5,000
Additional Dual Tone Rec. -	\$3,000
Total -	\$85,000

EQUIPPED PORTS

16-Channel Digital Voice/Data Interface -	\$16,000
8-Channel Analog Voice Interface -	\$15,000
4-Channel Public Tie Trunk 1/16 (4-wire) -	\$4,000
8-Channel Central Office Trunk Interface -	\$1,500
24-Channel TX Trunk Interface -	\$11,000
Attendance Console Controller -	\$500
Total -	\$70,000

SOFTWARE

Route Optimization -	\$2,000
Satellite Operations -	\$2,000
Enhanced Terminal Port Security -	\$1,000
Total -	\$5,000

SITE SPECIFIC MATERIALS

MDF Materials & Labor -	\$5,000
CSU's for US/WEST T-1's -	\$3,000
T1DN Cables -	\$200
Installation Labor -	\$7,000
Total -	\$15,000

OPTIONAL ITEMS

	\$21,000
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Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	SUBC / ROLM SYS	9005 MODEL 50 , REDUNDANT POWER, DUAL TONE REC.	1.00	LS						95,000.000	95,000.000
2.00	SUBC / EQUIP	EQUIPPED PORTS	1.00	LS						70,000.000	70,000.000
3.00	SUBC / SOFTWARE	SOFTWARE REQUIREMENTS	1.00	LS						5,000.000	5,000.000
4.00	SUBC / SITE	SITE SPECIFIC MATERIALS	1.00	LS						15,000.000	15,000.000
5.00	SUBC / OPT	OPTIONAL ITEMS	1.00	LS						21,000.000	21,000.000
		WorkSheet Totals								196,000	196,000

Prepared by *[Signature]*

Reviewed by: *[Signature]*

11/09/95

Number: 4200 Operation: RECAHLING	
Quantity: 1.00	Unit: LS
Prod: 1.000 LS/	Dura: 1.000
Estimator: LTP	Revised: / / Rev. Num:
Start Date: 01/01/96	End Date: 01/15/96
Field	Code WORK CODE Description
WORK PACKAGE: 1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	SUBC /TELEPHONE	TELEPHONE CABLE, 12 PAIR TO 600 PAIR 24 GAUGE	1.00	LS						8,000.000	8,000.000
2.00	SUBC /PROTECTION	PROTECTION FOR APPROX. 2400 PAIR	1.00	LS						35,000.000	35,000.000
3.00	SUBC /SPLICE	SPLICE CASES FOR BURIED CABLE AND VAULT CABLE SPLICES	1.00	LS						8,000.000	8,000.000
4.00	SUBC /LABOR	LABOR TO PLACE CABLES, PREP CABLES FOR CUT OVER AND ACTUAL CUT OVER	1.00	LS						25,000.000	25,000.000
5.00	SUBC /VAULT	VAULT HOUSE, CABLE VAULT	1.00	LS						15,000.000	15,000.000
6.00	SUBC /FIBER	FIBER CABLE CUT OVER	1.00	LS						15,000.000	15,000.000
Worksheet Totals:			1.00	LS						106,000	106,000

Prepared by:

Reviewed by:

11/08/96

Number:

4300 Operation: GEOTECH CROSSTOVERS

Quantity:

1.000 LS

Unit: LS

Dura: 1 000

Prod:

Revised: / /

Rev. Num:

Estimator: LTP

Start Date: 01/01/96

End Date: 01/30/96

Field

Code

Description

WORK PACKAGE:

1

Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	464 /1110	EXEMPT LABOR	960.00	HR	1.000 960.000	31.448 30,190.080					31.449 30,190.080
2.00	COM /KRONC	50 PAIR DISCONNECT BLOCKS P/H 6586-1-001-00	137.00	EA			27.500 3,767.500				27.500 3,767.500
3.00	COM /STANDOFF	BRACKET FOR M-BLOCKS (99-B)	177.00	EA			1.010 138.370				1.010 138.370
4.00	COM /CUR PROT	CURRENT PROTECTION, COM CODE 105216170	20.00	EA			447.730 8,954.600				447.730 8,954.600
5.00	COM /SERVICE	COM CODE 105216188	1.00	EA			307.000				307.000
6.00	COM /ELC BUGS	COM CODE 104386645	2,100.00	BX			3.860 8,106.000				3.860 8,106.000
Worksheet Totals:			1.00	LS	960	30,190	21,273				51,464

Prepared by:

Reviewed by:

11/08/96

Number: 5000 Operation: MOVE PARTITIONS			
Quantity: 1.000	LS/	Unit: LS	1.000
Prod: 1.000	LS/	Unit: LS	1.000
Estimator: LTP	Revised: 01/01/96	Rev. Num:	01/01/96
Field	Code	WORK CODE	Description
WORK PACKAGE: 1 Work Package Cost Summary			

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /PA1	JOURNEYMAN PAINTER - FY95	20.00	HR	1.000	20,715					20,715
					20.000	414,300					414,300
2.00	272 /LA2	LABORER II - FY95	20.00	HR	1.000	17,055					17,055
					20.000	341,100					341,100
3.00	272 /1110	EXEMPT LABOR	6.00	HR	1.000	25,050					25,050
					6.000	150,300					150,300
4.00	272 /CA1	JOURNEYMAN CARPENTER - FY95	20.00	HR	1.000	21,840					21,840
					20.000	436,800					436,800
5.00	272 /EL1	JOURNEYMAN ELECTRICIAN - FY95	10.00	HR	1.000	23,715					23,715
					10.000	237,150					237,150
Worksheet Totals:			1.00	LS	76	1,500					1,500

Number: 6000 Operation: MOVE UPS & A/C

Quantity: 1.000 LS/ Unit: LS
 Prod: 1.000 LS/ Unit: LS
 Estimator: LTP Start Date: 01/01/96 End Date: 01/03/96
 Rev. Num: 10/11/95

Field	Code	Description
WORK PACKAGE:	1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /EL1	JOURNEYMAN ELECTRICIAN - FY95	120.00	HR	1.000	23,715					23,715
					120.000	2,845.800					2,845.800
2.00	272 /CA1	JOURNEYMAN CAPRENTER - FY95	120.00	HR	1.000	21,840					21,840
					120.000	2,620.800					2,620.800
3.00	272 /LA2	LABORER II - FY95	120.00	HR	1.000	17,055					17,055
					120.000	2,046.600					2,046.600
4.00	272 /1110	EXEMPT LABOR	20.00	HR	1.000	25,050					25,050
					20.000	501.000					501.000
5.00	MIS /MISC BLDG	Miscellaneous materials and supplies for building penetrations	1.00	LS			5,000.000				5,000.000
		Worksheet Totals:	1.00	LS	380	8,014	5,000				13,014

Prepared by:

Reviewed by: 11/08/96

Number: 7000 Operation: CONSTRUCT OFFICES	
Quantity: 1.00	Unit: LS
Prod: 1.000 LS/	Dura: 1.000
Estimator: LTP	Revised: 10/11/95 Rev. Num:
Start Date: 01/01/96	End Date: 01/10/96
Field	Code Description
WORK PACKAGE: 1	Work Package Cost Summary

Notes

Assume all partitions, lighting fixtures, fire protection, etc. are not new purchases.

No carpeting is scheduled due to the capability of removing floor modules to the utilities below the surface.

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	092 /6202800	Partition Wall, Stud wall, 8' to 12' high, Metal studs, NLB, 25 ga., 16" OC	600.00	SF			1.440 864.000				1.440 864.000
2.00	272 /CA1	JOURNEYMAN CAPRENTER - FY95	60.00	HR	1.000 60.000	21.840 1,310.400					21.840 1,310.400
3.00	272 /EL1	JOURNEYMAN ELECTRICIAN - FY95	40.00	HR	1.000 40.000	23.715 948.600					23.715 948.600
4.00	272 /LA2	LABORER II - FY95	20.00	HR	1.000 20.000	17.055 341.100					17.055 341.100
5.00	272 /PA1	JOURNEYMAN PAINTER - FY95	10.00	HR	1.000 10.000	20.715 207.150					20.715 207.150
6.00	082 /0825040	Pre-Hung Door, Birch, flush, solid core, 1-1/8" x 6'-8" x 3'-0" wide	1.00	EA			175.000 525.000				175.000 525.000
7.00	082 /HARDWARE	Door latches, hinges, lock sets	1.00	SET			225.000 675.000				225.000 675.000
8.00	ELEC /P021300	Switch Wall 2 Pole, 1 Throw, Ivory	1.00	EA			121.000 363.000				121.000 363.000
9.00	ELEC /P016920	Wiremold Plugmold #20gbal9 @ 48"	1.00	EA			163.000 489.000				163.000 489.000
10.00	272 /1110	EXEMPT LABOR	10.00	HR	1.000 10.000	25.050 250.500					25.050 250.500
Worksheet Totals:			1.00	LS	140	3,058	2,916				5,974

Prepared by:

Reviewed by:

11/08/95

Number:		8000 Operation: CONSTRUCT NEW FIRE DOOR	
Quantity:	1.00	Unit:	LS
Prod:	1.000 LS/	Dura:	1.000
Estimator:	LTP	Revised:	10/25/95
		Start Date:	01/01/96
		End Date:	01/01/96
Field		Code	WORK CODE
Description			
WORK PACKAGE:		1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	081 /1100060	Fire Door, Steel, Flush, "B" label, 90 minutes, 1'-0" x 6' x 8"	1.00	EA			193.000				193.000
2.00	272 /1110	EXEMPT LABOR	4.00	HR	1.000 4.000	25.050 100.200					25.050 100.200
3.00	272 /CA1	JOURNEYMAN CARPENTER - FY95	10.00	HR	1.000 10.000	21.840 218.400					21.840 218.400
4.00	272 /PA1	JOURNEYMAN PAINTER - FY95	2.00	HR	1.000 2.000	20.715 41.430					20.715 41.430
Worksheet Totals:			1.00	LS	16	360	193				553

Prepared by:

Reviewed by:

11/08/95

Number: 9000 Operation: REMOVE & REPLACE RAMP	
Quantity: 1.000 LS/	Unit: LS
Prod: 1.000	Date: 1.000
Estimator: LTP	Revised: / /
Start Date: 01/01/96	Rev. Num: End Date: 01/01/96
Field	Code
Code	Description
WORK PACKAGE: 1 Work Package Cost Summary	

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	4.00	HR	1.000	25.050					25.050
					4.000	100.200					100.200
2.00	272 /CA1	JOURNEYMAN CARPENTER - FY95	20.00	HR	1.000	21.840					21.840
					20.000	436.800					436.800
3.00	272 /LA1	LABORER I - FY95	4.00	HR	1.000	15.900					15.900
					4.000	63.600					63.600
4.00	272 /PA1	JOURNEYMAN PAINTER - FY95	4.00	HR	1.000	20.715					20.715
					4.000	82.860					82.860
5.00	MIS /MISC CARP	Misc. Carpentry and Painting supplies	1.00	LS			400.000				400.000
Worksheet Totals:						683	400				1,083

Prepared by: Reviewed by: 11/08/95

Number: 10000 Operation: REMOVE EXISTING FIRE DOOR

Quantity: 1.00 Unit: LS
Prod: 1.000 LS/ Unit: 1.000
Estimator: LTP
Start Date: 01/01/95
Revised: 10/25/95
End Date: 01/01/96
Rev. Num:

Field	Code	Description
WORK PACKAGE:	1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /CA1	JOURNEYMAN CAPRENTER - FY95	10.00	HR	1.000 10.000	21.840 218.400					21.840 218.400
2.00	272 /PA1	JOURNEYMAN PAINTER - FY95	5.00	HR	1.000 5.000	20.715 103.580					20.715 103.580
Worksheet Totals:						322					322

Prepared by: Reviewed by: 11/08/95

Number: 11000 Operation: REPLACE TELECOMMUNICATIONS	
Quantity: 1.000 LS/	Unit: LS
Prod: LTP	Revised: 10/25/95
Estimator: LTP	Start Date: 01/01/96
	Rev. Num: 01/01/96
Field	Code
Description	
WORK PACKAGE: 1	Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	2.00	HR	1.000	25.050					25.050
					2.000	50.100					50.100
2.00	464 /1110	EXEMPT LABOR	16.00	HR	1.000	31.448					31.448
					16.000	503.170					503.170
Worksheet Totals:						553					553

Prepared by: [Signature] Reviewed by: [Signature] 11/04/95

Number: 12000 Operation: REPLACE COMPUTER SERVICE

Quantity: 1.00 Unit: LS
 Prod: 1.000 LS/ Dur: 1.000
 Estimator: LTP Revised: / / Rev. Num:
 Start Date: 01/01/96 End Date: 01/01/96
 WORK CODE

Field Code Description

WORK PACKAGE: 1 Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	2.00	HR	1.000	25.050					25.050
					2.000	50.100					50.100
2.00	482 /1110	EXEMPT LABOR	16.00	HR	1.000	29.067					29.067
					16.000	465.070					465.070
Worksheet Totals:						515					515
			1.00	LS	18						

Prepared by: *[Signature]*

Reviewed by: *[Signature]*

11/08/95

Number:	13000 Operation: MOVE OCCUPANTS TO NEW OFFICES				
Quantity:	1,000 LS	Unit:	LS	1,000	
Prod:	1,000 LS	Revised:	01/01/96	Rev. Num:	
Estimator:	LTP	Start Date:	01/01/96	End Date:	01/01/96
Field	Code	Work Code	Description		
WORK PACKAGE:	1	Work Package Cost Summary			

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 / 1110	EXEMPT LABOR	5.00	HR	1,000	25,050				1,500,000	25,050
						125,250					125,250
2.00	SUB / MOVERS	Office Moving Tasks	1.00	LS							1,500,000
		Worksheet Totals:	1.00	LS	5	125				1,500	1,625

Prepared by: *[Signature]* Reviewed by: *[Signature]* 11/08/96

Number: 14000 Operation: 14000 Inspection & Acceptance
 Quantity: 1.00 Unit: LS
 Prod: 1.000 LS/ Unit: LS
 Estimator: LTP Revised: / / 1.000
 Start Date: 01/01/96 Rev. Num.
 End Date: 01/01/96
 Field Code Description
 WORK PACKAGE: 1 Work Package Cost Summary

Line	Group/Code	Description	Quantity	Unit	Manhours	LABOR	MATERIALS	EQUIPMENT	ODC	SUB CONTRACTS	TOTAL COST
1.00	272 /1110	EXEMPT LABOR	4.00	HR	1.000 4.000	25.050 100.200					25.050 100.200
Worksheet Totals:						100					100

Prepared by: *[Signature]*
 Reviewed by: *[Signature]*
 11/04/96

RUST Rust Geotech Inc.

A WMA Technologies Company
PO Box 14000 • 2537 E 4th Road
Grand Junction, Colorado 81502-5504

Phone 970 243 5000
Fax 970 243 5040

May 19, 1995

Mr. Donald Leske
US Department of Energy
Grand Junction Projects Office
P. O. Box 2567
Grand Junction, Colorado 81502

Subject: Building 2 Remediation Options

Dear Mr. Leske:

At the request of construction management, the Engineering Department prepared an evaluation of Remediation Options for Building 2 & Telephone/Communication Equipment (see enclosed May 18, 1995, memorandum from G. Carlsrud to D. Gehring). Mr. Carlsrud interviewed knowledgeable service providers and maintenance personnel to reach the conclusion that it is not feasible to remove all radioactive contamination from Building 2 without shutting down the communication system.

Rust recommends that the Building 2 scope be removed from the FY95 baseline and the funds be returned to management reserve for use on other building D&D projects.

If you have any questions, please call Dave Gehring at extension 6562 or me at extension 6568.

Sincerely,

Carl L. Jacobson
Program Manager

CLJ

bcc: MC Butherus
SG Corle
DA Gehring
GB Carlsrud

GJPORAP File
CA File

RUST GEOTECH INC.

MEMO TO: D. Gehring, REMDP
FROM: G. Carlsrud, ENG
DATE: May 18, 1995
SUBJECT: Bldg. 2 - Remediation Options

Reference your memo to me dated April 20, 1995.

Evaluation of Remediation Options Building 2 & Telephone/Communications Equipment

General Discussion:

Building 2 is a wood frame single story building of Type V-N construction (combustible materials without fire protective coverings) as defined by the Uniform Building Code (UBC). The building does not meet the minimum requirements of DOE/EP-108 *Standard for Fire Protection of DOE Electronic Computer/Data Processing Systems*, January 1984. Essentially this standard applies to the GJPO central communications equipment and requires the building be constructed of non-combustible fire resistive materials. It also requires the equipment room be separated from other occupancies by fire rated walls, and further indicates preference that the equipment be housed in a separate building.

The GJPO central communications system utilizes computerized equipment comprised of hardware and software in conjunction with systems for telephone, phone mail, fire alarm, security, hvac monitoring, and computer network data transfer. It is a 12 volt, low amperage digital system. The majority of communications cables enter the equipment room underground from the north and east sides of the building. A loss of use of these systems would detrimentally impact functional operations of the entire GJPO.

The communications equipment is adversely affected by heat, shock, vibration, and dust. Introduction of any of these elements could result in the loss of the system software, programming, or hardware which would cause failure of the system. A shutdown of the system due to dust infiltration could take from a few hours to a few weeks to clean and restore to service. A loss of the system hardware could take as long as 6 months to replace. The risks of communications system shutdown and potential for equipment losses associated with removal of building materials within and beneath the telephone equipment room are extremely high. Removal of building materials above the ceiling and outside the walls presents a high risk. A formal risk analysis has not been performed.

Engineering would therefore recommend against remedial action within the telephone equipment room. Other work outside the room could be performed as outlined if the communications equipment is protected against dust infiltration, shock, and vibration. Building mechanical and electrical systems including the air conditioning equipment must remain operational. However, since complete decontamination of Building 2 is not feasible without risk of loss of communications, no remediation of the building is recommended until replacement of the communications equipment is justified by obsolescence.

Options 1 and 2:

The options as written are not feasible. Supporting the communications equipment and wiring on the walls in place would not allow sufficient work space to perform remediation. It is physically impossible to move most of the equipment and wiring from the walls to which they are attached without first disconnecting the wiring. Supporting floor mounted equipment in place and protecting it from damage while still operating would be virtually impossible. The equipment requires constant air movement around and within the cabinets to prevent overheating, thereby making protection from dust very difficult.

The risk of damage to the equipment is extremely high. The equipment would have to be shutdown or the remediation work could not be performed in the equipment room.

Option 1: *Partial decontamination with telephone equipment in place*

This option could be executed with the exception of remediation work within and beneath the telephone equipment room. There is a moderate to high risk of loss of communications. The building would not be decontaminated for free release.

Option 2: *Decontamination/demolition with telephone equipment in place*

Since it is not recommended to perform remedial action within the telephone equipment room, total building demolition would not be feasible and a secondary metal building would be unnecessary. The south portion of the building could be demolished, leaving the north end in place to house the telephone equipment room and related support functions. The north portion of the building could be partially decontaminated as for option 1, excluding the interior of the telephone equipment room. The building would not be decontaminated for free release.

Option 3: *Demolition/new construction*

Relocation of the communications equipment is not feasible because the shutdown time required for equipment removal, reinstallation, re-cabling, and reprogramming would be at least 2 months. Original installation of this equipment and preparation to go on line took approximately 9 months.

Alternative Options:

Option 4: *Exterior decontamination, defer interior decontamination*

Decontaminate only the exterior of the entire building, including the roofing, siding, and exposed surfaces of concrete foundations. Leave the interior contamination in place until such time that replacement of the GJPO communications system becomes economically feasible due to aging of the equipment and/or a need for major functional improvements of the system. The present system should be capable to serve the needs of GJPO for another 10 years without major modifications. This option involves minor risk to loss of communications. This option would not decontaminate the building for free release.

Option 4a: *Defer all decontamination*

Perform no decontamination at this time, using the building as described under option 5. Assume eventual replacement of the communications center after 10 years (FY 2005) as described under option 4 above. At that time the entire building would be demolished. Assume 50% of the products

of demolition to be radiologically contaminated requiring transport to a RAD waste repository outside Colorado. Other materials would be disposed of at a local sanitary landfill. The vacated land area would be landscaped as part of a centrally located "green" area that could function as a "gathering place" for the staff. This option would not decontaminate the building for free release for 10 years.

Option 5: *Partial decontamination*

Decontaminate the building excluding interior areas of the communications equipment room. The copy center operation presents a higher than average fire hazard in this building. Considering the high value equipment housed in the communications center, that fire hazard should be mitigated. This option recommends the copy center be permanently relocated to another centrally located building. The space vacated would best be utilized for communications or related functions, perhaps for a tele-conference center, security offices, or an emergency operating center. Assume eventual replacement of communications equipment in a new structure and total demolition of Building 2 in F 2005. Assume 30% of the products of demolition to be radiologically contaminated requiring transport to a RAD waste repository outside Colorado. This option would not decontaminate the building for free release for 10 years.

Option 6: *Total demolition and partial replacement*

Construct a new building to house the communications center, located to minimize costs for communications cabling. Purchase and install a new communications system including new equipment and cabling, leaving the existing system operating during the new installation. After construction of a new building and installation of new communications equipment, the existing equipment would be salvaged and excessed. Then the building would be demolished. This is an extremely high cost option, estimated to exceed \$500,000 in telephone equipment cost. A new 1,200 square foot building @ \$100/sf would cost \$120,000 and demolition of the existing building would cost \$7,000. The value of the salvaged telephone equipment could reduce the overall expenditure. Detailed cost estimates have not been prepared for this option.

This option provides the lowest risk to loss of communications, would result in the site being decontaminated for free release in approximately one year, and would provide a new state of the art communications system. It would also provide a new building to house the communications equipment. The new structure would be constructed to meet the requirements of DOE/EP-105 *Standard for Fire Protection of DOE Electronic Computer/Data Processing Systems*, and its preferred computer housing in a separate building of fire resistive construction.

cc

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Option 5: Partial decontamination - Work Scope

- A. Permanently relocate the Copy Center to another centrally located building.
- B. Maintain communications center offices in Bldg. 2 during decontamination to keep technical personnel on the job to avert problems and trouble shoot unexpected conditions.
- C. Install 10 mil reinforced PVC sheet material under equipment room ceiling, tape joints and juncture at walls.
- D. Temporarily protect roof mounted equipment outside immediate work areas and maintain in service.
- E. Roofing: Perform roof removal, decontamination, and reconstruction for 1/2 the roof area at a time leaving the other 1/2 area in tact.
 - 1. Provide temporary coverings on the roof to permit immediate protection if necessary.
 - 2. Remove roofing shingles, felts, and flashing materials. Dispose of asbestos containing materials (ACM) appropriately.
 - 3. Remove wood roof sheathing and nails.
 - 4. Remove insulation from attic space to expose ceiling framing and finish material.
 - 5. Vacuum exposed surfaces to remove debris, dust, and loose contamination.
 - 6. Characterize remaining contamination, paint with appropriate markings and coat with clear shellac.
 - 7. Install new R-26 unfaced batt (friction fit) fiberglass insulation between ceiling framing members.
 - 8. Install new 1/2 CDX plywood roof sheathing with ply-clips between panels and nail to framing members.
 - 9. Permanently reinstall roof mounted evaporative cooling units.
 - 10. Install new 3/4" red cedar eave fascia and rake boards.
 - 11. Install 26 gage galvanized sheet metal ridge, eave, and rake edge flashing.

12. Apply 2 plies asphalt saturated 15# roofing felts. Cover with 290# fiberglass roofing shingles with self sealing tabs.

13. Remove temporary facilities.

F. Exterior walls: (lower 2' only, to expose concrete foundation wall)

1. Cut and remove plywood finish panels and scan for contamination. Decontaminate or dispose of contaminated panels, salvage uncontaminated panels for reuse.

2. Remove and dispose of building paper and nails.

3. Scabble contaminated concrete foundation walls to remove contamination.

4. Scan exposed wall construction for contamination. If none found, reconstruct wall as described below.

5. If contamination is found, remove and dispose of insulation.

6. Vacuum exposed surfaces to remove debris, dust, and loose contamination.

7. Characterize remaining contamination, paint with appropriate markings, and coat with clear shellac.

8. Install new R-19 unfaced batt (friction fit) fiberglass insulation between wall framing members.

9. Install new 5/8" fire rated gypsum sheathing and screw attach to framing members.

10. Install "Tygar House Wrap" wind infiltration barrier.

11. Install new 5/8" red cedar faced plywood "Texture T1-11", grooves 4" o.c. attach with wood finishing screws.

12. Apply 2 coats of semi-transparent "Olympic Stain and Waterproofing" to wall paneling, roof fascia and rake boards.

G. Interior: (excluding equipment room)

1. Remove carpet and tile floor finish. Dispose of asbestos containing materials appropriately.

2. Remove plumbing fixtures, boiler, and water heater to allow for floor removal.
3. Remove concrete floors utilizing non-vibrating and non-shock methods to avoid damaging communications equipment. Excavate underlying soils to depths necessary to remove contamination.
4. Backfill to within 4" of finish floor elevation with roadbase, placed and compacted in maximum 6' lifts.
5. Place new 4" thick fiber reinforced concrete floor slab with steel trowel finish. Form or sawcut contraction joints at 10 feet o.c. both ways.
6. Cure concrete with liquid film curing compound.
7. Install new nylon carpeting and new 4" high vinyl base. Install new sheet vinyl flooring and integral cove base in rest rooms.
8. Reinstall plumbing fixtures, boiler, and water heater.

RUST GEOTECH INC.

MEMO TO: Engineering File

FROM: G. Carlsrud, ENG

DATE: May 15, 1995

SUBJECT: Bldg. 2 - Telephone equipment relocation options
Consultation discussions

5-3-95 Roger Leigh, Telecommunications Team Leader
Wayne Kreps, Telecommunications Engineer
Jeremy Brown, Telecommunications System Engineer

- Mr. Leigh and Mr. Kreps were both involved in the system design and installation by Rolm, Inc. They and Mr. Brown have completed extensive certification training by Rolm/IBM for system administration and "stand alone" maintenance (customer engineering equivalent). The Rolm/IBM contracts for service and maintenance have not been continued, since our in-house capabilities are entirely adequate to fulfill the communication system needs of the GJPO. This in-house service has proven effective and has saved the government in excess of \$1,000,000 over the past 7-1/2 years.
- The existing telephone system equipment is highly sensitive to shock and vibration. Previous jack-hammering work outside the building has caused problems with the hard disk drives in the equipment. In two cases the disks were damaged and required replacement at a cost of \$15,000 each time. Heat and dust are also enemies of the system and both can easily result in irreparable damage to the equipment.
- The existing system is digital system sending 24 volt signals with extremely low amperage over copper wire and/or fiber optics transmission lines. Any change to the wiring such as splices and taps will result in degrading or loss of the signal. Signals through fiber optics lines cannot turn corners, thus taps or bends will stop the signal. Half tapping of either type of transmission line is not possible.
- The greatest problem with relocation of equipment is in the time and cost necessary for recabling. Recabling would be necessary to connect each building with service to a new central equipment location. Then the equipment could be moved, but connections of all the new lines to the equipment would take months to complete. Service would be interrupted intermittently for at least 6 months.
- The only way to allow for remediation or demolition of Building 2 would be to provide a new location to house the equipment, purchase replacement equipment, install a parallel system including extensive cabling, and then begin a systematic switchover to the new system during off hours. That process would result in minimal down time of service. The existing equipment could be traded in against the new purchase, excessed, or sold. The cost would exceed \$500,000 for telephone system work only, including a manufacturer's engineer for inspection, certification, and warranty. Additional costs would be incurred for modifications

necessary for the fire alarm, security, and paging systems. Purchase of major portions of a new system will require approval of DOE-AL and DOE-HQ in accordance with DOE Order 5300.1C

5-5-95 Jim Widdows, President
Unitel

(303) 242-3921

- Mr. Widdows was a subcontractor for the Police station move to Horizon Drive (HMO Bldg) and for the move back to the downtown station. That project was not comparable with the Building 2 relocation of equipment. While the telephone switch was relocated from one building to the other, there were two switches available and the primary changeover was done from the telephone company downtown after all necessary cabling was in place.
- Mr. Widdows suggested that "half tapping" could be employed to provide cabling to a new location for the switch, setting up all wiring necessary, then relocating the equipment. His company would be interested in providing the cabling service, but would not have an interest in moving and setting up the main equipment because he is not very familiar with our system nor does he perform work with computer system networking.
- Mr. Widdows discussed a recent project in Rout County where remodeling was performed in the general area of the switch. That work caused sheetrock dust to penetrate equipment cabinets, shutting down the equipment. The equipment was replaced due to the damage.

5-11-95 Madge Hubbell, Service advisor tel. 303-784-7933
US West Interconnect - Large Business / Government Services

- Ms. Hubbell would not even consider allowing renovation work, especially concrete demolition and soils excavation, to be performed around or near operating telephone equipment. She strongly recommended against that approach.
- She recognized, without prompting, that relocation of the equipment would require shutdown of the system while equipment was moved and recabling work was performed. Ms. Hubbell stated that half tapping lines on a digital system would cause immediate failure of the signal, therefore would not be a viable option.
- Ms. Hubbell suggested that the most economically feasible approach would be to provide new equipment, install it in a new permanent location, recable independently from the existing system, and finally relocate the incoming service to the new equipment. The existing equipment could then be sold to help recover some of the costs. She felt that operation would require only a one week shutdown time for the system. This would involve a great deal of labor so making a single move, rather than temporarily moving out and back, would be the most practical approach. US West does not deal in sales of new equipment or trade-ins and resale of existing equipment.

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Section 11.0

References

References

ACZ Inc., 1992. *Preliminary Site Compatibility Study: Orchard Mesa Municipal Solid Waste Processing Area*, Steamboat Springs, CO. Prepared for Mesa County, Waste Management Coordinator, Mr. Robert Edminston, June. Volumes I and II.

Argonne National Laboratory, 1993. *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD, Version 5.0*, ANL/EAD/LD-2.

Edminston, R., 1997. Personal Communication. Mesa County, Waste Management Coordinator, Grand Junction, CO 81502.

Manugraphics, 1991. *STATGRAPHICS, Version 5*.

Rust Geotech, Inc., 1996. Rust Geotech Health and Safety Calculation Number, HP-Q-A40, *GJPO Instrument Committee Standard for Portable Survey Meter Check Sources*.

U.S. Department of Energy (DOE), 1996. *GJPORAP Building 2 Public Dose Evaluation*, DOE/ID/12584-265, prepared by Rust Geotech for the U.S. Department of Energy Grand Junction Projects Office, May.

Van der Leeden, F. L., Froise, D. K., Todd, 1990. Lewis Publishers, Chelsea MI.

Yu, C. C. Loureiro, J.J. Cheng, L.G. Jones, Y.Y. Wang, Y.P. Chia, and E. Faillace, 1993. *Data Collection Handbook to Support Modeling the Impacts of Radioactive Material in Soil*. ANL/EAIS-8.