

Attachment 2

Resrad Build Output Report

For Residual Contamination in Room R3

[illegible]

Input Parameters.....	0-1
For Each Time (I) :.....	
Time Specific Parameters.....	I-1
Receptor-Source Dose Summary.....	I-2
Dose by Pathway Detail.....	I-3
Dose by Nuclide Detail.....	I-4
Full Summary.....	F-1

```
** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 0- 1 :      2 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INP
```

[illegible]

```

Number of Sources      :    1
Number of Receptors    :    1
Total Time             : 3.650000E+02 days
Fraction Inside        : 5.000000E-01

```

Receptor Information

Receptor	Room	x	y	z	FracTime	Inhalation	Ingestion (Dust)
		[m]	[m]	[m]		[m3/day]	[m2/hr]
1	1	1.000	1.000	1.000	1.000	1.80E+01	1.00E-04

III Receptor-Source Shielding Relationship III

Receptor	Source	Density [g/cm3]	Thickness [cm]	Material
AA				
1	1	2.40E+00	0.00E+00	Concrete

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 0- 2 : 3 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INP

íííííííííí Building Information íííííííííí

Building Air Exchange Rate: 8.00E-01 1/hr

Height[m]	Air Exchanges [m3/hr]	
Area [m2]		

	*	*
	*	*
	*	<=Q01: 6.00E+00
H1: 2.500	* Room 1	* Q10 : 6.00E+00
	* LAMBDA: 8.00E-01	*
Area 3.000	*	*
	*	*

Deposition velocity: 1.00E-02 [m/s] Resuspension Rate: 5.00E-07 [1/s]

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 0- 3 : 4 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INP

Source Information

Source: 1

Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00[m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
Direct Ingestion Rate: 0.000E+00 [gm/hr]
Fraction released to air: 1.000E-01

Containment :: Number of Regions: 1 Contaminated Region: 1
Region : 1
Thickness [cm] :3.05E+01
Density [g/cm3] :2.40E+00
Material :Concrete
Erosion Rate [cm/day] :2.40E-08

Contamination::

Nuclide Concentration	Dose Conversion Factors					
	Ingestion [pCi/g]	Inhalation [mrem/pCi]	External (Surface) [mrem/yr/ (pCi/m2)]	External (Volume) [mrem/yr/ (pCi/m3)]	Submersion [mrem/yr/ (pCi/m3)]	
CS-137	2.000E+01	5.000E-05	3.190E-05	6.490E-05	2.140E-06	3.190E-03
SR-90	5.200E+00	1.530E-04	1.310E-03	6.560E-07	1.540E-08	2.310E-05

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 1- 1 :      5 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      0.000000      years

```

```

#####
#####
Assessment for Time: 1      III
Time =0.00E+00 yr          III
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.05E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	CS-137	1.977E+01
	SR-90	5.139E+00

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 1- 2 : 6 **
 Title : WRAIR Building 40 Rm. R3 Concrete
 Input File : C:\WINBLD\WRCCR3.INPEvaluation Time: 0.000000 years

```

iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	2.0E+00	2.0E+00
Total	2.0E+00	2.0E+00

Pathway Detail of Doses
 [mrem]

Source:	1					
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	2.02E+00	1.51E-07	6.16E-09	4.71E-06	0.00E+00	3.02E-06
Total	2.02E+00	1.51E-07	6.16E-09	4.71E-06	0.00E+00	3.02E-06


```

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiii
[mrem]

```

Nuclide	Receptor 1	Total
CS-137		
CS-137	2.01E+00	2.01E+00
SR-90		
SR-90	4.71E-03	4.71E-03

```

#####
#####
iii      Assessment for Time:  2      iii
iii      Time =1.00E+00 yr           iii
#####
#####

```

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.05E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

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** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 2- 2 : 10 **
 Title : WRAIR Building 40 Rm. R3 Concrete
 Input File : C:\WINBLD\WRCCR3.INPEvaluation Time: 1.00000 years

```

iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	2.0E+00	2.0E+00
Total	2.0E+00	2.0E+00

Pathway Detail of Doses
 [mrem]

11

```

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiii
[mrem]

```

Nuclide	Receptor 1	Total
CS-137		
CS-137	1.97E+00	1.97E+00
SR-90		
SR-90	4.60E-03	4.60E-03

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 3- 1 :    13 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      10.0000      years

```

```

#####
#####
iii      Assessment for Time:  3      iii
iii      Time =1.00E+01 yr           iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.05E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	CS-137	1.569E+01
	SR-90	4.050E+00

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 3- 2 : 14 **
 Title : WRAIR Building 40 Rm. R3 Concrete
 Input File : C:\WINBLD\WRCCR3.INPEvaluation Time: 10.0000 years

```

iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii      RESRAD-BUILD Dose Tables      iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 ii
 [mrem]

	Source	Total
	1	
Receptor 1	1.6E+00	1.6E+00
Total	1.6E+00	1.6E+00

Pathway Detail of Doses
 [mrem]

15

Nuclide Detail of Doses
 [mrem]

Nuclide	Receptor 1	Total
CS-137		
CS-137	1.60E+00	1.60E+00
SR-90		
SR-90	3.71E-03	3.71E-03

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 4- 1 :    17 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      100.000      years

```

```

#####
#####
iii      Assessment for Time:  4      iii
iii      Time =1.00E+02 yr           iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.05E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	CS-137	1.961E+00
	SR-90	4.754E-01

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 4- 2 : 18 **
 Title : WRAIR Building 40 Rm. R3 Concrete
 Input File : C:\WINBLD\WRCCR3.INPEvaluation Time: 100.000 years

```

iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii          RESRAD-BUILD Dose Tables          iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	2.0E-01	2.0E-01
Total	2.0E-01	2.0E-01

Pathway Detail of Doses
 [mrem]

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```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 4- 4 :    20 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:    100.000    years

```

```

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiii
[mrem]

```

Source: 1

Nuclide	Receptor 1	Total
CS-137		
CS-137	2.00E-01	2.00E-01
SR-90		
SR-90	4.36E-04	4.36E-04

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 5- 1 :    21 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      1000.00      years

```

```

#####
#####
iii      Assessment for Time: 5      iii
iii      Time =1.00E+03 yr          iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.05E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration [pCi/g]
	CS-137	1.826E-09
	SR-90	2.361E-10

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 5- 2 :    22 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      1000.00      years

```

[illegible]

Source Contributions to Receptor Doses
 [mrem]

		Source 1	Total
Receptor	1	1.9E-10	1.9E-10
Total		1.9E-10	1.9E-10

Pathway Detail of Doses
 [mrem]

23


```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 5- 4 :    24 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:    1000.00    years

```

Nuclide Detail of Doses
[mrem]

Source: 1

Nuclide	Receptor 1	Total
CS-137		
CS-137	1.86E-10	1.86E-10
SR-90		
SR-90	2.16E-13	2.16E-13

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 6- 1 :    25 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      10000.0      years

```

```

#####
#####
iii      Assessment for Time:  6      iii
iii      Time =1.00E+04 yr           iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	3.04E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration
		[pCi/g]
	CS-137	0.000E+00
	SR-90	0.000E+00

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 6- 2 : 26 **
 Title : WRAIR Building 40 Rm. R3 Concrete
 Input File : C:\WINBLD\WRCCR3.INPEvaluation Time: 10000.0 years

```

iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii      RESRAD-BUILD Dose Tables      iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Source Contributions to Receptor Doses
 iii
 [mrem]

	Source	Total
	1	
Receptor 1	0.0E+00	0.0E+00
Total	0.0E+00	0.0E+00

Pathway Detail of Doses
 [mrem]

Source: 1						
Receptor	External	Deposition	Immersion	Inhalation	Radon	Ingestion
1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

```

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiii
[mrem]

```

Nuclide	Receptor	Total
	1	

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 7- 1 :    29 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      100000.      years

```

```

#####
#####
iii      Assessment for Time:  7      iii
iii      Time =1.00E+05 yr           iii
#####
#####

```

Source Information

```
Source: 1
Location:: Room : 1 x: 1.00 y: 1.00 z: 0.00 [m]
Geometry:: Type: Volume Area:5.00E-01 [m2] Direction: z
Pathway ::
    Direct Ingestion Rate :0.000E+00 [gm/hr]
    Fraction released to air: 1.000E-01
```

Containment ::	Number of Regions:	1	Contaminated Region:	1
Region	:	1		
Thickness [cm]	:	2.96E+01		
Fraction Contaminated	:	1.00E+00		
Density [g/cm3]	:	2.40E+00		

Contamination::	Nuclide	Concentration
		[pCi/g]
	CS-137	0.000E+00
	SR-90	0.000E+00

```

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: 7- 2 :    30 **
Title : WRAIR Building 40 Rm. R3 Concrete
Input File : C:\WINBLD\WRCCR3.INPEvaluation Time:      100000.      years

```

[illegible]

Source Contributions to Receptor Doses
 [mrem]

		Source	Total
		1	
Receptor	1	0.0E+00	0.0E+00
Total		0.0E+00	0.0E+00

Pathway Detail of Doses
 [mrem]

31


```

Nuclide Detail of Doses
iiiiiiiiiiiiiiiiiiii
[mrem]

```

Nuclide	Receptor	Total
	1	

** RESRAD-BUILD Program Output, Version 3.0 02/28/01 09:42 Page: F- 1 : 33 **
 Title : WRAIR Building 40 Rm. R3 Concrete
 Input File : C:\WINBLD\WRCCR3.INP

```

iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iii                                     iii
iii      RESRAD-BUILD Dose (Time) Tables      iii
iii                                     iii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii
  
```

Receptor Doses Received for the Exposure Duration
 iii
 (mrem)

	Evaluation Time [yr]						
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05
1	2.02E+00	1.97E+00	1.60E+00	2.00E-01	1.86E-10	0.00E+00	0.00E+00

Receptor Dose/Yr Averaged Over Exposure Duration
 iii
 (mrem/yr)

	Evaluation Time [yr]						
	0.00E+00	1.00E+00	1.00E+01	1.00E+02	1.00E+03	1.00E+04	1.00E+05
1	2.02E+00	1.97E+00	1.60E+00	2.00E-01	1.86E-10	0.00E+00	0.00E+00