

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary ...	2
Site-Specific Parameter Summary	4
Summary of Pathway Selections	8
Contaminated Zone and Total Dose Summary	9
Total Dose Components	
Time = 0.000E+00	10
Time = 1.000E+00	11
Time = 3.000E+00	12
Time = 1.000E+01	13
Time = 3.000E+01	14
Time = 1.000E+02	15
Time = 3.000E+02	16
Time = 1.000E+03	17
Dose/Source Ratios Summed Over All Pathways	18
Single Radionuclide Soil Guidelines	18
Dose Per Nuclide Summed Over All Pathways	19
Soil Concentration Per Nuclide	19

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Dose Conversion Factor (and Related) Parameter Summary

Dose Library: Subsurface Soil DCGL 120614 Plus FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(1)
A-1	Co-60 (Source: FGR 12)	1.622E+01	1.622E+01	DCF1(2)
A-1	Cs-134 (Source: FGR 12)	9.472E+00	9.472E+00	DCF1(3)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(4)
A-1	Ni-63 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(5)
A-1	Sr-90 (Source: FGR 12)	7.043E-04	7.043E-04	DCF1(6)
A-1	Y-90 (Source: FGR 12)	2.391E-02	2.391E-02	DCF1(7)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Co-60	2.190E-04	2.190E-04	DCF2(1)
B-1	Cs-134	4.620E-05	4.620E-05	DCF2(2)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(3)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(4)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2(5)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Co-60	2.690E-05	2.690E-05	DCF3(1)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(2)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(3)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(4)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3(5)
D-34	Food transfer factors:			
D-34	Co-60 , plant/soil concentration ratio, dimensionless	1.500E-01	8.000E-02	RTF(1,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.800E-02	2.000E-02	RTF(1,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(1,3)
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	7.800E-02	4.000E-02	RTF(2,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	6.500E-02	3.000E-02	RTF(2,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.400E-02	8.000E-03	RTF(2,3)
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	7.800E-02	4.000E-02	RTF(3,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	6.500E-02	3.000E-02	RTF(3,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.400E-02	8.000E-03	RTF(3,3)
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	9.200E-02	5.000E-02	RTF(4,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(4,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.200E-02	2.000E-02	RTF(4,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	5.900E-01	3.000E-01	RTF(5,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(5,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.700E-03	2.000E-03	RTF(5,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(1,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(1,2)
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(2,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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

Dose Library: Subsurface Soil DCGL 120614 Plus FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(3,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(4,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(4,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(5,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(5,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETFG table in Ground Pathway of Detailed Report.

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

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	1.000E+02	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.000E+00	2.000E+00	---	THICK0
R011	Fraction of contamination that is submerged	0.000E+00	0.000E+00	---	SUBMFRACT
R011	Length parallel to aquifer flow (m)	1.130E+01	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): Co-60	1.000E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Cs-134	1.000E+00	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Cs-137	1.000E+00	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Ni-63	1.000E+00	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Sr-90	1.000E+00	0.000E+00	---	S1(5)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1 (1)
R012	Concentration in groundwater (pCi/L): Cs-134	not used	0.000E+00	---	W1 (2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1 (3)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1 (4)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1 (5)
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)	1.800E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.500E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.500E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	6.600E-02	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.880E+03	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	9.700E-01	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	4.200E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.250E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.300E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.900E-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
R014	Density of saturated zone (g/cm**3)	1.800E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.900E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	6.600E-02	2.000E-01	---	FCSZ

Summary : Zion Subsurface Soil 100 m^2 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R014	Saturated zone hydraulic conductivity (m/yr)	2.880E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	3.900E-03	2.000E-02	---	HGWT
R014	Saturated zone b parameter	not used	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	0.000E+00	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	3.300E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.250E+03	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	2.600E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.800E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.500E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.900E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	6.600E-02	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	9.700E-01	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	2.880E+03	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.161E+03	1.000E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	1.161E+03	1.000E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	1.161E+03	1.000E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.532E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	6.150E+02	4.600E+03	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	6.150E+02	4.600E+03	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	6.150E+02	4.600E+03	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.893E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	6.150E+02	4.600E+03	---	DCNUCC(3)
R016	Unsat. zone 1 (cm**3/g)	6.150E+02	4.600E+03	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	6.150E+02	4.600E+03	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.893E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	6.200E+01	1.000E+03	---	DCNUCC(4)
R016	Unsat. zone 1 (cm**3/g)	6.200E+01	1.000E+03	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	6.200E+01	1.000E+03	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.868E-03	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	2.300E+00	3.000E+01	---	DCNUCC(5)
R016	Unsat. zone 1 (cm**3/g)	2.300E+00	3.000E+01	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	2.300E+00	3.000E+01	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.614E-02	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.350E-05	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	5.500E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	4.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.490E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.240E-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)
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)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.780E+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	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E-01	FPLANT

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of meat	-1	-1	0.500E-02	FMEAT
R018	Contamination fraction of milk	-1	-1	0.500E-02	FMILK
R019	Livestock fodder intake for meat (kg/day)	2.830E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	6.520E+01	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	5.060E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	6.000E+01	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)	4.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	2.300E-01	1.500E-01	---	DM
R019	Depth of roots (m)	1.220E+00	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	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)	1.750E+00	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	2.900E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.900E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	2.460E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	1.230E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.200E-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	3.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	3.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	3.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	3.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	5.800E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	3.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	3.300E+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
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	1.000E+00	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)

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
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	512	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	17	---	---	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	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	100.00 square meters	Co-60	1.000E+00
Thickness:	1.00 meters	Cs-134	1.000E+00
Cover Depth:	0.00 meters	Cs-137	1.000E+00
		Ni-63	1.000E+00
		Sr-90	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):	8.617E+00	7.273E+00	5.347E+00	2.329E+00	7.467E-01	1.017E-01	9.706E-04	2.466E-08
M(t):	3.447E-01	2.909E-01	2.139E-01	9.315E-02	2.987E-02	4.067E-03	3.883E-05	9.863E-10

Maximum TDOSE(t): 8.617E+00 mrem/yr at t = 0.000E+00 years

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	4.594E+00	0.5331	9.858E-07	0.0000	0.000E+00	0.0000	2.066E-02	0.0024	1.893E-03	0.0002	4.999E-04	0.0001	3.565E-05	0.0000
Cs-134	2.426E+00	0.2815	1.885E-07	0.0000	0.000E+00	0.0000	2.653E-02	0.0031	3.041E-03	0.0004	4.739E-03	0.0005	8.807E-05	0.0000
Cs-137	1.015E+00	0.1178	1.515E-07	0.0000	0.000E+00	0.0000	2.106E-02	0.0024	2.414E-03	0.0003	3.762E-03	0.0004	6.991E-05	0.0000
Ni-63	0.000E+00	0.0000	3.007E-08	0.0000	0.000E+00	0.0000	2.886E-04	0.0000	2.461E-06	0.0000	1.159E-04	0.0000	8.122E-07	0.0000
Sr-90	7.080E-03	0.0008	5.981E-06	0.0000	0.000E+00	0.0000	4.697E-01	0.0545	5.414E-03	0.0006	1.477E-02	0.0017	2.057E-04	0.0000
Total	8.041E+00	0.9332	7.337E-06	0.0000	0.000E+00	0.0000	5.383E-01	0.0625	1.276E-02	0.0015	2.388E-02	0.0028	4.001E-04	0.0000

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

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.617E+00	0.5358
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.460E+00	0.2855
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.042E+00	0.1209
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.079E-04	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.972E-01	0.0577
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.617E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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

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

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	4.027E+00	0.5537	8.642E-07	0.0000	0.000E+00	0.0000	1.808E-02	0.0025	1.657E-03	0.0002	4.376E-04	0.0001	3.126E-05	0.0000
Cs-134	1.733E+00	0.2383	1.347E-07	0.0000	0.000E+00	0.0000	1.893E-02	0.0026	2.171E-03	0.0003	3.382E-03	0.0005	6.294E-05	0.0000
Cs-137	9.914E-01	0.1363	1.480E-07	0.0000	0.000E+00	0.0000	2.055E-02	0.0028	2.356E-03	0.0003	3.670E-03	0.0005	6.831E-05	0.0000
Ni-63	0.000E+00	0.0000	2.978E-08	0.0000	0.000E+00	0.0000	2.854E-04	0.0000	2.434E-06	0.0000	1.146E-04	0.0000	8.043E-07	0.0000
Sr-90	6.405E-03	0.0009	5.411E-06	0.0000	0.000E+00	0.0000	4.244E-01	0.0584	4.894E-03	0.0007	1.335E-02	0.0018	1.861E-04	0.0000
Total	6.759E+00	0.9292	6.588E-06	0.0000	0.000E+00	0.0000	4.822E-01	0.0663	1.108E-02	0.0015	2.096E-02	0.0029	3.494E-04	0.0000

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

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

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.047E+00	0.5565
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.758E+00	0.2417
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.018E+00	0.1400
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.033E-04	0.0001
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.492E-01	0.0618
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	7.273E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	3.095E+00	0.5788	6.641E-07	0.0000	0.000E+00	0.0000	1.385E-02	0.0026	1.270E-03	0.0002	3.354E-04	0.0001	2.402E-05	0.0000
Cs-134	8.853E-01	0.1656	6.880E-08	0.0000	0.000E+00	0.0000	9.640E-03	0.0018	1.106E-03	0.0002	1.722E-03	0.0003	3.214E-05	0.0000
Cs-137	9.463E-01	0.1770	1.413E-07	0.0000	0.000E+00	0.0000	1.955E-02	0.0037	2.243E-03	0.0004	3.494E-03	0.0007	6.520E-05	0.0000
Ni-63	0.000E+00	0.0000	2.920E-08	0.0000	0.000E+00	0.0000	2.790E-04	0.0001	2.381E-06	0.0000	1.121E-04	0.0000	7.887E-07	0.0000
Sr-90	5.242E-03	0.0010	4.428E-06	0.0000	0.000E+00	0.0000	3.463E-01	0.0648	3.994E-03	0.0007	1.089E-02	0.0020	1.523E-04	0.0000
Total	4.932E+00	0.9224	5.332E-06	0.0000	0.000E+00	0.0000	3.896E-01	0.0729	8.615E-03	0.0016	1.656E-02	0.0031	2.744E-04	0.0001

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

As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

Radio- Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.110E+00	0.5817
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.978E-01	0.1679
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.717E-01	0.1817
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.943E-04	0.0001
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.666E-01	0.0686
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.347E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m^2 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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- 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.
Co-60	1.232E+00	0.5288	2.643E-07	0.0000	0.000E+00	0.0000	5.454E-03	0.0023	5.008E-04	0.0002	1.321E-04	0.0001	9.558E-06	0.0000
Cs-134	8.427E-02	0.0362	6.549E-09	0.0000	0.000E+00	0.0000	9.079E-04	0.0004	1.044E-04	0.0000	1.624E-04	0.0001	3.059E-06	0.0000
Cs-137	8.041E-01	0.3453	1.200E-07	0.0000	0.000E+00	0.0000	1.644E-02	0.0071	1.890E-03	0.0008	2.941E-03	0.0013	5.540E-05	0.0000
Ni-63	0.000E+00	0.0000	2.727E-08	0.0000	0.000E+00	0.0000	2.578E-04	0.0001	2.204E-06	0.0000	1.037E-04	0.0000	7.365E-07	0.0000
Sr-90	2.599E-03	0.0011	2.196E-06	0.0000	0.000E+00	0.0000	1.699E-01	0.0729	1.960E-03	0.0008	5.345E-03	0.0023	7.550E-05	0.0000
Total	2.123E+00	0.9114	2.614E-06	0.0000	0.000E+00	0.0000	1.929E-01	0.0829	4.458E-03	0.0019	8.684E-03	0.0037	1.443E-04	0.0001

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- 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.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.238E+00	0.5315
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.545E-02	0.0367
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.254E-01	0.3545
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.644E-04	0.0002
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.799E-01	0.0772
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.329E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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- 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.
Co-60	8.850E-02	0.1185	1.899E-08	0.0000	0.000E+00	0.0000	3.800E-04	0.0005	3.503E-05	0.0000	9.223E-06	0.0000	6.869E-07	0.0000
Cs-134	1.017E-04	0.0001	7.904E-12	0.0000	0.000E+00	0.0000	1.062E-06	0.0000	1.230E-07	0.0000	1.907E-07	0.0000	3.692E-09	0.0000
Cs-137	5.049E-01	0.6762	7.538E-08	0.0000	0.000E+00	0.0000	1.001E-02	0.0134	1.159E-03	0.0016	1.797E-03	0.0024	3.479E-05	0.0000
Ni-63	0.000E+00	0.0000	2.242E-08	0.0000	0.000E+00	0.0000	2.055E-04	0.0003	1.768E-06	0.0000	8.289E-05	0.0001	6.055E-07	0.0000
Sr-90	3.502E-04	0.0005	2.959E-07	0.0000	0.000E+00	0.0000	2.219E-02	0.0297	2.564E-04	0.0003	6.987E-04	0.0009	1.017E-05	0.0000
Total	5.939E-01	0.7953	4.126E-07	0.0000	0.000E+00	0.0000	3.279E-02	0.0439	1.452E-03	0.0019	2.587E-03	0.0035	4.626E-05	0.0001

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- 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.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.893E-02	0.1191
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.031E-04	0.0001
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.179E-01	0.6936
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.908E-04	0.0004
Sr-90	1.153E-01	0.1544	0.000E+00	0.0000	0.000E+00	0.0000	5.562E-04	0.0007	4.885E-05	0.0001	9.308E-05	0.0001	1.395E-01	0.1868
Total	1.153E-01	0.1544	0.000E+00	0.0000	0.000E+00	0.0000	5.562E-04	0.0007	4.885E-05	0.0001	9.308E-05	0.0001	7.467E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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- 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.
Co-60	8.806E-06	0.0001	1.890E-12	0.0000	0.000E+00	0.0000	3.365E-08	0.0000	3.152E-09	0.0000	8.229E-10	0.0000	6.835E-11	0.0000
Cs-134	6.211E-15	0.0000	4.827E-22	0.0000	0.000E+00	0.0000	5.774E-17	0.0000	6.870E-18	0.0000	1.051E-17	0.0000	2.255E-19	0.0000
Cs-137	9.907E-02	0.9744	1.479E-08	0.0000	0.000E+00	0.0000	1.748E-03	0.0172	2.080E-04	0.0020	3.180E-04	0.0031	6.825E-06	0.0001
Ni-63	0.000E+00	0.0000	1.129E-08	0.0000	0.000E+00	0.0000	9.214E-05	0.0009	8.120E-07	0.0000	3.761E-05	0.0004	3.051E-07	0.0000
Sr-90	3.145E-07	0.0000	2.657E-10	0.0000	0.000E+00	0.0000	1.774E-05	0.0002	2.058E-07	0.0000	5.596E-07	0.0000	9.137E-09	0.0000
Total	9.908E-02	0.9744	2.635E-08	0.0000	0.000E+00	0.0000	1.857E-03	0.0183	2.090E-04	0.0021	3.562E-04	0.0035	7.140E-06	0.0001

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- 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.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.844E-06	0.0001
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.286E-15	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.013E-01	0.9968
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.309E-04	0.0013
Sr-90	1.679E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	8.178E-07	0.0000	7.285E-08	0.0000	1.402E-07	0.0000	1.877E-04	0.0018
Total	1.679E-04	0.0017	0.000E+00	0.0000	0.000E+00	0.0000	8.178E-07	0.0000	7.285E-08	0.0000	1.402E-07	0.0000	1.017E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m^2 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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.
Co-60	3.235E-17	0.0000	6.944E-24	0.0000	0.000E+00	0.0000	7.998E-20	0.0000	8.085E-21	0.0000	2.029E-21	0.0000	2.512E-22	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	9.441E-04	0.9726	1.409E-10	0.0000	0.000E+00	0.0000	1.077E-05	0.0111	1.454E-06	0.0015	2.093E-06	0.0022	6.505E-08	0.0001
Ni-63	0.000E+00	0.0000	1.593E-09	0.0000	0.000E+00	0.0000	8.407E-06	0.0087	8.284E-08	0.0001	3.632E-06	0.0037	4.304E-08	0.0000
Sr-90	6.208E-16	0.0000	5.244E-19	0.0000	0.000E+00	0.0000	2.264E-14	0.0000	2.686E-16	0.0000	7.214E-16	0.0000	1.803E-17	0.0000
Total	9.441E-04	0.9726	1.734E-09	0.0000	0.000E+00	0.0000	1.918E-05	0.0198	1.537E-06	0.0016	5.725E-06	0.0059	1.081E-07	0.0001

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.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.244E-17	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.585E-04	0.9875
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.217E-05	0.0125
Sr-90	2.202E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.073E-15	0.0000	9.556E-17	0.0000	1.839E-16	0.0000	2.458E-13	0.0000
Total	2.202E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.073E-15	0.0000	9.556E-17	0.0000	1.839E-16	0.0000	9.706E-04	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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

As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

Radio- Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
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- 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.
Co-60	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-134	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ni-63	2.432E-08	0.9862	0.000E+00	0.0000	0.000E+00	0.0000	9.815E-11	0.0040	6.519E-12	0.0003	2.367E-10	0.0096	2.466E-08	1.0000
Sr-90	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	2.432E-08	0.9862	0.000E+00	0.0000	0.000E+00	0.0000	9.815E-11	0.0040	6.519E-12	0.0003	2.367E-10	0.0096	2.466E-08	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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
Co-60	Co-60	1.000E+00	4.617E+00	4.047E+00	3.110E+00	1.238E+00	8.893E-02	8.844E-06	3.244E-17	0.000E+00
Cs-134	Cs-134	1.000E+00	2.460E+00	1.758E+00	8.978E-01	8.545E-02	1.031E-04	6.286E-15	4.064E-44	0.000E+00
Cs-137+D	Cs-137+D	1.000E+00	1.042E+00	1.018E+00	9.717E-01	8.254E-01	5.179E-01	1.013E-01	9.585E-04	0.000E+00
Ni-63	Ni-63	1.000E+00	4.079E-04	4.033E-04	3.943E-04	3.644E-04	2.908E-04	1.309E-04	1.217E-05	2.466E-08
Sr-90+D	Sr-90+D	1.000E+00	4.972E-01	4.492E-01	3.666E-01	1.799E-01	1.395E-01	1.877E-04	2.458E-13	0.000E+00

The DSR includes contributions from associated (half-life ≤ 30 days) daughters.

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
Co-60	5.415E+00	6.177E+00	8.037E+00	2.020E+01	2.811E+02	2.827E+06	*1.113E+15	*1.113E+15	
Cs-134	1.016E+01	1.422E+01	2.785E+01	2.926E+02	2.425E+05	*1.283E+15	*1.283E+15	*1.283E+15	
Cs-137	2.399E+01	2.456E+01	2.573E+01	3.029E+01	4.827E+01	2.467E+02	2.608E+04	*8.593E+13	
Ni-63	6.130E+04	6.199E+04	6.340E+04	6.860E+04	8.598E+04	1.910E+05	2.055E+06	1.014E+09	
Sr-90	5.028E+01	5.565E+01	6.820E+01	1.390E+02	1.792E+02	1.332E+05	1.017E+14	*1.366E+14	

*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)
Co-60	1.000E+00	0.000E+00	4.617E+00	5.415E+00	4.617E+00	5.415E+00
Cs-134	1.000E+00	0.000E+00	2.460E+00	1.016E+01	2.460E+00	1.016E+01
Cs-137	1.000E+00	0.000E+00	1.042E+00	2.399E+01	1.042E+00	2.399E+01
Ni-63	1.000E+00	0.000E+00	4.079E-04	6.130E+04	4.079E-04	6.130E+04
Sr-90	1.000E+00	0.000E+00	4.972E-01	5.028E+01	4.972E-01	5.028E+01

Summary : Zion Subsurface Soil 100 m² 120614

File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\ZION SUBSURFACE SOIL DCGL.RAD

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	
Co-60	Co-60	1.000E+00	4.617E+00	4.047E+00	3.110E+00	1.238E+00	8.893E-02	8.844E-06	3.244E-17	0.000E+00	
Cs-134	Cs-134	1.000E+00	2.460E+00	1.758E+00	8.978E-01	8.545E-02	1.031E-04	6.286E-15	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	1.042E+00	1.018E+00	9.717E-01	8.254E-01	5.179E-01	1.013E-01	9.585E-04	0.000E+00	
Ni-63	Ni-63	1.000E+00	4.079E-04	4.033E-04	3.943E-04	3.644E-04	2.908E-04	1.309E-04	1.217E-05	2.466E-08	
Sr-90	Sr-90	1.000E+00	4.972E-01	4.492E-01	3.666E-01	1.799E-01	1.395E-01	1.877E-04	2.458E-13	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	1.000E+02	3.000E+02	1.000E+03	
Co-60	Co-60	1.000E+00	1.000E+00	8.766E-01	6.737E-01	2.681E-01	1.927E-02	1.917E-06	7.044E-18	0.000E+00	
Cs-134	Cs-134	1.000E+00	1.000E+00	7.146E-01	3.650E-01	3.474E-02	4.193E-05	2.560E-15	1.682E-44	0.000E+00	
Cs-137	Cs-137	1.000E+00	1.000E+00	9.770E-01	9.326E-01	7.924E-01	4.976E-01	9.763E-02	9.304E-04	7.864E-11	
Ni-63	Ni-63	1.000E+00	1.000E+00	9.903E-01	9.710E-01	9.067E-01	7.454E-01	3.756E-01	5.299E-02	5.587E-05	
Sr-90	Sr-90	1.000E+00	1.000E+00	9.046E-01	7.403E-01	3.671E-01	4.946E-02	4.442E-05	8.767E-14	2.943E-44	

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

RESRAD.EXE execution time = 1.88 seconds