APPENDIX A

RESRAD INPUT PARAMETERS

DEFENSE NATIONAL STOCKPILE CENTER, NEW HAVEN DEPOT
DEFAULT AND RECOMMENDED VALUES FOR RESRAD INPUT PARAMETERS

RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
External Gamma	N/A	Active	Active	N/A	N/A	N/A
Inhalation (without radon)	N/A	Active	Active	N/A	N/A	N/A
Plant Ingestion	N/A	Active	Active	N/A	N/A	N/A
Meat Ingestion	N/A	Active	Active	N/A	N/A	N/A
Milk Ingestion	N/A	Active	Active	N/A	N/A	N/A
Aquatic Foods	N/A	Active	Active	N/A	N/A	N/A
Drinking Water	N/A	Active	Active	N/A	N/A	N/A
Soil Ingestion	N/A	Active	Active	N/A	N/A	N/A
Radon	N/A	Inactive	Inactive	N/A	Not applicable per Federal Register, 1994, p. 43210	NRC 1994
Area of contaminated zone	AREA	10,000	10,000	m^2	The RESRAD default is used as the base case for natural thorium.	Yu 1993 (Section 30)
Thickness of contaminated zone	THICK0	2	**0.5**	m	Contamination was assumed to be limited to the top 50 cm of soil for the majority of the site based on an evaluation of the site history and the resultant conceptual site model.	Yu 1993 (Section 39)
Length parallel to the aquifer	LCZPAQ	100	100	m	For all cases, the length parallel to the aquifer was calculated as the square root of the contaminated zone area.	Yu 1993 (Section 16)
Times for calculations	TI	1, 3, 10, 30, 100, 300, 1000	1, 3, 10, 30, 100, 300, 1000	yr	RESRAD defaults for calculation times.	Yu 2001
Cover depth	COVER)	0	0	m	As a conservative approach for dose modeling, no cover depth was assumed.	Yu 1993 (Section 31)
Density of cover material	DENSCV	1.5	**N/A**	g/cm^3	Lack of cover depth precludes an assigned value for this parameter.	Yu 1993 (Section 2)
Cover erosion rate	VCV	0.001	**N/A**	m/yr	Lack of cover depth precludes an assigned value for this parameter.	Yu 1993 (Section 14)

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Density of contaminated zone	DENSCZ	1.5	1.2	g/cm^3	The soil density was selected from Table 2.1 of the reference for silty clay.	USDA 2006b Yu 1993 (Section 2)
Contaminated zone erosion rate	VCZ	0.001	0.001	m/yr	RESRAD default used.	Yu 1993 (Section 14)
Contaminated zone total porosity	TPCZ	0.4	0.4	unitless	RESRAD default used as an estimate of the total porosity	Yu 1993 (Section 3)
Contaminated zone field capacity	FCCZ	0.2	0.2	unitless	RESRAD default used as an estimate of field capacity	Yu 2001
Contaminated zone hydraulic conductivity	HCCZ	10	**3.21**	m/yr	Assumed to be a factor of 10 less than the saturated zone hydraulic conductivity for silty clay from Table 5.2 of the reference.	Yu 1993 (Section 5)
Contaminated zone b parameter	BCZ	5.3	**10.4**	unitless	The contaminated zone b parameter was selected from Table 13.1 of the reference for silty clay.	Yu 1993 (Section 13)
Humidity in air	HUMID	8	**N/A**	g/m^3	Humidity input is only required in RESRAD when tritium is a radionuclide of concern.	Yu 2001
Evapotranspiration coefficient	EVAPTR	0.5	0.5	unitless	No site-specific data available. RESRAD default used.	Yu 1993 (Section 12)
Wind speed	WIND	2	**4.4**	m/sec	Per city-data.com, the average annual wind speed is 9.9 mph (4.4 m/sec).	Yu 1993 (Section 21) DLA, 2000
Precipitation	PRECIP	1	**0.88**	m/yr	Site-specific value based on reported average annual rainfall, 34.75 in (88.27 cm) over the year.	Yu 1993 (Section 9) DLA, 2000
Irrigation	RI	0.2	0.2	m/yr	No site-specific data available. RESRAD default used.	Yu 1993 (Section 11)
Irrigation mode	IDITCH	Overhead	Overhead	unitless	The "Overhead" and "Ditch" designations are independent of the depth of contaminated zone and have no significant impact on the RESRAD evaluation. The RESRAD default designation was selected.	Yu 2001
Runoff coefficient	RUNOFF	0.2	0.2	unitless	The RESRAD default value was selected based on reference value for intermediate combinations of clay and loam.	Yu 1993 (Section 10)

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Watershed area for nearby stream or pond	WAREA	1.00E6	1.00E6	m^2	RESRAD default used.	Yu 1993 (Section 17)
Accuracy for water/soil computations	EPS	0.001	0.001	unitless	RESRAD default used.	Yu 2001
Density of saturated zone	DENSAQ	1.5	1.2	g/cm^3	Soil density range from samples obtained by USDA at the site was 1.2 to 1.7. The RESRAD default was chosen as a reasonable average.	USDA 2006b Yu 1993 (Section 2)
Saturated zone total porosity	TPSZ	0.4	0.4	unitless	RESRAD default used. Equivalent to contaminated zone total porosity.	Yu 1993 (Section 3)
Saturated zone effective porosity	EPSZ	0.2	0.2	unitless	RESRAD default used.	Yu 1993 (Section 4)
Saturated zone field capacity	FCSZ	0.2	0.2	unitless	RESRAD default used.	Yu 2001
Saturated zone hydraulic conductivity	HCSZ	100	**32.1**	m/yr	Saturated zone hydraulic conductivity for silty clay taken from Table 5.2 of the reference.	Yu 1993 (Section 5)
Saturated zone hydraulic gradient	HGWT	0.02	0.02	unitless	RESRAD default used. Potable water at the Site is obtained via public water supply. Groundwater contamination is not considered a significant exposure pathway, though this parameter is "active" for conservatism.	Yu 1993 (Section 15)
Saturated zone b parameter	BSZ	5.3	**10.4**	unitless	The contaminated zone b parameter was selected from Table 13.1 of the reference for silty clay.	Yu 1993 (Section 13)
Water table drop rate	VWT	0.001	0.001	m/yr	RESRAD default used. Groundwater contamination is not considered a significant exposure pathway, though this parameter is "active" for conservatism.	Yu 1993 (Section 18)
Well pump intake depth (meters below water table)	DWIBWT	10	10	m	RESRAD default used. Groundwater contamination is not considered a significant exposure pathway, though this parameter is "active" for conservatism.	Yu 1993 (Section 19)
Model for Water Transport Parameters [Non-dispersion (ND) or Mass-Balance (MB)]	MODEL	ND	**MB**	unitless	Per NRC guidance, the MB model is an acceptable approach and provides a potentially more conservative dose estimate relative to the ND model. The MB model assumes a well is located at the center of the site rather than on the down gradient side of the Site boundary.	NUREG-1757, Vo. 2, App. I, page 1-40

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
					In addition, all radionuclides released from the contaminated zone are withdrawn through the well. Groundwater contamination is not considered a significant exposure pathway, though this parameter is "active" for conservatism.	NRC 1999b
Well pumping rate	UW	250	250	m^3/yr	RESRAD default used. Groundwater contamination is not considered a significant exposure pathway, though this parameter is "active" for conservatism.	Yu 2001
Number of unsaturated zone strata	NS	1	1	unitless	RESRAD default used.	Yu 1993 (Section 25)
Unsaturated zone thickness	H(1)	4	**14.50**	m	Determined by subtracting the contaminated zone thickness (0.15 m) from the assumed saturated zone depth below ground surface (15 m).	Yu 1993 (Section 25)
Unsaturated zone soil density	DENSUZ(1)	1.5	1.2	g/cm^3	Soil density range from samples obtained by USDA at the site was 1.2 to 1.7. The RESRAD default was chosen as a reasonable average.	USDA 2006b Yu 1993 (Section 2)
Unsaturated zone total porosity	TPUZ(1)	0.4	0.4	unitless	RESRAD default used (equivalent to saturated and contaminated zone total porosity inputs).	Yu 1993 (Section 3)
Unsaturated zone effective porosity	EPSZ(1)	0.2	0.2	unitless	RESRAD default used.	Yu 1993 (Section 4)
Unsaturated zone field capacity	FCSZ(1)	0.2	0.2	unitless	RESRAD default used.	Yu 2001
Unsaturated zone hydraulic conductivity	HCSZ(1)	100	**3.21**	m/yr	Assumed to be a factor of 10 less than the saturated zone hydraulic conductivity for silty clay from Table 5.2 of the reference.	Yu 1993 (Section 5)
Unsaturated zone b parameter	BSZ	5.3	**10.4**	unitless	The unsaturated zone b parameter was selected from Table 13.1 of the reference for silty clay.	Yu 1993 (Section 13)
Contaminated zone	DCNUCC(2 & 3)	60,000	**5,800**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input. However, for thorium, the value selected has no impact on the DCGL determination.	Yu 1993 (Section 32)
Unsaturated zone	DCNUCU(2 & 3,1)	60,000	**5,800**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input. However, for thorium, the value selected has no impact on the DCGL determination.	Yu 1993 (Section 32)

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Saturated zone	DCNUCS(2 & 3)	60,000	**5,800**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Leach rate	ALEACH(2 & 3)	0	0	y^{-1}	RESRAD default used.	Yu 2001
Solubility constant	SOLUBK(2 & 3)	0	0	unitless	RESRAD default used.	Yu 2001
Contaminated zone	DCNUCC(1)	70	**9,100**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Unsaturated zone	DCNUCU(1,1)	70	**9,100**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Saturated zone	DCNUCS(1)	70	**9,100**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Leach rate	ALEACH(1)	0	0	y^{-1}	RESRAD default used.	Yu 2001
Solubility constant	SOLUBK(1)	0	0	unitless	RESRAD default used.	Yu 2001
Contaminated zone	DCNUCC(1)	70	**1,600**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Unsaturated zone	DCNUCU(1,1)	70	**1,600**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Saturated zone	DCNUCS(1)	70	**1,600**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Leach rate	ALEACH(1)	0	0	y^{-1}	RESRAD default used.	Yu 2001
Solubility constant	SOLUBK(1)	0	0	unitless	RESRAD default used.	Yu 2001
Contaminated zone	DCNUCC(1)	70	**2,400**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Unsaturated zone	DCNUCU(1,1)	70	**2,400**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Saturated zone	DCNUCS(1)	70	**2,400**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Leach rate	ALEACH(1)	0	0	y^{-1}	RESRAD default used.	Yu 2001
Solubility constant	SOLUBK(1)	0	0	unitless	RESRAD default used.	Yu 2001
[illegible]						
Contaminated zone	DCNUCC(1)	70	**2,700**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Unsaturated zone	DCNUCU(1,1)	70	**2,700**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Saturated zone	DCNUCS(1)	70	**2,700**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Leach rate	ALEACH(1)	0	0	y^{-1}	RESRAD default used.	Yu 2001
Solubility constant	SOLUBK(1)	0	0	unitless	RESRAD default used.	Yu 2001
[illegible]						
Contaminated zone	DCNUCC(1)	70	**550**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Unsaturated zone	DCNUCU(1,1)	70	**550**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Saturated zone	DCNUCS(1)	70	**550**	cm^3/g	Site is predominantly silty clay. Value from Table 32.1 of the reference for clay selected as the input.	Yu 1993 (Section 32)
Leach rate	ALEACH(1)	0	0	y^{-1}	RESRAD default used.	Yu 2001
Solubility constant	SOLUBK(1)	0	0	unitless	RESRAD default used.	Yu 2001

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Inhalation rate	INHALR	8,400	8,400	m^3/y	RESRAD default used.	Yu 1993 (Section 43)
Mass loading for inhalation	MLINH	0.0001	0.0001	g/m^3	RESRAD default used.	Yu 1993 (Section 35)
Exposure duration	ED	30	30	yr	RESRAD default used. DCGL calculations not influenced by exposure duration.	Yu 2001
Inhalation shielding factor	SHF3	0.4	0.4	unitless	RESRAD default used.	Yu 1993 (Section 36)
External gamma shielding factor	SHF1	0.7	**0.5512**	unitless	EPA value from Equation 4 in reference used.	EPA 2000
Indoor time fraction	FIND	0.5	**0.6571**	unitless	EPA value from Equation 4 in reference used.	EPA 2000
Outdoor time fraction	FOTD	0.25	**0.1181**	unitless	EPA value from Equation 4 in reference used.	EPA 2000
Shape of the contaminated zone (circular or non-circular)	FS	Circular	Circular	unitless	RESRAD default used.	Yu 1993 (Section 50)
Fruits, vegetables and grain consumption	DIET(1)	160	**112**	kg/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 42) NUREG/CR 5512 (Vol. 4, p. 3-6)
Leafy vegetable consumption	DIET(2)	14	**21.4**	kg/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 44) NUREG/CR 5512 (Vol. 4, p. 3-6)
Milk consumption	DIET(3)	92	**233**	L/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 47) NUREG/CR 5512 (Vol. 4, p. 3-6)
Meat and poultry consumption	DIET(4)	63	**65.1**	kg/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 46)

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RESRAD Version 6.3					Parameter Justification	
Parameter	Code	Default Value	User Input Value	Units	Comments	Reference
						NUREG/CR 5512 (Vol. 4, p. 3-6)
Fish consumption	DIET(5)	5.4	**20.6**	kg/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 46) NUREG/CR 5512 (Vol. 4, p. 3-6)
Other seafood consumption	DIET(6)	0.9	0.9	kg/yr	No site-specific or NRC value is available. Hence, RESRAD default value was assigned.	ANL 1993 (Section 46) NUREG/CR 5512 (Vol. 4, p. 3-6)
Soil ingestion rate	SOIL	36.5	18.3	g/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 46) NUREG/CR 5512 (Vol. 4, p. 3-6)
Drinking water intake	DWI	510	**478.5**	L/yr	No site-specific value is available. Hence, NRC value was assigned.	ANL 1993 (Section 46) NUREG/CR 5512 (Vol. 4, p. 3-6)
Contamination fraction of drinking water	FDW	1	1	unitless	Maximum NRC value used.	NRC 1999b Yu 2001
Contamination fraction of household water	FHHW	1	**NA**	unitless	Radon pathway is not selected; hence this parameter is not applicable	N/A
Contamination fraction of livestock water	FLW	1	1	unitless	Maximum NRC value used.	N/A
Contamination fraction of irrigation water	FIRW	1	1	unitless	Maximum NRC value used.	NRC 1999b
Contamination fraction of aquatic food	FR9	0.5	0.5	unitless	No site-specific or NRC value is available. Hence, RESRAD default value was assigned.	N/A
Contaminated fraction of plant food	FPLANT	-1	-1	unitless	Setting the parameter to -1 allows RESRAD to determine appropriate value based on area factor.	Yu 1993
Contaminated fraction of meat	FMEAT	-1	-1	unitless	Setting the parameter to -1 allows RESRAD to determine appropriate value based on area factor.	N/A
Contaminated fraction of milk	FMILK	-1	-1	unitless	Setting the parameter to -1 allows RESRAD to determine appropriate value based on area factor.	N/A

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RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Livestock fodder intake for meat	LP15	68	68	kg/day	No site-specific value was available. NUREG/CR-6697 provides a range of values (13.4 to 53.6 kg/day); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 157)
Livestock fodder intake for milk	LP16	55	55	kg/day	No site-specific value was available. NUREG/CR-6697 provides a range of values (31.6 to 126 kg/day); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 158)
Livestock water intake for meat	LW15	50	50	L/day	No site-specific value was available. NUREG/CR-6697 provides a range of values (25 to 100 L/day). The "base" or middle value (50 L/day) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 158) ANL 1993 (Section 45)
Livestock water intake for milk	LW15	160	160	L/day	No site-specific value was available. NUREG/CR-6697 provides a range of values (30 to 120 L/day); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 158) ANL 1993 (Section 45)
Livestock intake of soil	LS1	0.5	0.5	kg/day	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.25 to 1.0 kg/day). The "base" or middle value (0.5 kg/day) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 158)
Mass loading for foliar deposition	MLFD	0.0001	0.0001	g/m^3	No site-specific value was available. NUREG/CR-6697 provides a range of values (1E-7 to 7E-4 g/m^3); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 158)
Depth of soil mixing layer	DM	0.15	0.15	m	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.075 to 0.3 m). The "base" or middle value (0.15 m) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 158) Yu 1993 (Section 35)
Depth of roots	DROOT	0.9	0.9	m	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.3 to 3 m). The "base" or middle value (0.9 m) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 159) Yu 1993 (Section 37)
Groundwater fractional usage: Drinking water	FGWDW	1	1	unitless	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)

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Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Groundwater fractional usage: Household water	FGWHH	1	N/A	unitless	Radon pathway not active	N/A
Groundwater fractional usage: Livestock water	FGWLW	1	1	unitless	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Groundwater fractional usage: Irrigation water	FGWIR	1	1	unitless	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
[redacted]						
Wet weight crop yield: non-leafy vegetables	YV(1)	0.7	0.7	kg/m^2	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.31 to 3 kg/m^2); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 159)
Wet weight crop yield: leafy vegetables	YV(2)	1.5	1.5	kg/m^2	No site-specific value was available. NUREG/CR-6697 provides a range of values (2.7 to 3 kg/m^2); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 159)
Wet weight crop yield: fodder	YV(3)	1.1	1.1	kg/m^2	No site-specific value was available. NUREG/CR-6697 provides a range of values (1.259 to 2.36 kg/m^2); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 159)
Length of growing season: non-leafy vegetables	TE(1)	0.17	0.17	years	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.085 to 0.4932 years); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 159)
Length of growing season: leafy vegetables	TE(2)	0.25	0.25	years	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.062 to 0.246 years); however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 159)
Length of growing season: fodder	TE(3)	0.08	0.08	years	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.04 to 0.16 years). The "base" or middle value (0.08) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Translocation factor: non-leafy vegetables	TIV(1)	0.1	0.1	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.06 to 0.2). The "base" or middle value (0.1) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)

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RESRAD Version 6.3					Parameter Justification	
Parameter	Code	Default Value	User Input Value	Units	Comments	Reference
Translocation factor: leafy vegetables	TIV(2)	1	1	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.5 to 1). The maximum value (1) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Translocation factor: fodder	TIV(3)	1	1	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values (0.5 to 1). The maximum value (1) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Weathering removal constant	WLAM	20	20	y^{-1}	No site-specific value was available. NUREG/CR-6697 provides a range of values (10 to 40). The "base" or middle value (20) is in agreement with the RESRAD default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Wet foliar interception fraction: non-leafy vegetables	RWET(1)	0.25	0.25	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values; however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Wet foliar interception fraction: leafy vegetables	RWET(2)	0.25	0.25	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values; however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 161)
Wet foliar interception fraction: fodder	RWET(3)	0.25	0.25	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values; however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 161)
Dry foliar interception fraction: non-leafy vegetables	RDRY(1)	0.25	0.25	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values; however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Dry foliar interception fraction: leafy vegetables	RDRY(2)	0.25	0.25	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values; however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)
Dry foliar interception fraction: fodder	RDRY(3)	0.25	0.25	unitless	No site-specific value was available. NUREG/CR-6697 provides a range of values; however, a specific justification for selecting a particular value within the range provided could not be identified. Therefore, the default value was selected.	NUREG/CR-6697, Table 3-1, p. 160)

DEFENSE NATIONAL STOCKPILE CENTER, NEW HAVEN DEPOT
DEFAULT AND RECOMMENDED VALUES FOR RESRAD INPUT PARAMETERS

RESRAD Version 6.3					Parameter Justification	
Parameter	**Code**	**Default Value**	**User Input Value**	**Units**	**Comments**	**Reference**
Fruits, non-leafy vegetables and grain	STOR_T(1)	14	14	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Leafy vegetables	STOR_T(2)	1	1	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Milk	STOR_T(3)	1	1	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Meat	STOR_T(4)	20	20	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Fish	STOR_T(5)	7	7	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Crustacea and mollusks	STOR_T(6)	7	7	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Well water	STOR_T(7)	1	1	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Surface water	STOR_T(8)	1	1	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)
Livestock fodder	STOR_T(9)	45	45	days	No site-specific value was identified; the RESRAD and NRC parameter values are identical and were selected.	NUREG/CR-6697, Table 3-1, p. 3-7)

APPENDIX B

RESRAD INPUT/OUTPUT FILES FOR NATURAL THORIUM AND NATURAL URANIUM

- **Appendix B-1: RESRAD Input/ Summary Report for Natural Thorium**
- **Appendix B-2: RESRAD Input/ Summary Report for Natural Uranium**

APPENDIX B-1

RESRAD INPUT/ SUMMARY REPORT FOR NATURAL THORIUM

Dose Conversion Factor (and Related) Parameter Summary
File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ra-228+D	5.078E-03	4.770E-03	DCF2(1)
B-1	Th-228+D	3.454E-01	3.420E-01	DCF2(2)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(3)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ra-228+D	1.442E-03	1.440E-03	DCF3(1)
D-1	Th-228+D	8.086E-04	3.960E-04	DCF3(2)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(3)
D-34	Food transfer factors:			
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(1,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(1,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(2,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(2,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(3,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(3,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(3,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(1,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(1,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(2,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(2,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(3,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(3,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	3.210E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	1.040E+01	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	1.120E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	2.140E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	2.330E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.510E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	2.060E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.785E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	1.000E+00	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.500E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E+00	FMILK

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

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	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
Water Independent Pathways (Inhalation excludes radon)

Radio-	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.
Ra-228	3.232E+00	0.3236	1.424E-03	0.0001	0.000E+00	0.0000	2.027E+00	0.2030	4.918E-02	0.0049	3.017E-01	0.0302	2.105E-02	0.0021
Th-228	3.804E+00	0.3808	7.087E-03	0.0007	0.000E+00	0.0000	2.514E-02	0.0025	1.137E-03	0.0001	2.115E-04	0.0000	9.622E-03	0.0010
Th-232	1.852E-01	0.0185	4.018E-02	0.0040	0.000E+00	0.0000	2.188E-01	0.0219	6.974E-03	0.0007	1.641E-02	0.0016	3.998E-02	0.0040
Total	7.221E+00	0.7230	4.869E-02	0.0049	0.000E+00	0.0000	2.271E+00	0.2274	5.729E-02	0.0057	3.183E-01	0.0319	7.065E-02	0.0071

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
Water Dependent Pathways

Radio-	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.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.633E+00	0.5640
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.847E+00	0.3852
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.075E-01	0.0508
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.987E+00	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 = 3.000E+00 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.
Ra-228	4.298E+00	0.4311	4.806E-03	0.0005	0.000E+00	0.0000	1.418E+00	0.1423	3.481E-02	0.0035	2.093E-01	0.0210	1.984E-02	0.0020
Th-228	1.282E+00	0.1286	2.389E-03	0.0002	0.000E+00	0.0000	8.425E-03	0.0008	3.832E-04	0.0000	7.126E-05	0.0000	3.244E-03	0.0003
Th-232	1.638E+00	0.1643	4.148E-02	0.0042	0.000E+00	0.0000	8.313E-01	0.0834	2.190E-02	0.0022	1.070E-01	0.0107	4.755E-02	0.0048
Total	7.219E+00	0.7241	4.868E-02	0.0049	0.000E+00	0.0000	2.258E+00	0.2265	5.709E-02	0.0057	3.163E-01	0.0317	7.063E-02	0.0071

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-	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.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.985E+00	0.6003
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.297E+00	0.1301
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.688E+00	0.2696
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.969E+00	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 = 3.000E+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.
Ra-228	2.392E-01	0.0244	3.227E-04	0.0000	0.000E+00	0.0000	5.210E-02	0.0053	1.323E-03	0.0001	7.739E-03	0.0008	9.506E-04	0.0001
Th-228	7.200E-05	0.0000	1.343E-07	0.0000	0.000E+00	0.0000	4.480E-07	0.0000	2.151E-08	0.0000	3.993E-09	0.0000	1.824E-07	0.0000
Th-232	6.952E+00	0.7097	4.818E-02	0.0049	0.000E+00	0.0000	2.076E+00	0.2119	5.407E-02	0.0055	2.950E-01	0.0301	6.944E-02	0.0071
Total	7.192E+00	0.7341	4.851E-02	0.0050	0.000E+00	0.0000	2.128E+00	0.2172	5.539E-02	0.0057	3.028E-01	0.0309	7.039E-02	0.0072

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

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.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.016E-01	0.0308
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.279E-05	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.495E+00	0.9692
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.797E+00	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+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.
Ra-228	5.114E-05	0.0000	6.947E-08	0.0000	0.000E+00	0.0000	9.538E-06	0.0000	2.631E-07	0.0000	1.485E-06	0.0000	2.046E-07	0.0000
Th-228	6.837E-16	0.0000	1.287E-18	0.0000	0.000E+00	0.0000	3.653E-18	0.0000	2.053E-19	0.0000	3.790E-20	0.0000	1.747E-18	0.0000
Th-232	7.084E+00	0.7605	4.807E-02	0.0052	0.000E+00	0.0000	1.795E+00	0.1926	5.103E-02	0.0055	2.678E-01	0.0288	6.975E-02	0.0075
Total	7.084E+00	0.7605	4.807E-02	0.0052	0.000E+00	0.0000	1.795E+00	0.1926	5.103E-02	0.0055	2.678E-01	0.0288	6.975E-02	0.0075

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.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.270E-05	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.907E-16	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.315E+00	1.0000
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	9.315E+00	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+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.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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.
Ra-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-228	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+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.

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

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	4.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-228	Ra-228	1.000E+00	4.912E+00	4.350E+00	3.411E+00	1.457E+00	1.281E-01	3.799E-02	2.572E-05	6.383E-16	0.000E+00
Ra-228	Th-232	1.000E+00	2.914E-01	8.466E-01	1.775E+00	3.693E+00	4.915E+00	4.952E+00	4.664E+00	3.390E+00	0.000E+00
Ra-228	-DOSE(j)		5.204E+00	5.197E+00	5.186E+00	5.150E+00	5.043E+00	4.990E+00	4.664E+00	3.390E+00	0.000E+00
Th-228	Ra-228	1.000E+00	7.208E-01	1.738E+00	2.574E+00	1.787E+00	1.735E-01	5.190E-02	3.698E-05	1.070E-15	0.000E+00
Th-228	Th-228	1.000E+00	3.847E+00	2.677E+00	1.297E+00	1.025E-01	7.279E-05	1.939E-06	6.907E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	3.041E-02	1.842E-01	7.277E-01	2.703E+00	4.401E+00	4.513E+00	4.488E+00	3.799E+00	0.000E+00
Th-228	-DOSE(j)		4.598E+00	4.599E+00	4.598E+00	4.593E+00	4.575E+00	4.565E+00	4.488E+00	3.799E+00	0.000E+00
Th-232	Th-232	1.000E+00	1.857E-01	1.855E-01	1.850E-01	1.834E-01	1.789E-01	1.767E-01	1.633E-01	1.201E-01	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	4.000E+01	1.000E+02	3.000E+02	1.000E+03
Ra-228	Ra-228	1.000E+00	1.000E+00	8.864E-01	6.964E-01	2.993E-01	2.681E-02	8.025E-03	5.769E-06	1.920E-16	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	1.136E-01	3.034E-01	6.997E-01	9.697E-01	9.872E-01	9.874E-01	9.621E-01	8.783E-01
Ra-228	-S(j):		1.000E+00	9.999E-01	9.997E-01	9.990E-01	9.965E-01	9.952E-01	9.875E-01	9.621E-01	8.783E-01
Th-228	Ra-228	1.000E+00	0.000E+00	2.853E-01	5.383E-01	4.085E-01	4.014E-02	1.202E-02	8.644E-06	2.877E-16	0.000E+00
Th-228	Th-228	1.000E+00	1.000E+00	6.960E-01	3.371E-01	2.666E-02	1.896E-05	5.054E-07	1.816E-16	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	1.864E-02	1.243E-01	5.638E-01	9.563E-01	9.832E-01	9.874E-01	9.621E-01	8.783E-01
Th-228	-S(j):		1.000E+00	9.999E-01	9.997E-01	9.989E-01	9.965E-01	9.952E-01	9.875E-01	9.621E-01	8.783E-01
Th-232	Th-232	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.987E-01	9.961E-01	9.948E-01	9.871E-01	9.617E-01	8.779E-01

THF(i) is the thread fraction of the parent nuclide.
RESCALC.EXE execution time = 3.86 seconds

APPENDIX B-2

RESRAD INPUT/ SUMMARY REPORT FOR NATURAL URANIUM

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

0Nuclide (j)	Parent (i)	THF(i)	t= 0.000E+00	1.000E+00	3.000E+00	S(j,t), pCi/g 1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	4.700E-02	4.551E-02	4.268E-02	3.408E-02	1.792E-02	1.887E-03	3.043E-06	5.124E-16
Ac-227	Pa-231	1.000E+00	0.000E+00	1.472E-03	4.277E-03	1.278E-02	2.865E-02	4.370E-02	4.292E-02	3.478E-02
Ac-227	U-235	1.000E+00	0.000E+00	1.566E-08	1.379E-07	1.422E-06	1.050E-05	6.696E-05	2.384E-04	6.567E-04
Ac-227	-S(j):		4.700E-02	4.699E-02	4.696E-02	4.685E-02	4.658E-02	4.566E-02	4.316E-02	3.543E-02
Pa-231	Pa-231	1.000E+00	4.700E-02	4.699E-02	4.696E-02	4.686E-02	4.658E-02	4.561E-02	4.294E-02	3.479E-02
Pa-231	U-235	1.000E+00	0.000E+00	9.941E-07	2.980E-06	9.906E-06	2.949E-05	9.568E-05	2.657E-04	6.766E-04
Pa-231	-S(j):		4.700E-02	4.699E-02	4.696E-02	4.687E-02	4.661E-02	4.570E-02	4.321E-02	3.547E-02
Pb-210	Pb-210	1.000E+00	1.000E+00	9.681E-01	9.072E-01	7.229E-01	3.777E-01	3.895E-02	5.909E-05	8.034E-15
Pb-210	Ra-226	1.000E+00	0.000E+00	3.058E-02	8.878E-02	2.647E-01	5.907E-01	8.863E-01	8.335E-01	5.808E-01
Pb-210	Th-230	1.000E+00	0.000E+00	6.659E-06	5.864E-05	6.046E-04	4.460E-03	2.845E-02	1.022E-01	2.943E-01
Pb-210	U-234	1.000E+00	0.000E+00	2.003E-11	5.320E-10	1.861E-08	4.310E-07	1.024E-05	1.236E-04	1.222E-03
Pb-210	U-238	9.999E-01	0.000E+00	1.422E-17	1.136E-15	1.339E-13	9.565E-12	8.124E-10	3.193E-08	1.094E-06
Pb-210	-S(j):		1.000E+00	9.986E-01	9.961E-01	9.882E-01	9.728E-01	9.537E-01	9.359E-01	8.763E-01
Ra-226	Ra-226	1.000E+00	1.000E+00	9.995E-01	9.985E-01	9.949E-01	9.846E-01	9.497E-01	8.565E-01	5.968E-01
Ra-226	Th-230	1.000E+00	0.000E+00	4.331E-04	1.298E-03	4.318E-03	1.287E-02	4.193E-02	1.179E-01	3.140E-01
Ra-226	U-234	1.000E+00	0.000E+00	1.949E-09	1.753E-08	1.943E-07	1.735E-06	1.878E-05	1.568E-04	1.343E-03
Ra-226	U-238	9.999E-01	0.000E+00	1.842E-15	4.969E-14	1.835E-12	4.915E-11	1.770E-09	4.413E-08	1.237E-06
Ra-226	-S(j):		1.000E+00	9.999E-01	9.998E-01	9.992E-01	9.975E-01	9.916E-01	9.746E-01	9.122E-01
Th-230	Th-230	1.000E+00	1.000E+00	9.999E-01	9.996E-01	9.986E-01	9.958E-01	9.862E-01	9.591E-01	8.701E-01
Th-230	U-234	1.000E+00	0.000E+00	8.999E-06	2.698E-05	8.974E-05	2.676E-04	8.730E-04	2.464E-03	6.654E-03
Th-230	U-238	9.999E-01	0.000E+00	1.275E-11	1.147E-10	1.271E-09	1.136E-08	1.231E-07	1.030E-06	8.913E-06
Th-230	-S(j):		1.000E+00	9.999E-01	9.996E-01	9.987E-01	9.961E-01	9.871E-01	9.616E-01	8.767E-01
U-234	U-234	1.000E+00	1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.859E-01	9.536E-01	8.673E-01	6.221E-01
U-234	U-238	9.999E-01	0.000E+00	2.833E-06	8.492E-06	2.821E-05	8.385E-05	2.704E-04	7.379E-04	1.766E-03
U-234	-S(j):		1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.859E-01	9.539E-01	8.680E-01	6.238E-01
U-235	U-235	1.000E+00	4.700E-02	4.698E-02	4.693E-02	4.678E-02	4.634E-02	4.483E-02	4.080E-02	2.932E-02
U-238	U-238	5.400E-05	5.400E-05	5.397E-05	5.392E-05	5.375E-05	5.324E-05	5.151E-05	4.687E-05	3.369E-05
U-238	U-238	9.999E-01	9.999E-01	9.995E-01	9.985E-01	9.952E-01	9.859E-01	9.539E-01	8.680E-01	6.238E-01
U-238	-S(j):		1.000E+00	9.995E-01	9.986E-01	9.953E-01	9.859E-01	9.539E-01	8.680E-01	6.238E-01

THF(i) is the thread fraction of the parent nuclide.
RESCALC.EXE execution time = 3.37 seconds

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

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr 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
Ac-227	Ac-227	1.000E+00	1.242E-01	1.201E-01	1.124E-01	8.912E-02	4.591E-02	4.485E-03	5.482E-06	0.000E+00
Ac-227	Pa-231	1.000E+00	2.268E-03	6.198E-03	1.357E-02	3.570E-02	7.564E-02	1.059E-01	7.873E-02	0.000E+00
Ac-227	U-235	1.000E+00	1.715E-08	1.074E-07	5.266E-07	4.220E-06	2.833E-05	1.634E-04	4.381E-04	0.000E+00
Ac-227	-DOSE(j)		1.264E-01	1.263E-01	1.260E-01	1.248E-01	1.216E-01	1.105E-01	7.917E-02	0.000E+00
Pa-231	Pa-231	1.000E+00	2.499E-01	2.494E-01	2.485E-01	2.452E-01	2.360E-01	2.043E-01	1.204E-01	0.000E+00
Pa-231	U-235	1.000E+00	2.493E-06	7.739E-06	1.822E-05	5.426E-05	1.517E-04	4.307E-04	7.458E-04	0.000E+00
Pa-231	-DOSE(j)		2.499E-01	2.494E-01	2.485E-01	2.453E-01	2.361E-01	2.048E-01	1.211E-01	0.000E+00
Pb-210	Pb-210	1.000E+00	3.090E+00	2.986E+00	2.788E+00	2.194E+00	1.104E+00	9.878E-02	8.441E-05	0.000E+00
Pb-210	Ra-226	1.000E+00	5.670E-02	1.523E-01	3.306E-01	8.601E-01	1.781E+00	2.293E+00	1.213E+00	0.000E+00
Pb-210	Th-230	1.000E+00	8.854E-06	5.452E-05	2.641E-04	2.090E-03	1.376E-02	7.414E-02	1.491E-01	0.000E+00
Pb-210	U-234	1.000E+00	2.107E-11	2.755E-10	2.907E-09	6.837E-08	1.358E-06	2.688E-05	1.807E-04	0.000E+00
Pb-210	U-238	9.999E-01	1.250E-17	3.357E-16	7.567E-15	5.228E-13	3.076E-11	2.145E-09	4.677E-08	0.000E+00
Pb-210	-DOSE(j)		3.147E+00	3.138E+00	3.119E+00	3.056E+00	2.899E+00	2.466E+00	1.363E+00	0.000E+00
Ra-226	Ra-226	1.000E+00	7.320E+00	7.312E+00	7.296E+00	7.240E+00	7.079E+00	6.521E+00	4.691E+00	0.000E+00
Ra-226	Th-230	1.000E+00	1.550E-03	4.712E-03	1.103E-02	3.296E-02	9.404E-02	2.893E-01	6.467E-01	0.000E+00
Ra-226	U-234	1.000E+00	4.589E-09	3.273E-08	1.743E-07	1.556E-06	1.289E-05	1.302E-04	8.616E-04	0.000E+00
Ra-226	U-238	9.999E-01	3.216E-15	4.936E-14	5.820E-13	1.544E-11	3.710E-10	1.233E-08	2.429E-07	0.000E+00
Ra-226	-DOSE(j)		7.321E+00	7.317E+00	7.307E+00	7.272E+00	7.173E+00	6.810E+00	5.339E+00	0.000E+00
Th-230	Th-230	1.000E+00	3.771E-02	3.766E-02	3.757E-02	3.725E-02	3.633E-02	3.317E-02	2.446E-02	0.000E+00
Th-230	U-234	1.000E+00	1.788E-07	5.190E-07	1.194E-06	3.525E-06	9.935E-06	2.952E-05	6.294E-05	0.000E+00
Th-230	U-238	9.999E-01	1.747E-13	1.166E-12	6.012E-12	5.262E-11	4.292E-10	4.183E-09	2.637E-08	0.000E+00
Th-230	-DOSE(j)		3.771E-02	3.766E-02	3.757E-02	3.725E-02	3.634E-02	3.320E-02	2.452E-02	0.000E+00
U-234	U-234	1.000E+00	4.694E-02	4.686E-02	4.670E-02	4.616E-02	4.461E-02	3.941E-02	2.610E-02	0.000E+00
U-234	U-238	9.999E-01	6.651E-08	1.992E-07	4.634E-07	1.374E-06	3.858E-06	1.123E-05	2.225E-05	0.000E+00
U-234	-DOSE(j)		4.694E-02	4.686E-02	4.670E-02	4.616E-02	4.462E-02	3.942E-02	2.613E-02	0.000E+00
U-235	U-235	1.000E+00	1.835E-02	1.834E-02	1.832E-02	1.825E-02	1.805E-02	1.736E-02	1.509E-02	0.000E+00
U-238	U-238	5.400E-05	2.276E-06	2.272E-06	2.265E-06	2.238E-06	2.163E-06	1.911E-06	1.265E-06	0.000E+00
U-238	U-238	9.999E-01	1.127E-01	1.126E-01	1.124E-01	1.117E-01	1.096E-01	1.026E-01	8.040E-02	0.000E+00
U-238	-DOSE(j)		1.127E-01	1.126E-01	1.124E-01	1.117E-01	1.096E-01	1.026E-01	8.040E-02	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (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
Ac-227	9.464E+00	9.783E+00	1.045E+01	1.318E+01	2.560E+01	2.620E+02	2.143E+05	*7.232E+13
Pa-231	4.659E+00	4.596E+00	4.483E+00	4.182E+00	3.771E+00	3.788E+00	5.902E+00	*4.723E+10
Pb-210	8.091E+00	8.373E+00	8.966E+00	1.140E+01	2.264E+01	2.531E+02	2.962E+05	*7.634E+13
Ra-226	3.389E+00	3.349E+00	3.278E+00	3.087E+00	2.821E+00	2.836E+00	4.234E+00	*9.885E+11
Th-230	6.367E+02	5.893E+02	5.117E+02	3.458E+02	1.735E+02	6.303E+01	3.048E+01	*2.018E+10
U-234	5.326E+02	5.335E+02	5.353E+02	5.416E+02	5.601E+02	6.314E+02	9.188E+02	•6.247E+09
U-235	6.402E+01	6.404E+01	6.407E+01	6.418E+01	6.445E+01	6.545E+01	7.218E+01	*2.161E+06
U-238	2.219E+02	2.221E+02	2.225E+02	2.239E+02	2.280E+02	2.436E+02	3.109E+02	*3.361E+05

*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 = 0.000E+00 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ac-227	4.700E-02	0.000E+00	2.642E+00	9.464E+00	2.642E+00	9.464E+00
Pa-231	4.700E-02	57.4 ñ 0.1	6.853E+00	3.648E+00	5.365E+00	4.659E+00
Pb-210	1.000E+00	0.000E+00	3.090E+00	8.091E+00	3.090E+00	8.091E+00
Ra-226	1.000E+00	56.8 ñ 0.1	9.112E+00	2.744E+00	7.377E+00	3.389E+00
Th-230	1.000E+00	324.8 ñ 0.6	8.274E-01	3.022E+01	3.926E-02	6.367E+02
U-234	1.000E+00	0.000E+00	4.694E-02	5.326E+02	4.694E-02	5.326E+02
U-235	4.700E-02	0.000E+00	3.905E-01	6.402E+01	3.905E-01	6.402E+01
U-238	1.000E+00	0.000E+00	1.127E-01	2.219E+02	1.127E-01	2.219E+02

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

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g) 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227+D	Ac-227+D	1.000E+00	2.642E+00	2.556E+00	2.392E+00	1.896E+00	9.767E-01	9.543E-02	1.166E-04	0.000E+00
Pa-231	Pa-231	1.000E+00	5.317E+00	5.307E+00	5.287E+00	5.218E+00	5.021E+00	4.348E+00	2.561E+00	0.000E+00
Pa-231	Ac-227+D	1.000E+00	4.825E-02	1.319E-01	2.888E-01	7.595E-01	1.609E+00	2.252E+00	1.675E+00	0.000E+00
Pa-231	-DSR(j)		5.365E+00	5.439E+00	5.576E+00	5.977E+00	6.630E+00	6.600E+00	4.236E+00	0.000E+00
Pb-210+D	Pb-210+D	1.000E+00	3.090E+00	2.986E+00	2.788E+00	2.194E+00	1.104E+00	9.878E-02	8.441E-05	0.000E+00
Ra-226+D	Ra-226+D	1.000E+00	7.320E+00	7.312E+00	7.296E+00	7.240E+00	7.079E+00	6.521E+00	4.691E+00	0.000E+00
Ra-226+D	Pb-210+D	1.000E+00	5.670E-02	1.523E-01	3.306E-01	8.601E-01	1.781E+00	2.293E+00	1.213E+00	0.000E+00
Ra-226+D	-DSR(j)		7.377E+00	7.464E+00	7.626E+00	8.100E+00	8.861E+00	8.814E+00	5.905E+00	0.000E+00
Th-230	Th-230	1.000E+00	3.771E-02	3.766E-02	3.757E-02	3.725E-02	3.633E-02	3.317E-02	2.446E-02	0.000E+00
Th-230	Ra-226+D	1.000E+00	1.550E-03	4.712E-03	1.103E-02	3.296E-02	9.404E-02	2.893E-01	6.467E-01	0.000E+00
Th-230	Pb-210+D	1.000E+00	8.854E-06	5.452E-05	2.641E-04	2.090E-03	1.376E-02	7.414E-02	1.491E-01	0.000E+00
Th-230	-DSR(j)		3.926E-02	4.243E-02	4.886E-02	7.229E-02	1.441E-01	3.966E-01	8.202E-01	0.000E+00
U-234	U-234	1.000E+00	4.694E-02	4.686E-02	4.670E-02	4.616E-02	4.461E-02	3.941E-02	2.610E-02	0.000E+00
U-234	Th-230	1.000E+00	1.788E-07	5.190E-07	1.194E-06	3.525E-06	9.935E-06	2.952E-05	6.294E-05	0.000E+00
U-234	Ra-226+D	1.000E+00	4.589E-09	3.273E-08	1.743E-07	1.556E-06	1.289E-05	1.302E-04	8.616E-04	0.000E+00
U-234	Pb-210+D	1.000E+00	2.107E-11	2.755E-10	2.907E-09	6.837E-08	1.358E-06	2.688E-05	1.807E-04	0.000E+00
U-234	-DSR(j)		4.694E-02	4.686E-02	4.670E-02	4.616E-02	4.464E-02	3.960E-02	2.721E-02	0.000E+00
U-235+D	U-235+D	1.000E+00	3.905E-01	3.902E-01	3.898E-01	3.883E-01	3.840E-01	3.693E-01	3.211E-01	0.000E+00
U-235+D	Pa-231	1.000E+00	5.304E-05	1.647E-04	3.877E-04	1.154E-03	3.228E-03	9.163E-03	1.587E-02	0.000E+00
U-235+D	Ac-227+D	1.000E+00	3.649E-07	2.285E-06	1.120E-05	8.978E-05	6.027E-04	3.476E-03	9.321E-03	0.000E+00
U-235+D	-DSR(j)		3.905E-01	3.904E-01	3.902E-01	3.895E-01	3.879E-01	3.819E-01	3.463E-01	0.000E+00
U-238	U-238	5.400E-05	2.276E-06	2.272E-06	2.265E-06	2.238E-06	2.163E-06	1.911E-06	1.265E-06	0.000E+00
U-238+D	U-238+D	9.999E-01	1.127E-01	1.126E-01	1.124E-01	1.117E-01	1.096E-01	1.026E-01	8.040E-02	0.000E+00
U-238+D	U-234	9.999E-01	6.651E-08	1.992E-07	4.634E-07	1.374E-06	3.858E-06	1.123E-05	2.225E-05	0.000E+00
U-238+D	Th-230	9.999E-01	1.747E-13	1.166E-12	6.012E-12	5.262E-11	4.292E-10	4.183E-09	2.637E-08	0.000E+00
U-238+D	Ra-226+D	9.999E-01	3.216E-15	4.936E-14	5.820E-13	1.544E-11	3.710E-10	1.233E-08	2.429E-07	0.000E+00
U-238+D	Pb-210+D	9.999E-01	1.250E-17	3.357E-16	7.567E-15	5.228E-13	3.076E-11	2.145E-09	4.677E-08	0.000E+00
U-238+D	-DSR(j)		1.127E-01	1.126E-01	1.124E-01	1.117E-01	1.096E-01	1.026E-01	8.042E-02	0.000E+00

The DSR includes contributions from associated (half-life ó 180 days) daughters.

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	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
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	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
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	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,t) 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)

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.
Ac-227	2.650E-06	0.0000	4.927E-07	0.0000	0.000E+00	0.0000	1.640E-06	0.0000	1.486E-08	0.0000	5.527E-08	0.0000	6.287E-07	0.0000
Pa-231	4.157E-02	0.0059	8.405E-03	0.0012	0.000E+00	0.0000	9.090E-02	0.0129	4.177E-02	0.0059	9.623E-04	0.0001	1.547E-02	0.0022
Pb-210	1.627E-07	0.0000	3.299E-08	0.0000	0.000E+00	0.0000	6.258E-05	0.0000	6.165E-06	0.0000	9.469E-06	0.0000	6.001E-06	0.0000
Ra-226	3.841E+00	0.5450	6.530E-04	0.0001	0.000E+00	0.0000	1.569E+00	0.2226	1.158E-01	0.0164	2.760E-01	0.0392	1.021E-01	0.0145
Th-230	5.300E-01	0.0752	7.732E-03	0.0011	0.000E+00	0.0000	2.106E-01	0.0299	1.550E-02	0.0022	3.616E-02	0.0051	2.023E-02	0.0029
U-234	8.687E-04	0.0001	2.820E-03	0.0004	0.000E+00	0.0000	9.359E-03	0.0013	1.419E-03	0.0002	9.226E-03	0.0013	3.516E-03	0.0005
U-235	1.418E-02	0.0020	1.703E-04	0.0000	0.000E+00	0.0000	9.520E-04	0.0001	3.208E-04	0.0000	4.134E-04	0.0001	2.448E-04	0.0000
U-238	5.590E-02	0.0079	2.508E-03	0.0004	0.000E+00	0.0000	8.639E-03	0.0012	1.330E-03	0.0002	8.732E-03	0.0012	3.311E-03	0.0005
Total	4.484E+00	0.6362	2.229E-02	0.0032	0.000E+00	0.0000	1.889E+00	0.2681	1.761E-01	0.0250	3.315E-01	0.0470	1.448E-01	0.0206

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+02 years
Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.482E-06	0.0000
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.991E-01	0.0282
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	8.441E-05	0.0000
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.905E+00	0.8378
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.202E-01	0.1164
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	2.721E-02	0.0039
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.628E-02	0.0023
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	8.042E-02	0.0114
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	7.048E+00	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+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.
Ac-227	1.708E-03	0.0002	3.055E-04	0.0000	0.000E+00	0.0000	2.036E-03	0.0002	9.480E-06	0.0000	3.652E-05	0.0000	3.899E-04	0.0000
Pa-231	4.418E-02	0.0045	8.621E-03	0.0009	0.000E+00	0.0000	1.912E-01	0.0195	4.906E-02	0.0050	1.081E-03	0.0001	1.604E-02	0.0016
Pb-210	1.083E-04	0.0000	2.175E-05	0.0000	0.000E+00	0.0000	8.259E-02	0.0084	4.497E-03	0.0005	7.612E-03	0.0008	3.956E-03	0.0004
Ra-226	4.743E+00	0.4847	7.028E-04	0.0001	0.000E+00	0.0000	3.402E+00	0.3478	1.444E-01	0.0148	4.142E-01	0.0423	1.093E-01	0.0112
Th-230	2.110E-01	0.0216	7.890E-03	0.0008	0.000E+00	0.0000	1.439E-01	0.0147	6.048E-03	0.0006	1.641E-02	0.0017	1.141E-02	0.0012
U-234	2.731E-04	0.0000	3.086E-03	0.0003	0.000E+00	0.0000	2.005E-02	0.0020	1.585E-03	0.0002	1.076E-02	0.0011	3.836E-03	0.0004
U-235	1.569E-02	0.0016	1.490E-04	0.0000	0.000E+00	0.0000	1.264E-03	0.0001	1.735E-04	0.0000	4.795E-04	0.0000	1.986E-04	0.0000
U-238	6.552E-02	0.0067	2.755E-03	0.0003	0.000E+00	0.0000	1.899E-02	0.0019	1.503E-03	0.0002	1.022E-02	0.0010	3.636E-03	0.0004
Total	5.081E+00	0.5193	2.353E-02	0.0024	0.000E+00	0.0000	3.863E+00	0.3948	2.073E-01	0.0212	4.608E-01	0.0471	1.488E-01	0.0152

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.485E-03	0.0005
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.102E-01	0.0317
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	9.878E-02	0.0101
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.814E+00	0.9008
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.966E-01	0.0405
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.960E-02	0.0040
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.795E-02	0.0018
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.026E-01	0.0105
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.784E+00	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 = 3.000E+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.
Ac-227	1.615E-02	0.0015	2.900E-03	0.0003	0.000E+00	0.0000	2.271E-02	0.0021	9.088E-05	0.0000	3.542E-04	0.0000	3.701E-03	0.0003
Pa-231	3.054E-02	0.0029	6.217E-03	0.0006	0.000E+00	0.0000	2.092E-01	0.0197	5.171E-02	0.0049	8.213E-04	0.0001	1.308E-02	0.0012
Pb-210	1.047E-03	0.0001	2.109E-04	0.0000	0.000E+00	0.0000	9.412E-01	0.0885	4.508E-02	0.0042	7.847E-02	0.0074	3.836E-02	0.0036
Ra-226	4.932E+00	0.4636	5.454E-04	0.0001	0.000E+00	0.0000	3.328E+00	0.3128	1.177E-01	0.0111	4.027E-01	0.0379	8.000E-02	0.0075
Th-230	6.609E-02	0.0062	7.947E-03	0.0007	0.000E+00	0.0000	5.476E-02	0.0051	2.071E-03	0.0002	4.806E-03	0.0005	8.460E-03	0.0008
U-234	1.927E-04	0.0000	3.185E-03	0.0003	0.000E+00	0.0000	2.429E-02	0.0023	1.652E-03	0.0002	1.136E-02	0.0011	3.959E-03	0.0004
U-235	1.609E-02	0.0015	1.421E-04	0.0000	0.000E+00	0.0000	1.203E-03	0.0001	1.065E-04	0.0000	5.048E-04	0.0000	1.825E-04	0.0000
U-238	6.762E-02	0.0064	2.847E-03	0.0003	0.000E+00	0.0000	2.306E-02	0.0022	1.569E-03	0.0001	1.079E-02	0.0010	3.758E-03	0.0004
Total	5.130E+00	0.4822	2.400E-02	0.0023	0.000E+00	0.0000	4.604E+00	0.4328	2.200E-01	0.0207	5.098E-01	0.0479	1.515E-01	0.0142

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

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.591E-02	0.0043
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.116E-01	0.0293
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	1.104E+00	0.1038
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.861E+00	0.8328
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.441E-01	0.0135
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.464E-02	0.0042
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.823E-02	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.096E-01	0.0103
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	1.064E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 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.
Ac-227	3.068E-02	0.0028	5.517E-03	0.0005	0.000E+00	0.0000	4.503E-02	0.0041	1.733E-04	0.0000	6.777E-04	0.0001	7.040E-03	0.0006
Pa-231	1.623E-02	0.0015	3.657E-03	0.0003	0.000E+00	0.0000	1.983E-01	0.0182	5.242E-02	0.0048	5.148E-04	0.0000	9.839E-03	0.0009
Pb-210	2.002E-03	0.0002	4.036E-04	0.0000	0.000E+00	0.0000	1.878E+00	0.1721	8.709E-02	0.0080	1.527E-01	0.0140	7.342E-02	0.0067
Ra-226	4.981E+00	0.4565	3.656E-04	0.0000	0.000E+00	0.0000	2.643E+00	0.2422	8.068E-02	0.0074	3.475E-01	0.0318	4.710E-02	0.0043
Th-230	2.326E-02	0.0021	7.965E-03	0.0007	0.000E+00	0.0000	3.033E-02	0.0028	1.209E-03	0.0001	1.616E-03	0.0001	7.916E-03	0.0007
U-234	1.863E-04	0.0000	3.214E-03	0.0003	0.000E+00	0.0000	2.556E-02	0.0023	1.672E-03	0.0002	1.154E-02	0.0011	3.995E-03	0.0004
U-235	1.621E-02	0.0015	1.413E-04	0.0000	0.000E+00	0.0000	1.177E-03	0.0001	8.580E-05	0.0000	5.124E-04	0.0000	1.793E-04	0.0000
U-238	6.819E-02	0.0062	2.874E-03	0.0003	0.000E+00	0.0000	2.426E-02	0.0022	1.588E-03	0.0001	1.096E-02	0.0010	3.793E-03	0.0003
Total	5.138E+00	0.4709	2.414E-02	0.0022	0.000E+00	0.0000	4.845E+00	0.4440	2.249E-01	0.0206	5.261E-01	0.0482	1.533E-01	0.0140

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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.912E-02	0.0082
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.809E-01	0.0257
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	2.194E+00	0.2010
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.100E+00	0.7423
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.229E-02	0.0066
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.616E-02	0.0042
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.831E-02	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.117E-01	0.0102
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	1.091E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 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.
Ac-227	3.841E-02	0.0035	6.909E-03	0.0006	0.000E+00	0.0000	5.720E-02	0.0052	2.173E-04	0.0000	8.506E-04	0.0001	8.816E-03	0.0008
Pa-231	8.586E-03	0.0008	2.284E-03	0.0002	0.000E+00	0.0000	1.901E-01	0.0173	5.266E-02	0.0048	3.480E-04	0.0000	8.099E-03	0.0007
Pb-210	2.511E-03	0.0002	5.066E-04	0.0000	0.000E+00	0.0000	2.391E+00	0.2170	1.097E-01	0.0100	1.928E-01	0.0175	9.214E-02	0.0084
Ra-226	4.998E+00	0.4537	2.682E-04	0.0000	0.000E+00	0.0000	2.224E+00	0.2019	6.007E-02	0.0055	3.146E-01	0.0286	2.931E-02	0.0027
Th-230	8.139E-03	0.0007	7.972E-03	0.0007	0.000E+00	0.0000	2.332E-02	0.0021	9.973E-04	0.0001	6.200E-04	0.0001	7.807E-03	0.0007
U-234	1.859E-04	0.0000	3.224E-03	0.0003	0.000E+00	0.0000	2.601E-02	0.0024	1.679E-03	0.0002	1.160E-02	0.0011	4.008E-03	0.0004
U-235	1.626E-02	0.0015	1.413E-04	0.0000	0.000E+00	0.0000	1.168E-03	0.0001	7.839E-05	0.0000	5.151E-04	0.0000	1.785E-04	0.0000
U-238	6.839E-02	0.0062	2.883E-03	0.0003	0.000E+00	0.0000	2.469E-02	0.0022	1.595E-03	0.0001	1.101E-02	0.0010	3.806E-03	0.0003
Total	5.141E+00	0.4667	2.419E-02	0.0022	0.000E+00	0.0000	4.937E+00	0.4482	2.269E-01	0.0206	5.323E-01	0.0483	1.542E-01	0.0140

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-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.124E-01	0.0102
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.621E-01	0.0238
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	2.788E+00	0.2531
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.626E+00	0.6923
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.886E-02	0.0044
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.670E-02	0.0042
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.834E-02	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.124E-01	0.0102
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	1.102E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 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.
Ac-227	4.095E-02	0.0037	7.368E-03	0.0007	0.000E+00	0.0000	6.125E-02	0.0055	2.318E-04	0.0000	9.076E-04	0.0001	9.402E-03	0.0009
Pa-231	6.063E-03	0.0005	1.831E-03	0.0002	0.000E+00	0.0000	1.872E-01	0.0169	5.272E-02	0.0048	2.927E-04	0.0000	7.524E-03	0.0007
Pb-210	2.679E-03	0.0002	5.406E-04	0.0000	0.000E+00	0.0000	2.561E+00	0.2319	1.171E-01	0.0106	2.061E-01	0.0187	9.832E-02	0.0089
Ra-226	5.003E+00	0.4529	2.359E-04	0.0000	0.000E+00	0.0000	2.081E+00	0.1884	5.319E-02	0.0048	3.034E-01	0.0275	2.342E-02	0.0021
Th-230	3.808E-03	0.0003	7.974E-03	0.0007	0.000E+00	0.0000	2.155E-02	0.0020	9.487E-04	0.0001	3.533E-04	0.0000	7.786E-03	0.0007
U-234	1.859E-04	0.0000	3.227E-03	0.0003	0.000E+00	0.0000	2.613E-02	0.0024	1.682E-03	0.0002	1.162E-02	0.0011	4.012E-03	0.0004
U-235	1.627E-02	0.0015	1.414E-04	0.0000	0.000E+00	0.0000	1.166E-03	0.0001	7.625E-05	0.0000	5.159E-04	0.0000	1.784E-04	0.0000
U-238	6.844E-02	0.0062	2.886E-03	0.0003	0.000E+00	0.0000	2.481E-02	0.0022	1.597E-03	0.0001	1.103E-02	0.0010	3.809E-03	0.0003
Total	5.141E+00	0.4654	2.420E-02	0.0022	0.000E+00	0.0000	4.964E+00	0.4494	2.276E-01	0.0206	5.342E-01	0.0484	1.545E-01	0.0140

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-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.201E-01	0.0109
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.556E-01	0.0231
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	2.986E+00	0.2703
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.464E+00	0.6757
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.243E-02	0.0038
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.686E-02	0.0042
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.835E-02	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.126E-01	0.0102
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	1.105E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 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.
Ac-227	4.229E-02	0.0038	7.609E-03	0.0007	0.000E+00	0.0000	6.337E-02	0.0057	2.394E-04	0.0000	9.375E-04	0.0001	9.709E-03	0.0009
Pa-231	4.740E-03	0.0004	1.593E-03	0.0001	0.000E+00	0.0000	1.856E-01	0.0168	5.274E-02	0.0048	2.634E-04	0.0000	7.222E-03	0.0007
Pb-210	2.768E-03	0.0003	5.584E-04	0.0001	0.000E+00	0.0000	2.651E+00	0.2397	1.210E-01	0.0109	2.130E-01	0.0193	1.016E-01	0.0092
Ra-226	5.005E+00	0.4525	2.189E-04	0.0000	0.000E+00	0.0000	2.004E+00	0.1812	4.949E-02	0.0045	2.973E-01	0.0269	2.032E-02	0.0018
Th-230	1.641E-03	0.0001	7.975E-03	0.0007	0.000E+00	0.0000	2.072E-02	0.0019	9.270E-04	0.0001	2.251E-04	0.0000	7.778E-03	0.0007
U-234	1.860E-04	0.0000	3.229E-03	0.0003	0.000E+00	0.0000	2.620E-02	0.0024	1.683E-03	0.0002	1.163E-02	0.0011	4.014E-03	0.0004
U-235	1.628E-02	0.0015	1.414E-04	0.0000	0.000E+00	0.0000	1.165E-03	0.0001	7.519E-05	0.0000	5.163E-04	0.0000	1.783E-04	0.0000
U-238	6.847E-02	0.0062	2.887E-03	0.0003	0.000E+00	0.0000	2.488E-02	0.0022	1.598E-03	0.0001	1.104E-02	0.0010	3.811E-03	0.0003
Total	5.142E+00	0.4649	2.421E-02	0.0022	0.000E+00	0.0000	4.977E+00	0.4500	2.278E-01	0.0206	5.349E-01	0.0484	1.546E-01	0.0140

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years
Water Dependent Pathways

Radio-	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.
Ac-227	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.242E-01	0.0112
Pa-231	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.522E-01	0.0228
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	3.090E+00	0.2794
Ra-226	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.377E+00	0.6670
Th-230	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.926E-02	0.0036
U-234	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.694E-02	0.0042
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.835E-02	0.0017
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.127E-01	0.0102
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	1.106E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Determination of Soil DCGL for Natural Uranium
File : Nat U DCGL for 10K sq m.RAD

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	10000.00 square meters	Ac-227	4.700E-02
Thickness:	0.50 meters	Pa-231	4.700E-02
Cover Depth:	0.00 meters	Pb-210	1.000E+00
		Ra-226	1.000E+00
		Th-230	1.000E+00
		U-234	1.000E+00
		U-235	4.700E-02
		U-238	1.000E+00

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 2.500E+01 mrem/yr
Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (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
TDOSE(t):	1.106E+01	1.105E+01	1.102E+01	1.091E+01	1.064E+01	9.784E+00	7.048E+00	0.000E+00
M(t):	4.424E-01	4.418E-01	4.406E-01	4.365E-01	4.256E-01	3.914E-01	2.819E-01	0.000E+00

Maximum TDOSE(t): 1.106E+01 mrem/yr at t = 0.000E+00 years

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	257	---	---	KYMAX

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	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	suppressed

R021	Average building air exchange rate (1/hr)	not used	5.000E-01	---	REXG
R021	Height of the building (room) (m)	not used	2.500E+00	---	HRM
R021	Building interior area factor	not used	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	not used	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	not used	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	not used	0.000E+00	---	CO2F
STOR	Storage times of contaminated foodstuffs (days):				
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	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)	not used	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	not used	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	not used	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	not used	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	not used	3.000E-07	---	DIFFL
R021	in contaminated zone soil	not used	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	not used	2.000E+00	---	HMIX

R19B	Wet weight crop yield for Non-Leafy	(kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy	(kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder	(kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy	(years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy	(years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder	(years)	8.000E-02	8.000E-02	---	TE(3)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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)	1.120E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	2.140E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	2.330E+02	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.510E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	2.060E+01	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.785E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	1.000E+00	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.500E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E+00	FMILK
R019	Livestock fodder intake for meat (kg/day)	2.685E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	6.325E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR

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)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.302E-04	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.719E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCC(7)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(7,1)
R016	Saturated zone (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.719E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.719E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
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	5.512E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.571E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.181E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 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)

R016	Unsaturated zone 1 (cm**3/g)	9.100E+03	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	9.100E+03	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.298E-05	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
R014	Density of saturated zone (g/cm**3)	1.200E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.000E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	3.210E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	2.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	1.040E+01	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
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)	1.450E+01	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.200E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	4.000E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	2.000E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.040E+01	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	3.210E+00	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.146E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.796E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.372E-03	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	9.100E+03	7.000E+01	---	DCNUCC(4)

R013	Precipitation (m/yr)	8.827E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-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

Site-Specific Parameter Summary

Menu	Parameter		User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)		1.000E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)		5.000E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)		1.000E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)		2.500E+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)		not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)		not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g):	Ac-227	4.700E-02	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g):	Pa-231	4.700E-02	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g):	Pb-210	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g):	Ra-226	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g):	Th-230	1.000E+00	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g):	U-234	1.000E+00	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g):	U-235	4.700E-02	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g):	U-238	1.000E+00	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L):	Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L):	Pa-231	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L):	Pb-210	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L):	Ra-226	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L):	Th-230	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L):	U-234	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L):	U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L):	U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)		0.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)		not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)		not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)		1.200E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)		1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity		4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity		2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)		3.210E+00	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter		1.040E+01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)		4.400E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)		not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient		5.000E-01	5.000E-01	---	EVAPTR

Dose Conversion Factor (and Related) Parameter Summary (continued)
File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(9,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(9,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(9,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(9,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(9,2)

*Base Case means Default.Lib w/o Associate Nuclide contributions.

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D-34  U-234     , plant/soil concentration ratio, dimensionless    2.500E-03  2.500E-03  RTF(  6,1)
D-34  U-234     , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)    3.400E-04  3.400E-04  RTF(  6,2)
D-34  U-234     , milk/livestock-intake ratio, (pCi/L)/(pCi/d)     6.000E-04  6.000E-04  RTF(  6,3)
D-34
D-34  U-235+D   , plant/soil concentration ratio, dimensionless    2.500E-03  2.500E-03  RTF(  7,1)
D-34  U-235+D   , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)    3.400E-04  3.400E-04  RTF(  7,2)
D-34  U-235+D   , milk/livestock-intake ratio, (pCi/L)/(pCi/d)     6.000E-04  6.000E-04  RTF(  7,3)
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Dose Conversion Factor (and Related) Parameter Summary
File: FGR 13 MORBIDITY

Menu	Parameter	Current Value	Base Case*	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.724E+00	6.700E+00	DCF2(1)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(2)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(3)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(4)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(5)
B-1	U-234	1.320E-01	1.320E-01	DCF2(6)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(7)
B-1	U-238	1.180E-01	1.180E-01	DCF2(8)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(9)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(2)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(3)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(4)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(5)
D-1	U-234	2.830E-04	2.830E-04	DCF3(6)
D-1	U-235+D	2.673E-04	2.660E-04	DCF3(7)
D-1	U-238	2.550E-04	2.550E-04	DCF3(8)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(9)
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				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				

Summary : Determination of Soil DCGL for Natural Uranium
File : Nat U DCGL for 10K sq m.RAD

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines