

Summary : Zion Subsurface Soil 64,500 m² 120614

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Time = 3.000E+00	12
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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)

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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.

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	6.450E+04	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)	2.870E+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): 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

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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)

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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	1.000E+00	-1	---	FPLANT

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of meat	1.000E+00	-1	---	FMEAT
R018	Contamination fraction of milk	1.000E+00	-1	---	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 64,500 m² 120614

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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 64,500 m² 120614

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Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area:	64500.00 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):	2.798E+01	2.436E+01	1.889E+01	9.097E+00	3.256E+00	3.583E-01	2.998E-03	2.089E-06
M(t):	1.119E+00	9.745E-01	7.556E-01	3.639E-01	1.302E-01	1.433E-02	1.199E-04	8.355E-08

Maximum TDOSE(t): 2.798E+01 mrem/yr at t = 0.000E+00 years

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	5.644E+00	0.2017	1.972E-06	0.0000	0.000E+00	0.0000	4.131E-01	0.0148	3.786E-01	0.0135	9.998E-02	0.0036	3.565E-04	0.0000
Cs-134	2.983E+00	0.1066	3.771E-07	0.0000	0.000E+00	0.0000	5.306E-01	0.0190	6.082E-01	0.0217	9.478E-01	0.0339	8.807E-04	0.0000
Cs-137	1.248E+00	0.0446	3.030E-07	0.0000	0.000E+00	0.0000	4.212E-01	0.0151	4.828E-01	0.0173	7.524E-01	0.0269	6.991E-04	0.0000
Ni-63	0.000E+00	0.0000	6.016E-08	0.0000	0.000E+00	0.0000	5.773E-03	0.0002	4.922E-04	0.0000	2.319E-02	0.0008	8.122E-06	0.0000
Sr-90	8.701E-03	0.0003	1.197E-05	0.0000	0.000E+00	0.0000	9.395E+00	0.3357	1.083E+00	0.0387	2.954E+00	0.1056	2.057E-03	0.0001
Total	9.883E+00	0.3532	1.468E-05	0.0000	0.000E+00	0.0000	1.077E+01	0.3847	2.553E+00	0.0912	4.777E+00	0.1707	4.001E-03	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 = 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	6.536E+00	0.2336
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	5.071E+00	0.1812
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.905E+00	0.1038
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	2.946E-02	0.0011
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	1.344E+01	0.4804
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	2.798E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	4.947E+00	0.2031	1.729E-06	0.0000	0.000E+00	0.0000	3.616E-01	0.0148	3.314E-01	0.0136	8.753E-02	0.0036	3.126E-04	0.0000
Cs-134	2.132E+00	0.0875	2.695E-07	0.0000	0.000E+00	0.0000	3.786E-01	0.0155	4.341E-01	0.0178	6.764E-01	0.0278	6.294E-04	0.0000
Cs-137	1.219E+00	0.0500	2.961E-07	0.0000	0.000E+00	0.0000	4.109E-01	0.0169	4.711E-01	0.0193	7.341E-01	0.0301	6.831E-04	0.0000
Ni-63	0.000E+00	0.0000	5.957E-08	0.0000	0.000E+00	0.0000	5.708E-03	0.0002	4.869E-04	0.0000	2.293E-02	0.0009	8.043E-06	0.0000
Sr-90	7.872E-03	0.0003	1.082E-05	0.0000	0.000E+00	0.0000	8.488E+00	0.3484	9.789E-01	0.0402	2.670E+00	0.1096	1.861E-03	0.0001
Total	8.306E+00	0.3410	1.318E-05	0.0000	0.000E+00	0.0000	9.645E+00	0.3959	2.216E+00	0.0910	4.191E+00	0.1720	3.494E-03	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+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	5.728E+00	0.2351
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	3.622E+00	0.1487
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.836E+00	0.1164
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	2.913E-02	0.0012
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	1.215E+01	0.4986
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	2.436E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	3.802E+00	0.2013	1.329E-06	0.0000	0.000E+00	0.0000	2.771E-01	0.0147	2.540E-01	0.0134	6.708E-02	0.0036	2.402E-04	0.0000
Cs-134	1.089E+00	0.0576	1.376E-07	0.0000	0.000E+00	0.0000	1.928E-01	0.0102	2.212E-01	0.0117	3.445E-01	0.0182	3.214E-04	0.0000
Cs-137	1.164E+00	0.0616	2.826E-07	0.0000	0.000E+00	0.0000	3.911E-01	0.0207	4.487E-01	0.0238	6.988E-01	0.0370	6.520E-04	0.0000
Ni-63	0.000E+00	0.0000	5.841E-08	0.0000	0.000E+00	0.0000	5.580E-03	0.0003	4.763E-04	0.0000	2.242E-02	0.0012	7.887E-06	0.0000
Sr-90	6.442E-03	0.0003	8.858E-06	0.0000	0.000E+00	0.0000	6.925E+00	0.3666	7.988E-01	0.0423	2.179E+00	0.1153	1.523E-03	0.0001
Total	6.061E+00	0.3209	1.067E-05	0.0000	0.000E+00	0.0000	7.792E+00	0.4125	1.723E+00	0.0912	3.312E+00	0.1753	2.744E-03	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	4.401E+00	0.2330
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	1.848E+00	0.0978
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.703E+00	0.1431
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	2.849E-02	0.0015
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	9.911E+00	0.5246
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	1.889E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	1.513E+00	0.1663	5.287E-07	0.0000	0.000E+00	0.0000	1.091E-01	0.0120	1.002E-01	0.0110	2.642E-02	0.0029	9.558E-05	0.0000
Cs-134	1.036E-01	0.0114	1.310E-08	0.0000	0.000E+00	0.0000	1.816E-02	0.0020	2.088E-02	0.0023	3.248E-02	0.0036	3.059E-05	0.0000
Cs-137	9.889E-01	0.1087	2.401E-07	0.0000	0.000E+00	0.0000	3.288E-01	0.0361	3.781E-01	0.0416	5.882E-01	0.0647	5.540E-04	0.0001
Ni-63	0.000E+00	0.0000	5.454E-08	0.0000	0.000E+00	0.0000	5.156E-03	0.0006	4.409E-04	0.0000	2.074E-02	0.0023	7.365E-06	0.0000
Sr-90	3.194E-03	0.0004	4.392E-06	0.0000	0.000E+00	0.0000	3.398E+00	0.3735	3.920E-01	0.0431	1.069E+00	0.1175	7.550E-04	0.0001
Total	2.609E+00	0.2867	5.229E-06	0.0000	0.000E+00	0.0000	3.859E+00	0.4242	8.916E-01	0.0980	1.737E+00	0.1909	1.443E-03	0.0002

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	1.749E+00	0.1922
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	1.752E-01	0.0193
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.285E+00	0.2511
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	2.634E-02	0.0029
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	4.863E+00	0.5345
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	9.097E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	1.087E-01	0.0334	3.799E-08	0.0000	0.000E+00	0.0000	7.601E-03	0.0023	7.006E-03	0.0022	1.845E-03	0.0006	6.869E-06	0.0000
Cs-134	1.251E-04	0.0000	1.581E-11	0.0000	0.000E+00	0.0000	2.125E-05	0.0000	2.460E-05	0.0000	3.814E-05	0.0000	3.692E-08	0.0000
Cs-137	6.210E-01	0.1907	1.508E-07	0.0000	0.000E+00	0.0000	2.002E-01	0.0615	2.318E-01	0.0712	3.593E-01	0.1103	3.479E-04	0.0001
Ni-63	0.000E+00	0.0000	4.484E-08	0.0000	0.000E+00	0.0000	4.109E-03	0.0013	3.536E-04	0.0001	1.658E-02	0.0051	6.055E-06	0.0000
Sr-90	4.304E-04	0.0001	5.918E-07	0.0000	0.000E+00	0.0000	4.439E-01	0.1363	5.127E-02	0.0157	1.397E-01	0.0429	1.017E-04	0.0000
Total	7.302E-01	0.2243	8.255E-07	0.0000	0.000E+00	0.0000	6.558E-01	0.2014	2.904E-01	0.0892	5.175E-01	0.1589	4.626E-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+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	1.252E-01	0.0384
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	2.091E-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	1.413E+00	0.4338
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	2.105E-02	0.0065
Sr-90	7.908E-01	0.2429	0.000E+00	0.0000	0.000E+00	0.0000	7.631E-02	0.0234	6.702E-02	0.0206	1.277E-01	0.0392	1.697E+00	0.5212
Total	7.908E-01	0.2429	0.000E+00	0.0000	0.000E+00	0.0000	7.631E-02	0.0234	6.702E-02	0.0206	1.277E-01	0.0392	3.256E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	1.082E-05	0.0000	3.780E-12	0.0000	0.000E+00	0.0000	6.731E-07	0.0000	6.305E-07	0.0000	1.646E-07	0.0000	6.835E-10	0.0000
Cs-134	7.638E-15	0.0000	9.656E-22	0.0000	0.000E+00	0.0000	1.155E-15	0.0000	1.374E-15	0.0000	2.102E-15	0.0000	2.255E-18	0.0000
Cs-137	1.218E-01	0.3400	2.958E-08	0.0000	0.000E+00	0.0000	3.495E-02	0.0975	4.159E-02	0.1161	6.361E-02	0.1775	6.825E-05	0.0002
Ni-63	0.000E+00	0.0000	2.259E-08	0.0000	0.000E+00	0.0000	1.843E-03	0.0051	1.624E-04	0.0005	7.523E-03	0.0210	3.051E-06	0.0000
Sr-90	3.866E-07	0.0000	5.316E-10	0.0000	0.000E+00	0.0000	3.548E-04	0.0010	4.117E-05	0.0001	1.119E-04	0.0003	9.137E-08	0.0000
Total	1.218E-01	0.3400	5.271E-08	0.0000	0.000E+00	0.0000	3.715E-02	0.1037	4.180E-02	0.1166	7.124E-02	0.1988	7.140E-05	0.0002

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	1.229E-05	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	1.227E-14	0.0000
Cs-137	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.620E-01	0.7314
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	9.531E-03	0.0266
Sr-90	6.380E-02	0.1781	0.000E+00	0.0000	0.000E+00	0.0000	6.215E-03	0.0173	5.537E-03	0.0155	1.066E-02	0.0297	8.672E-02	0.2420
Total	6.380E-02	0.1781	0.000E+00	0.0000	0.000E+00	0.0000	6.215E-03	0.0173	5.537E-03	0.0155	1.066E-02	0.0297	3.583E-01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	3.974E-17	0.0000	1.389E-23	0.0000	0.000E+00	0.0000	1.600E-18	0.0000	1.617E-18	0.0000	4.058E-19	0.0000	2.512E-21	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	1.161E-03	0.3872	2.820E-10	0.0000	0.000E+00	0.0000	2.154E-04	0.0719	2.908E-04	0.0970	4.186E-04	0.1396	6.505E-07	0.0002
Ni-63	0.000E+00	0.0000	3.187E-09	0.0000	0.000E+00	0.0000	1.681E-04	0.0561	1.657E-05	0.0055	7.265E-04	0.2423	4.304E-07	0.0001
Sr-90	7.629E-16	0.0000	1.049E-18	0.0000	0.000E+00	0.0000	4.529E-13	0.0000	5.372E-14	0.0000	1.443E-13	0.0000	1.803E-16	0.0000
Total	1.161E-03	0.3872	3.469E-09	0.0000	0.000E+00	0.0000	3.836E-04	0.1279	3.073E-04	0.1025	1.145E-03	0.3819	1.081E-06	0.0004

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	4.336E-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	2.087E-03	0.6959
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	9.117E-04	0.3041
Sr-90	8.541E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.321E-12	0.0000	7.413E-12	0.0000	1.427E-11	0.0000	1.161E-10	0.0000
Total	8.541E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.321E-12	0.0000	7.413E-12	0.0000	1.427E-11	0.0000	2.998E-03	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	6.780E-07	0.3246	0.000E+00	0.0000	0.000E+00	0.0000	5.473E-08	0.0262	3.635E-08	0.0174	1.320E-06	0.6318	2.089E-06	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	6.780E-07	0.3246	0.000E+00	0.0000	0.000E+00	0.0000	5.473E-08	0.0262	3.635E-08	0.0174	1.320E-06	0.6318	2.089E-06	1.0000

*Sum of all water independent and dependent pathways.

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	6.536E+00	5.728E+00	4.401E+00	1.749E+00	1.252E-01	1.229E-05	4.336E-17	0.000E+00
Cs-134	Cs-134	1.000E+00	5.071E+00	3.622E+00	1.848E+00	1.752E-01	2.091E-04	1.227E-14	5.045E-44	0.000E+00
Cs-137+D	Cs-137+D	1.000E+00	2.905E+00	2.836E+00	2.703E+00	2.285E+00	1.413E+00	2.620E-01	2.087E-03	0.000E+00
Ni-63	Ni-63	1.000E+00	2.946E-02	2.913E-02	2.849E-02	2.634E-02	2.105E-02	9.531E-03	9.117E-04	2.089E-06
Sr-90+D	Sr-90+D	1.000E+00	1.344E+01	1.215E+01	9.911E+00	4.863E+00	1.697E+00	8.672E-02	1.161E-10	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		3.825E+00	4.364E+00	5.681E+00	1.430E+01	1.997E+02	2.035E+06	*1.113E+15	*1.113E+15
Cs-134		4.930E+00	6.903E+00	1.353E+01	1.427E+02	1.196E+05	*1.283E+15	*1.283E+15	*1.283E+15
Cs-137		8.606E+00	8.815E+00	9.249E+00	1.094E+01	1.770E+01	9.540E+01	1.198E+04	*8.593E+13
Ni-63		8.486E+02	8.581E+02	8.775E+02	9.491E+02	1.188E+03	2.623E+03	2.742E+04	1.197E+07
Sr-90		1.860E+00	2.058E+00	2.522E+00	5.141E+00	1.473E+01	2.883E+02	2.154E+11	*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	6.536E+00	3.825E+00	6.536E+00	3.825E+00
Cs-134	1.000E+00	0.000E+00	5.071E+00	4.930E+00	5.071E+00	4.930E+00
Cs-137	1.000E+00	0.000E+00	2.905E+00	8.606E+00	2.905E+00	8.606E+00
Ni-63	1.000E+00	0.000E+00	2.946E-02	8.486E+02	2.946E-02	8.486E+02
Sr-90	1.000E+00	0.000E+00	1.344E+01	1.860E+00	1.344E+01	1.860E+00

Summary : Zion Subsurface Soil 64,500 m² 120614

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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	6.536E+00	5.728E+00	4.401E+00	1.749E+00	1.252E-01	1.229E-05	4.336E-17	0.000E+00	
Cs-134	Cs-134	1.000E+00	5.071E+00	3.622E+00	1.848E+00	1.752E-01	2.091E-04	1.227E-14	0.000E+00	0.000E+00	
Cs-137	Cs-137	1.000E+00	2.905E+00	2.836E+00	2.703E+00	2.285E+00	1.413E+00	2.620E-01	2.087E-03	0.000E+00	
Ni-63	Ni-63	1.000E+00	2.946E-02	2.913E-02	2.849E-02	2.634E-02	2.105E-02	9.531E-03	9.117E-04	2.089E-06	
Sr-90	Sr-90	1.000E+00	1.344E+01	1.215E+01	9.911E+00	4.863E+00	1.697E+00	8.672E-02	1.161E-10	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 = 1.75 seconds