Residual Radioactivity Guidelines for the Heavy Water Components Test Reactor at the Savannah River Site

by

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DOE Contract No. DE-AC09-96SR18500

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April 1997

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NOTATION

The following acronyms, initialisms and abbreviations (including units of measure) are used in this document.

ACRONYMS, INITIALISMS AND ABBREVIATIONS

ALARA	as low as reasonably achievable
DCGL	derived concentration guideline level
DOE	U. S. Department of Energy
HPLS	Horizontal power level sleeve
HWCTR	Heavy Water Components Test Reactor
RESRAD	<i>residual radioactive</i> material guideline computer code
RESRAD-BUILD	<i>residual radioactive</i> computer code for buildings
SRS	Savannah River Site

UNITS OF MEASURE

cm	centimeter	L	liter
cm ²	square centimeter	m	meter
cm ³	cubic centimeter	m ²	square meter
d	day	m ³	cubic meter
dpm	disintegrations per minute	mCi	millicurie
ft	foot	mrem	millirem
ft ²	square foot	μCi	microcurie
g	gram	pCi	picocurie
h	hour	yr	year
kg	kilogram		

EXECUTIVE SUMMARY

Guidelines were developed for acceptable levels of residual radioactivity in the Heavy Water Components Test Reactor (HWCTR) facility at the conclusion of its decommissioning, which will entail an unconditional release of the property. These guidelines are expressed as derived concentration guideline levels (DCGLs) for the radionuclides that will remain in the facility.

The calculated DCGLs, when compared to existing concentrations of radionuclides measured during a 1996 characterization program, indicate that no decontamination of concrete surfaces will be necessary. Also, based on the results of the calculations, activated concrete in the reactor biological shield does not have to be removed, and imbedded radioactive piping in the facility can remain in place.

Viewed in another way, the results of the calculations showed that the present inventory of residual radioactivity in the facility (not including that associated with the reactor vessel and steam generators) would produce less than one millirem per year above background to a hypothetical individual on the property. The residual radioactivity is estimated to be approximately 0.04 percent of the total inventory in the facility as of March, 1997.

According to the results, the only radionuclides that would produce greater than 0.01 millirem per year are Am-241 (0.013 mrem/yr at 300 years), C-14 (0.022 mrem/yr at 1000 years) and U-238 (0.034 mrem/yr at 6000 years). Human exposure would occur only through the ground-water pathways, that is, from water drawn from a well on the property. The maximum exposure would be approximately one percent of the 4 millirem per year ground water exposure limit established by the U.S. Environmental Protection Agency.

The HWCTR is a pressurized heavy water cooled and moderated test reactor located at the Savannah River Site (SRS). Housed in a steel-domed containment structure, the HWCTR was operated in the 1960s to test experimental fuel assemblies for heavy water power reactors. It is being dismantled and the two-acre site released for unrestricted use.

For this project, the U. S. Department of Energy (DOE) plans to use the release criteria of DOE Order 5400.5, *Radiation Protection of the*

Public and the Environment. These criteria require that exposure from residual radioactivity be as low as reasonably achievable (ALARA), but no more than 100 millirem per year.

Using source terms developed from data generated in a detailed 1996 characterization study, RESRAD and RASRAD-BUILD residual radioactivity computer codes were utilized to calculate DCGLs for radionuclides in the facility. These radionuclide limits also included embedded radioactive piping. A timeframe of 10,000 years for potential releases of residual radioactivity to the environment was used. Two sets of DCGLs were calculated, corresponding to exposure rates of 100 millirem per year and 15 millirem per year to a hypothetical individual at the site.

Two exposure pathway scenarios were studied. Scenario A was the basic RESRAD scenario, which entails having a family farm on the property. In Scenario A it was assumed that groundwater from a well on the property would be used for drinking and other purposes. One standard RESRAD exposure pathway - ingestion of fish from an onsite pond - was not considered plausible for the HWCTR site, and was not taken into account. In consideration of current SRS future-use plans, it was assumed that Scenario A would begin in 30 years.

Scenario B entailed use of the property for an administrative building where one existing wall in the upper part of the underground structure would form part of a building basement occupied by workers.

The assumptions used in the study were realistic but generally on the conservative side. The RESRAD results using Scenario A were considered to be more meaningful than the RESRAD-BUILD results using scenario B.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this report is to describe the results of using the RESRAD and RESRAD-BUILD residual *radioactivity* computer codes to calculate guidelines for residual radioactivity in the Heavy Water Components Test Reactor (HWCTR) facility at the Savannah River Site (SRS) at the conclusion of its decommissioning. The HWCTR decommissioning entails an unconditional release of the site property.

1.2 Scope

The study focused on the reactor containment building. It considered radiation exposure pathway scenarios appropriate for a 10,000-year timeframe. It produced residual radioactivity guidelines based on two different criteria: 100 mrem per year above background and 15 mrem per year above background to a hypothetical individual exposed to radioactivity on the site property. The 100 mrem per year value is the maximum limit of the current Department of Energy (DOE) unrestricted release criteria. The 15 mrem per year value corresponds to the criterion of the Nuclear Regulatory Commission's proposed radiation cleanup rule. It is considered appropriate for a reference value corresponding to as low as reasonably achievable (ALARA), given the limited amounts of radioactive contaminants in the HWCTR facility.

The study also produced two estimates of the maximum annual radiation exposure to a hypothetical individual on the property. One estimate assumed that the radioactivity associated with the biological shield, contaminated concrete and embedded radioactive piping would remain in place. The other assumed that this radioactivity would be left in place along with all radioactivity in installed equipment, with the exception of the reactor vessel assembly and the steam generators.

1.3 Background

The DOE is undertaking the decommissioning of the HWCTR. This process will involve dismantlement of the facility.

Equipment contaminated with radioactivity will be removed from the facility, along with hazardous materials. The steel containment dome will be removed. The

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The underground concrete structure of the reactor building will be removed to five feet below grade. A final radiation status survey will be accomplished. After it has been confirmed that residual radioactivity levels meet cleanup guidelines, concrete rubble produced during the decommissioning will be placed at the bottom of the building cavity. Clean earth will be used to fill the cavity. Then the property will be graded and seeded with grass, and made available for any suitable use.

Figure 1. Location of the HWCTR Facility on the Savannah River Site. The HWCTR property, shown in the lower part of the inset, comprises U-Area. U-Area lies within B-Area, which is designated an administrative area in long-term site property plans.

For this project, the DOE plans to use the release criteria of DOE Order 5400.5, *Radiation Protection of the Public and the Environment* (reference 1). These criteria require that exposure to members of the public from residual radioactivity be less than 100 millirem per year for all exposure pathways, and as low as reasonably achievable below this value. The DOE order also specifies that the exposure rate inside occupied structures shall be less than 20 μ rem per hour above background, although it states that this criterion does not necessarily apply to buried structures or buildings planned for demolition.

To implement the release criteria, guidelines are required that relate the amounts of different radionuclides remaining in the facility to the annual exposure limit. These guidelines are expressed in terms of dpm/100 cm² and pCi/g. They are known as derived concentration guideline levels, or DCGLs.

DOE Order 5400.5 specifies that authorized limits for each property shall be set equal to generic or derived guidelines. According to the order, the authorized limits (i.e., the DCGLs) are to be approved by the DOE headquarters program office.

The DOE *Decommissioning Resource Manual* (reference 2) states that site-specific guidelines for radioactivity in soils and remaining structures are to be developed using the DOE material code RESRAD, employing a realistic pathway analysis. Procedures for using RESRAD appear in the *Manual for Implementing Residual Radioactive Material Guidelines Using RESRAD* (reference 3).

When a building remaining on a decommissioned site may be occupied in a realistic future scenario, a related computer code may be used to calculate site-specific guidelines. This code is RESRAD-BUILD. It is described in *RESRAD-BUILD, A Computer Model for Analyzing the Radiological Doses Resulting from the Remediation and Occupancy of Buildings Contaminated with Radioactive Material* (reference 4). RESRAD-BUILD also may be used to establish guidelines associated with possible occupancy of a portion of a buried contaminated structure.

1.4 About RESRAD

As explained in reference 3, RESRAD is a computer code developed by Argonne National Laboratory that can be used to model the transport of radionuclides in

soil and determine the resulting radiation exposure to humans. Outputs include tables and graphs which show annual radiation exposure for periods as long as 10,000 years. Also, radionuclide guideline levels that equate to particular annual exposures can be produced by the code.

The basic RESRAD exposure pathway scenario, which reference 3 indicates is usually the most conservative, entails a family farm. The family living on the property could receive radiation exposure from residual radioactivity through eight different pathways, such as direct exposure to contaminated soil, eating plant foods grown on the property and drinking milk from on-site livestock. The model includes provisions for contamination from soil (or for the HWCTR case, buried structures) leaching into the ground water and then reaching the environment of those living on the property. Figure 2 illustrates the RESRAD pathways.

Figure 2. RESRAD Exposure Pathways.

RESRAD requires a variety of inputs. A source term that describes the concentrations of different radionuclides present is one key input. The geometry of the source, especially with respect to ground water, is another. Then there are numerous other inputs such as characteristics of the soil and the rates of intakes of foodstuffs.

1.5 About RESRAD-BUILD

As described in reference 4, RESRAD-BUILD is a pathway analysis model developed by Argonne National Laboratory to evaluate the potential radiological dose to an individual who lives or works in a building contaminated with radioactive material. Outputs include tables of exposures associated with building occupancy. Radionuclide guideline levels associated with a particular annual exposure can also be calculated. Unlike RESRAD, the program does not produce graphs.

The program makes use of an air quality model that considers the transport of radioactive material from one compartment in a building to another. Six exposure pathways are considered, including external exposure from the source and inhalation of airborne radioactive particles.

Like RESRAD, the program requires a variety of inputs, such as the radionuclide concentrations, the source geometry and the building description.

1.6 Derived Concentration Guideline Levels

The primary products of the RESRAD and RESRAD BUILD calculations are the DCGLs.

A final radiation status survey will be performed to ensure that cleanup criteria have been achieved. This survey will be performed in accordance with a detailed Final Survey Plan, which will follow guidelines in the HWCTR Decommissioning Plan (reference 5). The level of detail for this survey should be commensurate with need, based on the results of this study.

The final status survey will entail the use of DCGLs. These are radionuclide-specific activity concentrations within a survey unit that correspond to the release criteria. The HWCTR survey units are discussed in Section 4. A survey unit is basically an area for which a separate decision is made on whether the unit meets the cleanup standard.

1.7 Assumptions and Inherent Conservatism

Assumptions made in performing this study are described in Sections 5 and 6. Assumptions were generally realistic but on the conservative side. For example, in source term calculations the highest measured contamination levels were

considered to be average contamination levels. One inherent conservatism in the RESRAD process is modeling buried concrete structures as soil, which was done for the HWCTR project. Radionuclide migration from and through concrete would, of course, occur at a slower rate than through soil, allowing for more radioactive decay to take place before contaminants reached the environment. Another conservative assumption involves the lower axial shield below the reactor vessel. This shield, which contains most of the Co-60 in the facility, was assumed to remain in place. But it more likely will be removed during the dismantlement work.

2.0 FACILITY DESCRIPTION

The HWCTR facility is located on approximately two acres in the northwest quadrant of the SRS, on property known as U-Area. U-Area lies three miles from the nearest SRS property boundary and about two and one-half miles from any major nuclear materials production facilities on the site. See Figure 1.

The federally-owned SRS reservation is located near Aiken, South Carolina. The DOE Savannah River Operations Office manages the SRS. The Westinghouse Savannah River Company operates the site under contract to DOE.

The SRS occupies an area of approximately 310 square miles in western South Carolina in a mostly rural area of Aiken, Barnwell and Allendale counties, about 25 miles southeast of Augusta, Georgia.

The area east of the HWCTR facility is wooded. Adjoining the HWCTR property to the west is the site security force headquarters. Other administrative buildings of B-Area are nearby.

The elevation of the HWCTR site is approximately 288 feet above sea level. No stream runs near the property. The water table at the site is some 50 feet below the lowest point in the reactor containment building.

Figure 3 on the next page shows the HWCTR property. Figures 4 and 5 on page 9 show the reactor containment building.

The HWCTR was a pressurized heavy water test reactor used to test candidate fuel designs for heavy water power reactors. The nominal reactor power of 50 megawatts (thermal) was dissipated to the atmosphere through a muffler, which lies approximately 110 yards east of the reactor building.

Figure 3. The HWCTR Property

The containment building is 70 feet in diameter. The steel dome structure rises approximately 65 feet above the ground; the floor of the lowest level is approximately 52 feet below grade. The below-grade part was constructed of pre-stressed concrete.

The containment building houses the reactor and coolant systems, the refueling machine, the spent fuel basin and the reactor instrumentation. Arrangement of the reactor within the containment building is shown in Figure 4.

The reactor vessel has an overall height of 36.75 feet (including the monitor pin nozzles), a diameter of about eight feet and weighs approximately 100 tons. The vessel is made of carbon steel, three to five inches thick, clad internally with 0.25 inch stainless steel. The reactor vessel and its associated biological shielding are shown in Figure 6 on page 10.

The reactor main cooling system operated at 1200 pounds per square inch (gage) and 250 degrees Centigrade. Two test loops, isolated from the primary cooling system, provided special test conditions. These loops are comprised of four-inch diameter stainless steel piping.

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Figure 4. Section View of Reactor Building

Figure 5. Section View of Reactor Building Showing Steam Generators.
(This view is rotated 90 degrees from the view of Figure 4.)

Also in the reactor building is a small spent fuel basin made of reinforced concrete lined with stainless steel. This basin, 9 feet by 13 feet wide, extends from the ground floor to the minus 27-foot level. It contains a 54-inch by 54-inch shipping cask pit that extends 15 feet below the basin floor.

A system of floor drains leads to a 350 gallon sump tank located in the monitor room at the minus 52-foot level.

3.0 FACILITY HISTORY

The HWCTR was operated from March 1962 to December 1964 to test fuel elements and other reactor components of potential use in heavy water moderated and cooled power reactors. The total power history of the HWCTR was 13.882 megawatt-days.

During operation, 36 different fuel assemblies were tested. Ten of these experienced cladding failures as operational capabilities of the different designs were being established, releasing fission products, uranium and transuranics into the primary cooling system. Spills of radioactive water from the primary cooling system and other systems occurred frequently in most areas of the reactor building during the operating period.

In December of 1964, operations were terminated and the facility was placed in a standby condition, as a result of the decision by the U. S. Atomic Energy Commission to redirect research and development work on heavy water power reactors to reactors cooled with organic materials. For about one year, site personnel maintained the facility in a standby status, then retired the reactor in place.

In the 1970s, the U. S. Energy Research and Development Administration made preparations to decommission the HWCTR. To support planning for the decommissioning, a characterization study was accomplished in 1975 to determine the location and amounts of radiological contaminants in the facility. The study showed that radiation and radioactive contamination levels were low, and that most of the radioactivity was contained within the reactor vessel.

A decommissioning plan was developed in 1976, but this plan was never carried out. The facility condition for the past twenty years has approximated safe storage or protective confinement.

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- ① Carbon steel to stainless steel transition
- ② Ten-inch carbon steel pipe
- ③ Two 4-inch instrument pipes at this location
- ④ Six 4-inch isolated coolant loop stainless steel pipes at this location

Figure 6. Reactor and Biological Shield. The reactor vessel and piping which penetrates the biological shield will be removed, as will the removable concrete shielding blocks. The lower part of the biological shield was found during the 1996 characterization to have detectable radioactivity from neutron activation of the concrete at a maximum depth of 41 inches from the shielding inner surface.

Additional work on the HWCTR decommissioning project began several years ago. In Fiscal Year 94, four auxiliary buildings on the HWCTR site were demolished.

In early Fiscal Year 95 detailed radiological contamination surveys of the reactor building were performed. These showed that removable contamination levels in the facility were low.

In early 1996, the control building was demolished. During the summer of 1996 a detailed characterization study of the facility was performed. Details of the results appear in the HWCTR Facility Characterization Report (reference 6).

The characterization study showed that most areas of the facility had radiation levels below one millirem per hour and no detectable transferable radioactive contamination. Based on laboratory analysis of 50 samples from concrete surfaces, only low concentrations of radioactivity were found to be embedded in concrete floors. Dominant radionuclides were Cs-137, Sr-90 and Co-60. The reactor biological shield was determined to be activated a maximum of 41 inches from its inner surface, with Eu-152 the most abundant radionuclide. The data from the 1996 characterization study forms the basis for source terms used in this study. These source terms are discussed in Section 6.

As of April 1997, only the reactor containment building and two other small buildings remained on the property. One building is the health physics building, which is connected to the reactor building by a short passageway. The other is the small deluge control bunker, Building 788-U, which actually stands about 150 yards north of the site property. Also still in place are the ventilation exhaust stack (which is designated Building 791-U) and the steam muffler, which lies outside the security fence, 110 yards east of the reactor containment building. See Figure 3.

4.0 HWCTR SURVEY UNITS

At the time this study was accomplished, the draft HWCTR Decommissioning Plan (reference 5) specified that the underground part of the facility which will remain in place would be divided into survey units. A survey unit is a part of the facility for which a separate decision will be made about whether the unit meets the cleanup standard.

Typical survey units that could be used for the HWCTR are described in Table 1. These were considered during accomplishment of the RESRAD study. Note that the plans for using such survey units may be changed based on the results of this study.

Table 1. Typical HWCTR Survey Units (Refer to Figures 4 and 5)

Unit	Location
1	Floors and lower walls (up to 6') of monitor room at minus 52' level
2	Floors and lower walls of right instrument room at minus 52' level
3	Floors and lower walls of right cyclone room at minus 52' level
4	Floors and lower walls of left purification room at minus 52' level
5	Floors, walls and ceiling of pin room at minus 41' level
6	Floors and lower walls of right generator room at minus 37' level
7	Inside surfaces of reactor biological shield
8	Inside surfaces of spent fuel basin
9	Upper walls and ceiling of minus 52' level
10	Remaining upper concrete walls of underground structure
11	Outer walls of reactor biological shield and spent fuel basin shield wall
12	Building stairwell, minus 52' level to 0 level

These survey units cover only the parts of the underground reactor building structure that will remain in place. It is these areas for which DCGLs would be necessary, unless the final survey is simplified based on the results of this study.

As discussed in Section 8, the DCGLs calculated for the HWCTR turned out to be substantially higher than the levels of radioactivity determined to be present in the facility during the 1996 characterization study. In view of this situation, fewer survey units would be warranted. Also, one set of DCGLs could suffice for all of the survey units as explained in Section 8.

5.0 EXPOSURE PATHWAY SCENARIOS

Two potential exposure scenarios were considered in this study. The potential radiation exposures that could be associated with these scenarios and DCGLs for the HWCTR facility were calculated over a 10,000-year period using RESRAD and RESRAD-BUILD. Parameters used in the calculations are listed in Appendix A and Appendix B, respectively.

5.1 Scenario A - Residential Use

Scenario A assumed residential use of the site as a family farm. Reference 3 notes that this is typically the worst case scenario and that in cases where it is not realistic but still plausible, it can generally be assumed to be the most restrictive use.

It was assumed that the farm would not be built on the property for at least 30 years. This assumption is consistent with current future-use plans for the SRS, which do not entail residential use (reference 7).

A hypothetical resident was assumed to spend 50 percent of his time indoors in a house built on the remediated HWCTR property. Twenty-five percent of his time would be spent outdoors on the property, and the remaining 25 percent of time away from the site. The resident was assumed to eat homegrown produce and meat and drink milk from livestock fed with forage grown onsite. Groundwater drawn from a well located on the property would be the only source of water for drinking, household use and irrigation.

Note that RESRAD analyses also can model radiation exposures associated with eating fish from an onsite pond. This pathway was not considered plausible for the HWCTR site, given the small size of the property. The seven exposure pathways for Scenario A are described in Table 2.

Table 2. Exposure Pathways for Scenario A

No.	Pathway
1	Direct gamma exposure to contaminated soil
2	Internal dose from inhalation of dust
3	Internal dose from inhalation of radon
4	Internal dose from ingestion of plant foods
5	Internal dose from ingestion of meat and milk from onsite livestock
6	Internal dose from drinking water
7	Internal dose from ingestion of soil

5.2 Scenario B - Administrative Building

Another plausible use for the HWCTR property would involve constructing a building on the site. Scenario B assumes that an administrative building with a

basement four meters deep is built on the property. An administrative building would be more likely to be constructed than an industrial facility, since future-use plans for this part of the SRS call for it to remain an administrative area. Such a building may or may not have a basement. Any basement would be unlikely to be more than four meters deep.

It is assumed that the building basement incorporates as one of its walls an existing wall of the HWCTR underground structure. The wall shown in Figure 7 on page 19 was selected for the analysis since it could plausibly be used for this purpose. It would not be plausible for the curved outer walls of the containment building, the sides of the small spent fuel basin or the opening in the reactor biological shield to be utilized in such an application.

Under this scenario, a hypothetical individual was assumed to work eight hours per day inside the building basement, five days per week for 50 weeks per year. The exposure pathways associated with the scenario are shown in Table 3.

Table 3. Exposure Pathways for Scenario B

No.	Pathway
1	Direct gamma exposure to contaminated wall
2	External exposure due to air submersion
3	Internal dose from inhalation of airborne radioactive particulates
4	Internal dose for inadvertent ingestion of radioactive material

Note that two pathways considered by RESRAD-BUILD were not included because they were not applicable to the HWCTR project. These are inhalation of indoor radon progeny and external exposure from radioactive materials deposited on a floor. Radon was included in the RESRAD calculation as indicated in Section 5.2. But because radon is not generated by the radioactive materials which will remain in the HWCTR facility (apart from naturally-occurring radionuclides) it was not a significant factor in that calculation.

5.3 Considerations in Scenario Selection

DOE Order 5400.5 (reference 1) and the *Decommissioning Resource Manual* (reference 2) both indicate that a realistic pathway analysis should be employed in establishing the site-specific cleanup guidelines. The two scenarios selected for analysis may not be considered entirely realistic, given present expectations for future uses of the SRS property, but they are plausible.

The family farm scenario is a basic RESRAD exposure pathway scenario. It has been used in other RESRAD studies at the SRS. An example is the study of the Solid Waste Disposal Facility in E-Area, which is described in reference 8. Even though the present SRS future-use plan of reference 7 does not accommodate residential use, such use is plausible in the long term. Because the HWCTR property is not located in the central region of the site near highly-contaminated nuclear facilities, it would be more likely to eventually become a residential area than would property located in the central part of the SRS. The administrative building scenario also would be a plausible use for the HWCTR property. The assumption of a basement is plausible as well. This assumption opens up exposure pathways beyond those in the RESRAD analysis, as one can see by comparing Table 3 to Table 2.

Note that one could have assumed a basement in the family farmhouse of Scenario A. But the Scenario B building basement assumption was chosen because it could be more conservative. This is because Scenario A includes a 30-year period during which no structure is expected to be built, which allows for radioactive decay. (Note, however, that the source term was not corrected for 30 years decay since transport of the radionuclides into the soil column would begin immediately.)

The administrative building basement assumption is consistent with exposure pathway scenarios used in connection with decommissioning of the Shippingport Atomic Power Station in Pennsylvania (reference 9). The Shippingport project entailed dismantlement of that facility and unrestricted release of the site property. Some underground concrete structures with low levels of residual radioactivity remained in place. These were filled with building rubble and clean earth, as will be the case for the HWCTR project.

Please note that the scenarios selected for the HWCTR are not necessarily applicable to other similar SRS facilities to be decommissioned, such as the larger production reactors.

6.0 SOURCE TERMS

Section 6.1 identifies the three HWCTR source terms. Sections 6.2 through 6.7 describe the 1996 characterization data used in the calculations. In Section 6.8, the methodology for the calculations is described. Section 6.9 identifies assumptions made.

6.1 The Calculated Source Terms

As one can see in Table 4 below, the predominant radionuclide in the *biological shield source term* is Co-60 at approximately 620 mCi. The majority of this activity is found in the lower axial shield, which contains a concrete mixture with 90 percent steel shot. In the other concrete, the dominant radionuclides are Ba-133 at 103 mCi, Eu-152 at 57 mCi and Eu-154 at 3.58 mCi. The total amount of radioactivity in the shielding was calculated to be approximately 785 mCi. This amount includes radioactivity in reinforcing steel (rebar) and in piping embedded in the biological shield wall.

Table 4. Calculated Source Term - Reactor Biological Shield

Radionuclide	Bio-shield mass (g) x 93E+07							
	primary pipe pCi	copper pCi	HPLS pCi	Rebar pCi	Lower axial shield (pCi)	Barytes concrete (pCi)	Ordinary concrete (pCi)	activity pCi/g
Ba-133						1.03E+11		1.15E+03
Eu-152						2.39E+10	3.29E+10	6.36E+02
Eu-154						1.41E+09	2.15E+09	3.98E+01
Sr-90	3.00E+07							3.36E+01
Ni-63	3.23E+08							3.62E+00
C-14	5.89E+05							6.59E-03
Ni-59	4.04E+06							4.53E-02
Co-60	1.62E+08	1.77E+06	2.73E+07	9.67E+07	6.00E+11	2.01E+10	3.86E+08	6.95E+03
H-3	2.42E+07					1.36E+09	2.86E+08	1.87E+01
Cs-137	1.12E+06							1.25E-02
Pu-238	1.73E+05							1.94E-03
Pu-239	1.39E+06							1.55E-02
Am-241	3.23E+02							3.52E-06
Am-243	6.93E+02							7.76E-06
Am-244	2.89E+06							3.23E-02

HPLS = horizontal power level sleeve

Note the biological shield mass is specified in Table 4 as 8.93E+07 grams. This figure was based on the densities of the concrete in the shielding. An assumption was made that the radioactivity in the shield was uniformly distributed over the shield volume shown in the conceptual model of Figure 9. The concentrations of radionuclides (in pCi/g) in Table 4 are used as input to the RESRAD computer code for the biological shield model.

In the concrete floors of the facility, a total of approximately 6.6 mCi was calculated to be present. Cesium 137 was the predominant radionuclide at 4.5 mCi, followed by H-3 at 1.3 mCi, C-14 at 0.34 mCi, Sr-90 at 0.30 mCi and Co-60 at 0.05 mCi. These quantities include radioactivity inside embedded piping and the spent fuel basin. Table 5 shows the details of the *rubble source term*.

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Table 5. Calculated Source Term - Rubble

contaminated zone radius = 10.5m, height = 4.9m, density 1.6g/cm³
Mass of Contaminated rubble 2.79E+09

Radionuclide	concrete floor pCi	Zero elevation Drain lines pCi	-37' elevation Drain lines pCi	-52' elevation Drain lines pCi	-52' sump sediment pCi	Spent fuel basin pCi	Activity pCi/g
Sr-90	3.00E+07	1.61E+08	3.26E+07	6.96E+07	9.61E+06	6.00E+05	1.09E-01
C-14	3.35E+08					1.18E+04	1.20E-01
Co-60	3.88E+06	1.83E+07	3.70E+06	7.89E+06	5.31E+05	3.23E+06	1.34E-02
H-3	5.64E+08				1.43E+06	4.85E+05	2.03E-01
Cs-137	3.88E+09	3.85E+08	7.79E+07	1.66E+08	1.36E+07	5.95E+06	1.62E+00
Pu-238		1.87E+02	3.77E+01	8.05E+01	1.72E+03	3.46E+03	1.97E-06
Pu-239	1.53E+05	2.95E+04	5.98E+03	1.27E+04	2.72E+05	2.77E+04	1.80E-04
U-234	2.29E+07					6.47E+00	8.20E-03
U-235	7.76E+05						2.78E-04
U-238	1.73E+07					1.39E+01	6.18E-03
Am-241						5.77E+04	2.07E-05
Ni-59						8.08E+04	2.89E-05
Ni-63						6.47E+06	2.31E-03

In calculating the mass of the contaminated rubble, a density of 1.6 g/cm³ was assumed. This value, approximately two-thirds of the density of reinforced concrete, was selected to account for voids in the rubble volume. Radioactivity in embedded piping and in the spent fuel basin was included. The activity in pCi/g in the last column of Table 5 is the total for each radionuclide divided by the total mass of the contaminated concrete and rubble.

To determine the effect of leaving installed radioactive equipment in the facility, a *modified source term* was calculated. It is shown in Table 6. In this source term the radioactivity associated with all installed equipment except the reactor vessel assembly and steam generators is included. Also included is induced activity in the reactor biological shield.

Table 6. Calculated Source Term - Rubble, Installed Equipment and Biological Shield

Radionuclide	BioShield activity (pCi)	Rubble activity (pCi)	Systems activity (pCi)	Total activity (pCi)	Concentration pCi/g - rubble
Ba-133	1.03E+11			1.03E+11	3.69E+01
Eu-152	5.68E+10			5.68E+10	2.03E+01
Eu-154	3.55E+09			3.55E+09	1.27E+00
Sr-90	3.00E+07	3.04E+08	4.21E+09	4.55E+09	1.63E+00
Ni-63	3.23E+08	6.47E+06	4.54E+10	4.57E+10	1.64E+01
C-14	5.89E+05	3.35E+08	8.26E+07	4.18E+08	1.50E-01
Ni-59	4.04E+06	8.08E+04	5.67E+08	5.71E+08	2.04E-01
Co-60	6.21E+11	4.95E+07	2.27E+10	6.44E+11	2.30E+02
H-3	1.67E+09	1.25E+09	3.40E+09	6.32E+09	2.26E+00
Cs-137	1.12E+06	4.53E+09	1.57E+08	4.68E+09	1.68E+00
Pu-238	1.73E+05	5.49E+03	2.43E+07	2.45E+07	8.76E-03
Pu-239	1.39E+06	5.02E+05	1.94E+08	1.96E+08	7.03E-02
U-234	3.23E+02	2.29E+07	4.54E+04	2.30E+07	8.22E-03
U-235		7.76E+05		7.76E+05	2.78E-04
U-238	6.93E+02	7.58E+07	9.72E+04	7.59E+07	2.72E-02
Am-241	2.89E+06	5.77E+04	4.05E+08	4.08E+08	1.46E-01
	7.86E+11	6.57E+09	7.71E+10	8.70E+11	

One can see from this table that the part of the source term associated with radioactive systems is 0.0771 curies. This value is somewhat larger than the source term for contaminated concrete (rubble) and smaller than the one for the biological shield.

For the RESRAD-BUILD calculation, a source term was not calculated based in the 1996 characterization data. This approach would not have been meaningful because, based on that data, and surveys taken previously in the facility, the contamination levels on the walls are essentially background.

6.2 The 1996 Characterization Study Data

The 1996 characterization study (reference 6) served as the basis for the source term calculations. This study provides detailed information on the radioactive contaminants in the facility. All radioactive equipment will be removed from the HWCTR facility before the underground structure is filled with building rubble and earth. Given this situation, the following data from the 1996 characterization is most pertinent to this study:

- Induced radioactivity in the reactor biological shield, based on laboratory analysis of 35 samples from five cores,
- Radioactivity embedded in concrete floor surfaces, based on 49 concrete samples analyzed in a laboratory,
- Radioactivity inside floor drains and other embedded piping, and
- Transferable surface contamination based on the results of 970 smears taken on external surfaces in the facility.

These data are discussed in detail in the following sections. Figure 7 shows the areas of the facility involved.

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Figure 7. Plan View of Underground Structure. The different areas of the underground structure can be seen here. The top surfaces of the concrete will be five feet below grade. In Scenario B, one of the walls identified in the figure by a "B" was assumed to form one wall of a basement in a hypothetical building.

6.3 Induced Radioactivity in the Reactor Biological Shield

To measure induced radioactivity in the biological shield, five cores were taken through the shield from the right generator room. Figure 8 on page 21 shows the location of the cores and, with a dashed line, the approximate limits of detectable activation in the materials. The results of the sample analyses are summarized in Table 7.

Table 7. Biological Shield Activation Analysis Results

("<" signifies that the radionuclide was not identified by gamma spectroscopy.)

Sample ID Number	Elevation (feet)	Sample Depth (in)	⁶⁰ Co pCi/gm	¹³⁷ Ba pCi/g	¹⁵² Eu pCi/g	¹⁵⁴ Eu pCi/g
USE-H-15-J9-08-001-6-1	-28' 5"	15	<6.0E-02	<	<	<
USE-H-15-J9-08-001-5-1	-28' 5"	27	<1.0E-01	<	<	<
USE-H-15-J9-08-001-5-2	-28' 5"	39	7.3E-01	<	<	<
USE-H-15-J9-08-001-4-1	-28' 5"	45	<1.0E-01	<	<	<
USE-H-15-J9-08-001-3-1	-28' 5"	51	<1.0E-01	<	2.3E+00	<
USE-H-15-J9-08-001-2-1	-28' 5"	67	2.1E+00	<	6.0E+01	5.7E+00
USE-H-15-J9-08-001-1-1	-28' 5"	86	8.0E+02	4.1E+03	9.5E+02	5.6E+01
USE-H-15-J9-08-005-6-1	-26' 8"	15	<9.0E-02	<	<	<
USE-H-15-J9-08-005-5-1	-26' 8"	27	<8.0E-02	<	<	<
USE-H-15-J9-08-005-4-1	-26' 8"	39	<1.0E-01	<	2.2E+00	<
USE-H-15-J9-08-005-3-1	-26' 8"	45	<1.0E-01	<	7.6E+00	<

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Table 7 (continued)

Sample ID Number	Elevation (feet)	Sample Depth (in)	⁶⁰ Co pCi/gm	¹³³ Ba pCi/g	¹⁵² Eu pCi/g	¹⁵⁴ Eu pCi/g
USE-H-15-J9-08-005-3-2	-26' 8"	51	3.0E+00	<	3.9E+01	1.6E+00
USE-H-15-J9-08-005-2-1	-26' 8"	67	2.5E+02	<	5.1E+03	2.0E+02
USE-H-15-J9-08-004-6-1	-25' 2"	15	<9.0E-02	<	<	<
USE-H-15-J9-08-004-5-1	-25' 2"	27	<4.0E-02	<	<	<
USE-H-15-J9-08-004-4-1	-25' 2"	39	1.4E-01	<	<	<
USE-H-15-J9-08-004-3-1	-25' 2"	45	3.4E-01	<	2.0E+01	1.1E+00
USE-H-15-J9-08-004-2-1	-25' 2"	51	9.2E-01	<	5.8E+01	4.6E+00
USE-H-15-J9-08-004-1-1	-25' 2"	67	1.5E+01	<	1.1E+03	4.7E+01
USE-H-15-J9-08-004-8-1	-25' 2"	79	1.8E+02	<	1.5E+04	7.7E+02
USE-H-15-J9-08-003-6-1	-23' 2"	15	<1.0E-01	<	<	<
USE-H-15-J9-08-003-5-1	-23' 2"	27	<1.0E-01	<	<	<
USE-H-15-J9-08-003-5-2	-23' 2"	39	<1.0E-01	<	<	<
USE-H-15-J9-08-003-4-1	-23' 2"	45	5.7E-01	<	1.2E+01	7.0E-01
USE-H-15-J9-08-003-4-2	-23' 2"	51	9.4E-01	<	<	<
USE-H-15-J9-08-003-2-1	-23' 2"	67	2.8E+01	<	2.3E+03	9.9E+01
USE-H-15-J9-08-003-1-1	-23' 2"	83	2.7E+02	<	2.3E+04	1.5E+03
USE-H-15-J9-08-002-6-1	-21' 10"	15	<1.0E-01	<	<	<
USE-H-15-J9-08-002-6-2	-21' 10"	27	<6.0E-02	<	<	<
USE-H-15-J9-08-002-5-1	-21' 10"	39	<8.0E-02	<	<	<
USE-H-15-J9-08-002-4-1	-21' 10"	51	1.1E+00	<	4.5E+01	2.0E+00
USE-H-15-J9-08-002-3-1	-21' 10"	67	3.0E+01	<	1.6E+03	8.4E+01
USE-H-15-J9-08-002-2-1	-21' 10"	83	3.9E+02	<	1.4E+04	8.8E+02

Due to physical interferences, the cores were not taken along a radial from the reactor vessel center. A six-inch correction is required to correct core depth to radial depth (e.g., 39 inch core depth is equivalent to 33 inch radial depth). The detectable concentration ranged from a radial depth of 33 inches to 74 inches (inner biological shield wall adjacent to the reactor vessel).

The radial depth of activation in the region of the core with the highest thermal neutron flux is 41 inches. This region basically extends from minus 26 feet 8 inches elevation to minus 21 feet 10 inches, approximately five feet. Figure 8 displays the activation depth in the active core region. As can be seen from this figure, the activation depth varies from 25 inches to 41 inches over the entire height of the active core region, approximately 10 feet.

Based on the radial activity profile and axial neutron flux distribution, the activity inventory of Eu-152 was calculated. Europium 152 is the predominant radionuclide with an inventory of 3.29×10^{10} pCi in the activated concrete opposite the active core region.

The lower shield is a high density concrete. The aggregate in this concrete is barite which contains barium. The entire lower shield was conservatively calculated to have an inventory of 1.03×10^{11} pCi Ba-133. This estimate was based on a single data point.

The lower axial shield is removable. It consists of high density concrete containing 90 percent steel shot, encased in cadmium-plated carbon steel. Although this shield may be removed during the decommissioning, the activity associated with it was included in the source term in case it is left in place.

6.4 Radioactivity Embedded in Concrete Floors

During the 1996 characterization, a total of 50 concrete surface samples were taken in 47 different locations (three were duplicates for quality assurance purposes). All came from floor surfaces, except one, which was obtained from the wall of the spent fuel basin in the left generator room. Table 8 on page 22 summarizes the results.

Figure 8. Biological Shield Showing Core Samples. The locations of the five core samples obtained during the 1996 characterization program.

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Table 8. Concrete Sample Results^{1,2}
(Selected radionuclide concentrations in pCi/g)

Location	No.	H-3	Co-60	Sr-90	Cs-137	U-238	Pu-239
Concrete slab outside equipment hatch	5	-	<.03	-	<.06-14	-	.057
Health physics building	3	-	<.05	-	.26-.97	-	-
R. V. head area	3	<.23-71	<.005-.1	1.7	.84-7.7	-	<.01
Main floor	11	14-33	<.05-.9	.74	.36-220	.054-4.3	<.008-.06
Left pump room	1	-	0.04	-	.4	-	-
Right generator room	5	<.12	.15-.57	-	.028-2.2	-	-
Pin room	2	-	.06-.12	-	.24-.56	-	-
Left purification room	6	-	<.04-.18	-	1.1-27	-	-
Right cyclone room	4	-	<.06-.21	-	.73-7.6	-	-
Right instrument room	3	-	.11-.26	-	.86-27	-	-
Monitor room	5	-	<.03-.49	-	4.5-84	-	-
Stairwell	2	-	.09, .13	-	.5-2.2	-	-

¹ Dashes indicate not measured. ² < indicates less than minimum detectable value.

As seen from this table:

- H-3 concentrations ranged up to approximately seven times the detection limit,
- Co-60 concentrations are relatively low, with 0.9 pCi/g being the highest value,
- Cs-137 levels ranged up to 220 pCi/g, with the highest value in the expected location - between the reactor vessel head and the spent fuel basin,
- U-238 levels ranged from 0.54 to 4.3 pCi/g, with the highest near the spent fuel basin, and
- Pu-239 concentrations ranged from 0.01 to 0.06 pCi/gm, with the highest value on the concrete slab outside the equipment hatch.

The results of analyses of concrete samples from floor surfaces therefore show low levels of Co-60 and somewhat higher levels of Cs-137 contamination. Analysis of two core samples from the 0-level floor showed no detectable Co-60 or Cs-137 three inches deep in the concrete. It is likely that the contamination penetrates less than one inch deep, based on experience.

6.5 Radioactivity Inside Floor Drains and Other Embedded Piping

Beta-gamma scans of the openings to floor drains in the 0-level floor showed up to 380,000 dpm/100 cm²; alpha scans showed 20 dpm/100 cm² in two of these drains.

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The 4-inch diameter lines from these drains run through the shield wall of the spent fuel basin down to the sump tank at the minus 52-foot level.

At the time of the characterization work, most floor drains at the minus 52-foot level contained water. Water samples showed radioactivity concentrations in the following ranges:

- H-3 1.1×10^5 to 6×10^5 pCi/L
- Co-60 <20 to 150 pCi/L
- Cs-137 100 to 2.9×10^5 pCi/L

Table 9 lists embedded radioactive piping in the facility. It does not show small diameter piping - mostly instrument sample lines - that penetrates the walls of the monitor room at the minus 52-foot level.

Table 9. Embedded Radioactive Piping¹

Location	Diameter (inches)	Length (feet)	Drawings
Biological shield:	-	-	
Reactor piping	2 - 16	97	W231080, W231081, W230740
Power level sleeves ²	10	180	W231486, W231756
Copper cooling coils (except for coils around embedded pipes) ²	7/8	365	W231438
Spent fuel basin shield wall	1 - 4	228	W231443, W231252, W230856
0-level floor ³	½ - 6	477	W231537, W231477
Floor drains			
0-level floor	4	108	W231085, W231227
-37-foot level floor	4	68	W231086
-52-foot level floor	4	145	W238873

¹This table includes representative embedded piping that has been verified, or is expected to be activated or contaminated. It does not include piping that penetrates the monitor room wall.

²Not all portions of the power level sleeves and cooling coils will be radioactive.

³Not all piping embedded in the floor is radioactive. Much of this piping is under the floor.

In calculating the RESRAD source term, it was assumed that all of this embedded piping would remain in place. Average contamination levels in the system piping were assumed to be the maximum levels measured during system sampling in the 1996 characterization program. Average contamination levels in the floor drain system were likewise assumed to be the maximum levels measured during the 1996 characterization.

6.6 Radioactivity Inside Equipment

During the 1996 characterization, radioactivity inside installed equipment was measured in three ways. Smears were taken inside various systems. Water samples were taken from the spent fuel basin purification and cooling water systems. Metal coupons were cut from the main coolant and steam piping of each loop. All of the samples were analyzed in a laboratory.

The smears showed the average activity in the main coolant system to be approximately 2,500 pCi/100 cm² gross alpha and 65,000 pCi/100 cm² gross beta-gamma. Contamination levels measured in the two isolated coolant loops were slightly lower than these values.

The most significant of the system data was considered to be from analysis of the metal coupons taken from the main coolant system. The average of the two samples showed 18 pCi/g H-3, 135 pCi/g Co-60 and 0.78 pCi/g Pu-239.

6.7 Removable Contamination

During the 1996 characterization program, approximately 970 smears were taken to measure removable contamination on various external surfaces of the facility, with emphasis on cracks and crevices. Each one was analyzed for gross α and gross β - γ . Representative ones showing significant activity were analyzed by γ spectroscopy for Co-60, Cs-137 and other γ emitters. Eighteen smears showed significant activity; all but two of these were taken on equipment which will be removed. Table 10 shows the activity on the two smears located on facility surfaces. The surfaces involved have a combined area of less than three square feet.

Table 10. Smears Showing Significant Removable Activity¹

Location	α activity >20 dpm/100 cm ²	β - γ activity >1000 dpm/100 cm ²
CRDM and reactor vessel head area, under plastic near head (less than 1 ft ²)	33	134,200
Right cyclone room at -52', in radiation area	*	1432

¹Note that a value of 20 dpm/100 cm² was used for significant α activity. A value of 1000 dpm/100 cm² was used for β - γ radioactivity. *Amount below significant value.

Overall, the results of the smear surveys were consistent with those made in 1994 (approximately 1300 smears were taken in 1994 to support downgrading the facility status to a radiological buffer area) and show that removable contamination levels are low in the facility, even in cracks and crevices.

Because extensive surveys showed only very low levels of removable contamination on facility surfaces, it was assumed that there is no significant activity associated with removable contamination in the facility, apart from inside the spent fuel basin. Consequently, only the spent fuel basin activity was included in the source terms.

In the spent fuel basin, eight atomic wipes were used to measure surface contamination during the 1996 characterization program. These smears showed a maximum of 174 pCi/100 cm² Co-60 and 370 pCi/100 cm² Cs-137. These values were used as average contamination levels for these radionuclides in calculating the source term from the basin. Levels for other radionuclides were estimated using scaling factors developed from the results of laboratory analyses of contamination from other areas.

6.8 Methodology for Calculating the Source Terms

Because of their different locations and characteristics, the biological shield activity and the activity associated with contaminated concrete and rubble were treated as two different source terms.

6.8.1 Biological Shield Activity

Activity in the lower 10-inch piping in the reactor biological shield (which may remain in place) was calculated using the laboratory analysis results of a primary system metal sample activity averaged over the piping inner surface area.

The induced activity associated with activated copper cooling coils inside the biological shield was calculated using the laboratory analysis results of a piece of this material obtained from coring. Induced activity in the power level sleeves and steel reinforcing bar in the biological shield was calculated in the same fashion. Induced activity in the lower axial shield was calculated using information in the 1976 Decommissioning Plan (reference 11). In all three cases, Co-60 was the predominant radionuclide.

The induced activity in the barytes concrete lower biological shielding was calculated based on the laboratory analysis results of the one core sample segment which detected Ba-133 (sample USE-H-15-J9-08-001-1-1 of Table 7). The induced activity in the ordinary concrete biological shielding also was calculated using laboratory analysis results of core samples.

To support the RESRAD calculations, a conceptual model of the biological shield was developed. This model, which shows the location of the radioactivity in the underground structure, is illustrated in Figure 9. Note that the Ba-133 activity was assumed to be uniformly distributed over the

modeled volume. This assumption is equivalent in the RESRAD calculation to considering the activity to reside only in the lower portion of the modeled volume.

6.8.2 Contaminated Concrete and Rubble Activity

The activity in the embedded piping of the floor drain system was calculated based on the maximum measured surface contamination from β - γ and α scans averaged over the inner surface area of the piping, using the results of laboratory analysis of sediment in the drains for the fractional abundance of the radionuclides present. Activity inside the sump tank was calculated based on the analysis results of a sediment sample from the tank, assuming an average sediment thickness in the bottom of the tank of two centimeters.

The activity associated with contaminated concrete floors of the facility was calculated using the highest concentration of each radionuclide measured in laboratory analysis of the 49 samples from concrete floors. These values appear in Table 5. The average depth of contamination in the concrete floors was assumed to be one centimeter.

The activity inside installed equipment was calculated using estimates of system surface area derived from drawings and assuming average contamination levels from laboratory analysis of metal coupons taken from the main coolant system.

Figure 9 shows the conceptual model of the radioactivity associated with contaminated concrete and embedded piping.

6.8.3 RESRAD-BUILD Wall Activity

As noted in Section 6.1, it would not have been meaningful to calculate a RESRAD-BUILD source term because contamination levels on the walls of the facility are essentially background.

6.9 Assumptions Used in Computing Source Terms

In using the 1996 characterization data to calculate the source terms, certain assumptions were necessary. These were made in a conservative fashion. Some assumptions were mentioned above. Others include:

- The average length of the activated section of the power level sleeves is six feet.

Figure 9. Conceptual Models of Radioactivity in the Facility

- The amount of radioactivity associated with removable contamination in the facility is insignificant compared to contamination in the embedded piping and concrete floors, and induced activity in the biological shield. Consequently, the removable contamination was not included in the model.
- For the calculation of the source term which included the installed radioactive equipment, the conceptual model of Figure 9 was used. This concept assumed that the radioactivity associated with contaminated concrete, embedded piping, the biological shield and the installed equipment was contained within the contaminated rubble zone shown in the illustration. Use of this model is more conservative than the biological shield model in this instance because the contaminated zone is nearer to the ground water.
- Standard radiological control practices will be followed during dismantlement of radioactive systems so that the low existing removable contamination levels in the facility will not be substantially increased during the course of work.

7.0 OTHER PARAMETERS FOR RESRAD AND RESRAD-BUILD

In addition to the source terms discussed in Section 6, there are a variety of other input parameters to RESRAD and RESRAD-BUILD. These are identified in Appendix A and Appendix B, respectively. Appendix C identifies the input parameters for RESRAD with the additional source term associated with leaving radioactive equipment, except for the reactor vessel and steam generators, in the facility. In each case, a brief statement of the source of the value used is included. References are specified, as appropriate.

In most cases, the HWCTR values for environmental parameters are the same as those used in other RESRAD studies at the SRS, such as the one documented in reference 8.

8.0 RESULTS

8.1 Summary

The RESRAD calculations showed that radioactivity which would remain in the facility with no decontamination would produce under Scenario A a maximum annual exposure to a hypothetical individual of 0.037 mrem per year. This peak would occur in about the year 6962 as shown in Figure 10 and Figure 11 on the following pages. Calculated DCGLs for residual radioactivity which would produce 15 mrem per year were well above levels measured during the 1996 characterization program.

The second RESRAD calculations, which assumed that all installed radioactive equipment except the reactor vessel and steam generators would remain in place, also showed a maximum annual exposure of approximately 0.037 mrem per year. The slight increase in the source term of approximately nine percent from the installed equipment did not result in a significant increase in exposure.

The DCGLs from the two RESRAD runs were identical. The values are expressed in Table 13 for 15 mrem per year and Table 14 for 100 mrem per year. The calculated values substantially exceed the existing average radioactivity levels used in the calculations. The DCGLs for 15 mrem per year range from 13 pCi/g and $1.09\text{E}+05$ dpm/100 cm² for U-234 to $1.13\text{E}+15$ pCi/g and $3.03\text{E}+18$ dpm/100 cm² for Co-60. Cobalt-60 and other radionuclides marked with asterisks in the tables appeared at the individual nuclide limits as calculated by RESRAD. That is, no concentration of Co-60 in the facility as modeled could produce the exposure limit because it would decay to minuscule levels before reaching the ground water.

Because the calculated DCGLs are far above the radioactivity levels in the facility, one set of DCGLs may suffice for all surfaces in all survey units in the containment building.

The RESRAD-BUILD calculation indicated that the DCGLs for this scenario were 15,000 dpm/100 cm² β - γ or 150 dpm/100 cm² α , based on the most restrictive radionuclides. These DCGLs were calculated to equate to 15 mrem per year. The actual existing contamination levels for Scenario B are so low - effectively background - that calculating the exposure from these levels using RESRAD-BUILD was not meaningful. The results also show that the highest exposure is associated only with the first year of occupancy; each subsequent year the annual exposure decreases.

Comparison of the RESRAD-BUILD values of 15,000 dpm/100 cm² β - γ and 150 dpm/100 cm² α with the DCGLs of Table 13 shows that the former levels are much lower than the latter. Note that the calculated DCGLs would not apply to

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activation in the biological shield which should be treated differently from contamination in the facility in applying cleanup guideline values.

Figure 10. RESRAD Results With Present Source Terms For Biological Shield. This exposure projection is based primarily on activated concrete.

8.2 Detailed RESRAD Results

The RESRAD summary report for the biological shield activity assessment appears in Appendix D. The summary report for the radioactivity associated with contaminated concrete and embedded piping appears in Appendix E.

Figures 10 and 11 show the annual radiation exposure to a hypothetical individual on the property as calculated by RESRAD. Comparison of the two figures shows the contaminated concrete (which also includes radioactive embedded piping and contamination in the spent fuel basin) to be a much more significant source of radiation exposure than the biological shield activation. The peak annual exposure from the contaminated concrete is approximately 0.037 mrem. This value for the biological shield is less than 0.00003 mrem, a factor of about 1200 smaller.

TOTAL DOSE: All Isotopes and Pathways Summed

Figure 11. RESRAD Results With Present Source Terms For Contaminated Concrete. This exposure projection is based on removal of radioactive equipment but no decontamination of the facility structure which will remain in place.

The key results of the biological shield assessment, which appear on page 28 of Appendix D, are given in Table 11. The primary values in this table are the $G(i/tmin)$ values, which are the calculated DCGLs for an annual exposure of 15 mrem per year to a hypothetical person on the property.

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Table 11. RESRAD Results Summary - Biological Shield

RESRAD, Version 5.621 T* Limit = 0.5 year 03/06/97 12:11 Page 28
 Summary : Bio-Shield Activity Assessment HWCTR File: A:\BIOSHLD.DAT

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 = 464.9 p 0.5 years

Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	pCi/g	(years)		(pCi/g)		(pCi/g)
Am-241	3.230E-02	1489 p 1	2.389E-04	6.279E+04	0.000E+00	*3.430E+12
C-14	6.590E-03	465.3 p 0.5	5.305E-03	2.828E+03	5.324E-03	2.817E+03
Co-60	6.950E+03	0.000E+00	2.839E-24	*1.131E+15	0.000E+00	*1.131E+15
Cs-137	1.250E-02	0.000E+00	3.679E-30	*8.701E+13	0.000E+00	*8.701E+13
Eu-152	1.790E+03	0.000E+00	2.018E-26	*1.765E+14	0.000E+00	*1.765E+14
Eu-154	3.980E+01	0.000E+00	9.072E-26	*2.639E+14	0.000E+00	*2.639E+14
H-3	1.870E+01	258.2 p 0.3	1.541E-10	9.737E+10	5.070E-17	*9.594E+15
Ni-59	4.530E-02	0.0000 p 0.0000	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	3.620E+00	0.0000 p 0.0000	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Pu-238	1.940E-03	7558 p 8	1.630E-05	9.201E+05	1.383E-08	1.085E+09
Pu-239	1.550E-02	1.000E+04	1.193E-07	1.258E+08	0.000E+00	*6.212E+10
Sr-90	3.360E-01	2119 p 2	1.230E-23	*1.365E+14	0.000E+00	*1.365E+14
U-234	3.620E-06	7282 p 7	5.125E-02	2.927E+02	6.357E-05	2.360E+05
U-238	7.760E-06	7282 p 7	4.654E-02	3.223E+02	2.731E-08	*3.360E+05
*At specific activity limit						

The key results of the concrete and rubble assessment, which appear on page 27 of Appendix E, are given in Table 12.

Table 12. RESRAD Results Summary - Concrete and Rubble

RESRAD, Version 5.621 T Limit = 0.5 year 03/07/97 08:54 Page 27
 Summary : Radioactivity associated surface contaminated concrete and drainlines
 File : A:\RUBBLE.DAT

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 = 4965 p 5 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	2.070E-05	1243 p 1	8.397E-03	1.786E+03	7.564E-05	1.983E+05
C-14	1.200E-01	317.5 p 0.3	1.579E-01	9.500E+01	3.403E-12	4.408E+12
Co-60	1.770E-02	0.0000 p 0.0000	0.000E+00	*1.131E+15	0.000E+00	*1.131E+15
Cs-137	1.620E+00	0.0000 p 0.0000	0.000E+00	*8.701E+13	0.000E+00	*8.701E+13
H-3	4.490E-01	176.5 p 0.2	3.549E-07	4.227E+07	0.000E+00	*9.594E+15
Ni-59	2.890E-05	0.0000 p 0.0000	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	2.310E-03	0.0000 p 0.0000	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Pu-238	1.970E-06	5156 p 5	3.944E-04	3.804E+04	3.425E-04	4.380E+04
Pu-239	1.800E-04	1.000E+04	6.145E-06	2.441E+06	3.779E-07	3.969E+07
Sr-90	1.090E-01	1360 p 1	7.460E-15	*1.365E+14	0.000E+00	*1.365E+14
U-234	8.200E-03	4964 p 5	1.151E+00	1.303E+01	1.151E+00	1.304E+01
U-235	2.780E-04	4964 p 5	1.136E+00	1.320E+01	1.136E+00	1.320E+01
U-238	2.710E-02	4962 p 5	1.125E+00	1.334E+01	1.123E+00	1.335E+01
*At specific activity limit						

These tables show that the contaminated concrete and rubble have more limiting concentrations than the biological shield activation.

Table 13 compares the calculated DCGLs for the concrete floors, based on an annual exposure of 15 mrem per year to a hypothetical person on the property, to the average values used in the modeling. The nuclides listed are those which were identified in laboratory analyses of the concrete samples.

Table 13. Calculated DCGLs For Concrete Floors, Based on the 15 mrem/yr Criterion

Nuclide	DCGL - unit mass ^a pCi/g	Modeled average ^b pCi/g	Ratio - modeled average to DCGL	DCGL - surface contamination ^c dpm/100 cm ²
H-3	4.23E+07	4.490E-01	1.06E-08	3.53E+11
C-14	9.50E+01	1.200E-01	1.07E-03	7.95E+05
Co-60	*1.13E+15	1.770E-02	1.57E-17	3.03E+18
Sr-90	*1.37E+14	1.090E-01	7.96E-16	1.13E+17
Cs-137	*8.70E+13	1.620E+00	1.86E-14	6.24E+17
U-234	1.30E+01	8.200E-03	6.90E-04	1.09E+05
U-235	1.32E+01	2.780E-04	1.46E-05	1.10E+05
U-238	1.33E+01	2.710E-02	2.04E-03	1.10E+05
Pu-239	2.44E+06	1.800E-04	7.38E-11	6.34E+09

Notes: a- Assumes all contamination concentrated in top 1 cm of floors, homogeneously distributed within that volume. The maximum values measured in concrete samples were used in calculating the total radionuclide inventory.

b- Average used in modeling.

c- Assumes all surface contamination contained in top 1 mm of surface.

* These nuclides were at the individual nuclide limit as calculated by RESRAD.

The ratios of the concentrations modeled to the DCGLs provide a measure of the difference between the concentrations required to produce 15 mrem per year and the average contamination in the contaminated floors of the structure. Note that the highest ratio is 0.00204 for U-238. The ratios for most radionuclides fall far below this value. The three radionuclides marked with an asterisk are shown to be insignificant in producing exposure under the RESRAD pathway scenario.

Table 14 shows the calculated DCGLs for an annual exposure of 100 mrem per year to a hypothetical person on the property.

Table 14. Calculated DCGLs For Concrete Floors, Based on 100 mrem/yr Criterion

Nuclide	DCGL - unit mass ^a pCi/g	Modeled average ^b pCi/g	Ratio - modeled average to DCGL	DCGL - surface contamination ^d dpm/100 cm ²
H-3	2.81E+08	4.490E-01	1.60E-09	2.35E+12
C-14	6.33E+02	1.200E-01	1.89E-04	5.30E+06
Co-60	2.41E+15	1.770E-02	7.33E-18	2.02E+19
Sr-90	9.01E+13	1.090E-01	1.21E-15	7.54E+17
Cs-137	4.97E+14	1.620E+00	3.26E-15	4.16E+18
U-234	8.67E+01	8.200E-03	9.46E-05	7.25E+05
U-235	8.80E+01	2.780E-04	3.16E-06	7.36E+05
U-238	9.87E+01	2.710E-02	3.06E-04	7.42E+05
Pu-239	4.97E+06	1.800E-04	3.62E-011	4.16E+10

Notes: a- Assumes all contamination concentrated in top 1 cm of floors, homogeneously distributed within that volume. The maximum values measured in concrete samples were used in calculating the total radionuclide inventory.

b- Average used in modeling.

c- Assumes all surface contamination contained in top 1 mm of surface.

8.3 Detailed RESRAD Results - With Radioactive Equipment in Place

The RESRAD summary report for the radioactivity associated with radioactive equipment, contaminated concrete and embedded piping appears in Appendix F.

Figure 12 shows the annual radiation exposure to a hypothetical individual on the property as calculated by RESRAD. Comparison of this figure with Figure 11 shows that there is not a significance difference associated with the installed equipment. Table 15 shows the RESRAD summary from page 28 of Appendix F. One can see that the DCGLs which appear in the $G(i, t_{min})$ column are identical to those of Table 12. This situation shows that neither the additional contamination inside of installed equipment nor the induced radioactivity in the biological shield affect the outcome of the RESRAD calculation.

TOTAL DOSE: All Isotopes and Pathways Summed

Figure 12. RESRAD Results With Present Source Term for Radioactive Equipment and Contaminated Concrete.

Table 15. RESRAD Results Summary - Installed Equipment, Biological Shield and Concrete and Rubble.

RESRAD, Version 5.621 T Limit = 0.5 year 04/16/97 13:17 Page 23
 Summary : HWCTR - Reactor vessel and both steam generators removed
 File : A:\TOT_INV.DAT

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 = 4965 p 5 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	1.460E-01	1243 p 1	8.397E-03	1.786E+03	7.567E-05	1.982E+05
C-14	1.500E-01	317.5 p 0.3	1.579E-01	9.500E+01	3.408E-12	4.401E+12
Co-60	2.300E+02	0.0000 p 0.0000	0.000E+00	*1.131E+15	0.000E+00	*1.131E+15
Cs-137	1.680E+00	0.0000 p 0.0000	0.000E+00	*8.701E+13	0.000E+00	*8.701E+13
Eu-152	5.612E+01	0.0000 p 0.0000	0.000E+00	*1.765E+14	0.000E+00	*1.765E+14
Eu-154	1.270E+00	0.0000 p 0.0000	0.000E+00	*2.639E+14	0.000E+00	*2.639E+14
H-3	2.260E+00	176.5 p 0.2	3.549E-07	4.227E+07	0.000E+00	*9.594E+15
Ni-59	2.040E-01	0.0000 p 0.0000	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	1.640E+01	0.0000 p 0.0000	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Pu-238	8.760E-03	5156 p 5	3.944E-04	3.804E+04	3.422E-04	4.383E+04
Pb-239	7.030E-02	1.000E+04	6.145E-06	2.441E+06	3.774E-07	3.974E+07
Sr-90	1.630E+00	1360 p 1	7.460E-15	*1.365E+14	0.000E+00	*1.365E+14
U-234	8.200E-03	4964 p 5	1.151E+00	1.303E+01	1.151E+00	1.304E+01
U-235	2.780E-04	4964 p 5	1.136E+00	1.320E+01	1.136E+00	1.320E+01
U-238	2.710E-02	4962 p 5	1.125E+00	1.334E+01	1.124E+00	1.335E+01

*At specific activity limit

8.4 Water-Dependent Pathways

The RESRAD calculations showed that radiation exposure to humans would come through water-dependent pathways. That is, radioactivity from the facility enters the ground water and is drawn from the ground water by a well on the property. Humans living on the property drink water from the well. They eat foodstuffs grown in a garden irrigated with water from the well. They drink milk from cows who drink water from the well and eat forage grown on the property. They also eat meat from these livestock.

The effects of these pathways are displayed in Figure 13.

Figure 13. RESRAD Doses from Water-Dependent Pathways

8.5 Radionuclides of Most Significance

One can see from Figure 13 that the most-significant radionuclides in the RESRAD calculation results are C-14, Am-241 and U-238. The C-14 peak occurs at approximately 300 years. The Am-241 peak occurs at approximately 100 years. At approximately 6000 years the peak associated with U-238 appears.

From this figure one can also see the relative contributions from water, plants, milk and meat. The dose fractions associated with each of these pathways are 0.76, 0.18, 0.04 and 0.02, respectively. Note that the contributions from the different pathways are additive. For example, the C-14 peaks together amount to 0.02 mrem per year. The total for Am-241 is 0.013 mrem per year and for U-238, 0.034 mrem per year.

8.6 Detailed RESRAD-BUILD Results

The RESRAD-BUILD summary report appears in Appendix G. The principal results appear on page 5 of the appendix. It is from the table on this page that the DCGLs of 15,000 dpm/100 cm² β - γ and 150 dpm/100 cm² α described in Section 8.1 were drawn.

The RESRAD-BUILD computer code does not produce graphs as does RESRAD.

9.0 REFERENCES

- OK1. Department of Energy Order 5400.5, *Radiation Protection of the Public and the Environment*. U.S. Department of Energy, Washington, D.C.
- OK2. *Decommissioning Resource Manual*. U.S. Department of Energy, Office of Environmental Management Manual DOE /EM-0246, August 1995.
- OK3. Yu, C., et. al., *Manual for Implementing Residual Radioactivity Material Guidelines Using RESRAD, Version 5.0*. Argonne National Laboratory, ANL/EAD/LD-2 (September 1993).
- OK4. Yu, C., et. al., *RESRAD-BUILD, A Computer Model for Analyzing the Radiological Doses Resulting from the Remedial and Occupancy of Buildings Contaminated With Radioactive Material*, Argonne National Laboratory, ANL/EAD/LD-3 (November 1994).
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- OK6. *Heavy Water Components Test Reactor Facility Characterization Report*. U. S. Department of Energy, Savannah River Site, Aiken, SC 29808 (September 1996).
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- OK7. *Savannah River Site Future Use Report*, U. S. Department of Energy, Savannah River Site, Aiken, SC 29808 (January 1996).
- OK8. Hsu, R. H. and Cook, J. R., *Soil Release Guidelines - Expanded RESRAD Study*, WSRC-RP-95-287, Westinghouse Savannah River Company, Savannah River Technology Center, Aiken, SC 29808 (March 1, 1995).
- OK9. Eger, K.J., *Final Consolidated Implementation Plan for the Shippingport Station Decommissioning Project Site Release Criteria*, KJE87-144a, Revision 1 (July 13, 1988).

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- OK 10. *Heavy Water Components Test Reactor Screening Characterization Study*, U S ENERGY Corporation, Aiken, SC 29803 (April 1996).
- OK 11. Field, F. R., *A Decommissioning Plan for the Heavy Water Components Test Reactor*, U.S. Atomic Energy Commission Report DPST-75-417, duPont Savannah River Plant , Aiken, SC 29808 (January 1976).

APPENDIX A

PARAMETERS USED IN ANALYSIS - SCENARIO A

This appendix identifies in tables the parameters used for the Scenario A calculation. Scenario A assumes that a family farm would be built on the HWCTR site, 30 or more years in the future. All RESRAD pathways were considered, except for the ingestion of fish from a pond on the property. References for this appendix can be found following the tables. Each of the parameters is defined in the RESRAD manual (reference 1).

Table 1. RESRAD Parameters For Biological Shield Calculation

Parameter	Unit	Value	Basis
Area of contaminated zone	m ²	1.240E+01	Area of activated region.
Thickness of contaminated zone	m	3	Height of activated region.
Length parallel to aquifer flow	m	7	Size of activated zone.
Basic radiation dose limit	mrem/yr	100, 15	DOE limit and ALARA value.
Times for calculations	yr	0 - 10 ⁴ yr	RESRAD standard values, ref. 1
Initial principal radionuclide concentration	-	-	Radionuclide values were based on
H-3	pCi/g	1.870E+01	the 1996 characterization data in
C-14	pCi/g	6.590E-03	ref. 2 averaged over the mass of the
Ni-59	pCi/g	4.530E-02	different components in the
Co-60	pCi/g	6.950E+03	activated region, such as rebar
Ni-63	pCi/g	3.620E+00	and concrete.
Sr-90	pCi/g	3.360E-01	
Ba-133	pCi/g	-	Eu-152 was used as a surrogate for Ba-133 (Ba-133 not in RESRAD)
Cs-137	pCi/g	1.250E-02	
Eu-152	pCi/g	1.790E+03	
Eu-154	pCi/g	3.980E+01	
U-234	pCi/g	3.620E-06	
U-238	pCi/g	7.760E-06	
Pu-238	pCi/g	1.940E-03	
Pu-239	pCi/g	1.550E-02	
Am-241	pCi/g	3.230E-02	
Initial principal radionuclide concentration	pCi/L	not used	Groundwater contamination not applicable to HWCTR.
Cover depth	m	5	Depth to activated region.
Density of cover material	g/cm ³	1.44	Based on soil borings, ref. 1 & 3.
Cover depth erosion rate	m/yr	9.000E-05	Ref. 4.
Contaminated zone density	g/cm ³	2.400	Ref. 1, density of concrete.
Contaminated zone erosion rate	m/yr	0.000	Ref. 1 default.
Contaminated zone total porosity	-	0.43	Ref. 1 & 5, data from well P-29.
Contaminated zone effective porosity	-	0.33	Ref. 1 & 5, data from well P-29.
Contaminated zone hydraulic conductivity	m/yr	1.520	Ref. 6, from laboratory tests.
Contaminated zone b parameter	-	5.300	Ref. 1 & 3, data from soil borings.

Table 1 (continued)

Parameter	Unit	Value	Basis
Humidity in air	g/m ³	11	Ref. 7.
Evapotranspiration coefficient	-	0.910	Ref. 1, 6, 8.
Precipitation	m/yr	1.200	Ref. 6.
Irrigation	m/yr	0.76	Ref. 8.
Parameter	Unit	Value	Basis
Irrigation mode	-	overhead	Ref. 1 default.
Runoff coefficient	-	0.400	Ref. 1.
Watershed area for nearby streams or pond	m ²	1.000E+06	Ref. 1 default.
Accuracy for water/soil computations	-	1.000E-03	Ref. 1 default.
Density of saturated zone	g/cm ³	1.440	Ref. 1 & 5. Data from well P-29.
Saturated zone total porosity	-	0.430	Ref. 1 & 5. Data from well P-29.
Saturated zone effective porosity	-	0.330	Ref. 1 & 5. Data from well P-29.
Saturated zone hydraulic conductivity	m/yr	546	Ref. 6.
Saturated zone hydraulic gradient	-	3.500E-03	Ref. 6.
Saturated zone b parameter	-	5.300	Ref. 1, 5, 6. Data from well P-29.
Water table drop rate	m/yr	0	More conservative than ref. 1 default of 1.000E-03.
Well pump intake depth	m	6.100	Ref. 7.
Nondispersion or mass-balance	-	MB	Ref. 1.
Well pumping rate	m ³ /yr	250	Ref. 1 default.
Number of unsaturated zone strata	-	1	Ref. 1 default.
Unsaturated zone 1 thickness	m	24.9	Distance from contaminated zone to groundwater below.
Unsaturated zone 1 soil density	g/cm ³	1.44	Ref. 1 & 3.
Unsaturated zone 1 total porosity	-	0.430	Ref. 1 & 5.
Unsaturated zone 1 effective porosity	-	0.330	Ref. 1 & 5.
Unsat. Zone 1 soil - specific b parameter	-	5.300	Ref. 1 & 3.
Unsat. Zone 1 hydraulic conductivity	m/yr	1.520	Ref. 6. From laboratory results.
Distribution coefficients for Am-241	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.900E+03	
Unsaturated zone 1	cm ³ /g	1.900E+03	
Saturated zone	cm ³ /g	1.900E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for C-14	-	-	Ref. 9.
Contaminated zone	cm ³ /g	2.000E+00	
Unsaturated zone 1	cm ³ /g	2.000E+00	
Saturated zone	cm ³ /g	2.000E+00	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Co-60	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+01	
Unsaturated zone 1	cm ³ /g	1.000E+01	
Saturated zone	cm ³ /g	1.000E+01	

Table 1 (continued)

Parameter	Unit	Value	Basis
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Cs-137	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.300E+02	
Unsaturated zone 1	cm ³ /g	3.300E+02	
Saturated zone	cm ³ /g	3.300E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Eu-152	-	-	Ref. 9.
Contaminated zone	cm ³ /g	2.450E+02	
Unsaturated zone 1	cm ³ /g	2.450E+02	
Saturated zone	cm ³ /g	2.450E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Eu-154	-	-	Ref. 9.
Contaminated zone	cm ³ /g	2.450E+02	
Unsaturated zone 1	cm ³ /g	2.450E+02	
Saturated zone	cm ³ /g	2.450E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for H-3	-	-	Ref. 11.
Contaminated zone	cm ³ /g	1	
Unsaturated zone 1	cm ³ /g	1	
Saturated zone	cm ³ /g	1	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Ni-59	-	-	Ref. 10.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Ni-63	-	-	Ref. 10.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Pu-238	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+02	
Unsaturated zone 1	cm ³ /g	1.000E+02	
Saturated zone	cm ³ /g	1.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	

Table 1 (continued)

Parameter	Unit	Value	Basis
Distribution coefficients for Pu-239	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+02	
Unsaturated zone 1	cm ³ /g	1.000E+02	
Saturated zone	cm ³ /g	1.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Sr-90	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+01	
Unsaturated zone 1	cm ³ /g	1.000E+01	
Saturated zone	cm ³ /g	1.000E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for U-234	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for U-238	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Ac-227	-	-	Ref. 9.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Gd-152	-	-	Ref. 1 default.
Contaminated zone	cm ³ /g	-1.00E+00	
Unsaturated zone 1	cm ³ /g	-1.00E+00	
Saturated zone	cm ³ /g	-1.00E+00	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Np-237	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.000E+00	
Unsaturated zone 1	cm ³ /g	5.000E+00	
Saturated zone	cm ³ /g	5.000E+00	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Pa-231	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.500E+02	

Table 1 (continued)

Parameter	Unit	Value	Basis
Unsaturated zone 1	cm ³ /g	5.500E+02	
Saturated zone	cm ³ /g	5.500E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Pb-210	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.500E+01	
Unsaturated zone 1	cm ³ /g	5.500E+01	
Saturated zone	cm ³ /g	5.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Ra-226	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.000E+02	
Unsaturated zone 1	cm ³ /g	5.000E+02	
Saturated zone	cm ³ /g	5.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Th-229	-	-	
Contaminated zone	cm ³ /g	3.000E+03	Ref. 9.
Unsaturated zone 1	cm ³ /g	3000E+03	
Saturated zone	cm ³ /g	3.000E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Th-230	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.000E+03	
Unsaturated zone 1	cm ³ /g	3000E+03	
Saturated zone	cm ³ /g	3.000E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter U-233	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter U-235	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Inhalation rate	m ³ /yr	8.000E+03	
Mass loading for inhalation	g/m ³	2.000E-04	Ref. 1 default.
Dilution length for airborne dust, inhalation	m	3	Ref. 1 default.
Exposure duration	yr	30	Ref. 1 default.

Table 1 (continued)

Parameter	Unit	Value	Basis
Shielding factor, inhalation	-	4.000E-01	Ref. 1 default.
Shielding factor, external gamma	-	7.000E-01	Ref. 1 default.
Fraction of time spent indoors	-	5.000E-01	Ref. 1 default.
Fraction of time spent outdoors (on site)	-	2.500E-01	Ref. 1 default.
Shape factor flag, external gamma	-	1	Ref. 1 default.
Fractions of annular areas within AREAS	-	not used	-
Fruits, vegetable and grains consumption	kg/yr	1.630E+02	Ref. 9.
Leafy vegetable consumption	kg/yr	2.100E+01	Ref. 9.
Milk consumption	L/yr	1.200E+02	Ref. 8.
Meat and poultry consumption	kg/yr	4.300E+01	Ref. 8.
Fish consumption	kg/yr	not used	-
Other seafood consumption	kg/yr	not used	-
Soil ingestion rate	g/yr	3.650E+01	Ref. 1 default.
Drinking water intake	L/yr	7.300E+02	Ref. 1 default.
Contaminated fraction of drinking water	-	1	Ref. 1 default.
Contaminated fraction of household water	-	1	Ref. 1 default.
Contaminated fraction of livestock water	-	1	Ref. 1 default.
Contaminated fraction of irrigation water	-	1	Ref. 1 default.
Contamination fraction of aquatic food	-	not used	-
Contaminated fraction of plant food	-	5.000E-01	Ref. 9.
Contaminated fraction of meat	-	5.000E-01	Ref. 9.
Contaminated fraction of milk	-	5.000E-01	Ref. 9.
Livestock fodder intake for meat	kg/day	4.400E+01	Ref. 9.
Livestock fodder intake for milk	kg/day	4.000E+01	Ref. 8.
Livestock water intake for meat	L/day	5.000E+01	Ref. 1 default.
Livestock water intake for milk	L/day	1.600E+02	Ref. 1 default.
Livestock soil intake	kg/day	5.000E-01	Ref. 1 default.
Mass loading for foliar deposition	g/m ³	1.000E-04	Ref. 1 default.
Depth of soil mixing layer	m	1.500E-01	Ref. 1 default.
Depth of roots	m	9.000E-01	Ref. 1 default.
Drinking water fraction from groundwater	-	1	Ref. 1 default.
Household water fraction of groundwater	-	1	Ref. 1 default.
Livestock water fraction from groundwater	-	1	Ref. 1 default.
Irrigation fraction from groundwater	-	1	Ref. 1 default.
C-12 concentration in water	g/cm ³	2.000E-05	Ref. 1 default.
C-12 concentration in contaminated soil	g/g	3.000E-02	Ref. 1 default.
Fraction of vegetation carbon from soil	-	2.000E-02	Ref. 1 default.
Fraction of vegetation carbon from air	-	9.800E-01	Ref. 1 default.
C-14 evasion layer thickness in soil	m	3.000E-01	Ref. 1 default.
C-14 evasion flux rate from soil	1/sec	7.000E-07	Ref. 1 default.
C-12 evasion flux rate from soil	1/sec	1.000E-10	Ref. 1 default.
Fraction of grain in beef cattle feed	-	7.500E-01	Ref. 8.
Fraction of grain in milk cow feed	-	5.600E-01	Ref. 8.

Table 1 (continued)

Parameter	Unit	Value	Basis
Storage times for contaminated foodstuffs	-	-	-
Fruits, non-leafy vegetables and grains	days	1.400E+01	Ref. 1 default.
Leafy vegetables	days	1	Ref. 1 default.
Milk	days	3	Ref. 1 default.
Meat and poultry	days	6	Ref. 1 default.
Fish	days	not used	-
Crustacea and mollusks	days	not used	-
Well water	days	1	Ref. 1 default.
Surface water	days	1	Ref. 1 default.
Livestock fodder	days	45	Ref. 1 default.
Thickness of building foundation	m	1.500E-01	Ref. 1 default.
Bulk density of building foundation	g/cm ³	2.4	Ref. 1 default.
Total porosity of cover material	-	0.4	Ref. 1 default.
Total porosity of building foundation	-	0.1	Ref. 1 default.
Volumetric water content of cover material	-	5.000E-02	Ref. 1 default.
Volumetric water content of the foundation	-	3.000E-02	Ref. 1 default.
Diffusion coefficient for radon gas	-	-	-
In cover material	m/sec	2.000E-06	Ref. 1 default.
In foundation material	m/sec	3.000E-07	Ref. 1 default.
In contaminated zone soil	m/sec	2.500E-08	Ref. 9.
Radon vertical dimension of mixing	m	2	Ref. 1 default.
Average annual wind speed	m/sec	2	Ref. 1 default.
Average building air exchange rate	1/hr	5.000E-01	Ref. 1 default.
Height of the building (room)	m	2.5	Ref. 1 default.
Building interior area factor	-	0	Ref. 1 default.
Building depth below ground surface	m	-2.5	Ref. 1 default.
Emanating power of Rn-222 gas	-	2.500E-01	Ref. 1 default.
Emanating power of Rn-220 gas	-	not used	-

Parameters for the second RESRAD run for contaminated concrete and imbedded radioactive piping appear in Table 2.

Table 2. RESRAD Parameters For Contaminated Concrete Calculation

Parameter	Unit	Value	Basis
Area of contaminated zone	m ²	3.150E+02	Area of contaminated region.
Thickness of contaminated zone	m	5	Height of concrete and rubble.
Length parallel to aquifer flow	m	21	Distance involved.
Basic radiation dose limit	mrem/yr	100, 15	DOE limit and ALARA value.
Times for calculations	yr	0 - 10 ⁴ yr	RESRAD standard values, ref. 1
Initial principal radionuclide concentration	-	-	Radionuclide values were based on
H-3	pCi/g	2.030E-01	the 1996 characterization data in
C-14	pCi/g	1.200E-01	ref. 2 averaged over the mass of the
Ni-59	pCi/g	2.890E-05	concrete structure and rubble to

Table 2 (continued)

Parameter	Unit	Value	Basis
Co-60	pCi/g	1.340E-02	remain in place.
Ni-63	pCi/g	2.310E-03	
Sr-90	pCi/g	1.090E-01	
Cs-137	pCi/g	1.620E+00	
U-234	pCi/g	8.200E-03	
U-235	pCi/g	2.780E-04	
U-238	pCi/g	6.180E-03	
Pu-238	pCi/g	1.970E-06	
Pu-239	pCi/g	1.800E-04	
Am-241	pCi/g	2.070E-05	
Initial principal radionuclide concentration	pCi/L	not used	Groundwater contamination not applicable to HWCTR.
Cover depth	m	13	Depth of clean earth fill.
Density of cover material	g/cm ³	1.44	Based on soil borings, ref. 1 & 3.
Cover depth erosion rate	m/yr	9.000E-05	Ref. 4.
Contaminated zone density	g/cm ³	2.400	Ref. 1, density of concrete.
Contaminated zone erosion rate	m/yr	0.000	Ref. 1 default.
Contaminated zone total porosity	-	0.43	Ref. 1 & 5, data from well P-29.
Contaminated zone effective porosity	-	0.33	Ref. 1 & 5, data from well P-29.
Contaminated zone hydraulic conductivity	m/yr	1.520	Ref. 6, from laboratory tests.
Contaminated zone b parameter	-	5.300	Ref. 1 & 3, data from soil borings.
Humidity in air	g/m ³	11	Ref. 7.
Evapotranspiration coefficient	-	0.910	Ref. 1, 6, 8.
Precipitation	m/yr	1.200	Ref. 6.
Irrigation	m/yr	0.76	Ref. 8.
Irrigation mode	-	overhead	Ref. 1 default.
Runoff coefficient	-	0.400	Ref. 1.
Watershed area for nearby streams or pond	m ²	1.000E+06	Ref. 1 default.
Accuracy for water/soil computations	-	1.000E-03	Ref. 1 default.
Density of saturated zone	g/cm ³	1.440	Ref. 1 & 5. Data from well P-29.
Saturated zone total porosity	-	0.430	Ref. 1 & 5. Data from well P-29.
Saturated zone effective porosity	-	0.330	Ref. 1 & 5. Data from well P-29.
Saturated zone hydraulic conductivity	m/yr	546	Ref. 6.
Saturated zone hydraulic gradient	-	3.500E-03	Ref. 6.
Saturated zone b parameter	-	5.300	Ref. 1, 5, 6. Data from well P-29.
Water table drop rate	m/yr	0	More conservative than ref. 1 default of 1.000E-03.
Well pump intake depth	m	6.100	Ref. 7.
Nondispersion or mass-balance	-	ND	Ref. 1.
Well pumping rate	m ³ /yr	250	Ref. 1 default.
Number of unsaturated zone strata	-	1	Ref. 1 default.
Unsaturated zone 1 thickness	m	15.5	Distance from contaminated zone to groundwater below.
Unsaturated zone 1 soil density	g/cm ³	1.44	Ref. 1 & 3.

Table 2 (continued)

Parameter	Unit	Value	Basis
Unsaturated zone 1 total porosity	-	0.430	Ref. 1 & 5.
Unsaturated zone 1 effective porosity	-	0.330	Ref. 1 & 5.
Unsat. Zone 1 soil - specific b parameter	-	5.300	Ref. 1 & 3.
Unsat. Zone 1 hydraulic conductivity	m/yr	1.520	Ref. 6. From laboratory results.
Distribution coefficients for Am-241	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.900E+03	
Unsaturated zone 1	cm ³ /g	1.900E+03	
Saturated zone	cm ³ /g	1.900E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for C-14	-	-	Ref. 9.
Contaminated zone	cm ³ /g	2.000E+00	
Unsaturated zone 1	cm ³ /g	2.000E+00	
Saturated zone	cm ³ /g	2.000E+00	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Co-60	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+01	
Unsaturated zone 1	cm ³ /g	1.000E+01	
Saturated zone	cm ³ /g	1.000E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Cs-137	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.300E+02	
Unsaturated zone 1	cm ³ /g	3.300E+02	
Saturated zone	cm ³ /g	3.300E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for H-3	-	-	Ref. 11.
Contaminated zone	cm ³ /g	1	
Unsaturated zone 1	cm ³ /g	1	
Saturated zone	cm ³ /g	1	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Ni-59	-	-	Ref. 10.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Ni-63	-	-	Ref. 10.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	

Table 1 (continued)

Parameter	Unit	Value	Basis
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Pu-238	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+02	
Unsaturated zone 1	cm ³ /g	1.000E+02	
Saturated zone	cm ³ /g	1.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Pu-239	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+02	
Unsaturated zone 1	cm ³ /g	1.000E+02	
Saturated zone	cm ³ /g	1.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Sr-90	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+01	
Unsaturated zone 1	cm ³ /g	1.000E+01	
Saturated zone	cm ³ /g	1.000E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for U-234	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for U-238	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Ac-227	-	-	Ref. 9.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Np-237	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.000E+00	
Unsaturated zone 1	cm ³ /g	5.000E+00	
Saturated zone	cm ³ /g	5.000E+00	
Leach rate	/yr	0	
Solubility constant	-	0	

Table 2 (continued)

Parameter	Unit	Value	Basis
Distribution coefficients - daughter Pa-231	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.500E+02	
Unsaturated zone 1	cm ³ /g	5.500E+02	
Saturated zone	cm ³ /g	5.500E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Pb-210	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.500E+01	
Unsaturated zone 1	cm ³ /g	5.500E+01	
Saturated zone	cm ³ /g	5.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Ra-226	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.000E+02	
Unsaturated zone 1	cm ³ /g	5.000E+02	
Saturated zone	cm ³ /g	5.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Th-229	-	-	
Contaminated zone	cm ³ /g	3.000E+03	Ref. 9.
Unsaturated zone 1	cm ³ /g	3000E+03	
Saturated zone	cm ³ /g	3.000E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Th-230	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.000E+03	
Unsaturated zone 1	cm ³ /g	3000E+03	
Saturated zone	cm ³ /g	3.000E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter U-233	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter U-235	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Inhalation rate	m ³ /yr	8.000E+03	
Mass loading for inhalation	g/m ³	2.000E-04	Ref. 1 default.

Table 2 (continued)

Parameter	Unit	Value	Basis
Dilution length for airborne dust, inhalation	m	3	Ref. 1 default.
Exposure duration	-	30	Ref. 1 default.
Shielding factor, inhalation	-	4.000E-01	Ref. 1 default.
Shielding factor, external gamma	-	7.000E-01	Ref. 1 default.
Fraction of time spent indoors	-	5.000E-01	Ref. 1 default.
Fraction of time spent outdoors (on site)	-	2.500E-01	Ref. 1 default.
Shape factor flag, external gamma	-	1	Ref. 1 default.
Fractions of annular areas within AREAS	-	not used	-
Fruits, vegetable and grains consumption	kg/yr	1.630E+02	Ref. 9.
Leafy vegetable consumption	kg/yr	2.100E+01	Ref. 9.
Milk consumption	L/yr	1.200E+02	Ref. 8.
Meat and poultry consumption	kg/yr	4.300+01	Ref. 8.
Fish consumption	kg/yr	not used	-
Other seafood consumption	kg/yr	not used	-
Soil ingestion rate	g/yr	3.650E+01	Ref. 1 default.
Drinking water intake	L/yr	7.300E+02	Ref. 1 default.
Contaminated fraction of drinking water	-	1	Ref. 1 default.
Contaminated fraction of household water	-	1	Ref. 1 default.
Contaminated fraction of livestock water	-	1	Ref. 1 default.
Contaminated fraction of irrigation water	-	1	Ref. 1 default.
Contamination fraction of aquatic food	-	not used	-
Contaminated fraction of plant food	-	5.000E-01	Ref. 9.
Contaminated fraction of meat	-	5.000E-01	Ref. 9.
Contaminated fraction of milk	-	5.000E-01	Ref. 9.
Livestock fodder intake for meat	kg/day	4.400E+01	Ref. 9.
Livestock fodder intake for milk	kg/day	4.400E+01	Ref. 9.
Livestock water intake for meat	L/day	5.000E+01	Ref. 1 default.
Livestock water intake for milk	L/day	1.600E+02	Ref. 1 default.
Livestock soil intake	kg/day	5.000E-01	Ref. 1 default.
Mass loading for foliar deposition	g/m ³	1.000E-04	Ref. 1 default.
Depth of soil mixing layer	m	1.500E-01	Ref. 1 default.
Depth of roots	m	9.000E-01	Ref. 1 default.
Drinking water fraction from groundwater	-	1	Ref. 1 default.
Household water fraction of groundwater	-	1	Ref. 1 default.
Livestock water fraction from groundwater	-	1	Ref. 1 default.
Irrigation fraction from groundwater	-	1	Ref. 1 default.
C-12 concentration in water	g/cm ³	2.000E-05	Ref. 1 default.
C-12 concentration in contaminated soil	g/g	3.000E-02	Ref. 1 default.
Fraction of vegetation carbon from soil	-	2.000E-02	Ref. 1 default.
Fraction of vegetation carbon from air	-	9.800E-01	Ref. 1 default.
C-14 evasion layer thickness in soil	m	3.000E-01	Ref. 1 default.
C-14 evasion flux rate from soil	1/sec	7.000E-07	Ref. 1 default.
C-12 evasion flux rate from soil	1/sec	1.000E-10	Ref. 1 default.
Fraction of grain in beef cattle feed	-	7.500E-01	Ref. 8.

Table 2 (continued)

Parameter	Unit	Value	Basis
Fraction of grain in milk cow feed	-	5.600E-01	Ref. 8.
Storage times for contaminated foodstuffs	-	-	-
Fruits, non-leafy vegetables and grains	days	1.400E+01	Ref. 1 default.
Leafy vegetables	days	1	Ref. 1 default.
Milk	days	3	Ref. 1 default.
Meat and poultry	days	6	Ref. 1 default.
Fish	days	not used	-
Crustacea and mollusks	days	not used	-
Well water	days	1	Ref. 1 default.
Surface water	days	1	Ref. 1 default.
Livestock fodder	days	45	Ref. 1 default.
Thickness of building foundation	m	1.500E-01	Ref. 1 default.
Bulk density of building foundation	g/cm ³	2.4	Ref. 1 default.
Total porosity of cover material	-	0.4	Ref. 1 default.
Total porosity of building foundation	-	0.1	Ref. 1 default.
Volumetric water content of cover material	-	5.000E-02	Ref. 1 default.
Volumetric water content of the foundation	-	3.000E-02	Ref. 1 default.
Diffusion coefficient for radon gas	-	-	-
In cover material	m/sec	2.000E-06	Ref. 1 default.
In foundation material	m/sec	3.000E-07	Ref. 1 default.
In contaminated zone soil	m/sec	2.500E-08	Ref. 9.
Radon vertical dimension of mixing	m	2	Ref. 1 default.
Average annual wind speed	m/sec	2	Ref. 1 default.
Average building air exchange rate	1/hr	5.000E-01	Ref. 1 default.
Height of the building (room)	m	2.5	Ref. 1 default.
Building interior area factor	-	0	Ref. 1 default.
Building depth below ground surface	m	-2.5	Ref. 1 default.
Emanating power of Rn-222 gas	-	2.500E-01	Ref. 1 default.
Emanating power of Rn-220 gas	-	not used	-

References

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APPENDIX B

PARAMETERS USED IN ANALYSIS - SCENARIO B

This appendix identifies in tables the parameters used for the Scenario B calculation. Scenario B entails constructing an administrative building on the property. The building is assumed to have a 4-meter-deep basement. References for this appendix can be found following the tables. Each of the parameters is defined in the RESRAD-BUILD manual (reference 1).

Table 1. RESRAD-BUILD Parameters for Scenario B

Parameter	Unit	Value	Basis
Number of sources	-	1	One wall of one-room basement.
Number of receptors	-	1	Office worker.
Total time	days	3.65E+02	
Fraction inside	-	2.30E-01	40 hours per week, 50 weeks per year.
Receptor information:	-	-	-
Room	-	1	
x	m	1.00	Receptor 1 m from wall on average.
y	m	10.50	At center point of contaminated wall.
z	m	1.25	Conservative distance above floor.
FracTime	-	1.00	All time in area.
Inhalation	m ³ /day	2.19E+01	
Ingestion of dust	m ² /hr	1.00E-04	Ref. 1 default.
Receptor-source relationship:	-	-	-
Source density	g/cm ³	2.40	Concrete wall density.
Source thickness	cm	0.00	Assumed entirely on surface.
Building information:	-	-	-
Air exchange rate	1/hr	8.00E-01	Ref. 1 default.
Deposition velocity	m/s	1.00E-02	Ref. 1 default.
Resuspension rate	1/s	5.00E-07	Ref. 1 default.
Room 1:	-	-	-
H1	m	2.500	Ref. 1 default, height of ceiling.
Area	m ²	53.3	Assumed size of basement.
LAMBDA	-	9.80E-01	
Q01	-	1.31E+02	
Q10	-	1.31E-02	
Q12	-	0.00	
Room 2:	-	-	-
H2	m	2.50	Ref. 1 default.
Area	m ²	36.00	Ref. 1 default.
LAMBDA	-	1.00	
N12	-	0.00	
Q21	-	0.00	Ref. 1 default.
Q20	-	6.00E+01	

Table 1 (continued)

Parameter	Unit	Value	Basis
Q02	-	6.00E+01	
Q23	-	3.00E+01	
Room 3:	-	-	
H3	m	2.50	Ref. 1 default.
Area	m ²	36.00	Ref. 1 default.
LAMBDA	-	1.00	
N23	-	0.00	Ref. 1 default.
Q32	-	3.00E+01	
Q30	-	6.00E+01	
Q03	-	6.00E+01	
Source information	-	-	
Source	-	1	
Location	-	room 1	
x	m	0.00	
y	m	10.50	
z	m	2.50	
Geometry	-		
Type	-	area	
Area	m ²	5.33E+01	
Direction	-	x	
Pathway:	-	-	
Direct ingestion rate	l/hr	0.000	
Fraction released to air	-	1.000E-01	
Removable fraction	-	5.000E-01	
Time to remove	days	3.65E+02	
Radon release fraction	-	1.000E-01	
Contamination - nuclide concentration	-	-	Concentrations based on ref. 2 data.
Am-241	pCi/m ²	6.630E+03	
Pu-239	pCi/m ²	7.490E+03	
Np-237	pCi/m ²	0.000	
U-238	pCi/m ²	2.870E+04	
U-235	pCi/m ²	0.00	
U-234	pCi/m ²	0.00	
U-233	pCi/m ²	0.00	
Pa-231	pCi/m ²	0.00	
Th-230	pCi/m ²	0.00	
Ac-227	pCi/m ²	0.00	
Ra-226	pCi/m ²	0.00	
Pb-210	pCi/m ²	0.00	
Cs-137	pCi/m ²	2.680E+06	
Sr-90	pCi/m ²	2.100E+06	
Co-60	pCi/m ²	7.140E+05	
C-14	pCi/m ²	5.170E+08	
H-3	pCi/m ²	1.830E+10	

References

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APPENDIX C

PARAMETERS USED IN ANALYSIS - SCENARIO A
(WITH ADDITIONAL SOURCE TERM)

This appendix identifies the parameters used for the Scenario A calculation, with the added assumption that all of the radioactive hardware but the reactor vessel and steam generators would remain in place. Scenario A assumes that a family farm would be built on the HWCTR site, 30 or more years in the future. All RESRAD pathways were considered, except for the ingestion of fish from a pond on the property. The values in this table are similar to those of Table 2 of Appendix A except for the radionuclide concentrations which were increased to account for leaving the radioactive hardware in place, and Ba-133, Eu-152 and Eu-154 added because the biological shield activity was included in the calculation.

References for this appendix can be found following the tables. Each of the parameters is defined in the RESRAD manual (reference 1).

Table 1. RESRAD Parameters With Radioactive Hardware in Place

Parameter	Unit	Value	Basis
Area of contaminated zone	m ²	3.150E+02	Area of contaminated region.
Thickness of contaminated zone	m	5	Height of concrete and rubble.
Length parallel to aquifer flow	m	21	Distance involved.
Basic radiation dose limit	mrem/yr	100, 15	DOE limit and ALARA value.
Times for calculations	yr	0 - 10 ⁴ yr	RESRAD standard values, ref. 1
Initial principal radionuclide concentration	-	-	Radionuclide values were based on
H-3	pCi/g	2.260E+00	the 1996 characterization data in
C-14	pCi/g	1.500E-01	ref. 2 averaged over the mass of the
Ni-59	pCi/g	2.040E-01	concrete structure, rubble and
Co-60	pCi/g	2.230E+02	radioactive equipment to
Ni-63	pCi/g	1.640E+01	remain in place. Radioactivity
Sr-90	pCi/g	1.630E+00	associated with equipment except
Ba-133	pCi/g	-	the reactor vessel and steam
Cs-137	pCi/g	1.680E+00	generators was included, along
Eu-152	pCi/g	2.030E+01	with activation in the biological
Eu-154	pCi/g	1.270E+00	shield. Note that Eu-152 was used
U-234	pCi/g	8.220E-03	as a surrogate for Ba-133 in the
U-235	pCi/g	2.780E-04	calculation.
U-238	pCi/g	2.720E-02	
Pu-238	pCi/g	8.760E-03	
Pu-239	pCi/g	7.030E-02	
Am-241	pCi/g	1.460E-01	
Initial principal radionuclide concentration	pCi/L	not used	Groundwater contamination not applicable to HWCTR.

Table 1 (continued)

Parameter	Unit	Value	Basis
Cover depth	m	13	Depth of clean earth fill.
Density of cover material	g/cm ³	1.44	Based on soil borings, ref. 1 & 3.
Cover depth erosion rate	m/yr	9.000E-05	Ref. 4.
Contaminated zone density	g/cm ³	2.400	Ref. 1, density of concrete.
Contaminated zone erosion rate	m/yr	0.000	Ref. 1 default.
Contaminated zone total porosity	-	0.43	Ref. 1 & 5, data from well P-29.
Contaminated zone effective porosity	-	0.33	Ref. 1 & 5, data from well P-29.
Contaminated zone hydraulic conductivity	m/yr	1.520	Ref. 6, from laboratory tests.
Contaminated zone b parameter	-	5.300	Ref. 1 & 3, data from soil borings.
Humidity in air	g/m ³	11	Ref. 7.
Evapotranspiration coefficient	-	0.910	Ref. 1, 6, 8.
Precipitation	m/yr	1.200	Ref. 6.
Irrigation	m/yr	0.76	Ref. 8.
Irrigation mode	-	overhead	Ref. 1 default.
Runoff coefficient	-	0.400	Ref. 1.
Watershed area for nearby streams or pond	m ²	1.000E+06	Ref. 1 default.
Accuracy for water/soil computations	-	1.000E-03	Ref. 1 default.
Density of saturated zone	g/cm ³	1.440	Ref. 1 & 5. Data from well P-29.
Saturated zone total porosity	-	0.430	Ref. 1 & 5. Data from well P-29.
Saturated zone effective porosity	-	0.330	Ref. 1 & 5. Data from well P-29.
Saturated zone hydraulic conductivity	m/yr	546	Ref. 6.
Saturated zone hydraulic gradient	-	3.500E-03	Ref. 6.
Saturated zone b parameter	-	5.300	Ref. 1, 5, 6. Data from well P-29.
Water table drop rate	m/yr	0	More conservative than ref. 1 default of 1.000E-03.
Well pump intake depth	m	6.100	Ref. 7.
Nondispersion or mass-balance	-	ND	Ref. 1.
Well pumping rate	m ³ /yr	250	Ref. 1 default.
Number of unsaturated zone strata	-	1	Ref. 1 default.
Unsaturated zone 1 thickness	m	15.5	Distance from contaminated zone to groundwater below.
Unsaturated zone 1 soil density	g/cm ³	1.44	Ref. 1 & 3.
Unsaturated zone 1 total porosity	-	0.430	Ref. 1 & 5.
Unsaturated zone 1 effective porosity	-	0.330	Ref. 1 & 5.
Unsat. Zone 1 soil - specific b parameter	-	5.300	Ref. 1 & 3.
Unsat. Zone 1 hydraulic conductivity	m/yr	1.520	Ref. 6. From laboratory results.
Distribution coefficients for Am-241	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.900E+03	
Unsaturated zone 1	cm ³ /g	1.900E+03	
Saturated zone	cm ³ /g	1.900E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for C-14	-	-	Ref. 9.

Table 1 (continued)

Parameter	Unit	Value	Basis
Contaminated zone	cm ³ /g	2.000E+00	
Unsaturated zone 1	cm ³ /g	2.000E+00	
Saturated zone	cm ³ /g	2.000E+00	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Co-60	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+01	
Unsaturated zone 1	cm ³ /g	1.000E+01	
Saturated zone	cm ³ /g	1.000E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Cs-137	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.300E+02	
Unsaturated zone 1	cm ³ /g	3.300E+02	
Saturated zone	cm ³ /g	3.300E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for H-3	-	-	Ref. 11.
Contaminated zone	cm ³ /g	1	
Unsaturated zone 1	cm ³ /g	1	
Saturated zone	cm ³ /g	1	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Ni-59	-	-	Ref. 10.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Ni-63	-	-	Ref. 10.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Pu-238	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+02	
Unsaturated zone 1	cm ³ /g	1.000E+02	
Saturated zone	cm ³ /g	1.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Pu-239	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+02	

Table 1 (continued)

Parameter	Unit	Value	Basis
Unsaturated zone 1	cm ³ /g	1.000E+02	
Saturated zone	cm ³ /g	1.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for Sr-90	-	-	Ref. 9.
Contaminated zone	cm ³ /g	1.000E+01	
Unsaturated zone 1	cm ³ /g	1.000E+01	
Saturated zone	cm ³ /g	1.000E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for U-234	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients for U-238	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Ac-227	-	-	Ref. 9.
Contaminated zone	cm ³ /g	4.000E+02	
Unsaturated zone 1	cm ³ /g	4.000E+02	
Saturated zone	cm ³ /g	4.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Np-237	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.000E+00	
Unsaturated zone 1	cm ³ /g	5.000E+00	
Saturated zone	cm ³ /g	5.000E+00	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Pa-231	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.500E+02	
Unsaturated zone 1	cm ³ /g	5.500E+02	
Saturated zone	cm ³ /g	5.500E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Pb-210	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.500E+01	
Unsaturated zone 1	cm ³ /g	5.500E+01	

Table 1 (continued)

Parameter	Unit	Value	Basis
Saturated zone	cm ³ /g	5.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Ra-226	-	-	Ref. 9.
Contaminated zone	cm ³ /g	5.000E+02	
Unsaturated zone 1	cm ³ /g	5.000E+02	
Saturated zone	cm ³ /g	5.000E+02	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Th-229	-	-	
Contaminated zone	cm ³ /g	3.000E+03	Ref. 9.
Unsaturated zone 1	cm ³ /g	3000E+03	
Saturated zone	cm ³ /g	3.000E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter Th-230	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.000E+03	
Unsaturated zone 1	cm ³ /g	3000E+03	
Saturated zone	cm ³ /g	3.000E+03	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter U-233	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Distribution coefficients - daughter U-235	-	-	Ref. 9.
Contaminated zone	cm ³ /g	3.500E+01	
Unsaturated zone 1	cm ³ /g	3.500E+01	
Saturated zone	cm ³ /g	3.500E+01	
Leach rate	/yr	0	
Solubility constant	-	0	
Inhalation rate	m ³ /yr	8.000E+03	
Mass loading for inhalation	g/m ³	2.000E-04	Ref. 1 default.
Dilution length for airborne dust, inhalation	m	3	Ref. 1 default.
Exposure duration	-	30	Ref. 1 default.
Shielding factor, inhalation	-	4.000E-01	Ref. 1 default.
Shielding factor, external gamma	-	7.000E-01	Ref. 1 default.
Fraction of time spent indoors	-	5.000E-01	Ref. 1 default.
Fraction of time spent outdoors (on site)	-	2.500E-01	Ref. 1 default.
Shape factor flag, external gamma	-	1	Ref. 1 default.
Fractions of annular areas within AREAS	-	not used	-

Table 1 (continued)

Parameter	Unit	Value	Basis
Fruits, vegetable and grains consumption	kg/yr	1.630E+02	Ref. 9.
Leafy vegetable consumption	kg/yr	2.100E+01	Ref. 9.
Milk consumption	L/yr	1.200E+02	Ref. 8.
Meat and poultry consumption	kg/yr	4.300+01	Ref. 8.
Fish consumption	kg/yr	not used	-
Other seafood consumption	kg/yr	not used	-
Soil ingestion rate	g/yr	3.650E+01	Ref. 1 default.
Drinking water intake	L/yr	7.300E+02	Ref. 1 default.
Contaminated fraction of drinking water	-	1	Ref. 1 default.
Contaminated fraction of household water	-	1	Ref. 1 default.
Contaminated fraction of livestock water	-	1	Ref. 1 default.
Contaminated fraction of irrigation water	-	1	Ref. 1 default.
Contamination fraction of aquatic food	-	not used	-
Contaminated fraction of plant food	-	5.000E-01	Ref. 9.
Contaminated fraction of meat	-	5.000E-01	Ref. 9.
Contaminated fraction of milk	-	5.000E-01	Ref. 9.
Livestock fodder intake for meat	kg/day	4.400E+01	Ref. 9.
Livestock fodder intake for milk	kg/day	4.400E+01	Ref. 9.
Livestock water intake for meat	L/day	5.000E+01	Ref. 1 default.
Livestock water intake for milk	L/day	1.600E+02	Ref. 1 default.
Livestock soil intake	kg/day	5.000E-01	Ref. 1 default.
Mass loading for foliar deposition	g/m ²	1.000E-04	Ref. 1 default.
Depth of soil mixing layer	m	1.500E-01	Ref. 1 default.
Depth of roots	m	9.000E-01	Ref. 1 default.
Drinking water fraction from groundwater	-	1	Ref. 1 default.
Household water fraction of groundwater	-	1	Ref. 1 default.
Livestock water fraction from groundwater	-	1	Ref. 1 default.
Irrigation fraction from groundwater	-	1	Ref. 1 default.
C-12 concentration in water	g/cm ³	2.000E-05	Ref. 1 default.
C-12 concentration in contaminated soil	g/g	3.000E-02	Ref. 1 default.
Fraction of vegetation carbon from soil	-	2.000E-02	Ref. 1 default.
Fraction of vegetation carbon from air	-	9.800E-01	Ref. 1 default.
C-14 evasion layer thickness in soil	m	3.000E-01	Ref. 1 default.
C-14 evasion flux rate from soil	l/sec	7.000E-07	Ref. 1 default.
C-12 evasion flux rate from soil	l/sec	1.000E-10	Ref. 1 default.
Fraction of grain in beef cattle feed	-	7.500E-01	Ref. 8.
Fraction of grain in milk cow feed	-	5.600E-01	Ref. 8.
Storage times for contaminated foodstuffs	-	-	-
Fruits, non-leafy vegetables and grains	days	1.400E+01	Ref. 1 default.
Leafy vegetables	days	1	Ref. 1 default.
Milk	days	3	Ref. 1 default.
Meat and poultry	days	6	Ref. 1 default.
Fish	days	not used	-

Table 1 (continued)

Parameter	Unit	Value	Basis
Crustacea and mollusks	days	not used	-
Well water	days	1	Ref. 1 default.
Surface water	days	1	Ref. 1 default.
Livestock fodder	days	45	Ref. 1 default.
Thickness of building foundation	m	1.500E-01	Ref. 1 default.
Bulk density of building foundation	g/cm ³	2.4	Ref. 1 default.
Total porosity of cover material	-	0.4	Ref. 1 default.
Total porosity of building foundation	-	0.1	Ref. 1 default.
Volumetric water content of cover material	-	5.000E-02	Ref. 1 default.
Volumetric water content of the foundation	-	3.000E-02	Ref. 1 default.
Diffusion coefficient for radon gas	-	-	-
In cover material	m/sec	2.000E-06	Ref. 1 default.
In foundation material	m/sec	3.000E-07	Ref. 1 default.
In contaminated zone soil	m/sec	2.500E-08	Ref. 9.
Radon vertical dimension of mixing	m	2	Ref. 1 default.
Average annual wind speed	m/sec	2	Ref. 1 default.
Average building air exchange rate	1/hr	5.000E-01	Ref. 1 default.
Height of the building (room)	m	2.5	Ref. 1 default.
Building interior area factor	-	0	Ref. 1 default.
Building depth below ground surface	m	-2.5	Ref. 1 default.
Emanating power of Rn-222 gas	-	2.500E-01	Ref. 1 default.
Emanating power of Rn-220 gas	-	not used	-

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Appendix D

RESRAD Summary Report

Biological Shield

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AAAAAAAAAAAAAAAAAAAA

Part I: Mixture Sums and Single Radionuclide Guidelines

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Time = 0.000E+00	17
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Time = 1.000E+01	19
Time = 3.000E+01	20
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Dose Conversion Factor (and Related) Parameter Summary
 File: DOSFAC.BIN

Menu	Parameter	Current	Default	Parameter
		Value		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	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	C-14	2.090E-06	2.090E-06	DCF2(3)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(4)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(5)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(6)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(8)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(9)
B-1	H-3	6.400E-08	6.400E-08	DCF2(10)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(11)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(12)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(13)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(14)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(15)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(16)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(17)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2(18)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(19)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(20)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(21)
B-1	U-233	1.350E-01	1.350E-01	DCF2(22)
B-1	U-234	1.320E-01	1.320E-01	DCF2(23)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(24)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(25)

D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	C-14	2.090E-06	2.090E-06	DCF3(3)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(4)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(5)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(6)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(8)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(9)
D-1	H-3	6.400E-08	6.400E-08	DCF3(10)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(11)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(12)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(13)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(14)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(15)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(16)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(17)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(18)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(19)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(20)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(21)
D-1	U-233	2.890E-04	2.890E-04	DCF3(22)
D-1	U-234	2.830E-04	2.830E-04	DCF3(23)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(24)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(25)

Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
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 *	Am-241, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34 *	Am-241, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34 *	Am-241, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34 *	C-14, plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(3,1)
D-34 *	C-14, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(3,2)
D-34 *	C-14, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(3,3)
D-34 *	Co-60, plant/soil concentration ratio, dimensionless	9.000E-02	8.000E-02	RTF(4,1)
D-34 *	Co-60, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(4,2)
D-34 *	Co-60, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(4,3)
D-34 *	Cs-137+D, plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34 *	Cs-137+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(5,2)
D-34 *	Cs-137+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(5,3)
D-34 *	Eu-152, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34 *	Eu-152, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(6,2)
D-34 *	Eu-152, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)
D-34 *	Eu-154, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34 *	Eu-154, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,2)
D-34 *	Eu-154, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,3)
D-34 *	Gd-152, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34 *	Gd-152, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(9,2)
D-34 *	Gd-152, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(9,3)
D-34 *	H-3, plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(10,1)
D-34 *	H-3, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(10,2)
D-34 *	H-3, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(10,3)
D-34 *	Ni-59, plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(11,1)
D-34 *	Ni-59, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(11,2)
D-34 *	Ni-59, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(11,3)
D-34 *	Ni-63, plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(12,1)
D-34 *	Ni-63, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(12,2)
D-34 *	Ni-63, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(12,3)
D-34 *	Np-237+D, plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(13,1)
D-34 *	Np-237+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(13,2)
D-34 *	Np-237+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)

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

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-34	P-231, plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(14,1)
D-34	Pa-231, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(14,2)
D-34	Pa-231, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(14,3)
D-34				
D-34	Pb-210+D, plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(15,1)
D-34	Pb-210+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(15,2)
D-34	Pb-210+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(15,3)
D-34				
D-34	Pu-238, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(16,1)
D-34	Pu-238, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(16,2)
D-34	Pu-238, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(16,3)
D-34				
D-34	Pu-239, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(17,1)
D-34	Pu-239, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(17,2)
D-34	Pu-239, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(17,3)
D-34				
D-34	Ra-226+D, plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(18,1)
D-34	Ra-226+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(18,2)
D-34	Ra-226+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(18,3)
D-34				
D-34	Sr-90+D, plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(19,1)
D-34	Sr-90+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(19,2)
D-34	Sr-90+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(19,3)
D-34				
D-34	Th-229+D, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(20,1)
D-34	Th-229+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(20,2)
D-34	Th-229+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(20,3)
D-34				
D-34	Th-230, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(21,1)
D-34	Th-230, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(21,2)
D-34	Th-230, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(21,3)
D-34				
D-34	U-233, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(22,1)
D-34	U-233, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(22,2)
D-34	U-233, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(22,3)
D-34				
D-34	U-234, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(23,1)
D-34	U-234, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(23,2)
D-34	U-234, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(23,3)
D-34				
D-34	U-235+D, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(24,1)
D-34	U-235+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(24,2)
D-34	U-235+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(24,3)
D-34				
D-34	U-238+D, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(25,1)
D-34	U-238+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(25,2)
D-34	U-238+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(25,3)
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)

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

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Am-241, fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	C-14, fish	5.000E+04	5.000E+04	BIOFAC(3,1)
D-5	C-14, crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(3,2)
D-5				
D-5	Co-60, fish	3.000E+02	3.000E+02	BIOFAC(4,1)
D-5	Co-60, crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(4,2)
D-5				
D-5	Cs-137+D, fish	2.000E+03	2.000E+03	BIOFAC(5,1)
D-5	Cs-137+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)
D-5				
D-5	Su-152, fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Su-152, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Su-154, fish	5.000E+01	5.000E+01	BIOFAC(8,1)
D-5	Su-154, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
D-5				
D-5	Gd-152, fish	2.500E+01	2.500E+01	BIOFAC(9,1)
D-5	Gd-152, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(9,2)
D-5				
D-5	H-3, fish	1.000E+00	1.000E+00	BIOFAC(10,1)
D-5	H-3, crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(10,2)
D-5				
D-5	Ni-59, fish	1.000E+02	1.000E+02	BIOFAC(11,1)
D-5	Ni-59, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Ni-63, fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Ni-63, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(12,2)
D-5				
D-5	Np-237+D, fish	3.000E+01	3.000E+01	BIOFAC(13,1)
D-5	Np-237+D, crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(13,2)
D-5				
D-5	Pa-231, fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	Pa-231, crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(14,2)
D-5				
D-5	Pb-210+D, fish	3.000E+02	3.000E+02	BIOFAC(15,1)
D-5	Pb-210+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(15,2)
D-5				
D-5	Pu-238, fish	3.000E+01	3.000E+01	BIOFAC(16,1)
D-5	Pu-238, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(16,2)
D-5				
D-5	Pu-239, fish	3.000E+01	3.000E+01	BIOFAC(17,1)
D-5	Pu-239, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(17,2)
D-5				
D-5	Ra-226+D, fish	5.000E+01	5.000E+01	BIOFAC(18,1)
D-5	Ra-226+D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(18,2)
D-5				
D-5	Sr-90+D, fish	6.000E+01	6.000E+01	BIOFAC(19,1)
D-5	Sr-90+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(19,2)
D-5				

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: DOSFAC.BIN

Menu	Parameter	Current		Parameter
		Value	Default	Name

D-5	Th-229-D, fish	1.000E+02	1.000E+02	BIOFAC(20,1)
D-5	Th-229-D, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(20,2)
D-5				
D-5	Th-230, fish	1.000E+02	1.000E+02	BIOFAC(21,1)
D-5	Th-230, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(21,2)
D-5				
D-5	U-233, fish	1.000E+01	1.000E+01	BIOFAC(22,1)
D-5	U-233, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(22,2)
D-5				
D-5	U-234, fish	1.000E+01	1.000E+01	BIOFAC(23,1)
D-5	U-234, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(23,2)
D-5				
D-5	U-235-D, fish	1.000E+01	1.000E+01	BIOFAC(24,1)
D-5	U-235-D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(24,2)
D-5				
D-5	238-D, fish	1.000E+01	1.000E+01	BIOFAC(25,1)
D-5	238-D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(25,2)

Site-Specific Parameter Summary

Menu	Parameter	User	Input	Default	(If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.240E+01	1.000E+04			AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00			THICKO
R011	Length parallel to aquifer flow (m)	7.000E+00	1.000E+02			LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+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+01	3.000E+00			T (3)
R011	Times for calculations (yr)	3.000E+01	1.000E+01			T (4)
R011	Times for calculations (yr)	5.000E+01	3.000E+01			T (5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02			T (6)
R011	Times for calculations (yr)	5.000E+02	3.000E+02			T (7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03			T (8)
R011	Times for calculations (yr)	1.000E+04	0.000E+00			T (9)
R011	Times for calculations (yr)	not used	0.000E+00			T (10)
R012	Initial principal radionuclide (pCi/g)	Am-241	3.230E-02	0.000E+00		SI (2)
R012	Initial principal radionuclide (pCi/g)	C-14	6.590E-03	0.000E+00		SI (3)
R012	Initial principal radionuclide (pCi/g)	Co-60	6.950E+03	0.000E+00		SI (4)
R012	Initial principal radionuclide (pCi/g)	Cs-137	1.250E-02	0.000E+00		SI (5)
R012	Initial principal radionuclide (pCi/g)	Eu-152	1.790E+03	0.000E+00		SI (6)
R012	Initial principal radionuclide (pCi/g)	Eu-154	3.980E+01	0.000E+00		SI (8)
R012	Initial principal radionuclide (pCi/g)	H-3	1.870E+01	0.000E+00		SI (10)
R012	Initial principal radionuclide (pCi/g)	Ni-59	4.530E-02	0.000E+00		SI (11)
R012	Initial principal radionuclide (pCi/g)	Ni-63	3.620E+00	0.000E+00		SI (12)
R012	Initial principal radionuclide (pCi/g)	Pu-238	1.940E-03	0.000E+00		SI (16)
R012	Initial principal radionuclide (pCi/g)	Pu-239	1.550E-02	0.000E+00		SI (17)
R012	Initial principal radionuclide (pCi/g)	Sr-90	3.360E-01	0.000E+00		SI (19)
R012	Initial principal radionuclide (pCi/g)	U-234	3.620E-06	0.000E+00		SI (23)
R012	Initial principal radionuclide (pCi/g)	U-238	7.760E-06	0.000E+00		SI (25)
R012	Concentration in groundwater (pCi/L)	Am-241	not used	0.000E+00		MI (2)
R012	Concentration in groundwater (pCi/L)	C-14	not used	0.000E+00		MI (3)
R012	Concentration in groundwater (pCi/L)	Co-60	not used	0.000E+00		MI (4)
R012	Concentration in groundwater (pCi/L)	Cs-137	not used	0.000E+00		MI (5)
R012	Concentration in groundwater (pCi/L)	Eu-152	not used	0.000E+00		MI (6)
R012	Concentration in groundwater (pCi/L)	Eu-154	not used	0.000E+00		MI (8)
R012	Concentration in groundwater (pCi/L)	H-3	not used	0.000E+00		MI (10)
R012	Concentration in groundwater (pCi/L)	Ni-59	not used	0.000E+00		MI (11)
R012	Concentration in groundwater (pCi/L)	Ni-63	not used	0.000E+00		MI (12)
R012	Concentration in groundwater (pCi/L)	Pu-238	not used	0.000E+00		MI (16)
R012	Concentration in groundwater (pCi/L)	Pu-239	not used	0.000E+00		MI (17)
R012	Concentration in groundwater (pCi/L)	Sr-90	not used	0.000E+00		MI (19)
R012	Concentration in groundwater (pCi/L)	U-234	not used	0.000E+00		MI (23)
R012	Concentration in groundwater (pCi/L)	U-238	not used	0.000E+00		MI (25)
R013	Cover depth (m)	5.000E+00	0.000E+00			COVERO
R013	Density of cover material (g/cm**3)	1.440E+00	1.500E+00			DENSCV
R013	Cover depth erosion rate (m/yr)	9.000E-05	1.000E-03			VCV
R013	Density of contaminated zone (g/cm**3)	2.400E+00	1.500E+00			DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03			VCZ
R013	Contaminated zone total porosity	4.300E-01	4.000E-01			TPCZ
R013	Contaminated zone effective porosity	3.300E-01	2.000E-01			EP CZ

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Contaminated zone hydraulic conductivity (m/yr)	1.520E+00	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	1.100E+01	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.100E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.200E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R012	Watershed area for nearby stream or pond (m**2)	1.000E+06	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)	1.440E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	3.300E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.460E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	3.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+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)	6.100E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	2.490E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.440E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	3.300E-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)	1.520E+00	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.736E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.605E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+03	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	1.000E+01	1.000E+03	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+03	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.823E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	3.300E+02	1.000E+03	---	DCNUCC (5)
R016	Unsaturated zone 1 (cm**3/g)	3.300E+02	1.000E+03	---	DCNUCU (5,1)
R016	Saturated zone (cm**3/g)	3.300E+02	1.000E+03	---	DCNUCS (5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.604E-05	ALEACH (5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (5)
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	2.450E+02	1.000E+00	---	DCNUCC (6)
R016	Unsaturated zone 1 (cm**3/g)	2.450E+02	1.000E+00	---	DCNUCU (6,1)
R016	Saturated zone (cm**3/g)	2.450E+02	1.000E+00	---	DCNUCS (6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.546E-05	ALEACH (6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (6)
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	2.450E+02	1.000E+00	---	DCNUCC (8)
R016	Unsaturated zone 1 (cm**3/g)	2.450E+02	1.000E+00	---	DCNUCU (8,1)
R016	Saturated zone (cm**3/g)	2.450E+02	1.000E+00	---	DCNUCS (8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.546E-05	ALEACH (8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (8)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCC (10)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (10,1)
R016	Saturated zone (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCS (10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.609E-02	ALEACH (10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (10)
R016	Distribution coefficients for Ni-59				
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCC (11)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (11,1)
R016	Saturated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS (11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.623E-05	ALEACH (11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (11)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCC (12)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (12,1)
R016	Saturated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS (12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.623E-05	ALEACH (12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (12)
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCC (16)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCU (16,1)
R016	Saturated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCS (16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.847E-04	ALEACH (16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (16)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.847E-04	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)

R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.823E-03	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)

R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.263E-04	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)

R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.263E-04	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)

R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.623E-05	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

R016	Distribution coefficients for daughter Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.212E-05	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)

R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCU(13,1)
R016	Saturated zone (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.592E-03	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)

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 Pa-231				
R016	Contaminated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCC(14)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU(14,1)
R016	Saturated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCS(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.363E-05	ALEACH(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(14)

R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCU(15,1)
R016	Saturated zone (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.354E-04	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)

R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCC(18)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(18,1)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.699E-05	ALEACH(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(18)

R016	Distribution coefficients for daughter Th-229				
R016	Contaminated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.166E-06	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)

R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCS(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.166E-06	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)

R016	Distribution coefficients for daughter U-233				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(22,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.263E-04	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)

R016	Distribution coefficients for daughter U-235				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.263E-04	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)

R017	Inhalation rate (m**3/yr)	8.000E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
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	Radius 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)	1.630E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	2.100E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.200E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	4.300E+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)	7.300E+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	---	FHW
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	5.000E-01	-1	---	FPLANT
R018	Contamination fraction of meat	5.000E-01	-1	---	FMEAT
R018	Contamination fraction of milk	5.000E-01	-1	---	FMILK

Site-Specific Parameter Summary (continued)

Menu	Parameter	User	Default	(If different from user input)	Name
		Used by RESRAD			Parameter

R019	Livestock fodder intake (kg/day)	4.400E+01	6.800E+01	---	LFIS
R019	Livestock fodder intake for meat (kg/day)	4.400E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWIS
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LW16
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)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGMDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGMDH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGMLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGMIR
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	7.500E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	5.600E-01	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	3.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	6.000E+00	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 foundation	5.000E-02	5.000E-02	---	PHZOCV
R021	Diffusion coefficient for radon gas (m/sec):	3.000E-02	3.000E-02	---	PHZOFL
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	2.500E-08	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)	2.000E+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	---	FAL
R021	Building depth below ground surface (m)	-2.500E+00	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	---	EMANA(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
	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
Area: 12.40 square meters
Thickness: 3.00 meters
Cover Depth: 5.00 meters

Am-241	3.230E-02
C-14	6.590E-03
Co-60	6.950E-03
Cs-137	1.250E-02
Eu-152	1.790E-03
Eu-154	3.980E-01
H-3	1.870E+01
Ni-59	4.530E-02
Ni-63	3.620E+00
Pu-238	1.940E-03
Pu-239	1.550E-02
Sr-90	3.360E-01
U-234	3.620E-06
U-238	7.760E-06

Total Dose TDSE(c), mrem/yr
Basic Radiation Dose Limit = 15 mrem/yr
Total Mixture Sum M(c) = Fraction of Basic Dose Limit Received at Time (c)
c (years): 0.000E+00 1.000E+00 1.000E+01 3.000E+01 5.000E+01 1.000E+02 5.000E+03 1.000E+04
TDSE(c): 1.977E-20 1.322E-15 1.195E-13 1.080E-12 3.011E-12 1.212E-11 2.584E-05 3.401E-07 1.876E-07
M(c): 1.318E-21 7.946E-17 7.964E-15 7.199E-14 2.007E-13 8.080E-13 1.722E-06 2.268E-08 1.251E-08

Maximum TDSE(c): 3.509E-05 mrem/yr at c = 464.9 p 0.5 years

Total Dose Contributions TDSE(I,p,c) for Individual Radionuclides (I) and Pathways (p)
As mrem/yr and Fraction of Total Dose At c = 464.9 years

Water Independent Pathways (Inhalation excludes radon)

Radionuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Radio-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Radio-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Radio-240	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Radio-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	1.531E-34	0.000E+00	2.571E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 464.9 years

Water Dependent Pathways

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Am-241	0.000E+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	0.000E+00 0.0000
C-14	2.337E-05 0.8371	0.000E+00 0.0000	0.000E+00 0.0000	2.267E-06 0.0646	9.259E-07 0.0264	2.522E-06 0.0719	3.509E-05 1.0000
Co-60	0.000E+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	0.000E+00 0.0000
Cs-137	0.000E+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	0.000E+00 0.0000
Eu-152	0.000E+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	0.000E+00 0.0000
Eu-154	0.000E+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	0.000E+00 0.0000
H-3	8.438E-16 0.0000	0.000E+00 0.0000	0.000E+00 0.0000	4.179E-17 0.0000	1.011E-17 0.0000	5.241E-17 0.0000	9.481E-16 0.0000
Ni-59	0.000E+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	0.000E+00 0.0000
Ni-63	0.000E+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	0.000E+00 0.0000
Pu-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	0.000E+00 0.0000
Pu-239	0.000E+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	0.000E+00 0.0000
Sr-90	0.000E+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	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	0.000E+00 0.0000	0.000E+00 0.0000
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	0.000E+00 0.0000
Total	2.337E-05 0.8371	0.000E+00 0.0000	0.000E+00 0.0000	2.267E-06 0.0646	9.259E-07 0.0264	2.522E-06 0.0719	3.509E-05 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 = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	1.973E-20	0.9980	0.000E+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
Cs-137	4.599E-32	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
Eu-152	3.613E-23	0.0018	0.000E+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
Eu-154	3.611E-24	0.0002	0.000E+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
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.784E-36	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
Total	1.977E-20	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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	1.973E-20	0.9980
Cs-137	0.000E+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	4.599E-32	0.0000
Eu-152	0.000E+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	3.613E-23	0.0018
Eu-154	0.000E+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	3.611E-24	0.0002
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	0.0000
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	9.784E-36	0.0000
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	1.977E-20	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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	1.729E-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	0.000E+00	0.0000
Cs-137	4.499E-32	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
Eu-152	3.433E-23	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
Eu-154	3.341E-24	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
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	6.021E-19	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	1.191E-15	0.9995	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.790E-36	0.0000	0.000E+00	0.0000	2.424E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.732E-20	0.0000	0.000E+00	0.0000	1.192E-15	1.0000	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 = 1.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	1.729E-20	0.0000
Cs-137	0.000E+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-32	0.0000
Eu-152	0.000E+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	3.433E-23	0.0000
Eu-154	0.000E+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	3.341E-24	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	6.021E-19	0.0005
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	1.191E-15	0.9995
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	2.424E-21	0.0000
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	1.192E-15	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Nuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	5.255E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	3.693E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	2.170E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	1.659E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-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
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
St-90	0.000E+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
U-238	9.849E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	5.278E-21	0.000E+00	0.000E+00	1.195E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+01 years

Water Dependent Pathways

Radio-	Nuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-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
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
St-90	0.000E+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
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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.195E-13

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 = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	3.727E-22	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
Cs-137	2.382E-32	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
Eu-152	7.826E-24	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
Eu-154	3.501E-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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	1.528E-14	0.0141	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	1.065E-12	0.9858	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.981E-36	0.0000	0.000E+00	0.0000	6.460E-17	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.808E-22	0.0000	0.000E+00	0.0000	1.080E-12	1.0000	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 = 3.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide														
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	3.727E-22	0.0000
Cs-137	0.000E+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	2.382E-32	0.0000
Eu-152	0.000E+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	7.826E-24	0.0000
Eu-154	0.000E+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	3.501E-25	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	1.528E-14	0.0141
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	1.065E-12	0.9858
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	6.460E-17	0.0001
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	1.080E-12	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 = 5.000E+01 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.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	2.643E-23	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
Cs-137	1.536E-32	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
Eu-152	2.823E-24	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
Eu-154	7.390E-26	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
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	6.782E-14	0.0225	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	0.000E+00	0.0000	0.000E+00	0.0000	2.943E-12	0.9774	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.011E-35	0.0000	0.000E+00	0.0000	2.974E-16	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.933E-23	0.0000	0.000E+00	0.0000	3.011E-12	1.0000	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 = 5.000E+01 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.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	2.643E-23	0.0000
Cs-137	0.000E+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	1.536E-32	0.0000
Eu-152	0.000E+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	2.823E-24	0.0000
Eu-154	0.000E+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	7.390E-26	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	6.782E-14	0.0225
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	2.943E-12	0.9774
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	2.974E-16	0.0001
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	3.011E-12	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions (T.D.C.) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+02 years
Water Independent Pathways (Inhalation excludes radon)

Radionuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.575E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-238	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

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 = 5.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	0.000E+00	0.0000	0.000E+00	0.0000	3.178E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	1.659E-34	0.0000	0.000E+00	0.0000	2.639E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.364E-35	0.0000	0.000E+00	0.0000	2.610E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.796E-34	0.0000	0.000E+00	0.0000	2.959E-10	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 = 5.000E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	2.163E-05	0.8371	0.000E+00	0.0000	0.000E+00	0.0000	1.670E-06	0.0646	6.818E-07	0.0264	1.857E-06	0.0719	2.584E-05	1.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	6.705E-17	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.321E-18	0.0000	8.032E-19	0.0000	4.165E-18	0.0000	7.534E-17	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	3.178E-11	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	2.639E-10	0.0000
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	2.610E-13	0.0000
Total	2.163E-05	0.8371	0.000E+00	0.0000	0.000E+00	0.0000	1.670E-06	0.0646	6.818E-07	0.0264	1.857E-06	0.0719	2.584E-05	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Radio-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Nuclide	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
St-90	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
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	9.835E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+03 years

Water Dependent Pathways

	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Radio-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Nuclide	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
St-90	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
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Total	2.838E-07	0.834E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.401E-07

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+04 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	2.829E-29	0.0000	0.000E+00	0.0000	4.004E-09	0.0213	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	1.507E-28	0.0000	0.000E+00	0.0000	2.132E-08	0.1137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.639E-30	0.0000	0.000E+00	0.0000	2.309E-10	0.0012	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.806E-28	0.0000	0.000E+00	0.0000	2.556E-08	0.1362	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+04 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	1.544E-10	0.0008	0.000E+00	0.0000	0.000E+00	0.0000	3.662E-11	0.0002	5.813E-13	0.0000	2.762E-12	0.0000	1.944E-10	0.0010
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	9.295E-09	0.0495	0.000E+00	0.0000	7.795E-12	0.0000	2.204E-09	0.0118	4.664E-11	0.0002	1.809E-10	0.0010	1.574E-08	0.0839
Pu-239	1.465E-09	0.0078	0.000E+00	0.0000	0.000E+00	0.0000	3.474E-10	0.0019	9.882E-12	0.0001	2.632E-11	0.0001	1.849E-09	0.0099
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	4.716E-08	0.2514	0.000E+00	0.0000	4.130E-11	0.0002	1.118E-08	0.0596	2.397E-10	0.0013	9.105E-10	0.0049	8.086E-08	0.4310
U-238	7.023E-08	0.3744	0.000E+00	0.0000	3.686E-12	0.0000	1.665E-08	0.0888	2.549E-10	0.0014	1.590E-09	0.0085	8.896E-08	0.4742
Total	1.283E-07	0.6839	0.000E+00	0.0000	5.278E-11	0.0003	3.042E-08	0.1622	5.518E-10	0.0029	2.710E-09	0.0144	1.876E-07	1.0000

*Sum of all water independent and dependent pathways.

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

Parent (i)	Product (j)	Branch Fraction	DSR(j,t) (mrem/yr)/(pCi/g)									
			t=	0.000E+00	1.000E+00	1.000E+01	3.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03	1.000E+04
Am-241	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	Np-237	1.000E+00	0.000E+00	0.000E+00	5.605E-45	1.962E-44	3.223E-44	6.166E-44	2.158E-43	2.929E-43	4.929E-43	0.000E+00
Am-241	U-233	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.717E-09
Am-241	Th-229	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.121E-44	1.009E-43	8.081E-10
Am-241	SDSR(j)		0.000E+00	0.000E+00	5.605E-45	1.962E-44	3.223E-44	6.166E-44	2.270E-43	3.938E-43	6.018E-09	0.000E+00
C-14	C-14	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	3.920E-03	5.145E-05	3.772E-39
Co-60	Co-60	1.000E+00	2.839E-24	2.487E-24	7.561E-25	5.362E-26	3.803E-27	5.094E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00	3.679E-30	3.599E-30	2.954E-30	1.905E-30	1.229E-30	4.105E-31	6.364E-35	1.101E-39	0.000E+00	0.000E+00
Eu-152	Eu-152	7.208E-01	1.455E-26	1.382E-26	8.737E-27	3.151E-27	1.137E-27	8.881E-29	1.234E-37	0.000E+00	0.000E+00	0.000E+00
Eu-152	Eu-152	2E-01	5.635E-27	5.355E-27	3.384E-27	1.221E-27	4.403E-28	3.440E-29	4.780E-38	0.000E+00	0.000E+00	0.000E+00
Eu-152	Gd-152	2.792E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	SDSR(j)		5.635E-27	5.355E-27	3.384E-27	1.221E-27	4.403E-28	3.440E-29	4.780E-38	0.000E+00	0.000E+00	0.000E+00
Eu-154	Eu-154	1.000E+00	9.072E-26	8.394E-26	4.168E-26	8.797E-27	1.857E-27	3.800E-29	1.173E-42	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.029E-18	8.138E-34	0.000E+00
Ni-59	Ni-59	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	Pu-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
Pu-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	4.180E-06
Pu-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	4.904E-09
Pu-238	Ra-226	1.000E+00	0.000E+00	3.104E-16	3.044E-13	7.874E-12	3.496E-11	2.528E-10	1.638E-08	7.344E-08	2.106E-06	0.000E+00
Pu-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	1.822E-06
Pu-238	SDSR(j)		0.000E+00	3.104E-16	3.044E-13	7.874E-12	3.496E-11	2.528E-10	1.638E-08	7.344E-08	8.113E-06	0.000E+00
Pu-239	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.062E-40
Pu-239	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	9.327E-08
Pu-239	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	2.803E-45	9.244E-09
Pu-239	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	1.121E-44	1.676E-08
Pu-239	SDSR(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	1.401E-44	1.193E-07
Sr-90	Sr-90	1.000E+00	4.015E-40	3.919E-40	3.156E-40	1.950E-40	1.205E-40	3.616E-41	2.803E-45	0.000E+00	0.000E+00	0.000E+00
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	1.114E-02
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	1.386E-05
U-234	Ra-226	1.000E+00	0.000E+00	3.291E-10	3.284E-08	2.941E-07	8.129E-07	3.212E-06	7.290E-05	2.592E-04	6.009E-03	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	5.174E-03
U-234	SDSR(j)		0.000E+00	3.291E-10	3.284E-08	2.941E-07	8.129E-07	3.212E-06	7.290E-05	2.592E-04	2.234E-02	0.000E+00

- At specific activity limit

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 = 464.9 p 0.5 years

Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	pCi/g	(years)		(pCi/g)		(pCi/g)
Am-241	3.230E-02	1489 p 1	2.389E-04	6.279E+04	0.000E+00	*3.430E+12
C-14	6.590E-03	465.3 p 0.5	5.305E-03	2.828E+03	5.324E-03	2.817E+03
Co-60	6.950E+03	0.000E+00	2.839E-24	*1.131E+15	0.000E+00	*1.131E+15
Cs-137	1.250E-02	0.000E+00	3.679E-30	*8.701E+13	0.000E+00	*8.701E+13
Eu-152	1.790E+03	0.000E+00	2.018E-26	*1.765E+14	0.000E+00	*1.765E+14
Eu-154	3.980E+01	0.000E+00	9.072E-26	*2.639E+14	0.000E+00	*2.639E+14
H-3	1.870E+01	258.2 p 0.3	1.541E-10	9.737E+10	5.070E-17	*9.594E+15
Ni-59	4.530E-02	0.0000 p 0.0000	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	3.620E+00	0.0000 p 0.0000	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Pu-238	1.940E-03	7558 p 8	1.630E-05	9.201E+05	1.383E-08	1.085E+09
Pu-239	1.550E-02	1.000E+04	1.193E-07	1.258E+08	0.000E+00	*6.212E+10
Sr-90	3.360E-01	2119 p 2	1.230E-23	*1.365E+14	0.000E+00	*1.365E+14
U-234	3.620E-06	7282 p 7	5.125E-02	2.927E+02	6.357E-05	2.360E+05
U-238	7.760E-06	7282 p 7	4.654E-02	3.223E+02	2.731E-08	*3.360E+05

*At specific activity limit

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

Nuclide	Parent	BRF(I)	DOSE(j,t), mrem/yr									
(j)	(i)		t=	0.000E+00	1.000E+00	1.000E+01	3.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03	1.000E+04
Am-241	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.592E-11
U-233	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.524E-10
Th-229	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.610E-11
C-14	C-14	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.584E-05	3.391E-07	0.000E+00
Co-60	Co-60	1.000E+00	1.973E-20	1.729E-20	5.255E-21	3.727E-22	2.643E-23	3.540E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00	4.599E-32	4.499E-32	3.693E-32	2.382E-32	1.536E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Eu-152	7.208E-01	2.604E-23	2.474E-23	1.564E-23	5.641E-24	2.035E-24	1.590E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Eu-152	2.792E-01	1.009E-23	9.585E-24	6.058E-24	2.185E-24	7.881E-25	6.158E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	DOSE(j):		3.613E-23	3.433E-23	2.170E-23	7.826E-24	2.823E-24	2.206E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Gd-152	Eu-152	2.792E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	Eu-154	1.000E+00	3.611E-24	3.341E-24	1.659E-24	3.501E-25	7.390E-26	1.512E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.534E-17	0.000E+00	0.000E+00
Ni-59	Ni-59	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	Pu-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-234	Pu-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	8.109E-09
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	4.033E-08
U-234	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	2.486E-09
U-234	DOSE(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	5.092E-08
Th-230	Pu-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	9.514E-12
Th-230	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	5.016E-11
Th-230	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	2.544E-12
Th-230	DOSE(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	6.222E-11
Ra-226	Pu-238	1.000E+00	0.000E+00	6.021E-19	5.905E-16	1.528E-14	6.782E-14	4.904E-13	3.178E-11	1.425E-10	4.085E-09	
Ra-226	U-234	1.000E+00	0.000E+00	1.191E-15	1.189E-13	1.065E-12	2.943E-12	1.163E-11	2.639E-10	9.384E-10	2.175E-08	
Ra-226	U-238	1.000E+00	0.000E+00	2.424E-21	2.407E-18	6.460E-17	2.974E-16	2.344E-15	2.610E-13	1.810E-12	2.692E-10	
Ra-226	DOSE(j):		0.000E+00	1.192E-15	1.195E-13	1.080E-12	3.011E-12	1.212E-11	2.959E-10	1.083E-09	2.611E-08	
Pb-210	Pu-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	3.535E-09
Pb-210	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	1.873E-08
Pb-210	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	1.666E-09
Pb-210	DOSE(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	2.393E-08

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

Nuclide Parent		BRF(i)	DOSE(j,t), mrem/yr									
(j)	(i)		t = 0.000E+00	1.000E+00	1.000E+01	3.000E+01	5.000E+01	1.000E+02	5.000E+02	1.000E+03	1.000E+04	
aaaaaaa	aaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa
Pu-239	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.446E-09	
Pa-231	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.433E-10	
Ac-227	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.598E-10	
Sr-90	Sr-90	1.000E+00	0.000E+00	0.000E+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-238	1.000E+00	9.784E-36	9.790E-36	9.849E-36	9.981E-36	1.011E-35	1.046E-35	1.364E-35	1.902E-35	8.453E-08	
aaaaaaaa	aaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa	aaaaaaaaa

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

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g									
(j)	(i)		t= 0.000E+00 1.000E+00 1.000E+01 3.000E+01 5.000E+01 1.000E+02 5.000E+02 1.000E+03 1.000E+04									
Am-241	Am-241	1.000E+00	3.230E-02	3.225E-02	3.178E-02	3.077E-02	2.980E-02	2.749E-02	1.442E-02	6.434E-03	3.176E-09	
Np-237	Am-241	1.000E+00	0.000E+00	1.043E-08	1.019E-07	2.903E-07	4.594E-07	8.077E-07	1.482E-06	9.074E-07	5.197E-13	
U-233	Am-241	1.000E+00	0.000E+00	2.283E-14	2.244E-12	1.944E-11	5.200E-11	1.893E-10	2.308E-09	4.072E-09	6.840E-11	
Th-229	Am-241	1.000E+00	0.000E+00	7.190E-19	7.097E-16	1.861E-14	8.372E-14	6.234E-13	4.531E-11	1.971E-10	6.803E-10	
C-14	C-14	1.000E+00	6.590E-03	6.533E-03	6.039E-03	5.072E-03	4.260E-03	2.754E-03	8.394E-05	1.069E-06	8.328E-41	
Co-60	Co-60	1.000E+00	6.950E+03	6.083E+03	1.832E+03	1.273E+02	8.849E+00	1.127E-02	7.778E-26	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	1.250E-02	1.221E-02	9.916E-03	6.240E-03	3.926E-03	1.233E-03	1.168E-07	1.092E-12	0.000E+00	
Eu-152	Eu-152	7.208E-01	1.290E+03	1.225E+03	7.665E+02	2.705E+02	9.547E+01	7.065E+00	6.351E-09	3.126E-20	0.000E+00	
Eu-152	Eu-152	2.792E-01	4.998E+02	4.744E+02	2.969E+02	1.048E+02	3.698E+01	2.737E+00	2.460E-09	1.211E-20	0.000E+00	
Eu-152	OS(j):		1.790E+03	1.699E+03	1.063E+03	3.753E+02	1.325E+02	9.801E+00	8.811E-09	4.337E-20	0.000E+00	
Gd-152	Eu-152	2.792E-01	0.000E+00	3.125E-12	2.500E-11	4.865E-11	5.697E-11	6.110E-11	6.065E-11	5.968E-11	4.470E-11	
Eu-154	Eu-154	1.000E+00	3.980E+01	3.678E+01	1.809E+01	3.738E+00	7.724E-01	1.499E-02	3.017E-16	2.286E-33	0.000E+00	
H-3	H-3	1.000E+00	1.870E+01	1.740E+01	9.083E+00	2.143E+00	5.055E-01	1.366E-02	3.895E-15	8.114E-31	0.000E+00	
Ni-59	Ni-59	1.000E+00	4.530E-02	4.530E-02	4.527E-02	4.522E-02	4.517E-02	4.505E-02	4.406E-02	4.286E-02	2.601E-02	
Ni-63	Ni-63	1.000E+00	3.620E+00	3.594E+00	3.366E+00	2.911E+00	2.517E+00	1.750E+00	9.568E-02	2.529E-03	1.001E-31	
Pu-238	Pu-238	1.000E+00	1.940E-03	1.924E-03	1.789E-03	1.522E-03	1.295E-03	8.643E-04	3.406E-05	5.979E-07	1.500E-38	
U-234	Pu-238	1.000E+00	0.000E+00	5.476E-09	5.269E-08	1.453E-07	2.230E-07	3.661E-07	5.459E-07	4.286E-07	3.664E-09	
U-234	U-234	1.000E+00	3.620E-06	3.618E-06	3.601E-06	3.563E-06	3.525E-06	3.433E-06	2.778E-06	2.133E-06	1.822E-08	
U-234	U-238	1.000E+00	0.000E+00	2.199E-11	2.188E-10	6.496E-10	1.071E-09	2.087E-09	8.449E-09	1.298E-08	1.123E-09	
U-234	OS(j):		3.620E-06	3.624E-06	3.654E-06	3.709E-06	3.750E-06	3.802E-06	3.333E-06	2.574E-06	2.301E-08	
Th-230	Pu-238	1.000E+00	0.000E+00	2.468E-14	2.406E-12	2.047E-11	5.382E-11	1.887E-10	2.076E-09	4.247E-09	1.019E-08	
Th-230	U-234	1.000E+00	0.000E+00	3.258E-11	3.250E-10	9.697E-10	1.607E-09	3.172E-09	1.426E-08	2.510E-08	5.416E-08	
Th-230	U-238	1.000E+00	0.000E+00	9.898E-17	9.867E-15	8.817E-14	2.432E-13	9.555E-13	2.075E-11	6.982E-11	6.241E-10	
Th-230	OS(j):		0.000E+00	3.260E-11	3.274E-10	9.902E-10	1.661E-09	3.361E-09	1.636E-08	2.941E-08	6.498E-08	
Ra-226	Pu-238	1.000E+00	0.000E+00	3.567E-18	3.495E-15	9.024E-14	3.999E-13	2.878E-12	1.797E-10	7.694E-10	9.283E-09	
Ra-226	U-234	1.000E+00	0.000E+00	7.056E-15	7.035E-13	6.289E-12	1.735E-11	6.824E-11	1.493E-09	5.067E-09	4.943E-08	
Ra-226	U-238	1.000E+00	0.000E+00	1.436E-20	1.424E-17	3.816E-16	1.753E-15	1.376E-14	1.476E-12	9.774E-12	5.353E-10	
Ra-226	OS(j):		0.000E+00	7.060E-15	7.070E-13	6.379E-12	1.775E-11	7.114E-11	1.674E-09	5.846E-09	5.925E-08	
Pb-210	Pu-238	1.000E+00	0.000E+00	2.756E-20	2.565E-16	1.783E-14	1.191E-13	1.371E-12	1.539E-10	7.157E-10	9.183E-09	
Pb-210	U-234	1.000E+00	0.000E+00	7.254E-17	6.756E-14	1.572E-12	6.353E-12	3.783E-11	1.313E-09	4.750E-09	4.890E-08	
Pb-210	U-238	1.000E+00	0.000E+00	1.402E-22	1.042E-18	7.467E-17	5.144E-16	6.402E-15	1.227E-12	8.900E-12	5.290E-10	
Pb-210	OS(j):		0.000E+00	7.257E-17	6.782E-14	1.590E-12	6.472E-12	3.921E-11	1.468E-09	5.475E-09	5.861E-08	

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide Parent		BRF(i)	S(j,t), pCi/g									
(j)	(i)		t = 0.000E+00 1.000E+00 1.000E+01 3.000E+01 5.000E+01 1.000E+02 5.000E+02 1.000E+03 1.000E+04									
aaaaaaaa	aaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa
Pu-239	Pu-239	1.000E+00	1.550E-02	1.550E-02	1.547E-02	1.540E-02	1.534E-02	1.517E-02	1.393E-02	1.252E-02	1.832E-03	
U-235	Pu-239	1.000E+00	0.000E+00	1.526E-11	1.521E-10	4.529E-10	7.493E-10	1.471E-09	6.350E-09	1.059E-08	5.516E-09	
Pa-231	Pu-239	1.000E+00	0.000E+00	1.615E-16	1.611E-14	1.442E-13	3.984E-13	1.573E-12	3.541E-11	1.245E-10	1.737E-09	
Ac-227	Pu-239	1.000E+00	0.000E+00	1.700E-18	1.582E-15	3.680E-14	1.486E-13	8.853E-13	3.142E-11	1.177E-10	1.734E-09	
Sr-90	Sr-90	1.000E+00	3.360E-01	3.275E-01	2.600E-01	1.558E-01	9.330E-02	2.591E-02	9.157E-07	2.496E-12	0.000E+00	
U-238	U-238	1.000E+00	7.760E-06	7.756E-06	7.719E-06	7.638E-06	7.558E-06	7.362E-06	5.964E-06	4.584E-06	4.019E-08	
aaaaaaaa	aaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa
BRF(i) is the branch fraction of the parent nuclide.												

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

Appendix E

RESRAD Summary Report

Contaminated Concrete and

Embedded Piping

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Dose Conversion Factor (and Related) Parameter Summary ...	2
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Total Dose Components	
Time = 0.000E+00	16
Time = 1.000E+00	17
Time = 3.000E+00	18
Time = 1.000E+01	19
Time = 3.000E+01	20
Time = 1.000E+02	21
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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	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	C-14	2.090E-06	2.090E-06	DCF2(3)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(4)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(5)
B-1	H-3	6.400E-08	6.400E-08	DCF2(6)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(7)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(8)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(9)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(10)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2(11)
B-1	Po-210	3.920E-01	3.920E-01	DCF2(12)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(13)
B-1	U-235+D	8.600E-03	8.600E-03	DCF2(14)
B-1	U-238+D	1.310E-03	1.310E-03	DCF2(15)
B-1	U-238+D	2.160E+00	2.160E+00	DCF2(16)
B-1	Th-232	3.260E-01	3.260E-01	DCF2(17)
B-1	U-233	1.350E-01	1.350E-01	DCF2(18)
B-1	U-234	1.320E-01	1.320E-01	DCF2(19)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(20)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(21)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	C-14	2.090E-06	2.090E-06	DCF3(3)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(4)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(5)
D-1	H-3	6.400E-08	6.400E-08	DCF3(6)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(7)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(8)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(9)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(10)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(11)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(12)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(13)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(14)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(15)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(16)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(17)
D-1	U-233	2.890E-04	2.890E-04	DCF3(18)
D-1	U-234	2.830E-04	2.830E-04	DCF3(19)
D-1	U-235+D	2.670E-04	2.670E-04	DCF3(20)
D-1	U-238+D	2.690E-04	2.690E-04	DCF3(21)
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)

Summary : Radioactivity associated surface contaminated concrete and drainlines

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

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Am-241 plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34				
D-34	C-14 plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(3,1)
D-34	C-14 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(3,2)
D-34	C-14 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(3,3)
D-34				
D-34	Co-60 plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(4,1)
D-34	Co-60 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(4,2)
D-34	Co-60 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(4,3)
D-34				
D-34	Cs-137-D plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34	Cs-137-D beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(5,2)
D-34	Cs-137-D milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(5,3)
D-34				
D-34	H-3 plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(6,1)
D-34	H-3 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(6,2)
D-34	H-3 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(6,3)
D-34				
D-34	Ni-59 plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(7,1)
D-34	Ni-59 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(7,2)
D-34	Ni-59 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(7,3)
D-34				
D-34	Ni-63 plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(8,1)
D-34	Ni-63 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(8,2)
D-34	Ni-63 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(8,3)
D-34				
D-34	Np-237-D plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(9,1)
D-34	Np-237-D beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(9,2)
D-34	Np-237-D milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(9,3)
D-34				
D-34	Pa-231 plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(10,1)
D-34	Pa-231 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(10,2)
D-34	Pa-231 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(10,3)
D-34				
D-34	Pb-210-D plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(11,1)
D-34	Pb-210-D beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(11,2)
D-34	Pb-210-D milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(11,3)
D-34				
D-34	Pu-238 plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Pu-238 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(12,2)
D-34	Pu-238 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(12,3)
D-34				
D-34	Pu-239 plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Pu-239 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(13,2)
D-34	Pu-239 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(13,3)
D-34				

Dose Conversion Factor (and Related) Parameter Summary (continued)
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Menu	Parameter	Current Value	Default	Parameter Name

D-34	Ra-226-D, plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(14,1)
D-34	Ra-226-D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(14,2)
D-34	Ra-226-D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(14,3)
D-34				
D-34	Sr-90-D, plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(15,1)
D-34	Sr-90-D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(15,2)
D-34	Sr-90-D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(15,3)
D-34				
D-34	Th-229-D, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(16,1)
D-34	Th-229-D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(16,2)
D-34	Th-229-D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(16,3)
D-34				
D-34	Th-230, plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(17,1)
D-34	Th-230, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(17,2)
D-34	Th-230, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(17,3)
D-34				
D-34	U-233, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(18,1)
D-34	U-233, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(18,2)
D-34	U-233, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(18,3)
D-34				
D-34	U-234, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(19,1)
D-34	U-234, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(19,2)
D-34	U-234, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(19,3)
D-34				
D-34	U-235-D, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(20,1)
D-34	U-235-D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(20,2)
D-34	U-235-D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(20,3)
D-34				
D-34	U-238-D, plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(21,1)
D-34	U-238-D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(21,2)
D-34	U-238-D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(21,3)
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	Am-241, fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	C-14, fish	5.000E+04	5.000E+04	BIOFAC(3,1)
D-5	C-14, crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(3,2)
D-5				
D-5	Co-60, fish	3.000E+02	3.000E+02	BIOFAC(4,1)
D-5	Co-60, crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(4,2)
D-5				
D-5	Cs-137-D, fish	2.000E+03	2.000E+03	BIOFAC(5,1)
D-5	Cs-137-D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)
D-5				
D-5	H-3, fish	1.000E+00	1.000E+00	BIOFAC(6,1)
D-5	H-3, crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(6,2)

Summary : Radioactivity associated surface contaminated concrete and drainlines

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

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Menu	Parameter	Current Value	Default	Parameter Name
D-5	Ni-59, fish	1.000E+02	1.000E+02	BIOFAC(7,1)
D-5	Ni-59, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(7,2)
D-5				
D-5	Ni-63, fish	1.000E+02	1.000E+02	BIOFAC(8,1)
D-5	Ni-63, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(8,2)
D-5				
D-5	Np-237+D, fish	3.000E+01	3.000E+01	BIOFAC(9,1)
D-5	Np-237+D, crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(9,2)
D-5				
D-5	Pa-231, fish	1.000E+01	1.000E+01	BIOFAC(10,1)
D-5	Pa-231, crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(10,2)
D-5				
D-5	Pb-210+D, fish	3.000E+02	3.000E+02	BIOFAC(11,1)
D-5	Pb-210+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Pu-238, fish	3.000E+01	3.000E+01	BIOFAC(12,1)
D-5	Pu-238, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(12,2)
D-5				
D-5	Pu-239, fish	3.000E+01	3.000E+01	BIOFAC(13,1)
D-5	Pu-239, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(13,2)
D-5				
D-5	Ra-226+D, fish	5.000E+01	5.000E+01	BIOFAC(14,1)
D-5	Ra-226+D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(14,2)
D-5				
D-5	Sr-90+D, fish	6.000E+01	6.000E+01	BIOFAC(15,1)
D-5	Sr-90+D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(15,2)
D-5				
D-5	Th-229+D, fish	1.000E+02	1.000E+02	BIOFAC(16,1)
D-5	Th-229+D, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(16,2)
D-5				
D-5	Th-230, fish	1.000E+02	1.000E+02	BIOFAC(17,1)
D-5	Th-230, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(17,2)
D-5				
D-5	U-233, fish	1.000E+01	1.000E+01	BIOFAC(18,1)
D-5	U-233, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(18,2)
D-5				
D-5	U-234, fish	1.000E+01	1.000E+01	BIOFAC(19,1)
D-5	U-234, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(19,2)
D-5				
D-5	U-235+D, fish	1.000E+01	1.000E+01	BIOFAC(20,1)
D-5	U-235+D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(20,2)
D-5				
D-5	U-238+D, fish	1.000E+01	1.000E+01	BIOFAC(21,1)
D-5	U-238+D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(21,2)

Summary : Radioactivity associated surface contaminated concrete and drainlines

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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)	3.150E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	5.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	2.100E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+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)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	1.000E+04	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	2.070E-05	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): C-14	1.200E-01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Co-60	1.770E-02	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.620E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): H-3	4.490E-01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Ni-59	2.890E-05	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): Ni-63	2.310E-03	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Pu-238	1.970E-06	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.800E-04	0.000E+00	---	S1(13)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.090E-01	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): U-234	9.200E-03	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): U-235	2.780E-04	0.000E+00	---	S1(20)
R012	Initial principal radionuclide (pCi/g): U-238	2.710E-02	0.000E+00	---	S1(22)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(13)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(15)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(19)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(20)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(21)
R013	Cover depth (m)	1.300E+01	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.440E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	9.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	2.400E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	3.300E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.520E+00	1.000E+01	---	HCCZ

Summary : Radioactivity associated surface contaminated concrete and drainlines

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	1.100E+01	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	9.100E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.200E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	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)	1.440E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	3.300E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.460E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	3.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+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)	6.100E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UM
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1. thickness (m)	1.550E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1. soil density (g/cm**3)	1.440E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1. total porosity	4.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1. effective porosity	3.300E-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)	1.520E+00	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.842E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.163E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+03	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	1.000E+01	1.000E+03	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+03	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.094E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cs-137	3.300E+02	1.000E+03	---	DCNUCC(5)
R016	Contaminated zone (cm**3/g)	3.300E+02	1.000E+03	---	DCNUCU(5,1)
R016	Unsaturated zone 1 (cm**3/g)	3.300E+02	1.000E+03	---	DCNUCS(5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	3.362E-05	ALEACH(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Solubility constant				
R016	Distribution coefficients for H-3	1.000E+00	0.000E+00	---	DCNUCC(6)
R016	Contaminated zone (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU(6,1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCS(6)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	9.654E-03	ALEACH(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Solubility constant				
R016	Distribution coefficients for Ni-59	4.000E+02	1.000E+03	---	DCNUCC(7)
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(7,1)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS(7)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	2.774E-05	ALEACH(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Solubility constant				
R016	Distribution coefficients for Ni-63	4.000E+02	1.000E+03	---	DCNUCC(8)
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(8,1)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS(8)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	2.774E-05	ALEACH(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Solubility constant				
R016	Distribution coefficients for Pu-238	1.000E+02	2.000E+03	---	DCNUCC(12)
R016	Contaminated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCU(12,1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCS(12)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	1.108E-04	ALEACH(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Solubility constant				
R016	Distribution coefficients for Pu-239	1.000E+02	2.000E+03	---	DCNUCC(13)
R016	Contaminated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCU(13,1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCS(13)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	1.108E-04	ALEACH(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Solubility constant				
R016	Distribution coefficients for Sr-90	1.000E+01	3.000E+01	---	DCNUCC(15)
R016	Contaminated zone (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCU(15,1)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCS(15)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	1.094E-03	ALEACH(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(15)
R016	Solubility constant				

Summary : Radioactivity associated surface contaminated concrete and drainlines

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(20,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(21)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(21,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(21)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.774E-05	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Np-237				
R016	Contaminated zone (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCC(9)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCU(9,1)
R016	Saturated zone (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCS(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.155E-03	ALEACH(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(9)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU(10,1)
R016	Saturated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.018E-05	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCU(11,1)
R016	Saturated zone (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.013E-04	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)

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 Ra-226			---	DCNUCC(14)
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(14,1)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(14)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	2.219E-05	ALEACH(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(14)
R016	Solubility constant	0.000E+00	0.000E+00		
R016	Distribution coefficients for daughter Th-229			---	DCNUCC(16)
R016	Contaminated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCU(16,1)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCS(16)
R016	Saturated zone (cm**3/g)	3.000E+03	6.000E+04	3.700E-06	ALEACH(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Solubility constant	0.000E+00	0.000E+00		
R016	Distribution coefficients for daughter Th-230			---	DCNUCC(17)
R016	Contaminated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCU(17,1)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCS(17)
R016	Saturated zone (cm**3/g)	3.000E+03	6.000E+04	3.700E-06	ALEACH(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Solubility constant	0.000E+00	0.000E+00		
R016	Distribution coefficients for daughter U-233			---	DCNUCC(18)
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(18,1)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(18)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	3.158E-04	ALEACH(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	not used	SOLUBK(18)
R016	Solubility constant	0.000E+00	0.000E+00		
R017	Inhalation rate (m**3/yr)	8.000E+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
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
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

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Site-Specific Parameter Summary (continued)

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Menu      . Parameter
          . Input    . Default . If different from user input) . Name
          . User      . Used by RESRAD . Parameter
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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name

					MLFD
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	DM
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DROOT
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	FGWDN
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R019	Irrigation fraction from ground water				
					C12WTR
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12CZ
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CAIR
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	DMC
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	EVSN
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	REVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	AVFG4
C14	Fraction of grain in beef cattle feed	7.500E-01	8.000E-01	---	AVFG5
C14	Fraction of grain in milk cow feed	5.600E-01	2.000E-01	---	
STOR	Storage times of contaminated foodstuffs (days):				STOR_T(1)
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(2)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Milk	3.000E+00	1.000E+00	---	STOR_T(4)
STOR	Meat and poultry	6.000E+00	2.000E+01	---	STOR_T(5)
STOR	Fish	not used	7.000E+00	---	STOR_T(6)
STOR	Crustacea and mollusks	not used	7.000E+00	---	STOR_T(7)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(9)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	
					FLOOR
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	DENSFL
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	TPCV
R021	Total porosity of the cover material	4.000E-01	4.000E-01	---	TPFL
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	---	PH2OCV
R021	Volumetric water content of the cover material	5.000E-02	5.000E-02	---	PH2OFL
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	---	
R021	Diffusion coefficient for radon gas (m/sec):				DIFCV
R021	in cover material	2.000E-06	2.000E-06	---	DIFFL
R021	in foundation material	3.000E-07	3.000E-07	---	DIFCZ
R021	in contaminated zone soil	2.500E-08	2.000E-06	---	HMIX
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	WIND
R021	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	REXG
R021	Average building air exchange rate (1/hr)	5.000E-01	5.000E-01	---	HRM
R021	Height of the building (room) (m)	2.500E+00	2.500E+00	---	FAI
R021	Building interior area factor	0.000E+00	0.000E+00	code computed (time dependent)	DMFL
R021	Building depth below ground surface (m)	-2.500E+00	-1.000E+00	code computed (time dependent)	EMANA(1)
R021	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	---	EMANA(2)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	

Summary of Pathway Selections

Pathway		
User Selection		
Pathway		
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	
aaaaaaaaaaaaaaaaaaaaaaaaaaaa		aaaaaaaaaaaaaaaaaaaaaaaaaaaa	
Area:	315.00 square meters	Am-241	2.070E-05
Thickness:	5.00 meters	C-14	1.200E-01
Cover Depth:	13.00 meters	Co-60	1.770E-02

Initial Soil Concentrations. pCi/g

#####

Am-241	2.070E-05
C-14	1.200E-01
Co-60	1.770E-02
Cs-137	1.620E-00
H-3	4.490E-01
Ni-59	2.890E-05
Ni-63	2.310E-03
Pu-238	1.970E-06
Pu-239	1.800E-04
Sr-90	1.090E-01
U-234	9.200E-03
U-235	2.780E-04
U-238	2.710E-02

Total Dose TDOSE(t). mrem/yr

Basic Radiation Dose Limit = 15 mrem/yr

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

	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04
years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04
DOSE(t):	0.002E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.611E-03	5.144E-04	1.135E-02
M(t):	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.074E-04	3.430E-05	7.565E-04

Maximum TDOSE(t): 4.020E-02 mrem/yr at t = 4965 p 5 years

Total Dose Contributions TDOSE (i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 4965 years

Water Independent Pathways (Inhalation excludes radon)

[illegible]

Total Dose Contributions TDOSR(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1965 years

Water Dependent Pathways

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*
Radio-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Nuclide	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr	mrem/yr
frac.	frac.	frac.	frac.	frac.	frac.	frac.	frac.
Am-241	1.254E-09	0.000E+00	0.000E+00	2.984E-10	1.238E-11	4.608E-13	1.566E-09
C-14	2.757E-13	0.000E+00	0.000E+00	8.870E-14	1.449E-14	2.944E-14	4.083E-13
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	5.340E-10	0.000E+00	8.718E-15	1.266E-10	1.905E-12	1.217E-11	6.747E-10
Pu-239	5.385E-11	0.000E+00	0.000E+00	1.277E-11	2.097E-13	1.204E-12	6.803E-11
St-90	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	7.467E-03	0.000E+00	4.438E-08	1.770E-03	2.650E-05	1.704E-04	9.435E-03
U-235	2.500E-04	0.000E+00	0.000E+00	5.927E-05	1.018E-06	5.527E-06	3.158E-04
U-238	2.410E-02	0.000E+00	2.839E-08	5.713E-03	8.530E-05	5.504E-04	3.045E-02
Total	3.181E-02	0.000E+00	7.337E-08	7.542E-03	1.128E-04	7.264E-04	4.020E-02

*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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Summary : Radioactivity associated surface contaminated concrete and drainlines

File : A:\RUBBLE.DAT

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.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Summary : Radioactivity associated surface contaminated concrete and drainlines

File : A:\RUBBLE.DAT

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

As mrem/yr and Fraction of Total Dose At t = 3.000E+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.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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 = 3.000E+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.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Radio-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Nuclide	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SI-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At t = 1.00E+01 years

Water Dependent Pathways

	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Radio-	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Nuclide	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.	mrem/yr frac.
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SI-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Sum of all water independent and dependent pathways.

Total Dose Contributions (DOSE(I,P,C)) for Individual Radionuclides (r) and Pathways (p) As mrem/yr and Fraction of Total Dose At t = 3.00E+01 years

Water Independent Pathways (Inhalation excludes radon)

[illegible]

As mrem/yr and fraction of total dose at t = 3.00E+01 years

Water Dependent Pathways

[illegible]

Sum of all water independent and dependent pathways.

Summary : Radioactivity associated surface contaminated concrete and drainlines
File : A:\RUBBLE.DAT

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

Water Independent Pathways (Inhalation excludes radon)

Radionuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Radio-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Radio-228	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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

Water Dependent Pathways

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*
Radio-226	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Radio-228	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

*Sum of all water independent and dependent pathways.

Total dose contributions (DOSE_i, p.c.) for individual radionuclides (i) and pathways (p) as mrem/yr and fraction of total dose at t = 3,000E+02 years

Water independent pathways (Inhalation excludes radon)

Water Independent Pathways (Inhalation excludes radon)

[illegible]

(d) Total dose (distributions IDOSE (1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,59,60,61,62,63,64,65,66,67,68,69,70,71,72,73,74,75,76,77,78,79,80,81,82,83,84,85,86,87,88,89,90,91,92,93,94,95,96,97,98,99,100) for individual radionuclides (1) and pathways (2) as mrem/yr and fraction of total dose at t = 3.00E+02 years

As mgm/yr and Fraction of Total Dose At c = 3.00E+02 years

Water Dependent Pathways

	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*
Radio- Nucleide	0.000E+00 mrem/Yr frac.	0.000E+00 mrem/Yr frac.	0.000E+00 mrem/Yr frac.	0.000E+00 mrem/Yr frac.	0.000E+00 mrem/Yr frac.	0.000E+00 mrem/Yr frac.	0.000E+00 mrem/Yr frac.
Am-241	0.000E+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	0.000E+00 0.0000
C-14	5.138E-03 0.6752	0.000E+00 0.0000	0.000E+00 0.0000	1.653E-03 0.2172	2.701E-04 0.0355	5.489E-04 0.0721	7.611E-03 1.0000
Co-60	0.000E+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	0.000E+00 0.0000
Cs-137	0.000E+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	0.000E+00 0.0000
H-3	0.000E+00 0.0000	0.000E+00 0.0000	0.000E+00 0.0000	2.080E-12 0.0000	5.028E-13 0.0000	2.607E-12 0.0000	4.716E-11 0.0000
Ni-59	0.000E+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	0.000E+00 0.0000
Ni-63	0.000E+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	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	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	0.000E+00 0.0000
Sr-90	0.000E+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	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	0.000E+00 0.0000	0.000E+00 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	0.000E+00 0.0000
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	0.000E+00 0.0000
Total	5.138E-03 0.6752	0.000E+00 0.0000	0.000E+00 0.0000	1.653E-03 0.2172	2.701E-04 0.0355	5.489E-04 0.0721	7.611E-03 1.0000

Sum of all water independent and dependent pathways.

Summary : Radioactivity
File : A:\RUBBLE.DAT

Total Dose Contributions IDOSE (I, P, C) 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)

[illegible]

Total Dose Contributions TDOSE(I,P,C) 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- Nucleide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways*
Am-241	1.197E-07	0.000E+00	0.000E+00	2.850E-08	0.0001	1.247E-09	0.0000
C-14	3.472E-04	0.000E+00	0.000E+00	1.117E-04	0.2172	1.825E-05	0.0355
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
St-90	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
U-234	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.473E-04	0.6752	0.000E+00	0.0000	1.117E-04	1.826E-05	0.0355

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+04 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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+04 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.		mrem/yr fract.	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	3.213E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.622E-13	0.0000	1.293E-14	0.0000	5.217E-14	0.0000	4.041E-12	0.0000
C-14	7.698E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.477E-25	0.0000	4.047E-26	0.0000	8.222E-26	0.0000	1.140E-24	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	1.184E-10	0.0000	0.000E+00	0.0000	5.041E-13	0.0000	7.555E-11	0.0000	2.016E-12	0.0000	5.243E-12	0.0000	4.017E-10	0.0000
Pu-239	8.773E-10	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.080E-10	0.0000	7.647E-12	0.0000	1.307E-11	0.0000	1.106E-09	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	3.692E-03	0.3253	0.000E+00	0.0000	5.952E-06	0.0005	8.758E-04	0.0772	2.357E-05	0.0021	6.034E-05	0.0053	4.658E-03	0.4104
U-235	1.525E-04	0.0134	0.000E+00	0.0000	0.000E+00	0.0000	3.617E-05	0.0032	2.035E-06	0.0002	1.185E-06	0.0001	1.919E-04	0.0169
U-238	5.143E-03	0.4533	0.000E+00	0.0000	4.356E-07	0.0000	1.219E-03	0.1075	1.896E-05	0.0017	1.158E-04	0.0102	6.498E-03	0.5726
Total	8.988E-03	0.7921	0.000E+00	0.0000	6.387E-06	0.0006	2.131E-03	0.1878	4.456E-05	0.0039	1.773E-04	0.0156	1.135E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : Radioactivity associated surface contaminated concrete and drainlines

File : A:\RUBBLE.DAT

Dose/Source Ratios Summed Over All Pathways

Parent and Progeny Principal Radionuclide Contributions Indicated

[illegible]

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

Parent	Product	Branch	DSR(j,t) (mrem/yr) / (pCi/g)									
(i)	(j)	Fraction	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04	
U-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	2.257E-01	
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	6.637E-03	
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	1.178E-05	
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	1.670E-04	
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	7.254E-03	
U-238	DSR(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	2.398E-01	
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 μ 0.5 yr) daughters.												

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 15 mrem/yr

[illegible]

*At specific activity limit

Summary : Radioactivity associated surface contaminated concrete and drainlines

File : A:\RUBBLE.DAT

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 = 4965 ± 5 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Am-241	2.070E-05	1243 ± 1	8.397E-03	1.786E+03	7.564E-05	1.983E+05
C-14	1.200E-01	317.5 ± 0.3	1.579E-01	9.500E+01	3.403E-12	4.408E+12
Co-60	1.770E-02	0.0000 ± 0.0000	0.000E+00	*1.131E+15	0.000E+00	*1.131E+15
Cs-137	1.620E+00	0.0000 ± 0.0000	0.000E+00	*8.701E+13	0.000E+00	*8.701E+13
H-3	4.490E-01	176.5 ± 0.2	3.549E-07	4.227E+07	0.000E+00	*9.594E+15
Ni-59	2.890E-05	0.0000 ± 0.0000	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	2.310E-03	0.0000 ± 0.0000	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Pu-238	1.970E-06	5156 ± 5	3.944E-04	3.804E+04	3.425E-04	4.380E+04
Pu-239	1.800E-04	1.000E+04	6.145E-06	2.441E+06	3.779E-07	3.969E+07
Sr-90	1.090E-01	1360 ± 1	7.460E-15	*1.365E+14	0.000E+00	*1.365E+14
U-234	8.200E-03	4964 ± 5	1.151E+00	1.303E+01	1.151E+00	1.304E+01
U-235	2.780E-04	4964 ± 5	1.136E+00	1.320E+01	1.136E+00	1.320E+01
U-238	2.710E-02	4962 ± 5	1.125E+00	1.334E+01	1.123E+00	1.335E+01

*At specific activity limit

Parent Nuclide and Branch Fraction Indicated

[illegible]

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

Nuclide	Parent	BRF (t)	DOSE (t, l), mrem/yr
(1)	(1)	t = 0.000E+00	1.000E+00
Pa-231	Pa-239	1.000E+00	3.000E+02
Pa-231	U-235	1.000E+00	1.000E+01
Pa-231	DOSE (t):	0.000E+00	0.000E+00
Ac-227	Pu-239	1.000E+00	0.000E+00
Ac-227	U-235	1.000E+00	0.000E+00
Ac-227	DOSE (t):	0.000E+00	0.000E+00
St-90	St-90	1.000E+00	0.000E+00
U-238	U-238	1.000E+00	0.000E+00
BRF (t) is the branch fraction of the parent nuclide.			

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g									
(j)	(i)		t = 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03 1.000E+04									
aaaaaaaa	aaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	aaaaaaaaaaaa	
Am-241	Am-241	1.000E+00	2.070E-05	2.067E-05	2.060E-05	2.037E-05	1.972E-05	1.762E-05	1.277E-05	4.139E-06	2.116E-12	
Np-237	Am-241	1.000E+00	0.000E+00	6.692E-12	2.000E-11	6.580E-11	1.901E-10	5.555E-10	1.145E-09	1.033E-09	1.250E-15	
U-233	Am-241	1.000E+00	0.000E+00	1.464E-17	1.314E-16	1.446E-15	1.267E-14	1.280E-13	8.829E-13	4.056E-12	5.041E-13	
Th-229	Am-241	1.000E+00	0.000E+00	4.610E-22	1.242E-20	4.567E-19	1.208E-17	4.160E-16	9.165E-15	1.744E-13	1.289E-12	
C-14	C-14	1.000E+00	1.200E-01	1.194E-01	1.181E-01	1.138E-01	1.024E-01	7.074E-02	2.459E-02	6.085E-04	1.349E-24	
Co-60	Co-60	1.000E+00	1.770E-02	1.550E-02	1.189E-02	4.700E-03	3.314E-04	3.086E-08	9.382E-20	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	1.620E+00	1.583E+00	1.511E+00	1.285E+00	8.092E-01	1.602E-01	1.566E-03	1.447E-10	0.000E+00	
H-3	H-3	1.000E+00	4.490E-01	4.204E-01	3.686E-01	2.326E-01	6.241E-02	6.244E-04	1.208E-09	1.215E-29	0.000E+00	
Ni-59	Ni-59	1.000E+00	2.890E-05	2.890E-05	2.890E-05	2.889E-05	2.887E-05	2.879E-05	2.858E-05	2.785E-05	1.997E-05	
Ni-63	Ni-63	1.000E+00	2.310E-03	2.293E-03	2.260E-03	2.148E-03	1.859E-03	1.119E-03	2.626E-04	1.644E-06	7.689E-35	
Pu-238	Pu-238	1.000E+00	1.970E-06	1.954E-06	1.923E-06	1.818E-06	1.549E-06	8.842E-07	1.781E-07	6.537E-10	3.190E-41	
U-234	Pu-238	1.000E+00	0.000E+00	5.562E-12	1.655E-11	5.358E-11	1.482E-10	3.774E-10	5.942E-10	5.277E-10	3.000E-11	
U-234	U-234	1.000E+00	8.200E-03	8.197E-03	8.192E-03	8.174E-03	8.122E-03	7.943E-03	7.452E-03	5.963E-03	3.389E-04	
U-234	U-238	1.000E+00	0.000E+00	7.680E-08	2.303E-07	7.658E-07	2.283E-06	7.443E-06	2.096E-05	5.594E-05	3.220E-05	
U-234	ΔS(j):		8.200E-03	8.197E-03	8.192E-03	8.175E-03	8.124E-03	7.950E-03	7.473E-03	6.019E-03	3.711E-04	
Th-230	Pu-238	1.000E+00	0.000E+00	2.507E-17	2.244E-16	2.445E-15	2.084E-14	1.935E-13	1.126E-12	4.753E-12	1.721E-11	
Th-230	U-234	1.000E+00	0.000E+00	7.380E-08	2.213E-07	7.369E-07	2.203E-06	7.261E-06	2.108E-05	6.279E-05	2.025E-04	
Th-230	U-238	1.000E+00	0.000E+00	3.457E-13	3.110E-12	3.451E-11	3.092E-10	3.384E-09	2.918E-08	2.794E-07	5.304E-06	
Th-230	ΔS(j):		0.000E+00	7.380E-08	2.213E-07	7.370E-07	2.204E-06	7.264E-06	2.111E-05	6.307E-05	2.078E-04	
Ra-226	Pu-238	1.000E+00	0.000E+00	3.622E-21	9.737E-20	3.551E-18	9.184E-17	2.945E-15	5.538E-14	8.411E-13	1.541E-11	
Ra-226	U-234	1.000E+00	0.000E+00	1.598E-11	1.438E-10	1.595E-09	1.428E-08	1.558E-07	1.331E-06	1.235E-05	1.819E-04	
Ra-226	U-238	1.000E+00	0.000E+00	5.013E-17	1.347E-15	4.980E-14	1.337E-12	4.858E-11	1.242E-09	3.801E-08	4.250E-06	
Ra-226	ΔS(j):		0.000E+00	1.598E-11	1.438E-10	1.595E-09	1.428E-08	1.558E-07	1.332E-06	1.239E-05	1.862E-04	
Pb-210	Pu-238	1.000E+00	0.000E+00	2.797E-23	2.231E-21	2.607E-19	1.815E-17	1.404E-15	4.243E-14	7.838E-13	1.530E-11	
Pb-210	U-234	1.000E+00	0.000E+00	1.643E-13	4.367E-12	1.532E-10	3.571E-09	8.642E-08	1.077E-06	1.160E-05	1.806E-04	
Pb-210	U-238	1.000E+00	0.000E+00	2.177E-19	3.063E-17	3.642E-15	2.616E-13	2.261E-11	9.201E-10	3.464E-08	4.211E-06	
Pb-210	ΔS(j):		0.000E+00	1.643E-13	4.367E-12	1.532E-10	3.571E-09	8.645E-08	1.078E-06	1.164E-05	1.848E-04	
Pu-239	Pu-239	1.000E+00	1.800E-04	1.800E-04	1.799E-04	1.797E-04	1.792E-04	1.775E-04	1.726E-04	1.565E-04	4.455E-05	
U-235	Pu-239	1.000E+00	0.000E+00	1.772E-13	5.315E-13	1.769E-12	5.282E-12	1.733E-11	4.968E-11	1.414E-10	2.063E-10	
U-235	U-235	1.000E+00	2.780E-04	2.779E-04	2.777E-04	2.771E-04	2.754E-04	2.694E-04	2.529E-04	2.027E-04	1.182E-05	
U-235	ΔS(j):		2.780E-04	2.779E-04	2.777E-04	2.771E-04	2.754E-04	2.694E-04	2.529E-04	2.027E-04	1.182E-05

Appendix F

RESRAD Summary Report

Radioactive Equipment,

Contaminated Concrete and

Embedded Piping

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 Part I: Mixture Sums and Single Radionuclide Guidelines
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2	Dose Conversion Factor (and Related) Parameter Summary
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14	Summary of Pathway Selections
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	Total Dose Components
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RESRAD, Version 5.621 T Limit = 0.5 year 04/16/97 13:17 Page 2
 Summary : HWCTR - Reactor vessel and both steam generators removed
 File : A:\TOT_INV.DAT

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	Am-241	4.440E-01	4.440E-01	DCF2(2)
B-1	C-14	2.090E-06	2.090E-06	DCF2(3)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(4)
B-1	Cs-137-D	3.190E-05	3.190E-05	DCF2(5)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(6)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(8)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(9)
B-1	H-3	6.400E-08	6.400E-08	DCF2(10)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(11)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(12)
B-1	Np-237-D	5.400E-01	5.400E-01	DCF2(13)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(14)
B-1	Pb-210-D	2.320E-02	2.320E-02	DCF2(15)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(16)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(17)
B-1	Ra-226-D	8.600E-03	8.600E-03	DCF2(18)
B-1	Sr-90-D	1.310E-03	1.310E-03	DCF2(19)
B-1	Th-229-D	2.160E+00	2.160E+00	DCF2(20)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(21)
B-1	U-233	1.350E-01	1.350E-01	DCF2(22)
B-1	U-234	1.320E-01	1.320E-01	DCF2(23)
B-1	U-235-D	1.230E-01	1.230E-01	DCF2(24)
B-1	U-238-D	1.180E-01	1.180E-01	DCF2(25)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227-D	1.480E-02	1.480E-02	DCF3(1)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(2)
D-1	C-14	2.090E-06	2.090E-06	DCF3(3)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(4)
D-1	Cs-137-D	5.000E-05	5.000E-05	DCF3(5)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(6)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(8)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(9)
D-1	H-3	6.400E-08	6.400E-08	DCF3(10)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(11)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(12)
D-1	Np-237-D	4.440E-03	4.440E-03	DCF3(13)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(14)
D-1	Pb-210-D	7.270E-03	7.270E-03	DCF3(15)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(16)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(17)
D-1	Ra-226-D	1.330E-03	1.330E-03	DCF3(18)
D-1	Sr-90-D	1.530E-04	1.530E-04	DCF3(19)
D-1	Th-229-D	4.030E-03	4.030E-03	DCF3(20)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(21)
D-1	U-233	2.890E-04	2.890E-04	DCF3(22)
D-1	U-234	2.830E-04	2.830E-04	DCF3(23)
D-1	U-235-D	2.670E-04	2.670E-04	DCF3(24)

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-1	U-238+D	2.690E-04	2.690E-04	DCF3 (25)
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	Am-241 plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Am-241 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(2,2)
D-34	Am-241 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(2,3)
D-34	C-14 plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(3,1)
D-34	C-14 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(3,2)
D-34	C-14 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(3,3)
D-34	Co-60 plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(4,1)
D-34	Co-60 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(4,2)
D-34	Co-60 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(4,3)
D-34	Cs-137+D plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(5,1)
D-34	Cs-137+D beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(5,2)
D-34	Cs-137+D milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(5,3)
D-34	Eu-152 plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	Eu-152 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(6,2)
D-34	Eu-152 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(6,3)
D-34	Eu-154 plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	Eu-154 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(8,2)
D-34	Eu-154 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(8,3)
D-34	Gd-152 plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	Gd-152 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(9,2)
D-34	Gd-152 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(9,3)
D-34	H-3 plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(10,1)
D-34	H-3 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(10,2)
D-34	H-3 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(10,3)
D-34	Ni-59 plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(11,1)
D-34	Ni-59 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(11,2)
D-34	Ni-59 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(11,3)
D-34	Ni-63 plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(12,1)
D-34	Ni-63 beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(12,2)
D-34	Ni-63 milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(12,3)
D-34	Np-237+D plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(13,1)
D-34	Np-237+D beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(13,2)
D-34	Np-237+D milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(13,3)

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 Summary : HWCTR - Reactor vessel and both steam generators removed.
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Dose Conversion Factor (and Related) Parameter Summary (continued)
 File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-34 * Pa-231	plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(14.1)
D-34 * Pa-231	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(14.2)
D-34 * Pa-231	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(14.3)
D-34 *				
D-34 * Pb-210-D	plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(15.1)
D-34 * Pb-210-D	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(15.2)
D-34 * Pb-210-D	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(15.3)
D-34 *				
D-34 * Pu-238	plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(16.1)
D-34 * Pu-238	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(16.2)
D-34 * Pu-238	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(16.3)
D-34 *				
D-34 * Pu-239	plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(17.1)
D-34 * Pu-239	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(17.2)
D-34 * Pu-239	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(17.3)
D-34 *				
D-34 * Ra-226-D	plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(18.1)
D-34 * Ra-226-D	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(18.2)
D-34 * Ra-226-D	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(18.3)
D-34 *				
D-34 * Sr-90-D	plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(19.1)
D-34 * Sr-90-D	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	9.000E-03	9.000E-03	RTF(19.2)
D-34 * Sr-90-D	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(19.3)
D-34 *				
D-34 * Th-229-D	plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(20.1)
D-34 * Th-229-D	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(20.2)
D-34 * Th-229-D	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(20.3)
D-34 *				
D-34 * Th-230	plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(21.1)
D-34 * Th-230	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(21.2)
D-34 * Th-230	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(21.3)
D-34 *				
D-34 * U-233	plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(22.1)
D-34 * U-233	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(22.2)
D-34 * U-233	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(22.3)
D-34 *				
D-34 * U-234	plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(23.1)
D-34 * U-234	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(23.2)
D-34 * U-234	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(23.3)
D-34 *				
D-34 * U-235-D	plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(24.1)
D-34 * U-235-D	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(24.2)
D-34 * U-235-D	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(24.3)
D-34 *				
D-34 * U-238-D	plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(25.1)
D-34 * U-238-D	beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(25.2)
D-34 * U-238-D	milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(25.3)

Summary : HWCTR - Reactor vessel and both steam generators removed

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

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
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	Am-241, fish	3.000E+01	3.000E+01	BIOFAC(2,1)
D-5	Am-241, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(2,2)
D-5				
D-5	C-14, fish	5.000E+04	5.000E+04	BIOFAC(3,1)
D-5	C-14, crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(3,2)
D-5				
D-5	Co-60, fish	3.000E+02	3.000E+02	BIOFAC(4,1)
D-5	Co-60, crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(4,2)
D-5				
D-5	Cs-137-D, fish	2.000E+03	2.000E+03	BIOFAC(5,1)
D-5	Cs-137-D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)
D-5				
D-5	Eu-152, fish	5.000E+01	5.000E+01	BIOFAC(6,1)
D-5	Eu-152, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5				
D-5	Eu-154, fish	5.000E+01	5.000E+01	BIOFAC(8,1)
D-5	Eu-154, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(8,2)
D-5				
D-5	Gd-152, fish	2.500E+01	2.500E+01	BIOFAC(9,1)
D-5	Gd-152, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(9,2)
D-5				
D-5	H-3, fish	1.000E+00	1.000E+00	BIOFAC(10,1)
D-5	H-3, crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(10,2)
D-5				
D-5	Ni-59, fish	1.000E+02	1.000E+02	BIOFAC(11,1)
D-5	Ni-59, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(11,2)
D-5				
D-5	Ni-63, fish	1.000E+02	1.000E+02	BIOFAC(12,1)
D-5	Ni-63, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(12,2)
D-5				
D-5	Np-237-D, fish	3.000E+01	3.000E+01	BIOFAC(13,1)
D-5	Np-237-D, crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(13,2)
D-5				
D-5	Pa-231, fish	1.000E+01	1.000E+01	BIOFAC(14,1)
D-5	Pa-231, crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(14,2)
D-5				
D-5	Pb-210-D, fish	3.000E+02	3.000E+02	BIOFAC(15,1)
D-5	Pb-210-D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(15,2)
D-5				
D-5	Pu-238, fish	3.000E+01	3.000E+01	BIOFAC(16,1)
D-5	Pu-238, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(16,2)
D-5				
D-5	Pu-239, fish	3.000E+01	3.000E+01	BIOFAC(17,1)
D-5	Pu-239, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(17,2)
D-5				

Summary : HWCTR - Reactor vessel and both steam generators removed

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

File: DOSFAC.BIN

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Ra-226-D, fish	5.000E+01	5.000E+01	BIOFAC(18,1)
D-5	Ra-226-D, crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(18,2)
D-5	Sr-90-D, fish	6.000E+01	6.000E+01	BIOFAC(19,1)
D-5	Sr-90-D, crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(19,2)
D-5	Th-229-D, fish	1.000E+02	1.000E+02	BIOFAC(20,1)
D-5	Th-229-D, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(20,2)
D-5	Th-230, fish	1.000E+02	1.000E+02	BIOFAC(21,1)
D-5	Th-230, crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(21,2)
D-5	U-233, fish	1.000E+01	1.000E+01	BIOFAC(22,1)
D-5	U-233, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(22,2)
D-5	U-234, fish	1.000E+01	1.000E+01	BIOFAC(23,1)
D-5	U-234, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(23,2)
D-5	U-235-D, fish	1.000E+01	1.000E+01	BIOFAC(24,1)
D-5	U-235-D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(24,2)
D-5	U-238-D, fish	1.000E+01	1.000E+01	BIOFAC(25,1)
D-5	U-238-D, crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(25,2)

Summary : HWCIR - Reactor vessel and both steam generators removed

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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)	3.150E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	5.000E+00	2.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	2.100E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+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)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	1.000E+04	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Am-241	1.460E-01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): C-14	1.500E-01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Co-60	2.300E+02	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.600E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Eu-152	5.612E+01	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Eu-154	1.270E+00	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): H-3	2.260E+00	0.000E+00	---	S1(10)
R012	Initial principal radionuclide (pCi/g): Ni-59	2.040E-01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): Ni-63	1.640E+01	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): Pu-238	9.760E-03	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): Pu-239	7.030E-02	0.000E+00	---	S1(17)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.630E+00	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): U-234	8.200E-03	0.000E+00	---	S1(23)
R012	Initial principal radionuclide (pCi/g): U-235	2.780E-04	0.000E+00	---	S1(24)
R012	Initial principal radionuclide (pCi/g): U-238	2.710E-02	0.000E+00	---	S1(25)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Eu-152	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(10)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(16)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(17)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(19)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(23)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(24)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(25)
R013	Cover depth (m)	1.300E+01	0.000E+00	---	COVERO
R013	Density of cover material (g/cm**3)	1.440E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	9.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	2.400E+00	1.500E+00	---	DENSCZ

Summary : HWCTR - Reactor vessel and both steam generators removed

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	3.300E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.520E+00	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Humidity in air (g/cm**3)	1.100E-01	8.000E-00	---	HUMID
R013	Evapotranspiration coefficient	9.100E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.200E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	7.600E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	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)	1.440E+00	1.500E+00	---	DENSAO
R014	Saturated zone total porosity	4.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	3.300E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	5.460E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	3.500E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+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)	6.100E+00	1.000E+01	---	DNIBMT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UM
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1. thickness (m)	1.550E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1. soil density (g/cm**3)	1.440E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1. total porosity	4.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1. effective porosity	3.300E-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)	1.520E+00	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU(2.1)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.842E-06	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCU(3.1)
R016	Saturated zone (cm**3/g)	2.000E+00	0.000E+00	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.163E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	Input	Default	(if different from user input)	Name
.	User	.	.	Used by RESRAD	Parameter

RO16	Distribution coefficients for Co-60																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																</

Summary : HWCTR - Reactor vessel and both steam generators removed

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCC(16)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCU(16,1)
R016	Saturated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCS(16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.108E-04	ALEACH(16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(16)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCU(17,1)
R016	Saturated zone (cm**3/g)	1.000E+02	2.000E+03	---	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.108E-04	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCU(19,1)
R016	Saturated zone (cm**3/g)	1.000E+01	3.000E+01	---	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.094E-03	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(23)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(23,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(23)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(24)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(24,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(24)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(25)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(25,1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(25)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	4.000E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.774E-05	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)

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 Gd-152				DCNUCC(9)
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCU(9.1)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	DCNUCS(9)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	5.758E+02	ALEACH(9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.927E-05	SOLUBK(9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	
R016	Distribution coefficients for daughter Np-237				DCNUCC(13)
R016	Contaminated zone (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCU(13.1)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+00	-1.000E+00	---	DCNUCS(13)
R016	Saturated zone (cm**3/g)	5.000E+00	-1.000E+00	---	ALEACH(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.155E-03	SOLUBK(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	
R016	Distribution coefficients for daughter Pa-231				DCNUCC(14)
R016	Contaminated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU(14.1)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCS(14)
R016	Saturated zone (cm**3/g)	5.500E+02	5.000E+01	---	ALEACH(14)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.018E-05	SOLUBK(14)
R016	Solubility constant	0.000E+00	0.000E+00	not used	
R016	Distribution coefficients for daughter Pb-210				DCNUCC(15)
R016	Contaminated zone (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCU(15.1)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+01	1.000E+02	---	DCNUCS(15)
R016	Saturated zone (cm**3/g)	5.500E+01	1.000E+02	---	ALEACH(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.013E-04	SOLUBK(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	
R016	Distribution coefficients for daughter Ra-226				DCNUCC(18)
R016	Contaminated zone (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCU(18.1)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	7.000E+01	---	DCNUCS(18)
R016	Saturated zone (cm**3/g)	5.000E+02	7.000E+01	---	ALEACH(18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.219E-05	SOLUBK(18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	
R016	Distribution coefficients for daughter Th-229				DCNUCC(20)
R016	Contaminated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCU(20.1)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCS(20)
R016	Saturated zone (cm**3/g)	3.000E+03	6.000E+04	---	ALEACH(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.700E-06	SOLUBK(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	
R016	Distribution coefficients for daughter Th-230				DCNUCC(21)
R016	Contaminated zone (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCU(21.1)
R016	Unsaturated zone 1 (cm**3/g)	3.000E+03	6.000E+04	---	DCNUCS(21)
R016	Saturated zone (cm**3/g)	3.000E+03	6.000E+04	---	ALEACH(21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.700E-06	SOLUBK(21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	

Summary : HWCIR - Reactor vessel and both steam generators removed

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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 U-233				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC(22)
R016	Unsaturated zone 1 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU(22.1)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS(22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.158E-04	ALEACH(22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(22)
R017	Inhalation rate (m**3/yr)	8.000E+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
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
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	not used	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)	1.630E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	2.100E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	1.200E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	4.300E+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)

Summary : HWCTR - Reactor vessel and both steam generators removed

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (if different from user input)	Parameter Name
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	7.300E+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	---	FHW
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	---	FIW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	5.000E-01	-1	---	FPLANT
R018	Contamination fraction of meat	5.000E-01	-1	---	FMEAT
R018	Contamination fraction of milk	5.000E-01	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	4.400E+01	6.800E+01	---	LFIS
R019	Livestock fodder intake for milk (kg/day)	4.400E+01	5.500E+01	---	LFIS
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWIS
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWIS
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	---	MLPD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGMDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGMHW
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGMLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	CL2WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	CL2CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (l/sec)	7.000E-07	7.000E-07	---	EVSX
C14	C-12 evasion flux rate from soil (l/sec)	1.000E-10	1.000E-10	---	REVSX
C14	Fraction of grain in beef cattle feed	7.500E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	5.600E-01	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	3.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	6.000E+00	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

Summary : HWCTR - Reactor vessel and both steam generators removed

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	2.500E-08	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMLX
R021	Average annual wind speed (m/sec)	2.000E+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)	-2.500E+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	suppressed
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

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Initial Soil Concentrations, pci/g

Contaminated Zone Dimensions

Area: 315.00 square meters

Thickness: 5.00 meters

Cover Depth: 13.00 meters

AM-241	1.60E-01
CG-14	1.50E-01
CG-60	2.30E+02
CG-137	1.68E+00
EU-152	5.13E+01
EU-154	1.27E+00
H-3	2.26E+00
NI-59	2.04E-01
NI-63	1.64E+01
PU-238	9.76E-03
PU-239	7.03E-02
SE-90	1.63E+00
U-234	9.70E-03
U-235	2.78E-04
U-238	2.71E-02

Total Dose TDOSE(t), wrem/yr

BASIC Radiation Dose Limit = 15 mrem/yr

LOCAL MIXTURE SUM W(2) = FRACTION OF BASIC DOSE LIMIT RECEIVED AT TIME (2)

=====

t (years) : 0.000E+00 1.000E+00 3.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03 1.000E+04

TABLE 1 : 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 9.513E-03 1.697E-03 1.135E-02

M(1) : 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 0.000E+00 6.342E-04 1.132E-04 7.566E-04

Maximum Dose (Ci): 4.021E-02 mrem/yr at 5 years 4965 p 5 years

Total Dose Contributions (DOSE(I,P,C)) for Individual Radionuclides (i) and Pathways (p)

Water independent pathways (inhalation excludes radon)

Soft

HTTW

2804

2047

top

NOT:

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02924

NOTES

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AB-24

41-14

09-03

CS-11

51-73

51-73

H-3

SS-IN

9-1N

22-23

22-23

SI-96

0-234

U-239

U-230

44444

1021

Summary: HMCIR - Reactor vessel and both steam generators removed

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Total Dose Contributions (DOSE(I,P,C)) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At C = 1965 Years

Water Dependent Pathways

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Am-241	8.848E-06 0.0002	0.000E+00 0.0000	0.000E+00 0.0000	2.106E-06 0.0001	9.151E-08 0.0000	3.251E-09 0.0000	1.105E-05 0.0003
C-14	3.452E-13 0.0000	0.000E+00 0.0000	0.000E+00 0.0000	1.112E-13 0.0000	1.315E-14 0.0000	3.687E-14 0.0000	5.112E-13 0.0000
Co-60	0.000E+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	0.000E+00 0.0000
Cs-137	0.000E+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	0.000E+00 0.0000
Eu-152	0.000E+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	0.000E+00 0.0000
Eu-154	0.000E+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	0.000E+00 0.0000
H-3	0.000E+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	0.000E+00 0.0000
Ni-59	0.000E+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	0.000E+00 0.0000
Ni-63	0.000E+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	0.000E+00 0.0000
Pu-238	2.373E-06 0.0001	0.000E+00 0.0000	3.871E-11 0.0000	5.626E-07 0.0000	8.463E-09 0.0000	5.406E-08 0.0000	2.998E-06 0.0001
Pu-239	2.100E-08 0.0000	0.000E+00 0.0000	0.000E+00 0.0000	4.979E-09 0.0000	8.177E-11 0.0000	4.695E-10 0.0000	2.653E-08 0.0000
Sr-90	0.000E+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	0.000E+00 0.0000
U-234	7.468E-03 0.1857	0.000E+00 0.0000	4.429E-08 0.0000	1.771E-03 0.0440	2.650E-05 0.0007	1.704E-04 0.0042	9.436E-03 0.2346
U-235	2.500E-04 0.0062	0.000E+00 0.0000	0.000E+00 0.0000	5.927E-05 0.0015	1.018E-06 0.0000	5.527E-06 0.0001	3.158E-04 0.0079
U-238	2.410E-02 0.5993	0.000E+00 0.0000	2.892E-08 0.0000	5.713E-03 0.1421	8.531E-05 0.0021	5.505E-04 0.0137	3.045E-02 0.7572
Total	3.183E-02 0.7915	0.000E+00 0.0000	7.325E-08 0.0000	7.546E-03 0.1876	1.129E-04 0.0028	7.265E-04 0.0181	4.021E-02 1.0000

Sum of all water independent and dependent pathways.

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide	0.000E+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	0.000E+00	0.0000
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Nuclide	0.000E+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	0.000E+00	0.0000
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Water Independent Pathways (Inhalation excludes radon)

[illegible]

Water Dependent Pathways

Sum of all water independent and dependent pathways.

Summary: HWCTR - Reactor vessel and both steam generators removed

File A:\TOT_INV.DAT

Total Dose Contributions TDose(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At C = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radionuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Water Dependent Pathways

Total Dose Contributions TDose(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At C = 3.000E+00 years

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Sum of all water independent and dependent pathways.

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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+01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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+01 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

Summary: HMCIR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At C = 3.00E+01 years

Water Independent Pathways (Inhalation excludes radon)

Radionuclide	Ground	Inhalation	Radon	Plant	Meat	Milk	Soil
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Total Dose Contributions TDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At C = 3.00E+01 years

Water Dependent Pathways

Radionuclide	Water	Fish	Radon	Plant	Meat	Milk	All Pathways
Am-241	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
C-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Co-60	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-59	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NI-63	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-239	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	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
U-235	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
Total	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Sum of all water independent and dependent pathways.

Summary : HWCIR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
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	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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
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	0.000E+00	0.0000

*Sum of all water independent and dependent pathways.

File : A:\TOT_INV.DAT

(d) Total Dose Contributions IDOSE(I,P,C) for Individual Radionuclides (I) and Pathways (P)
As mrem/yr and Fraction of Total Dose At C = 3.00E+02 years

Water Independent Pathways (Inhalation excludes radon)

[illegible]

Total dose contributions (DOSE (1, P. 2)) for individual radionuclides (1) and pathways (P) as mrem/yr and fraction of total dose at C = 3, 000E-02 years

Water Dependent Pathways

[illegible]

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
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	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+03 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	8.446E-04	0.4976	0.000E+00	0.0000	0.000E+00	0.0000	2.010E-04	0.1184	8.792E-06	0.0052	1.610E-07	0.0001	1.055E-03	0.6213
C-14	4.340E-04	0.2557	0.000E+00	0.0000	0.000E+00	0.0000	1.396E-04	0.0823	2.282E-05	0.0134	4.636E-05	0.0273	6.429E-04	0.3787
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
Total	1.279E-03	0.7533	0.000E+00	0.0000	0.000E+00	0.0000	3.407E-04	0.2007	3.161E-05	0.0186	4.652E-05	0.0274	1.697E-03	1.0000

*Sum of all water independent and dependent pathways.

Summary : HWCIR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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+04 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	0.000E+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	0.000E+00	0.0000
C-14	0.000E+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	0.000E+00	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-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	0.000E+00	0.0000
Pu-239	0.000E+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	0.000E+00	0.0000
Sr-90	0.000E+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	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	0.000E+00	0.0000	0.000E+00	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	0.000E+00	0.0000
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	0.000E+00	0.0000
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
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	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+04 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Am-241	2.267E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.376E-09	0.0000	9.123E-11	0.0000	3.679E-10	0.0000	2.850E-08	0.0000
C-14	9.622E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.096E-25	0.0000	5.059E-26	0.0000	1.028E-25	0.0000	1.425E-24	0.0000
Co-60	0.000E+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	0.000E+00	0.0000
Cs-137	0.000E+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	0.000E+00	0.0000
Eu-152	0.000E+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	0.000E+00	0.0000
Eu-154	0.000E+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	0.000E+00	0.0000
H-3	0.000E+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	0.000E+00	0.0000
Ni-59	0.000E+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	0.000E+00	0.0000
Ni-63	0.000E+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	0.000E+00	0.0000
Pu-238	1.416E-06	0.0001	0.000E+00	0.0000	2.242E-09	0.0000	3.359E-07	0.0000	8.966E-09	0.0000	2.331E-08	0.0000	1.786E-06	0.0002
Pu-239	3.426E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.125E-08	0.0000	2.987E-09	0.0000	5.104E-09	0.0000	4.320E-07	0.0000
Sr-90	0.000E+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	0.000E+00	0.0000
U-234	1.692E-03	0.3253	0.000E+00	0.0000	5.952E-06	0.0005	8.758E-04	0.0772	2.357E-05	0.0021	6.034E-05	0.0053	4.658E-03	0.4104
U-235	1.525E-04	0.0134	0.000E+00	0.0000	0.000E+00	0.0000	3.617E-05	0.0032	2.035E-06	0.0002	1.185E-06	0.0001	1.919E-04	0.0169
U-238	5.143E-03	0.4532	0.000E+00	0.0000	4.356E-07	0.0000	1.219E-03	0.1074	1.896E-05	0.0017	1.158E-04	0.0102	6.498E-03	0.5725
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
Total	8.990E-03	0.7921	0.000E+00	0.0000	6.390E-06	0.0006	2.132E-03	0.1878	4.458E-05	0.0039	1.773E-04	0.0156	1.135E-02	1.0000

*Sum of all water independent and dependent pathways.

Parent	Product	Branch	DSR (j,t) (mrem/yr) (pCi/g)										
(i)	(j)	Fraction	t =	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04	
Am-241	Am-241	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Am-241	Np-237	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.223E-03	2.516E-08	
Am-241	U-233	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.543E-08	1.389E-07	
Am-241	Th-229	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.316E-10	3.117E-08	
Am-241	ODSR(j)			0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.223E-03	1.952E-07	
C-14	C-14	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.342E-02	4.286E-03	9.501E-24	
Co-60	Co-60	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Eu-152	Eu-152	7.208E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Eu-152	Eu-152	2.792E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Eu-152	Gd-152	2.792E-01		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Eu-152	ODSR(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	
Eu-154	Eu-154	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
H-3	H-3	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.050E-10	1.057E-30	0.000E+00	
Ni-59	Ni-59	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Ni-63	Ni-63	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-238	Pu-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	
Pu-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	8.507E-05	
Pu-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	2.198E-07	
Pu-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	2.658E-06	
Pu-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	1.160E-04	
Pu-238	ODSR(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	2.039E-04	
Pu-239	Pu-239	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-239	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	3.961E-06	
Pu-239	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	7.713E-07	
Pu-239	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	1.413E-06	
Pu-239	ODSR(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	6.145E-06	
Sr-90	Sr-90	1.000E+00		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-234	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	2.308E-01	
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	6.190E-04	
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	7.539E-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	0.000E+00	3.290E-01	
U-234	ODSR(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	5.680E-01	

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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

Parent	Product	Branch	DSR(j,t) (mrem/yr)/(pCi/g)									
(i)	(j)	Fraction	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04
U-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	2.240E-01
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	1.645E-01
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	3.019E-01
U-235	DSR(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	6.904E-01

U-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	2.257E-01
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	6.637E-03
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	1.178E-05
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	1.670E-04
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	7.254E-03
U-238	DSR(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	2.398E-01

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 μ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g

Basic Radiation Dose Limit = 15 mrem/yr

Nuclide	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04
Am-241	*1.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	2.077E+03	7.684E+07
C-14	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	3.500E+03	*4.454E+12
Co-60	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15
Cs-137	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13
Eu-152	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14
Eu-154	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14
H-3	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	1.428E+11	*9.594E+15	*9.594E+15
Ni-59	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10
Ni-63	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13
Pu-238	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	7.355E+04
Pu-239	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	2.441E+06
Sr-90	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14	*1.365E+14
U-234	*6.245E+09	*6.245E+09	*6.245E+09	*6.245E+09	*6.245E+09	*6.245E+09	*6.245E+09	*6.245E+09	*6.245E+09	2.641E+01
U-235	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	2.173E+01
U-238	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	6.256E+01

*At specific activity limit

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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 = 4965 p 5 years

Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	pCi/g	(years)		(pCi/g)		(pCi/g)
Am-241	1.460E-01	1243 p 1	8.397E-03	1.786E+03	7.567E-05	1.982E+05
C-14	1.500E-01	317.5 p 0.3	1.579E-01	9.500E+01	3.408E-12	4.401E+12
Co-60	2.300E-02	0.0000 p 0.0000	0.000E+00	*1.131E+15	0.000E+00	*1.131E+15
Cs-137	1.680E+00	0.0000 p 0.0000	0.000E+00	*8.701E+13	0.000E+00	*8.701E+13
Eu-152	5.612E+01	0.0000 p 0.0000	0.000E+00	*1.765E+14	0.000E+00	*1.765E+14
Eu-154	1.270E+00	0.0000 p 0.0000	0.000E+00	*2.639E+14	0.000E+00	*2.639E+14
H-3	2.260E+00	176.5 p 0.2	1.549E-07	4.227E+07	0.000E+00	*9.594E+15
Ni-59	2.040E-01	0.0000 p 0.0000	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	1.640E+01	0.0000 p 0.0000	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Pu-238	8.760E-03	5156 p 5	3.944E-04	3.804E+04	3.422E-04	4.383E+04
Pu-239	7.030E-02	1.000E+04	6.145E-06	2.441E+06	3.774E-07	3.974E+07
Sr-90	1.630E+00	1360 p 1	7.460E-15	*1.365E+14	0.000E+00	*1.365E+14
U-234	8.200E-03	4964 p 5	1.151E+00	1.303E+01	1.151E+00	1.304E+01
U-235	2.780E-04	4964 p 5	1.136E+00	1.320E+01	1.136E+00	1.320E+01
U-238	2.710E-02	4962 p 5	1.125E+00	1.334E+01	1.124E+00	1.335E+01

*At specific activity limit

Nuclide	Parent	BRF(i)	DOSE(j,t), mrem/yr									
(j)	(i)		t =	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04
Am-241	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Np-237	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.055E-03	3.673E-09
U-233	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.552E-09	2.028E-08
Th-229	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.921E-11	4.550E-09
C-14	C-14	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.513E-03	6.429E-04	1.425E-24
Co-60	Co-60	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cs-137	Cs-137	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Eu-152	7.208E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	Eu-152	2.792E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-152	DOSE(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
Gd-152	Eu-152	2.792E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Eu-154	Eu-154	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.374E-10	0.000E+00	0.000E+00
Ni-59	Ni-59	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ni-63	Ni-63	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-238	Pu-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-234	Pu-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	7.452E-07
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	1.893E-03
U-234	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	1.799E-04
U-234	DOSE(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	2.073E-03
Th-230	Pu-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	1.926E-09
Th-230	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	5.076E-06
Th-230	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	3.193E-07
Th-230	DOSE(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	5.397E-06
Ra-226	Pu-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	2.328E-08
Ra-226	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	6.182E-05
Ra-226	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	4.525E-06
Ra-226	DOSE(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	6.637E-05
Pb-210	Pu-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	1.016E-06
Pb-210	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	2.698E-03
Pb-210	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	1.966E-04
Pb-210	DOSE(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	2.896E-03

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

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

Nuclide	Parent	BRF(i)	DOSE(j,t), mrem/yr									
(j)	(i)		t = 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	
Pu-239	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
U-235	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.784E-07	
U-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	6.228E-05	
U-235	DOSE(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	6.256E-05	
Pa-231	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.422E-08	
Pa-231	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	4.573E-05	
Pa-231	DOSE(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	4.578E-05	
Ac-227	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.931E-08	
Ac-227	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	8.393E-05	
Ac-227	DOSE(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	8.403E-05	
Sr-90	Sr-90	1.000E+00	0.000E+00	0.000E+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-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	6.117E-03	
*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	

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

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t). pCi/g									
(j)	(i)		t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	1.000E+04
Am-241	Am-241	1.000E+00	1.460E-01	1.458E-01	1.453E-01	1.437E-01	1.391E-01	1.243E-01	9.008E-02	2.920E-02	1.493E-08	
Np-237	Am-241	1.000E+00	0.000E+00	4.720E-08	1.411E-07	4.641E-07	1.341E-06	3.918E-06	8.074E-06	7.286E-06	8.814E-12	
U-233	Am-241	1.000E+00	0.000E+00	1.033E-13	9.268E-13	1.020E-11	8.934E-11	9.030E-10	6.227E-09	2.861E-08	3.556E-09	
Th-229	Am-241	1.000E+00	0.000E+00	3.252E-18	8.761E-17	3.221E-15	8.517E-14	2.934E-12	6.464E-11	1.230E-09	9.088E-09	
C-14	C-14	1.000E+00	1.500E-01	1.492E-01	1.476E-01	1.423E-01	1.280E-01	8.843E-02	3.073E-02	7.606E-04	1.686E-24	
Co-60	Co-60	1.000E+00	2.300E+02	2.014E+02	1.545E+02	6.108E+01	4.307E+00	4.010E-04	1.219E-15	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	1.680E+00	1.642E+00	1.567E+00	1.333E+00	8.392E-01	1.661E-01	1.624E-03	1.501E-10	0.000E+00	
Eu-152	Eu-152	7.208E-01	4.045E+01	3.840E+01	3.460E+01	2.404E+01	8.489E+00	2.222E-01	6.701E-06	1.010E-21	0.000E+00	
Eu-152	Eu-152	2.792E-01	1.567E+01	1.487E+01	1.340E+01	9.311E+00	3.288E+00	8.606E-02	2.596E-06	3.913E-22	0.000E+00	
Eu-152	OS(j):		5.612E+01	5.327E+01	4.801E+01	3.335E+01	1.178E+01	3.082E-01	9.297E-06	1.401E-21	0.000E+00	
Gd-152	Eu-152	2.792E-01	0.000E+00	9.799E-14	2.793E-13	7.839E-13	1.526E-12	1.919E-12	1.922E-12	1.896E-12	1.594E-12	
Eu-154	Eu-154	1.000E+00	1.270E+00	1.174E+00	1.003E+00	5.775E-01	1.194E-01	4.798E-04	6.847E-11	7.519E-35	0.000E+00	
H-3	H-3	1.000E+00	2.260E+00	2.116E+00	1.855E+00	1.171E+00	3.141E-01	3.143E-03	6.079E-09	6.118E-29	0.000E+00	
Ni-59	Ni-59	1.000E+00	2.040E-01	2.040E-01	2.040E-01	2.039E-01	2.038E-01	2.032E-01	2.017E-01	1.966E-01	1.409E-01	
Ni-63	Ni-63	1.000E+00	1.640E+01	1.628E+01	1.605E+01	1.525E+01	1.320E+01	7.944E+00	1.864E+00	1.167E-02	5.459E-31	
Pu-238	Pu-238	1.000E+00	8.760E-03	8.690E-03	8.552E-03	8.086E-03	6.889E-03	3.932E-03	7.921E-04	2.907E-06	1.419E-37	
U-234	Pu-238	1.000E+00	0.000E+00	2.473E-08	7.358E-08	2.383E-07	6.590E-07	1.678E-06	2.642E-06	2.347E-06	1.334E-07	
U-234	U-234	1.000E+00	8.200E-03	8.197E-03	8.192E-03	8.174E-03	8.122E-03	7.943E-03	7.452E-03	5.963E-03	3.389E-04	
U-234	U-238	1.000E+00	0.000E+00	7.680E-08	2.303E-07	7.658E-07	2.283E-06	7.443E-06	2.096E-05	5.594E-05	3.220E-05	
U-234	OS(j):		8.200E-03	8.197E-03	8.192E-03	8.175E-03	8.125E-03	7.952E-03	7.476E-03	6.021E-03	3.712E-04	
Th-230	Pu-238	1.000E+00	0.000E+00	1.115E-13	9.977E-13	1.087E-11	9.269E-11	8.605E-10	5.008E-09	2.114E-08	7.654E-08	
Th-230	U-234	1.000E+00	0.000E+00	7.380E-08	2.213E-07	7.369E-07	2.203E-06	7.261E-06	2.108E-05	6.279E-05	2.025E-04	
Th-230	U-238	1.000E+00	0.000E+00	3.457E-13	3.110E-12	3.451E-11	3.092E-10	3.384E-09	2.918E-08	2.794E-07	5.304E-06	
Th-230	OS(j):		0.000E+00	7.380E-08	2.213E-07	7.370E-07	2.204E-06	7.265E-06	2.111E-05	6.309E-05	2.079E-04	
Ra-226	Pu-238	1.000E+00	0.000E+00	1.611E-17	4.330E-16	1.579E-14	4.084E-13	1.310E-11	2.463E-10	3.740E-09	6.854E-08	
Ra-226	U-234	1.000E+00	0.000E+00	1.598E-11	1.438E-10	1.595E-09	1.428E-08	1.558E-07	1.331E-06	1.235E-05	1.819E-04	
Ra-226	U-238	1.000E+00	0.000E+00	5.013E-17	1.347E-15	4.980E-14	1.337E-12	4.858E-11	1.242E-09	3.801E-08	4.250E-06	
Ra-226	OS(j):		0.000E+00	1.598E-11	1.438E-10	1.595E-09	1.428E-08	1.558E-07	1.332E-06	1.240E-05	1.862E-04	
Pb-210	Pu-238	1.000E+00	0.000E+00	1.244E-19	9.919E-18	1.159E-15	8.071E-14	6.243E-12	1.887E-10	3.485E-09	6.803E-08	
Pb-210	U-234	1.000E+00	0.000E+00	1.643E-13	4.367E-12	1.532E-10	3.571E-09	8.642E-08	1.077E-06	1.160E-05	1.806E-04	
Pb-210	U-238	1.000E+00	0.000E+00	2.177E-19	3.063E-17	3.642E-15	2.616E-13	2.261E-11	9.201E-10	3.464E-08	4.211E-06	
Pb-210	OS(j):		0.000E+00	1.643E-13	4.367E-12	1.532E-10	3.572E-09	8.645E-08	1.079E-06	1.164E-05	1.849E-04	

Summary : HWCTR - Reactor vessel and both steam generators removed

File : A:\TOT_INV.DAT

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide Parent	BRF(i)	S(j,t), pCi/g
(j)	(i)	
		t= 0.000E+00 1.000E+00 3.000E+00 1.000E+01 3.000E+01 1.000E+02 3.000E+02 1.000E+03 1.000E+04
*****	*****	*****
Pu-239	Pu-239 1.000E+00	7.030E-02 7.029E-02 7.027E-02 7.020E-02 7.001E-02 6.933E-02 6.742E-02 6.114E-02 1.740E-02
U-235	Pu-239 1.000E+00	0.000E+00 6.922E-11 2.076E-10 6.908E-10 2.063E-09 6.758E-09 1.940E-08 5.521E-08 8.057E-08
U-235	U-235 1.000E+00	2.780E-04 2.779E-04 2.777E-04 2.771E-04 2.754E-04 2.694E-04 2.529E-04 2.027E-04 1.182E-05
U-235	OS(j):	2.780E-04 2.779E-04 2.777E-04 2.771E-04 2.754E-04 2.694E-04 2.529E-04 2.028E-04 1.190E-05
Pa-231	Pu-239 1.000E+00	0.000E+00 7.323E-16 6.589E-15 7.312E-14 6.559E-13 7.204E-12 6.274E-11 6.217E-10 1.626E-08
Pa-231	U-235 1.000E+00	0.000E+00 5.881E-09 1.764E-08 5.872E-08 1.755E-07 5.778E-07 1.673E-06 4.936E-06 1.326E-05
Pa-231	OS(j):	0.000E+00 5.881E-09 1.764E-08 5.872E-08 1.755E-07 5.778E-07 1.673E-06 4.936E-06 1.328E-05
Ac-227	Pu-239 1.000E+00	0.000E+00 7.710E-18 2.049E-16 7.182E-15 1.673E-13 4.050E-12 5.115E-11 5.862E-10 1.622E-08
Ac-227	U-235 1.000E+00	0.000E+00 9.263E-11 8.161E-10 8.432E-09 6.254E-08 4.050E-07 1.504E-06 4.802E-06 1.326E-05
Ac-227	OS(j):	0.000E+00 9.263E-11 8.161E-10 8.432E-09 6.254E-08 4.050E-07 1.504E-06 4.802E-06 1.328E-05
Sr-90	Sr-90 1.000E+00	1.630E+00 1.590E+00 1.513E+00 1.271E+00 7.723E-01 1.352E-01 9.299E-04 2.510E-11 0.000E+00
U-238	U-238 1.000E+00	2.710E-02 2.709E-02 2.707E-02 2.701E-02 2.684E-02 2.626E-02 2.465E-02 1.976E-02 1.152E-03
*****	*****	*****

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

Appendix G

RESRAD-BUILD

Summary Report

RESRAD-BUILD Table of Contents

Input Parameters.....	0-1
For Each Time (I) :.....	
Time Specific Parameters.....	I-1
Receptor-Source Dose Summary.....	I-2
Dose by Pathway Detail.....	I-3
Dose by Nuclide Detail.....	I-4
Full Summary.....	F-1

```

  RESRAD-BUILD Input Parameters
  
```

```

  Number of Sources : 1
  Number of Receptors: 1
  Total Time : 3.650000E+02 days
  Fraction Inside : 2.300000E-01
  
```

Receptor Information

Receptor	Room	x [m]	y [m]	z [m]	FracTime	Inhalation [m3/day]	Ingestion(Dust) [m2/hr]
1	1	1.000	10.500	1.250	1.000	2.19E+01	1.00E-04

Receptor-Source Relationship

Recept	Source	Density [g/cm3]	Thickness Or [cm]
1	1	2.40E+00	0.00E+00 RT

~~~~~ Building Information ~~~~~

Building Air Exchange Rate: 8.00E-01 1/hr

Height [m]	Area [m2]	Air Exchanges [m3/hr]
*****		
H3: 2.500	Area 36.000	<div style="display: flex; justify-content: space-between;"> <div> Room 3
 LAMBDA: 1.00E+00
 N23: 0.00E+00 </div> <div> <=Q03: 6.00E+01
 Q30 : 6.00E+01

 Q32 : 3.00E+01
 Q23 : 3.00E+01 </div> </div> |
| ***** | | |
| H2: 2.500 | Area 36.000 | <div style="display: flex; justify-content: space-between;"> <div> Room 2
 LAMBDA: 1.00E+00
 N12: 0.00E+00 </div> <div> <=Q02: 6.00E+01
 Q20 : 6.00E+01

 Q21 : 0.00E+00
 Q12 : 0.00E+00 </div> </div> |
| ***** | | |
| H1: 2.500 | Area 53.300 | <div style="display: flex; justify-content: space-between;"> <div> Room 1
 LAMBDA: 9.80E-01 </div> <div> <=Q01: 1.31E+02
 Q10 : 1.31E+02 </div> </div> |
| ***** | | |

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

Source Information

Source: 1
 Location:: Room : 1 x: 0.00 y: 10.50 z: 2.50[m]
 Geometry:: Type: Area Area:5.33E+01 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 3.650E+02 [day]
 Radon Release Fraction: 1.000E-01

Contamination::

Nuclide Concentration

Dose Conversion Factors

		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)]
AM-241	6.630E+03	4.500E-03	5.200E-01	3.220E-06	2.740E-08	9.570E-05
PU-239	7.490E+03	4.300E-03	5.100E-01	4.290E-08	1.850E-10	4.960E-07
NP-237	0.000E+00	3.900E-03	4.900E-01	2.620E-05	6.880E-07	1.210E-03
U-238	2.870E+04	2.500E-04	1.200E-01	3.530E-06	9.510E-08	1.600E-04
U-235	0.000E+00	2.500E-04	1.200E-01	1.950E-05	4.740E-07	9.030E-04
U-234	0.000E+00	2.600E-04	1.300E-01	8.750E-08	2.520E-10	8.930E-07
U-233	0.000E+00	2.700E-04	1.300E-01	8.380E-08	8.750E-10	1.910E-06
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
TH-229	0.000E+00	4.300E-03	2.000E+00	3.680E-05	9.870E-07	1.720E-03
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
CS-137	2.680E+06	5.000E-05	3.200E-05	6.490E-05	2.140E-06	3.190E-03
SR-90	2.210E+06	1.400E-04	1.300E-03	6.560E-07	1.540E-08	2.310E-05
CO-60	7.140E+05	2.600E-05	1.500E-04	2.750E-04	1.020E-05	1.470E-02
C-14	5.170E+08	2.100E-06	2.100E-06	1.880E-09	8.420E-12	2.620E-08
H-3	1.830E+10	6.300E-08	6.300E-08	0.000E+00	0.000E+00	3.870E-08

```

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

Source Information

Source: 1

Location:: Room : 1 x: 0.00 y: 10.50 z: 2.50 [m]
 Geometry:: Type: Area Area:5.33E+01 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 3.650E+02 [day]

| Contamination:: | Nuclide | Concentration
[pCi/m2] |
|-----------------|---------|---------------------------|
| | AM-241 | 6.630E+03 |
| | PU-239 | 7.490E+03 |
| | NP-237 | 0.000E+00 |
| | U-238 | 2.870E+04 |
| | U-235 | 0.000E+00 |
| | U-234 | 0.000E+00 |
| | U-233 | 0.000E+00 |
| | PA-231 | 0.000E+00 |
| | TH-230 | 0.000E+00 |
| | TH-229 | 0.000E+00 |
| | AC-227 | 0.000E+00 |
| | RA-226 | 0.000E+00 |
| | PB-210 | 0.000E+00 |
| | CS-137 | 2.680E+06 |
| | SR-90 | 2.210E+06 |
| | CO-60 | 7.140E+05 |
| | C-14 | 5.170E+08 |
| | H-3 | 1.830E+10 |

Receptor Point-Source Doses
[mrem]

| | | Source
1 | Total |
|----------|---|-------------|---------|
| Receptor | 1 | 1.2E+02 | 1.2E+02 |
| Total | | 1.2E+02 | 1.2E+02 |

Pathway Detail of Doses
 [mrem]

Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.57E+01	1.15E+00	9.91E-03	6.80E+01	3.42E-32	2.53E+01
Total	2.57E+01	1.15E+00	9.91E-03	6.80E+01	3.42E-32	2.53E+01

Nuclide Detail of Doses
 ~~~~~  
 [mrem]

Source: 1

Nuclide	Receptor 1	Total
AM-241		
AM-241	1.50E+01	1.50E+01
PU-239		
PU-239	1.67E+01	1.67E+01
U-238		
U-238	1.48E+01	1.48E+01
CS-137		
CS-137	1.46E+01	1.46E+01
SR-90		
SR-90	1.50E+01	1.50E+01
CO-60		
CO-60	1.43E+01	1.43E+01
C-14		
C-14	1.48E+01	1.48E+01
H-3		
H-3	1.49E+01	1.49E+01

```

  Assessment for Time: 2
  Time =1.00E+00 yr
  
```

Source Information

Source: 1

Location:: Room : 1 x: 0.00 y: 10.50 z: 2.50 [m]  
 Geometry:: Type: Area Area:5.33E+01 [m2] Direction: x  
 Pathway ::  
 Direct Ingestion Rate: 0.000E+00 [1/hr]  
 Fraction released to air: 1.000E-01  
 Removable fraction: 5.000E-01  
 Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	AM-241	3.310E+03
	PU-239	3.745E+03
	NP-237	1.073E-03
	U-238	1.435E+04
	U-235	3.689E-06
	U-234	4.062E-02
	U-233	2.342E-09
	PA-231	3.900E-11
	TH-230	1.829E-07
	TH-229	7.415E-14
	AC-227	4.122E-13
	RA-226	2.338E-11
	PB-210	5.607E-14
	CS-137	1.310E+06
	SR-90	1.079E+06
	CO-60	3.130E+05
	C-14	2.585E+08
	H-3	8.648E+09

```

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

```

Receptor Point-Source Doses  
 [mrem]

		Source 1	Total
Receptor	1	1.2E+01	1.2E+01
Total		1.2E+01	1.2E+01

Pathway Detail of Doses  
 ~~~~~  
 [mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	1.19E+01	0.00E+00	0.00E+00	0.00E+00	2.74E-17	0.00E+00
total	1.19E+01	0.00E+00	0.00E+00	0.00E+00	2.74E-17	0.00E+00

Title : Building on the HWCTR site

Input File : HWCTRE.DAT

Evaluation Time:

1.00000

years

Nuclide Detail of Doses

~~~~~

[mrem]

Source: 1

Nuclide	Receptor 1	Total
AM-241		
AM-241	1.03E-03	1.03E-03
NP-237	2.24E-09	2.24E-09
U-233	2.30E-17	2.30E-17
TH-229	2.13E-19	2.13E-19
PU-239		
PU-239	2.93E-05	2.93E-05
U-235	5.90E-12	5.90E-12
PA-231	1.54E-17	1.54E-17
AC-227	1.44E-18	1.44E-18
U-238		
U-238	3.97E-03	3.97E-03
U-234	4.92E-10	4.92E-10
TH-230	1.93E-15	1.93E-15
RA-226	3.38E-16	3.38E-16
PB-210	2.57E-21	2.57E-21
CS-137		
CS-137	6.07E+00	6.07E+00
SR-90		
SR-90	4.55E-02	4.55E-02
CO-60		
CO-60	5.76E+00	5.76E+00
C-14		
C-14	0.00E+00	0.00E+00
H-3		
H-3	0.00E+00	0.00E+00


```

#####
#####
Assessment for Time: 3
Time =1.00E+01 yr
#####
#####

```

Source: 1

Contamination::	Nuclide	Concentration [pCi/m2]
	AM-241	3.262E+03
	PU-239	3.744E+03
	NP-237	1.066E-02
	U-238	1.435E+04
	U-235	3.689E-05
	U-234	4.062E-01
	U-233	2.331E-07
	PA-231	3.900E-09
	TH-230	1.829E-05
	TH-229	7.388E-11
	AC-227	3.843E-10
	RA-226	2.640E-08
	PB-210	1.931E-09
	CS-137	1.065E+06
	SR-90	8.685E+05
	CO-60	9.575E+04
	C-14	2.582E+08
	H-3	5.206E+09

```

    eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
    eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
    eee                                     eee
    eee      RESRAD-BUILD Dose Tables      eee
    eee                                     eee
    eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
    eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
  
```

Receptor Point-Source Doses
 eeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeeee
 [mrem]

	Source	Total
	1	
Receptor 1	6.7E+00	6.7E+00
Total	6.7E+00	6.7E+00

* RESRAD-BUILD Program Output, Version 2.10 03/06/97 13:41 Page: 3- 3 : 15 **
Title : Building on the HWCTR site
Input File : HWCTRE.DAT Evaluation Time: 10.0000 years

Pathway Detail of Doses
~~~~~  
[mrem]

| | | | | | | |
|-----------|----------|------------|-----------|------------|----------|-----------|
| Source: 1 | | | | | | |
| Receptor | External | Deposition | Immersion | Inhalation | Radon | Ingestion |
| 1 | 6.74E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.10E-14 | 0.00E+00 |
| Total | 6.74E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 3.10E-14 | 0.00E+00 |

Nuclide Detail of Doses
 ~~~~~  
 [mrem]

Source: 1

Nuclide	Receptor 1	Total
AM-241		
AM-241	1.01E-03	1.01E-03
NP-237	2.22E-08	2.22E-08
U-233	2.29E-15	2.29E-15
TH-229	2.12E-16	2.12E-16
PU-239		
PU-239	2.93E-05	2.93E-05
U-235	5.90E-11	5.90E-11
PA-231	1.54E-15	1.54E-15
AC-227	1.34E-15	1.34E-15
U-238		
U-238	3.97E-03	3.97E-03
U-234	4.92E-09	4.92E-09
TH-230	1.93E-13	1.93E-13
RA-226	3.82E-13	3.82E-13
PB-210	8.86E-17	8.86E-17
CS-137		
CS-137	4.94E+00	4.94E+00
SR-90		
SR-90	3.67E-02	3.67E-02
CO-60		
CO-60	1.76E+00	1.76E+00
C-14		
C-14	0.00E+00	0.00E+00
H-3		
H-3	0.00E+00	0.00E+00

** RESRAD-BUILD Program Output, Version 2.10 03/06/97 13:41 Page: 4- 1 : 17 **
 Title : Building on the HWCTR site
 Input File : HWCTRE.DAT Evaluation Time: 30.0000 years

```

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

Source Information

Source: 1
 Location:: Room : 1 x: 0.00 y: 10.50 z: 2.50 [m]
 Geometry:: Type: Area Area:5.33E+01 [m2] Direction: x
 Pathway ::
 Direct Ingestion Rate: 0.000E+00 [1/hr]
 Fraction released to air: 1.000E-01
 Removable fraction: 5.000E-01
 Time to Remove: 3.650E+02 [day]

Contamination::	Nuclide	Concentration [pCi/m2]
	AM-241	3.159E+03
	PU-239	3.742E+03
	NP-237	3.147E-02
	U-238	1.435E+04
	U-235	1.106E-04
	U-234	1.219E+00
	U-233	2.075E-06
	PA-231	3.509E-08
	TH-230	1.646E-04
	TH-229	1.978E-09
	AC-227	8.970E-09
	RA-226	7.113E-07
	PB-210	1.393E-07
	CS-137	6.728E+05
	SR-90	5.366E+05
	CO-60	6.888E+03
	C-14	2.576E+08
	H-3	1.686E+09

RESRAD-BUILD Dose Tables

[mrem]

3.3E+00

* RESRAD-BUILD Program Output, Version 2.10 03/06/97 13:41 Page: 4- 3 : 19 **
 Title : Building on the HWCTR site
 Input File : HWCTRE.DAT Evaluation Time: 30.0000 years

Pathway Detail of Doses
 ~~~~~  
 [mrem]

| | | | | | | |
|-----------|----------|------------|-----------|------------|----------|-----------|
| Source: 1 | | | | | | |
| Receptor | External | Deposition | Immersion | Inhalation | Radon | Ingestion |
| 1 | 3.27E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.35E-13 | 0.00E+00 |
| Total | 3.27E+00 | 0.00E+00 | 0.00E+00 | 0.00E+00 | 8.35E-13 | 0.00E+00 |

Nuclide Detail of Doses
 ~~~~~  
 [mrem]

Source: 1

Nuclide	Receptor 1	Total
AM-241		
AM-241	9.81E-04	9.81E-04
NP-237	6.56E-08	6.56E-08
U-233	2.04E-14	2.04E-14
TH-229	5.69E-15	5.69E-15
PU-239		
PU-239	2.93E-05	2.93E-05
U-235	1.77E-10	1.77E-10
PA-231	1.39E-14	1.39E-14
AC-227	3.14E-14	3.14E-14
U-238		
U-238	3.97E-03	3.97E-03
U-234	1.48E-08	1.48E-08
TH-230	1.73E-12	1.73E-12
RA-226	1.03E-11	1.03E-11
PB-210	6.39E-15	6.39E-15
CS-137		
CS-137	3.12E+00	3.12E+00
SR-90		
SR-90	2.26E-02	2.26E-02
CO-60		
CO-60	1.27E-01	1.27E-01
C-14		
C-14	0.00E+00	0.00E+00
H-3		
H-3	0.00E+00	0.00E+00