Index of RESRAD Runs for Response to 6-11-09 RAI Comment No.8
Recreationist Scenario – Fish Consumption Pathway

Run Date	Description [1]	Pages	File Name	Result (mrem) [2]	
				Deterministic	Probabilistic
8/4/09	Dose from Cs-137 in 1500 m^2 contaminated zone, 0.76 m thick.	Part I: 1-7, Part IV: 1-3, 13, 18, 53. Concentration figures 3 p., dose.figure 1 p. 17 pp. total	08040901	Total: 5.785 E-02 Fish: 5.784E-02	Total: 6.85 ± 8.53 E-02 Fish: 6.83 ± 8.53 E-02
8/4/09	Dose from Cs-137 in 28.27 m^2 local elevated activity source, 0.76 m thick.	Part I: 1-7, Part IV: 1-3, 13, 18, 53. 13 pp.total	08040902	Total: 1.090 E-03 Fish: 1.090 E-03	Total: 1.29 ± 1.61 E-03 Fish: 1.29 ± 1.61 E-03
8/4/09	Dose from Co-60 in 1500 m^2 contaminated zone, 0.15 m thick.	Part I: 1-8, Part IV: 1-3, 13, 18, 53. 14 pp.total	08040903	Total: 1.923 E-02 Fish: 1.922 E-02	Total: 2.61 ± 3.97 E-02 Fish: 2.61 ± 3.97 E-02
Notes:	1. Only fish consumption, direct sediment ingestion and inhalation pathways are active. 2. All dose results are in units of mrem/y per pCi/g.				

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary ... 2
Site-Specific Parameter Summary 3
Summary of Pathway Selections 6
Contaminated Zone and Total Dose Summary 7
Total Dose Components
Time = 0.000E+00 8
Time = 2.000E-01 9
Time = 5.000E-01 10
Time = 1.000E+00 11
Time = 1.000E+01 12
Time = 3.000E+01 13
Dose/Source Ratios Summed Over All Pathways 14
Single Radionuclide Soil Guidelines 14
Dose Per Nuclide Summed Over All Pathways 15
Soil Concentration Per Nuclide 15

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)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
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-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)

#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.

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)	1.500E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	7.600E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	4.400E+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)	2.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	5.000E-01	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+00	1.000E+01	---	T(4)
R011	Times for calculations (yr)	1.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	3.000E+01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	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	1.000E+00	0.000E+00	---	S1(1)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(1)
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)	1.522E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.500E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.700E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	7.120E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	3.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.500E+03	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)	1.522E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.700E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	5.000E-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)	8.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.543E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R017	Inhalation rate (m**3/yr)	1.400E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.250E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	not used	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)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+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)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	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):				

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	suppressed
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1500.00 square meters	Cs-137	1.000E+00
Thickness:	0.76 meters		
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	2.000E-01	5.000E-01	1.000E+00	1.000E+01	3.000E+01
TDOSE(t):	5.501E-02	5.775E-02	5.729E-02	5.659E-02	4.535E-02	2.772E-02
M(t):	2.201E-03	2.310E-03	2.291E-03	2.263E-03	1.814E-03	1.109E-03

Maximum TDOSE(t): 5.785E-02 mrem/yr at t = 0.1001 ± 0.0002 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.001E-01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	7.659E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-05	0.0002
Total	0.000E+00	0.0000	7.659E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.128E-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 = 1.001E-01 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	5.784E-02	0.9998	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.785E-02	1.0000
Total	0.000E+00	0.0000	5.784E-02	0.9998	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.785E-02	1.0000

*Sum of all water independent and dependent pathways.

Table of Contents

Part VI: Uncertainty Analysis

RESRAD Uncertainty Analysis Results

Probabilistic Input 2
Total Dose 3
Total Risk 4
Dose vs Pathway: Ground External 5
Dose vs Pathway: Inhalation (w/o Radon) 6
Dose vs Pathway: Radon (Water Ind.) 7
Dose vs Pathway: Plant (Water Ind.) 8
Dose vs Pathway: Meat (Water Ind.) 9
Dose vs Pathway: Milk (Water Ind.) 10
Dose vs Pathway: Soil Ingestion 11
Dose vs Pathway: Water Ingestion 12
Dose vs Pathway: Fish Ingestion 13
Dose vs Pathway: Radon (Water Dep.) 14
Dose vs Pathway: Plant (Water Dep.) 15
Dose vs Pathway: Meat (Water Dep.) 16
Dose vs Pathway: Milk (Water Dep.) 17
Cumulative Probability Summary..... 18
Summary of dose at graphical times, reptition 1..... 19
Summary of dose at graphical times, reptition 2..... 20
Summary of dose at graphical times, reptition 3..... 21
Peak of the mean dose at graphical times..... 22
Correlation and Regression coefficients (if any)..... 23

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	BBIO(55,1)	LOGNORMAL-N	7.6	.7	
2	DIET(5)	TRIANGULAR	2.7	5.4	8.1
3	FR9	TRIANGULAR	0	.39	1
4	WAREA	TRIANGULAR	750	1500	3000
5	AREA	TRIANGULAR	750	1500	3000
6	DCACTC(1)	TRIANGULAR	2300	4600	9200

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE(j,t), mrem/yr t= 0.00E+00	2.00E-01	5.00E-01	1.00E+00	1.00E+01	3.00E+01
Cs-137								
Min	1.00E-01	7.21E-04	6.86E-04	7.20E-04	7.14E-04	7.05E-04	5.66E-04	3.46E-04
Max	1.00E-01	6.29E-01	5.98E-01	6.28E-01	6.23E-01	6.15E-01	4.93E-01	3.02E-01
Avg	1.00E-01	6.85E-02	6.51E-02	6.84E-02	6.78E-02	6.70E-02	5.37E-02	3.28E-02
Std	9.69E-06	8.53E-02	8.12E-02	8.52E-02	8.45E-02	8.35E-02	6.69E-02	4.09E-02
∑ALL								
Min	1.00E-01	7.21E-04	6.86E-04	7.20E-04	7.14E-04	7.05E-04	5.66E-04	3.46E-04
Max	1.00E-01	6.29E-01	5.98E-01	6.28E-01	6.23E-01	6.15E-01	4.93E-01	3.02E-01
Avg	1.00E-01	6.85E-02	6.51E-02	6.84E-02	6.78E-02	6.70E-02	5.37E-02	3.28E-02
Std	9.69E-06	8.53E-02	8.12E-02	8.52E-02	8.45E-02	8.35E-02	6.69E-02	4.09E-02

∑ALL is total dose summed for all nuclides.

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	DOSE(i,j,t), mrem/yr t= 0.00E+00	2.00E-01	5.00E-01	1.00E+00	1.00E+01	3.00E+01
Cs-137						
Min	6.75E-04	7.08E-04	7.03E-04	6.94E-04	5.57E-04	3.41E-04
Max	5.98E-01	6.28E-01	6.23E-01	6.15E-01	4.93E-01	3.02E-01
Avg	6.51E-02	6.83E-02	6.78E-02	6.70E-02	5.37E-02	3.28E-02
Std	8.12E-02	8.52E-02	8.45E-02	8.35E-02	6.69E-02	4.09E-02
∑ALL						
Min	6.75E-04	7.08E-04	7.03E-04	6.94E-04	5.57E-04	3.41E-04
Max	5.98E-01	6.28E-01	6.23E-01	6.15E-01	4.93E-01	3.02E-01
Avg	6.51E-02	6.83E-02	6.78E-02	6.70E-02	5.37E-02	3.28E-02
Std	8.12E-02	8.52E-02	8.45E-02	8.35E-02	6.69E-02	4.09E-02

∑ALL is total pathway dose summed for all nuclides.

Probabilistic results summary : Recreationist for TBD 08-006 unit Cs-137 Dose F-
ish Pathway CFile: C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040901.RAD

Cumulative Probability Summary for: Total Dose Over Pathways

Cumulative	Dose(t), mrem/yr					
Probability	t= 0.00E+00	2.00E-01	5.00E-01	1.00E+00	1.00E+01	3.00E+01
0.025	4.66E-03	4.89E-03	4.85E-03	4.79E-03	3.84E-03	2.34E-03
0.050	6.73E-03	7.06E-03	7.01E-03	6.92E-03	5.55E-03	3.39E-03
0.075	8.52E-03	8.94E-03	8.87E-03	8.76E-03	7.02E-03	4.30E-03
0.100	1.10E-02	1.15E-02	1.14E-02	1.13E-02	9.03E-03	5.51E-03
0.125	1.29E-02	1.35E-02	1.34E-02	1.33E-02	1.06E-02	6.52E-03
0.150	1.45E-02	1.53E-02	1.51E-02	1.50E-02	1.20E-02	7.33E-03
0.175	1.65E-02	1.73E-02	1.71E-02	1.69E-02	1.36E-02	8.30E-03
0.200	1.74E-02	1.82E-02	1.81E-02	1.79E-02	1.43E-02	8.77E-03
0.225	1.88E-02	1.98E-02	1.96E-02	1.94E-02	1.55E-02	9.46E-03
0.250	2.08E-02	2.18E-02	2.16E-02	2.13E-02	1.71E-02	1.05E-02
0.275	2.18E-02	2.29E-02	2.27E-02	2.24E-02	1.80E-02	1.10E-02
0.300	2.29E-02	2.40E-02	2.38E-02	2.35E-02	1.89E-02	1.16E-02
0.325	2.55E-02	2.68E-02	2.66E-02	2.63E-02	2.10E-02	1.29E-02
0.350	2.66E-02	2.79E-02	2.77E-02	2.74E-02	2.19E-02	1.34E-02
0.375	2.79E-02	2.93E-02	2.90E-02	2.87E-02	2.30E-02	1.40E-02
0.400	3.03E-02	3.18E-02	3.16E-02	3.12E-02	2.50E-02	1.53E-02
0.425	3.21E-02	3.37E-02	3.34E-02	3.30E-02	2.65E-02	1.62E-02
0.450	3.40E-02	3.57E-02	3.54E-02	3.50E-02	2.81E-02	1.72E-02
0.475	3.63E-02	3.81E-02	3.78E-02	3.73E-02	2.99E-02	1.83E-02
0.500	3.81E-02	4.00E-02	3.97E-02	3.92E-02	3.15E-02	1.92E-02
0.525	4.26E-02	4.47E-02	4.43E-02	4.38E-02	3.51E-02	2.15E-02
0.550	4.43E-02	4.65E-02	4.61E-02	4.56E-02	3.65E-02	2.23E-02
0.575	4.78E-02	5.02E-02	4.98E-02	4.92E-02	3.94E-02	2.41E-02
0.600	4.93E-02	5.18E-02	5.13E-02	5.07E-02	4.06E-02	2.48E-02
0.625	5.24E-02	5.50E-02	5.46E-02	5.39E-02	4.32E-02	2.64E-02
0.650	5.60E-02	5.88E-02	5.83E-02	5.76E-02	4.62E-02	2.82E-02
0.675	6.14E-02	6.44E-02	6.39E-02	6.31E-02	5.06E-02	3.10E-02
0.700	6.71E-02	7.05E-02	6.99E-02	6.91E-02	5.54E-02	3.39E-02
0.725	7.10E-02	7.45E-02	7.39E-02	7.30E-02	5.86E-02	3.58E-02
0.750	7.66E-02	8.04E-02	7.98E-02	7.88E-02	6.32E-02	3.86E-02
0.775	8.93E-02	9.38E-02	9.30E-02	9.19E-02	7.35E-02	4.49E-02
0.800	9.19E-02	9.65E-02	9.57E-02	9.46E-02	7.58E-02	4.62E-02
0.825	1.02E-01	1.07E-01	1.06E-01	1.04E-01	8.37E-02	5.12E-02
0.850	1.09E-01	1.15E-01	1.14E-01	1.12E-01	9.00E-02	5.49E-02
0.875	1.20E-01	1.26E-01	1.25E-01	1.23E-01	9.90E-02	6.05E-02
0.900	1.45E-01	1.53E-01	1.51E-01	1.50E-01	1.20E-01	7.33E-02
0.925	1.68E-01	1.77E-01	1.75E-01	1.73E-01	1.39E-01	8.48E-02
0.950	2.02E-01	2.12E-01	2.10E-01	2.07E-01	1.66E-01	1.02E-01
0.975	3.08E-01	3.23E-01	3.20E-01	3.16E-01	2.54E-01	1.55E-01
1.000	5.98E-01	6.28E-01	6.23E-01	6.15E-01	4.93E-01	3.02E-01

Title : Recreationist for TBD 08-006 unit Cs-137 Dose Fish Pathway Contaminated Zone Mod

Input File : C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040901.RAD

Coefficients for peak Fish Ingestion Dose

Coefficient =	PCC		SRC		PRCC		SRRC	
Repetition =	1		1		1		1	
Description of Probabilistic Variable	Sig	Coeff	Sig	Coeff	Sig	Coeff	Sig	Coeff
Fish transfer factor for Cs	1	0.77	1	0.65	1	0.88	1	0.63
Fish consumption	5	0.31	5	0.17	6	0.39	6	0.14
Aquatic food	2	0.56	2	0.36	2	0.84	2	0.53
Watershed area for nearby stream or pond	4	-0.38	4	-0.22	4	-0.58	4	-0.24
Area of contaminated zone	6	0.22	6	0.12	3	0.68	3	0.31
Kd of Cs-137 in Contaminated Zone	3	-0.42	3	-0.25	5	-0.50	5	-0.20
R-SQUARE		0.71		0.71		0.89		0.89

-Rank is set to zero if the dose is zero or the correlation matrix is singular.

-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary ... 2
Site-Specific Parameter Summary 3
Summary of Pathway Selections 6
Contaminated Zone and Total Dose Summary 7
Total Dose Components
Time = 0.000E+00 8
Time = 2.000E-01 9
Time = 5.000E-01 10
Time = 1.000E+00 11
Time = 1.000E+01 12
Time = 3.000E+01 13
Dose/Source Ratios Summed Over All Pathways 14
Single Radionuclide Soil Guidelines 14
Dose Per Nuclide Summed Over All Pathways 15
Soil Concentration Per Nuclide 15

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)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(1)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(1)
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-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)

#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.

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)	2.827E+01	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	7.600E-01	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	4.400E+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)	2.000E-01	1.000E+00	---	T(2)
R011	Times for calculations (yr)	5.000E-01	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+00	1.000E+01	---	T(4)
R011	Times for calculations (yr)	1.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	3.000E+01	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	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	1.000E+00	0.000E+00	---	S1(1)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(1)
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)	1.522E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.500E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.700E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	7.120E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	3.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.500E+03	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)	1.522E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.700E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	5.000E-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)	8.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCC(1)
R016	Saturated zone (cm**3/g)	4.600E+03	4.600E+03	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.543E-04	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R017	Inhalation rate (m**3/yr)	1.400E+04	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.250E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	not used	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)	not used	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	5.400E+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)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	not used	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):				

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
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
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	suppressed
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	28.27 square meters	Cs-137	1.000E+00
Thickness:	0.76 meters		
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	2.000E-01	5.000E-01	1.000E+00	1.000E+01	3.000E+01
TDOSE(t):	1.037E-03	1.089E-03	1.080E-03	1.067E-03	8.549E-04	5.226E-04
M(t):	4.148E-05	4.354E-05	4.319E-05	4.267E-05	3.420E-05	2.090E-05

Maximum TDOSE(t): 1.090E-03 mrem/yr at t = 0.1001 ± 0.0002 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.001E-01 years

Water Independent Pathways (Inhalation excludes radon)

Radio-Nuclide	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	5.023E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.189E-07	0.0003
Total	0.000E+00	0.0000	5.023E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.189E-07	0.0003

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.001E-01 years

Water Dependent Pathways

Radio-Nuclide	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
Cs-137	0.000E+00	0.0000	1.090E-03	0.9997	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.090E-03	1.0000
Total	0.000E+00	0.0000	1.090E-03	0.9997	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.090E-03	1.0000

*Sum of all water independent and dependent pathways.

Table of Contents

Part VI: Uncertainty Analysis

RESRAD Uncertainty Analysis Results

Probabilistic Input 2
Total Dose 3
Total Risk 4
Dose vs Pathway: Ground External 5
Dose vs Pathway: Inhalation (w/o Radon) 6
Dose vs Pathway: Radon (Water Ind.) 7
Dose vs Pathway: Plant (Water Ind.) 8
Dose vs Pathway: Meat (Water Ind.) 9
Dose vs Pathway: Milk (Water Ind.) 10
Dose vs Pathway: Soil Ingestion 11
Dose vs Pathway: Water Ingestion 12
Dose vs Pathway: Fish Ingestion 13
Dose vs Pathway: Radon (Water Dep.) 14
Dose vs Pathway: Plant (Water Dep.) 15
Dose vs Pathway: Meat (Water Dep.) 16
Dose vs Pathway: Milk (Water Dep.) 17
Cumulative Probability Summary..... 18
Summary of dose at graphical times, reptition 1..... 19
Summary of dose at graphical times, reptition 2..... 20
Summary of dose at graphical times, reptition 3..... 21
Peak of the mean dose at graphical times..... 22
Correlation and Regression coefficients (if any)..... 23

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	BBIO(55,1)	LOGNORMAL-N	7.6	.7	
2	DIET(5)	TRIANGULAR	2.7	5.4	8.1
3	FR9	TRIANGULAR	0	.39	1
4	WAREA	TRIANGULAR	750	1500	3000
5	AREA	TRIANGULAR	14.14	28.27	56.54
6	DCACTC(1)	TRIANGULAR	2300	4600	9200

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	DOSE(j,t), mrem/yr t= 0.00E+00	2.00E-01	5.00E-01	1.00E+00	1.00E+01	3.00E+01
Cs-137								
Min	1.00E-01	1.38E-05	1.32E-05	1.38E-05	1.37E-05	1.35E-05	1.09E-05	6.65E-06
Max	1.00E-01	1.19E-02	1.13E-02	1.18E-02	1.17E-02	1.16E-02	9.29E-03	5.68E-03
Avg	1.00E-01	1.29E-03	1.23E-03	1.29E-03	1.28E-03	1.26E-03	1.01E-03	6.19E-04
Std	9.49E-06	1.61E-03	1.53E-03	1.61E-03	1.59E-03	1.57E-03	1.26E-03	7.70E-04
∑ALL								
Min	1.00E-01	1.38E-05	1.32E-05	1.38E-05	1.37E-05	1.35E-05	1.09E-05	6.65E-06
Max	1.00E-01	1.19E-02	1.13E-02	1.18E-02	1.17E-02	1.16E-02	9.29E-03	5.68E-03
Avg	1.00E-01	1.29E-03	1.23E-03	1.29E-03	1.28E-03	1.26E-03	1.01E-03	6.19E-04
Std	9.49E-06	1.61E-03	1.53E-03	1.61E-03	1.59E-03	1.57E-03	1.26E-03	7.70E-04

∑ALL is total dose summed for all nuclides.

Probabilistic results summary : Recreationist for TBD 08-006 unit Cs-137 Dose F-
ish Pathway CFile: C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040902.RAD
Cumulative Probability Summary for: Total Dose Over Pathways

Cumulative	Dose(t), mrem/yr					
Probability	t= 0.00E+00	2.00E-01	5.00E-01	1.00E+00	1.00E+01	3.00E+01
0.025	8.79E-05	9.23E-05	9.15E-05	9.04E-05	7.24E-05	4.42E-05
0.050	1.27E-04	1.33E-04	1.32E-04	1.31E-04	1.05E-04	6.41E-05
0.075	1.61E-04	1.69E-04	1.67E-04	1.65E-04	1.33E-04	8.11E-05
0.100	2.07E-04	2.17E-04	2.15E-04	2.13E-04	1.70E-04	1.04E-04
0.125	2.43E-04	2.56E-04	2.54E-04	2.50E-04	2.01E-04	1.23E-04
0.150	2.74E-04	2.88E-04	2.86E-04	2.82E-04	2.26E-04	1.38E-04
0.175	3.10E-04	3.26E-04	3.23E-04	3.19E-04	2.56E-04	1.57E-04
0.200	3.28E-04	3.44E-04	3.41E-04	3.37E-04	2.70E-04	1.65E-04
0.225	3.55E-04	3.72E-04	3.69E-04	3.65E-04	2.92E-04	1.78E-04
0.250	3.91E-04	4.11E-04	4.07E-04	4.02E-04	3.23E-04	1.97E-04
0.275	4.11E-04	4.32E-04	4.28E-04	4.23E-04	3.39E-04	2.07E-04
0.300	4.32E-04	4.53E-04	4.49E-04	4.44E-04	3.56E-04	2.18E-04
0.325	4.81E-04	5.05E-04	5.01E-04	4.95E-04	3.97E-04	2.43E-04
0.350	5.02E-04	5.27E-04	5.23E-04	5.16E-04	4.14E-04	2.53E-04
0.375	5.26E-04	5.52E-04	5.47E-04	5.41E-04	4.33E-04	2.64E-04
0.400	5.71E-04	6.00E-04	5.95E-04	5.88E-04	4.71E-04	2.88E-04
0.425	6.06E-04	6.36E-04	6.31E-04	6.23E-04	5.00E-04	3.06E-04
0.450	6.42E-04	6.74E-04	6.68E-04	6.60E-04	5.29E-04	3.24E-04
0.475	6.84E-04	7.18E-04	7.13E-04	7.04E-04	5.64E-04	3.45E-04
0.500	7.19E-04	7.55E-04	7.49E-04	7.40E-04	5.93E-04	3.63E-04
0.525	8.03E-04	8.43E-04	8.36E-04	8.26E-04	6.62E-04	4.05E-04
0.550	8.35E-04	8.77E-04	8.70E-04	8.59E-04	6.89E-04	4.21E-04
0.575	9.01E-04	9.46E-04	9.38E-04	9.27E-04	7.43E-04	4.54E-04
0.600	9.29E-04	9.76E-04	9.68E-04	9.56E-04	7.66E-04	4.68E-04
0.625	9.88E-04	1.04E-03	1.03E-03	1.02E-03	8.15E-04	4.98E-04
0.650	1.06E-03	1.11E-03	1.10E-03	1.09E-03	8.70E-04	5.31E-04
0.675	1.16E-03	1.21E-03	1.20E-03	1.19E-03	9.54E-04	5.84E-04
0.700	1.27E-03	1.33E-03	1.32E-03	1.30E-03	1.04E-03	6.39E-04
0.725	1.34E-03	1.41E-03	1.39E-03	1.38E-03	1.10E-03	6.75E-04
0.750	1.44E-03	1.52E-03	1.50E-03	1.49E-03	1.19E-03	7.28E-04
0.775	1.68E-03	1.77E-03	1.75E-03	1.73E-03	1.39E-03	8.45E-04
0.800	1.73E-03	1.82E-03	1.80E-03	1.78E-03	1.43E-03	8.72E-04
0.825	1.91E-03	2.01E-03	1.99E-03	1.97E-03	1.58E-03	9.64E-04
0.850	2.06E-03	2.16E-03	2.14E-03	2.12E-03	1.70E-03	1.03E-03
0.875	2.26E-03	2.38E-03	2.36E-03	2.33E-03	1.87E-03	1.14E-03
0.900	2.74E-03	2.88E-03	2.85E-03	2.82E-03	2.26E-03	1.38E-03
0.925	3.17E-03	3.33E-03	3.31E-03	3.27E-03	2.62E-03	1.60E-03
0.950	3.80E-03	3.99E-03	3.96E-03	3.91E-03	3.13E-03	1.92E-03
0.975	5.80E-03	6.09E-03	6.04E-03	5.96E-03	4.78E-03	2.92E-03
1.000	1.13E-02	1.18E-02	1.17E-02	1.16E-02	9.29E-03	5.68E-03

Title : Recreationist for TBD 08-006 unit Cs-137 Dose Fish Pathway Contaminated Zone Mod

Input File : C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040902.RAD

Coefficients for peak Fish Ingestion Dose

Coefficient =	PCC		SRC		PRCC		SRRC	
Repetition =	1		1		1		1	
Description of Probabilistic Variable	Sig	Coeff	Sig	Coeff	Sig	Coeff	Sig	Coeff
Fish transfer factor for Cs	1	0.77	1	0.65	1	0.88	1	0.63
Fish consumption	5	0.31	5	0.17	6	0.39	6	0.14
Aquatic food	2	0.56	2	0.36	2	0.84	2	0.53
Watershed area for nearby stream or pond	4	-0.38	4	-0.22	4	-0.58	4	-0.24
Area of contaminated zone	6	0.22	6	0.12	3	0.68	3	0.31
Kd of Cs-137 in Contaminated Zone	3	-0.42	3	-0.25	5	-0.50	5	-0.20
R-SQUARE		0.71		0.71		0.89		0.89

-Rank is set to zero if the dose is zero or the correlation matrix is singular.

-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary ... 2
Site-Specific Parameter Summary 3
Summary of Pathway Selections 6
Contaminated Zone and Total Dose Summary 7
Total Dose Components
Time = 0.000E+00 8
Time = 1.000E+00 9
Time = 3.000E+00 10
Time = 1.000E+03 11
Dose/Source Ratios Summed Over All Pathways 12
Single Radionuclide Soil Guidelines 12
Dose Per Nuclide Summed Over All Pathways 13
Soil Concentration Per Nuclide 13

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	Co-60 (Source: FGR 12)	1.622E+01	1.622E+01	DCF1(1)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Co-60	2.190E-04	2.190E-04	DCF2(1)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Co-60	2.690E-05	2.690E-05	DCF3(1)
D-34	Food transfer factors:			
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(1,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-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-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)

#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.

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Param Nam
R011	Area of contaminated zone (m**2)	1.500E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	1.500E-01	2.000E+00	---	THICK(
R011	Length parallel to aquifer flow (m)	4.400E+01	1.000E+02	---	LCZPA(
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+03	1.000E+01	---	T(4)
R011	Times for calculations (yr)	not used	3.000E+01	---	T(5)
R011	Times for calculations (yr)	not used	1.000E+02	---	T(6)
R011	Times for calculations (yr)	not used	3.000E+02	---	T(7)
R011	Times for calculations (yr)	not used	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	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(1)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVER(
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)	1.522E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.500E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.700E+02	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	7.120E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	5.000E-01	5.000E-01	---	EVAPTF
R013	Precipitation (m/yr)	8.600E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	1.040E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	3.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.500E+03	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)	1.522E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.500E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	2.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.700E+02	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	5.000E-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)	8.000E+00	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	MB	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	1.180E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	0	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Param Nam
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCC
R016	Saturated zone (cm**3/g)	1.000E+03	1.000E+03	---	DCNUCS
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.595E-03	ALEACH
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBH
R017	Inhalation rate (m**3/yr)	1.400E+04	8.400E+03	---	INHALF
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	1.000E+00	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	not used	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	0.000E+00	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	1.250E-02	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	not used	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_SH
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SH
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SH
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SH
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(
R017	Ring 2	not used	2.732E-01	---	FRACA(
R017	Ring 3	not used	0.000E+00	---	FRACA(
R017	Ring 4	not used	0.000E+00	---	FRACA(
R017	Ring 5	not used	0.000E+00	---	FRACA(
R017	Ring 6	not used	0.000E+00	---	FRACA(
R017	Ring 7	not used	0.000E+00	---	FRACA(
R017	Ring 8	not used	0.000E+00	---	FRACA(
R017	Ring 9	not used	0.000E+00	---	FRACA(
R017	Ring 10	not used	0.000E+00	---	FRACA(
R017	Ring 11	not used	0.000E+00	---	FRACA(
R017	Ring 12	not used	0.000E+00	---	FRACA(
R018	Fruits, vegetables and grain consumption (kg/yr)	not used	1.600E+02	---	DIET(1
R018	Leafy vegetable consumption (kg/yr)	not used	1.400E+01	---	DIET(2
R018	Milk consumption (L/yr)	not used	9.200E+01	---	DIET(3
R018	Meat and poultry consumption (kg/yr)	not used	6.300E+01	---	DIET(4
R018	Fish consumption (kg/yr)	5.400E+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)	not used	5.100E+02	---	DWI

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Param Nam
R018	Contamination fraction of drinking water	not used	1.000E+00	---	FDW
R018	Contamination fraction of household water	not used	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	not used	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	not used	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	not used	-1	---	FPLANT
R018	Contamination fraction of meat	not used	-1	---	FMEAT
R018	Contamination fraction of milk	not used	-1	---	FMILK
R019	Livestock fodder intake for meat (kg/day)	not used	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	not used	5.500E+01	---	LFI6
R019	Livestock water intake for meat (L/day)	not used	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	not used	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	not used	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	not used	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	not used	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	not used	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	not used	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	not used	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	not used	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	not used	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	not used	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	not used	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	not used	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	not used	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	not used	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	not used	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	not used	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	not used	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RDRY(1
R19B	Dry Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RDRY(2
R19B	Dry Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RDRY(3
R19B	Wet Foliar Interception Fraction for Non-Leafy	not used	2.500E-01	---	RWET(1
R19B	Wet Foliar Interception Fraction for Leafy	not used	2.500E-01	---	RWET(2
R19B	Wet Foliar Interception Fraction for Fodder	not used	2.500E-01	---	RWET(3
R19B	Weathering Removal Constant for Vegetation	not used	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTF
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):				

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Param Nam
STOR	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T
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	---	DENSFI
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	---	PH2OFI
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
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA
TITL	Number of graphical time points	32	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	suppressed
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	suppressed
4 -- meat ingestion	suppressed
5 -- milk ingestion	suppressed
6 -- aquatic foods	active
7 -- drinking water	suppressed
8 -- soil ingestion	active
9 -- radon	suppressed
Find peak pathway doses	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	1500.00 square meters	Co-60	1.000E+00
Thickness:	0.15 meters		
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+03
TDOSE(t):	1.923E-02	1.764E-02	1.328E-02	0.000E+00
M(t):	7.691E-04	7.057E-04	5.314E-04	0.000E+00

Maximum TDOSE(t): 1.923E-02 mrem/yr at t = 0.000E+00 years

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

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mren
Co-60	0.000E+00	0.0000	4.971E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.737
Total	0.000E+00	0.0000	4.971E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.737

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

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mren
Co-60	0.000E+00	0.0000	1.922E-02	0.9997	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.923
Total	0.000E+00	0.0000	1.922E-02	0.9997	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.923

*Sum of all water independent and dependent pathways.

Table of Contents

Part VI: Uncertainty Analysis

RESRAD Uncertainty Analysis Results

Probabilistic Input 2
Total Dose 3
Total Risk 4
Dose vs Pathway: Ground External 5
Dose vs Pathway: Inhalation (w/o Radon) 6
Dose vs Pathway: Radon (Water Ind.) 7
Dose vs Pathway: Plant (Water Ind.) 8
Dose vs Pathway: Meat (Water Ind.) 9
Dose vs Pathway: Milk (Water Ind.) 10
Dose vs Pathway: Soil Ingestion 11
Dose vs Pathway: Water Ingestion 12
Dose vs Pathway: Fish Ingestion 13
Dose vs Pathway: Radon (Water Dep.) 14
Dose vs Pathway: Plant (Water Dep.) 15
Dose vs Pathway: Meat (Water Dep.) 16
Dose vs Pathway: Milk (Water Dep.) 17
Cumulative Probability Summary..... 18
Summary of dose at graphical times, reptition 1..... 19
Summary of dose at graphical times, reptition 2..... 20
Summary of dose at graphical times, reptition 3..... 21
Peak of the mean dose at graphical times..... 22
Correlation and Regression coefficients (if any)..... 23

Probabilistic Input

Number of Sample Runs: 300

Number	Name	Distribution	Parameters		
1	AREA	TRIANGULAR	750	1500	2250
2	DCACTC(1)	TRIANGULAR	500	1000	2000
3	BBIO(27,1)	LOGNORMAL-N	5.7	1.1	
4	DIET(5)	TRIANGULAR	2.7	5.4	8.1
5	FR9	TRIANGULAR	0	.39	1
6	WAREA	TRIANGULAR	750	1500	3000

Probabilistic Total Dose Summary

Nuclide (j)	Peak Time	Peak Dose	t= 0.00E+00	DOSE(j,t), mrem/yr 1.00E+00	3.00E+00	1.00E+03
Co-60						
Min	0.00E+00	3.67E-04	3.67E-04	3.37E-04	2.54E-04	0.00E+00
Max	0.00E+00	3.07E-01	3.07E-01	2.82E-01	2.13E-01	0.00E+00
Avg	0.00E+00	2.61E-02	2.61E-02	2.40E-02	1.81E-02	0.00E+00
Std	0.00E+00	3.97E-02	3.97E-02	3.64E-02	2.74E-02	0.00E+00
∑ALL						
Min	0.00E+00	3.67E-04	3.67E-04	3.37E-04	2.54E-04	0.00E+00
Max	0.00E+00	3.07E-01	3.07E-01	2.82E-01	2.13E-01	0.00E+00
Avg	0.00E+00	2.61E-02	2.61E-02	2.40E-02	1.81E-02	0.00E+00
Std	0.00E+00	3.97E-02	3.97E-02	3.64E-02	2.74E-02	0.00E+00

∑ALL is total dose summed for all nuclides.

Probabilistic results summary : Recreationist for TBD 08-006 unit Co-60 Dose Assessment ConFile: C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040903.RAD

Probabilistic Dose vs Pathway(i): Fish Ingestion

Nuclide (j)	DOSE(i,j,t), mrem/yr t= 0.00E+00	1.00E+00	3.00E+00	1.00E+03
Co-60				
Min	3.62E-04	3.32E-04	2.50E-04	0.00E+00
Max	3.07E-01	2.82E-01	2.13E-01	0.00E+00
Avg	2.61E-02	2.40E-02	1.81E-02	0.00E+00
Std	3.97E-02	3.64E-02	2.74E-02	0.00E+00
∑ALL				
Min	3.62E-04	3.32E-04	2.50E-04	0.00E+00
Max	3.07E-01	2.82E-01	2.13E-01	0.00E+00
Avg	2.61E-02	2.40E-02	1.81E-02	0.00E+00
Std	3.97E-02	3.64E-02	2.74E-02	0.00E+00

∑ALL is total pathway dose summed for all nuclides.

Probabilistic results summary : Recreationist for TBD 08-006 unit Co-60 Dose Assessment ConFile: C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040903.RAD

Cumulative Probability Summary for: Total Dose Over Pathways

Cumulative Probability	Dose(t), mrem/yr t= 0.00E+00	1.00E+00	3.00E+00	1.00E+03
0.025	7.96E-04	7.32E-04	5.53E-04	0.00E+00
0.050	1.01E-03	9.28E-04	6.99E-04	0.00E+00
0.075	1.78E-03	1.64E-03	1.23E-03	0.00E+00
0.100	2.04E-03	1.87E-03	1.40E-03	0.00E+00
0.125	2.57E-03	2.36E-03	1.77E-03	0.00E+00
0.150	2.91E-03	2.67E-03	2.02E-03	0.00E+00
0.175	3.56E-03	3.27E-03	2.47E-03	0.00E+00
0.200	4.03E-03	3.70E-03	2.79E-03	0.00E+00
0.225	4.35E-03	4.00E-03	3.01E-03	0.00E+00
0.250	4.89E-03	4.49E-03	3.38E-03	0.00E+00
0.275	5.38E-03	4.93E-03	3.72E-03	0.00E+00
0.300	5.84E-03	5.36E-03	4.03E-03	0.00E+00
0.325	6.63E-03	6.08E-03	4.58E-03	0.00E+00
0.350	7.04E-03	6.46E-03	4.87E-03	0.00E+00
0.375	7.57E-03	6.95E-03	5.23E-03	0.00E+00
0.400	7.89E-03	7.24E-03	5.45E-03	0.00E+00
0.425	8.99E-03	8.25E-03	6.21E-03	0.00E+00
0.450	9.93E-03	9.08E-03	6.83E-03	0.00E+00
0.475	1.07E-02	9.84E-03	7.41E-03	0.00E+00
0.500	1.21E-02	1.11E-02	8.31E-03	0.00E+00
0.525	1.31E-02	1.20E-02	9.01E-03	0.00E+00
0.550	1.38E-02	1.26E-02	9.52E-03	0.00E+00
0.575	1.58E-02	1.45E-02	1.09E-02	0.00E+00
0.600	1.77E-02	1.62E-02	1.21E-02	0.00E+00
0.625	1.98E-02	1.82E-02	1.37E-02	0.00E+00
0.650	2.28E-02	2.09E-02	1.58E-02	0.00E+00
0.675	2.45E-02	2.25E-02	1.70E-02	0.00E+00
0.700	2.67E-02	2.45E-02	1.85E-02	0.00E+00
0.725	2.79E-02	2.56E-02	1.93E-02	0.00E+00
0.750	3.00E-02	2.75E-02	2.06E-02	0.00E+00
0.775	3.24E-02	2.97E-02	2.24E-02	0.00E+00
0.800	3.46E-02	3.17E-02	2.39E-02	0.00E+00
0.825	4.44E-02	4.06E-02	3.05E-02	0.00E+00
0.850	4.89E-02	4.49E-02	3.38E-02	0.00E+00
0.875	5.25E-02	4.82E-02	3.63E-02	0.00E+00
0.900	6.85E-02	6.28E-02	4.73E-02	0.00E+00
0.925	8.18E-02	7.51E-02	5.65E-02	0.00E+00
0.950	9.55E-02	8.74E-02	6.55E-02	0.00E+00
0.975	1.13E-01	1.04E-01	7.81E-02	0.00E+00
1.000	3.07E-01	2.82E-01	2.13E-01	0.00E+00

Title : Recreationist for TBD 08-006 unit Co-60 Dose Asssessment Cont Zone Surface 6 in
Input File : C:\RESRAD_FAMILY\RESRAD\USERFILES\PBRF_OFF-SITE\08040903.RAD

Coefficients for peak Fish Ingestion Dose

Coefficient =	PCC		SRC		PRCC	
Repetition =	1		1		1	
Description of Probabilistic Variable	Sig	Coeff	Sig	Coeff	Sig	Coeff
Area of contaminated zone	3	0.35	3	0.16	5	0.58
Kd of Co-60 in Contaminated Zone	6	-0.24	6	-0.11	3	-0.72
Fish transfer factor for Co	1	0.89	1	0.85	1	0.96
Fish consumption	5	0.25	5	0.11	6	0.56
Aquatic food	2	0.38	2	0.18	2	0.87
Watershed area for nearby stream or pond	4	-0.31	4	-0.14	4	-0.64
R-SQUARE		0.81		0.81		0.95

-Rank is set to zero if the dose is zero or the correlation matrix is singular.
-R-SQUARE varies between 0 and 1 and is called the coefficient of determination; it provides a measure of the variation in the dependent variable (Dose) explained by regression on the independent variables.