

Appendix H35 –
RESRAD 7.0 Output for Area L23

Appendix H35: RESRAD 7.0 Output for Area L23

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Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.RAD.

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Dose Conversion Factor (and Related) Parameter Summary Dose Library: 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	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(2)
A-1	Sr-90 (Source: FGR 12)	7.043E-04	7.043E-04	DCF1(3)
A-1	Y-90 (Source: FGR 12)	2.391E-02	2.391E-02	DCF1(4)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2(2)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3(2)
D-34	Food transfer factors:			
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(1,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(1,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(1,3)
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(2,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(2,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(2,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(1,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(1,2)
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(2,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(2,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETRG 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)	1.308E+05	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)	1.650E+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): Cs-137	1.690E-01	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Sr-90	7.000E-03	0.000E+00	---	S1(2)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(2)
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)	1.700E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	0.000E+00	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.600E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	1.400E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.400E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.600E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	7.800E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.160E+00	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	4.700E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.100E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.370E+07	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.700E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.600E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.500E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	1.400E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	3.000E-02	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)	5.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL

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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	Well pumping rate (m**3/yr)	5.720E+03	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS
R015	Unsat. zone 1, thickness (m)	2.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.700E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.600E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.500E-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	1.400E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.400E+02	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.333E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	5.000E+00	3.000E+01	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	5.000E+00	3.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+00	3.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.919E-02	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.480E-05	1.000E-04	---	MLINH
R017	Exposure duration	1.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	1.000E+00	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	2.730E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	6.600E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	---	FS
R017	Radii of shape factor array (used if FS = -1):			>0 shows circular AREA:	
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)

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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	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)	2.100E+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)	6.500E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	9.000E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	0.000E+00	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	1.830E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	7.300E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	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	1.000E+00	-1	---	FPLANT
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)	2.730E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	6.420E+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)	4.000E-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)	1.750E+00	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)

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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	6.700E-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	1.800E+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	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
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

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

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Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	130760.00 square meters	Cs-137	1.690E-01
Thickness:	1.00 meters	Sr-90	7.000E-03
Cover Depth:	0.00 meters		

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):	4.142E-01	4.030E-01	3.815E-01	3.160E-01	1.882E-01	3.595E-02	3.098E-04	2.206E-11
M(t):	1.657E-02	1.612E-02	1.526E-02	1.264E-02	7.530E-03	1.438E-03	1.239E-05	8.826E-13

Maximum TDOSE(t): 4.142E-01 mrem/yr at t = 0.000E+00 years

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:06 Page 9
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	2.398E-01	0.5791	1.264E-07	0.0000	0.000E+00	0.0000	4.444E-02	0.1073	2.594E-02	0.0626	4.779E-02	0.1154	1.391E-04	0.0003
Sr-90	7.085E-05	0.0002	2.115E-07	0.0000	0.000E+00	0.0000	4.160E-02	0.1004	4.729E-03	0.0114	9.624E-03	0.0232	1.735E-05	0.0000
Total	2.399E-01	0.5793	3.379E-07	0.0000	0.000E+00	0.0000	8.603E-02	0.2077	3.067E-02	0.0740	5.741E-02	0.1386	1.564E-04	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 = 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.
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	3.582E-01	0.8647
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	5.604E-02	0.1353
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.142E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:06 Page 10
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	2.343E-01	0.5814	1.234E-07	0.0000	0.000E+00	0.0000	4.340E-02	0.1077	2.534E-02	0.0629	4.668E-02	0.1158	1.358E-04	0.0003
Sr-90	6.718E-05	0.0002	2.006E-07	0.0000	0.000E+00	0.0000	3.944E-02	0.0979	4.485E-03	0.0111	9.127E-03	0.0226	1.645E-05	0.0000
Total	2.343E-01	0.5815	3.240E-07	0.0000	0.000E+00	0.0000	8.285E-02	0.2056	2.982E-02	0.0740	5.580E-02	0.1385	1.523E-04	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 = 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.
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	3.498E-01	0.8681
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	5.314E-02	0.1319
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.030E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:06 Page 11
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA.L23.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.
Cs-137	2.235E-01	0.5858	1.178E-07	0.0000	0.000E+00	0.0000	4.141E-02	0.1085	2.417E-02	0.0634	4.453E-02	0.1167	1.296E-04	0.0003
Sr-90	6.039E-05	0.0002	1.803E-07	0.0000	0.000E+00	0.0000	3.546E-02	0.0929	4.032E-03	0.0106	8.205E-03	0.0215	1.478E-05	0.0000
Total	2.236E-01	0.5860	2.981E-07	0.0000	0.000E+00	0.0000	7.687E-02	0.2015	2.821E-02	0.0739	5.274E-02	0.1382	1.444E-04	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+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.
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	3.338E-01	0.8748
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	4.777E-02	0.1252
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.815E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:06 Page 12
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	1.896E-01	0.6000	9.990E-08	0.0000	0.000E+00	0.0000	3.513E-02	0.1112	2.050E-02	0.0649	3.778E-02	0.1195	1.099E-04	0.0003
Sr-90	4.159E-05	0.0001	1.242E-07	0.0000	0.000E+00	0.0000	2.442E-02	0.0773	2.777E-03	0.0088	5.651E-03	0.0179	1.018E-05	0.0000
Total	1.896E-01	0.6001	2.241E-07	0.0000	0.000E+00	0.0000	5.955E-02	0.1884	2.328E-02	0.0737	4.343E-02	0.1374	1.201E-04	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 = 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.
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	2.831E-01	0.8959
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	3.290E-02	0.1041
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.160E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:06 Page 13
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	1.185E-01	0.6294	6.242E-08	0.0000	0.000E+00	0.0000	2.195E-02	0.1166	1.281E-02	0.0681	2.361E-02	0.1254	6.870E-05	0.0004
Sr-90	1.433E-05	0.0001	4.280E-08	0.0000	0.000E+00	0.0000	8.416E-03	0.0447	9.570E-04	0.0051	1.947E-03	0.0103	3.509E-06	0.0000
Total	1.185E-01	0.6294	1.052E-07	0.0000	0.000E+00	0.0000	3.037E-02	0.1613	1.377E-02	0.0731	2.555E-02	0.1357	7.221E-05	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+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.
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	1.769E-01	0.9398
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	1.134E-02	0.0602
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	1.882E-01	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:06 Page 14
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	2.285E-02	0.6357	1.204E-08	0.0000	0.000E+00	0.0000	4.234E-03	0.1178	2.471E-03	0.0687	4.553E-03	0.1267	1.325E-05	0.0004
Sr-90	3.443E-07	0.0000	1.028E-09	0.0000	0.000E+00	0.0000	2.022E-04	0.0056	2.299E-05	0.0006	4.678E-05	0.0013	8.430E-08	0.0000
Total	2.285E-02	0.6357	1.307E-08	0.0000	0.000E+00	0.0000	4.436E-03	0.1234	2.494E-03	0.0694	4.600E-03	0.1280	1.333E-05	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 = 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.
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	3.412E-02	0.9492
Sr-90	8.395E-04	0.0234	2.972E-05	0.0008	0.000E+00	0.0000	3.359E-04	0.0093	1.049E-04	0.0029	2.434E-04	0.0068	1.826E-03	0.0508
Total	8.395E-04	0.0234	2.972E-05	0.0008	0.000E+00	0.0000	3.359E-04	0.0093	1.049E-04	0.0029	2.434E-04	0.0068	3.595E-02	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:06 Page 15
Summary : RESRAD Default Parameters
File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	2.074E-04	0.6696	1.093E-10	0.0000	0.000E+00	0.0000	3.843E-05	0.1241	2.243E-05	0.0724	4.132E-05	0.1334	1.203E-07	0.0004
Sr-90	8.132E-12	0.0000	2.428E-14	0.0000	0.000E+00	0.0000	4.775E-09	0.0000	5.430E-10	0.0000	1.105E-09	0.0000	1.991E-12	0.0000
Total	2.074E-04	0.6696	1.093E-10	0.0000	0.000E+00	0.0000	3.843E-05	0.1241	2.243E-05	0.0724	4.133E-05	0.1334	1.203E-07	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.
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	3.097E-04	0.9999
Sr-90	1.983E-08	0.0001	7.019E-10	0.0000	0.000E+00	0.0000	7.934E-09	0.0000	2.477E-09	0.0000	5.749E-09	0.0000	4.312E-08	0.0001
Total	1.983E-08	0.0001	7.019E-10	0.0000	0.000E+00	0.0000	7.934E-09	0.0000	2.477E-09	0.0000	5.749E-09	0.0000	3.098E-04	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:06 Page 16
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.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.
Cs-137	1.478E-11	0.6697	7.785E-18	0.0000	0.000E+00	0.0000	2.738E-12	0.1241	1.598E-12	0.0724	2.944E-12	0.1334	8.568E-15	0.0004
Sr-90	5.206E-28	0.0000	1.554E-30	0.0000	0.000E+00	0.0000	3.057E-25	0.0000	3.476E-26	0.0000	7.073E-26	0.0000	1.274E-28	0.0000
Total	1.478E-11	0.6697	7.785E-18	0.0000	0.000E+00	0.0000	2.738E-12	0.1241	1.598E-12	0.0724	2.944E-12	0.1334	8.568E-15	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 = 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.
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	2.206E-11	1.0000
Sr-90	1.269E-24	0.0000	4.493E-26	0.0000	0.000E+00	0.0000	5.079E-25	0.0000	1.586E-25	0.0000	3.680E-25	0.0000	2.760E-24	0.0000
Total	1.269E-24	0.0000	4.493E-26	0.0000	0.000E+00	0.0000	5.079E-25	0.0000	1.586E-25	0.0000	3.680E-25	0.0000	2.206E-11	1.0000

*Sum of all water independent and dependent pathways.

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T_{1/2} Limit = 180 days 07/22/2016 11:06 Page 17
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.RAD

Dose/Source Ratios Summed Over All Pathways										
Parent and Progeny Principal Radionuclide Contributions Indicated										
0 Parent	Product	Thread	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)							
(i)	(j)	Fraction	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137+D	Cs-137+D	1.000E+00	2.119E+00	2.070E+00	1.975E+00	1.675E+00	1.047E+00	2.019E-01	1.833E-03	1.306E-10
0Sr-90+D	Sr-90+D	1.000E+00	8.005E+00	7.591E+00	6.824E+00	4.700E+00	1.620E+00	2.608E-01	6.160E-06	3.944E-22

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

Single Radionuclide Soil Guidelines G(i,t) in pCi/g								
Basic Radiation Dose Limit = 2.500E+01 mrem/yr								
0Nuclide	t=	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02
(i)								
Cs-137	1.180E+01	1.208E+01	1.266E+01	1.492E+01	2.388E+01	1.238E+02	1.364E+04	1.915E+11
Sr-90	3.123E+00	3.293E+00	3.663E+00	5.319E+00	1.543E+01	9.585E+01	4.058E+06	*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						
0Nuclide	Initial	tmin	DSR(i,tmin)	G(i,tmin)	DSR(i,tmax)	G(i,tmax)
(i)	(pCi/g)	(years)		(pCi/g)		(pCi/g)
Cs-137	1.690E-01	0.000E+00	2.119E+00	1.180E+01	2.119E+00	1.180E+01
Sr-90	7.000E-03	0.000E+00	8.005E+00	3.123E+00	8.005E+00	3.123E+00

Appendix H35: RESRAD 7.0 Output for Area L23

RESRAD, Version 7.0 T½ Limit = 180 days 07/22/2016 11:06 Page 18
 Summary : RESRAD Default Parameters
 File : C:\RESRAD_FAMILY\RESRAD\7.0\USERFILES\AREA L23.RAD

Individual Nuclide Dose Summed Over All Pathways										
Parent Nuclide and Branch Fraction Indicated			DOSE(j,t), mrem/yr							
ONuclide	Parent	THF(i)	t=							
(j)	(i)		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	3.582E-01	3.498E-01	3.338E-01	2.831E-01	1.769E-01	3.412E-02	3.097E-04	2.206E-11
OSr-90	Sr-90	1.000E+00	5.604E-02	5.314E-02	4.777E-02	3.290E-02	1.134E-02	1.826E-03	4.312E-08	2.760E-24

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

Individual Nuclide Soil Concentration										
Parent Nuclide and Branch Fraction Indicated			S(j,t), pCi/g							
ONuclide	Parent	THF(i)	t=							
(j)	(i)		0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Cs-137	Cs-137	1.000E+00	1.690E-01	1.651E-01	1.575E-01	1.336E-01	8.348E-02	1.610E-02	1.461E-04	1.041E-11
OSr-90	Sr-90	1.000E+00	7.000E-03	6.637E-03	5.966E-03	4.109E-03	1.416E-03	3.402E-05	8.034E-10	5.143E-26

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

ORESCALC.EXE execution time = 0.41 seconds