

# **Radionuclide Emission Estimation for the Center for Advanced Energy Studies (CAES)**

Bradley Schrader

February 2010



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**February 2010**

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## **ABSTRACT**

An Radiological Safety Analysis Computer Program (RSAC)-7 model dose assessment was performed to evaluate maximum Center for Advanced Energy Studies (CAES) boundary effective dose equivalent (EDE, in mrem/yr) for potential individual releases of radionuclides from the facility. The CAES is a public/private partnership between the State of Idaho and its academic research institutions, the federal government through the U.S. Department of Energy (DOE), and the Idaho National Laboratory (INL) managed by the Battelle Energy Alliance (BEA). CAES serves to advance energy security for our nation by expanding educational opportunities at Idaho universities in energy-related areas, creating new capabilities within its member institutions, and delivering technological innovations leading to technology-based economic development for the intermountain region.

CAES has developed a strategic plan (INL/EXT-07-12950) based on the balanced scorecard approach. At the present time it is unknown exactly what processes will be used in the facility in support of this strategic plan. What is known is that the Idaho State University (ISU) Radioactive Materials License (Nuclear Regulatory Commission [NRC] license 11-27380-01) is the basis for handling radioactive material in the facility. The material in this license is shared between the ISU campus and the CAES facility. There currently are no agreements in place to limit the amount of radioactive material at the CAES facility or what is done to the material in the facility.

The scope of this analysis is a summary look at the basis dose for each radionuclide included under the license at a distance of 100, 500, and 1,000 m. Inhalation, ingestion and ground surface dose was evaluated using the NRC design basis guidelines. The results can be used to determine a sum of the fractions approach to facility safety. This sum of the fractions allows a facility threshold value (TV) to be established and potential activities to be evaluated against this TV.

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## ACRONYMS

ARRF	airborne respirable release fraction
BEA	Battelle Energy Alliance
CAES	Center for Advanced Energy Studies
DOE	U.S. Department of Energy
DR	damage ratio
EDE	effective dose equivalent
INL	Idaho National Laboratory
ISU	Idaho State University
LPF	leak path factor
MAR	material-at-risk
NRC	Nuclear Regulator Commission
RSAC	Radiological Safety Analysis Computer Program
ST	source term
TV	threshold value

# **Radionuclide Emission Estimation for the Center of Advanced Energy Studies (CAES)**

## **1. SCOPE AND BRIEF DESCRIPTION**

An Radiological Safety Analysis Computer Program (RSAC)-7 model dose assessment was performed to evaluate maximum Center for Advanced Energy Studies (CAES) boundary effective dose equivalent (EDE, in mrem/yr) for potential individual releases of radionuclides from the facility. The CAES is a public/private partnership between the State of Idaho and its academic research institutions, the federal government through the U.S. Department of Energy (DOE) and the Idaho National Laboratory (INL) managed by the Battelle Energy Alliance (BEA). CAES serves to advance energy security for our nation by expanding educational opportunities at Idaho universities in energy-related areas, creating new capabilities within its member institutions, and delivering technological innovations leading to technology-based economic development for the intermountain region.

CAES has developed a strategic plan (INL/EXT-07-12950)<sup>1</sup> based on the balanced scorecard approach. At the present time it is unknown exactly what processes will be used in the facility in support of this strategic plan. What is known is that the Idaho State University (ISU) Radioactive Materials License (Nuclear Regulatory Commission [NRC] license 11-27380-01)<sup>2</sup> is the basis for handling radioactive material in the facility. The material in this license is shared between the ISU campus and the CAES facility. There currently are no agreements in place to limit the amount of radioactive material at the CAES facility or what is done to the material in the facility.

Therefore, the scope of this analysis is a summary look at the basis dose for each radionuclide included under the license at a distance of 100, 500, and 1,000 m. Inhalation, ingestion and ground surface dose was evaluated using the NRC design basis guidelines<sup>3</sup> (see Appendix A).

## **2. DESIGN INPUTS AND SOURCES**

- a. NRC license 11-27380-01, Idaho State University Radioactive Materials License.
- b. INL/EXT-07-12950, *Center for Advanced Energy Studies (CAES) Strategic Plan*

## **3. RESULTS OF LITERATURE SEARCHES AND OTHER BACKGROUND DATA**

10 CFR 61 / Appendix D – Method for Estimating Radionuclide Emissions

## **4. ASSUMPTIONS**

The release is at ground level. This is due to the low stack height with respect to the facility. NRC mandates that to be considered an elevated release it must be at least 2.5 times the nearest building height. The CAES stack does not meet the criteria of a stack.

Sealed sources (registered pursuant to 10 CFR 32.210<sup>4</sup>) are exempt from this evaluation.

## **5. COMPUTER CODE VALIDATION**

- a. Dell, Property #413668
- b. Computer program: RSAC-7<sup>45</sup>
- c. Inputs: see Appendix A
- d. Outputs: see Appendix A
- e. Validation: see <http://www.inl.gov/rsac>

## 6. RELEASE PARAMETERS

### 6.1 MATERIAL-AT-RISK

The material-at-risk (MAR) is the total inventory that could be impacted for a given accident scenario and is expressed in terms of the total quantity at risk. The MAR for the CAES facility could potentially be any of the radionuclides listed in the NRC Radioactive Materials license. Table 1 lists the radionuclides and the maximum quantities allowed under the license.

Table 1. Material-at-risk.

Byproduct Material and/or Special Nuclear Material	Maximum Amount
Any byproduct material with Atomic Numbers 3 through 83	0.375 curie per radionuclide with a total possession limit of 7.5 curies
Any byproduct material with Atomic Numbers 84 through 103	0.007 curie per radionuclide with a total possession limit of 700 millicuries
Depleted Uranium	200 kilograms
Natural Uranium	1 kilogram
Uranium – 235	5 grams
Plutonium – 239	0.11 grams
Uranium – 238	7 millicuries

### 6.2 DAMAGE RATIO

The damage ratio (DR) represents the fraction of MAR that could be affected by the postulated accident and is a function of the accident initiator and the operational scenario being evaluated. The DR is estimated based upon engineering analysis of the response of structural materials and materials-of-construction for containment to the type and level of stress/force generated by the event.

Standard engineering approximations were used. These approximations included a degree of conservatism due to simplification of phenomena to obtain a useable model, but the purpose of the approximation was to obtain, to the degree possible, a realistic understanding of potential effects. The damage ratio for the uncharacterized release scenario is based on conservative estimates. For this evaluation, a conservative damage ratio of 1.0 was selected since at this time no clear defined activities can be analyzed.

### 6.3 AIRBORNE RESPIRABLE RELEASE FRACTION

The airborne respirable release fraction (ARRF) is the fraction of airborne particles that is released during an event which can be transported through air and inhaled into the pulmonary region of the human respiratory system. The particles made airborne under accident induced stresses are dependent upon a variety of factors, such as the bulk density (i.e., how well a powder at rest compacts), the presence of moisture, how effectively the type and level of stress de-agglomerates the powder or subdivides the solid/liquid, the efficiency with which the stress suspends the powder/fragments of solid over varying size ranges, and the degree of immediate proximity of surfaces on which airborne particles may impact/settle. The ARRF includes particles having a 10- $\mu$ m aerodynamic equivalent diameter or less. The 10 CFR 61 Appendix D reference of, "Environmental Protection Agency (EPA), A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclides Emissions from NRC-Licensed and Non-DOE Federal Facilities," EPA 520/1-89-002, January 1989, was used as the basis for the airborne release fraction. For unknown discrete events, the ARRF was selected as 1.E-3 for particulates and liquids by the following procedure:



## Appendix D to Part 61—Methods for Estimating Radionuclide Emissions

### 1. Purpose and Background

Facility owners or operators may estimate radionuclide emissions to the atmosphere for dose calculations instead of measuring emissions. Particulate emissions from mill tailings piles should be estimated using the procedures listed in reference re #2. All other emissions may be estimated by using the "Procedures" listed below, or using the method described in reference #1.

### 2. Procedure

To estimate emissions to the atmosphere:

(a) Determine the amount (in curies) used at facilities for the period under consideration. Radioactive materials in sealed packages that remain unopened, and have not leaked during the assessment period should not be included in the calculation.

(b) Multiply the amount used by the following factors which depend on the physical state of the radionuclide. They are:

(i) 1 for gases;

(ii)  $10^{-3}$  for liquids or particulate solids; and

(iii)  $10^{-6}$  for solids.

If any nuclide is heated to a temperature of 100 degrees Celsius or more, boils at a temperature of 100 degrees Celsius or less, or is intentionally dispersed into the environment, it must be considered to be a gas.

(c) If a control device is installed between the place of use and the point of release, multiply emissions from (b) by an adjustment factor. These are presented in Table 1.

Table 1—Adjustment to Emission Factors for Effluent Controls

Controls	Types of radionuclides controlled	Adjustment factor to emissions	Comments and conditions
HEPA filters	Particulates	0.01	Not applicable to gaseous radionuclides; periodic testing is prudent to ensure high removal efficiency.
Fabric filter	Particulates	0.1	Monitoring would be prudent to guard against tears in filter.
Sintered metal	Particulates	1	Insufficient data to make recommendation.
Activated carbon filters	Iodine gas	0.1	Efficiency is time dependent; monitoring is necessary to ensure effectiveness.
Douglas bags: Held one week or longer for decay	Xenon	0.5/wk	Based on xenon half-life of 5.3 days;
Douglas bags: Released within one week	Xenon	1	Provides no reduction of exposure to general public.
Venturi scrubbers	Particulates Gases	0.05 1	Although venturis may remove gases, variability in gaseous removal efficiency dictates adjustment factor for particulates only.
Packed bed scrubbers	Gases	0.1	Not applicable to particulates.
Electrostatic precipitators	Particulates	0.05	Not applicable for gaseous radionuclides
Xenon traps	Xenon	0.1	Efficiency is time dependent; monitoring is necessary to ensure effectiveness.
Fume hoods	All	1	Provides no reduction to general public exposures.
Vent stacks	All	1	Generally provides no reduction of exposure to general public.

## 6.4 LEAK PATH FACTOR

Leak path factors (LPFs) are assumed to be 1.0 to ensure an unmitigated analysis. The LPF is the fraction of the radionuclides in the aerosol transported through some confinement deposition or filtration mechanism. There can be many LPFs for some accident conditions (e.g., the fraction transported from the package, such as a shipping or storage container, to the cell or enclosure; the fraction leaked from the enclosure or cell to the operating area around the enclosure or room outside the hot cell; the fraction leaked from the room to the building-atmosphere interface). Where multiple leak paths are involved, their cumulative effect is often expressed as one value that is the product of all leak path multiples. The LPF is a calculated or standard value based upon (1) established relationships between size of the particulate material, airborne transport mechanisms, and losses by deposition mechanisms, or (2) specified filtration efficiencies.

A LPF of 1.0 was selected for the receptor location since the CAES facility is assumed to be breached at ground level. Large particle size and plate out are not accounted for as the plume moves out of the facility, resulting in a very conservative assumption.

## 7. SOURCE TERM

The accident specific parameters used to evaluate the dose to downwind receptors require that certain assumptions be made that modify the dispersion release fraction due to the physical aspects of the release. The five components of the following source-term (ST) equation recommended by the NRC contain the basis for the event analysis. To calculate downwind radiological doses for these scenarios, a ST was determined. The ST is the amount of radioactive material released during the postulated accident scenario. The STs are determined using the following equation:

$$ST = MAR \times DR \times ARF \times RF \times LPF$$

where

<i>ST</i>	=	source term (Ci)
<i>MAR</i>	=	material-at-risk (Ci)
<i>DR</i>	=	damage ratio (no units)
<i>ARF</i>	=	airborne release fraction (no units)
<i>RF</i>	=	respirable fraction (no units)
<i>LPF</i>	=	leak path factor (no units).

## 8. DOWNWIND EXPOSURES

RSAC-7 was used to quantify the plume dispersion coefficients of the postulated accident. The program is used to calculate the doses of the release of radionuclides to the atmosphere. The meteorological capabilities of RSAC-7 include Gaussian plume diffusion for the Pasquill-Gifford, Hilsmeier-Gifford, and Markee diffusion models. The Markee model is used in this analysis. The RSAC input parameters are summarized in Table 2.

Table 2. RSAC parameters downwind scenario.

RSAC Input Parameters	Input Values
Release elevation (m)	0
Stability class	F
Wind speed (m/second)	1.04
Diffusion coefficient	Markee
Downwind receptor distance (m)	100 m, 5.0 km

The RSAC-7 program allows the user to specify meteorological conditions at the time of radiological release and to calculate diffusion, dispersion, and depletion factors.

A 95% meteorology applicable to the CAES facility was used to evaluate the dispersion coefficients. Stability class of F and a wind speed class of 1.04 m/second were used for the RSAC-7 runs. As mentioned previously, a ground release was assumed for this scenario. Values for dry deposition were generated to include plume fallout. Deposition velocities were set to 1.0E-3 m/s for solids.

Receptor locations are at 100 m downwind from the release for determining the offsite public dose. Additional calculations were made at 500 and 1,000 m for information only. The 100 m dose should be used.

## 9. RECOMMENDATIONS

The radionuclide by radionuclide contribution to dose at the 100 m receptor location is listed in Appendix A and should be used as a reference basis for comparison against defined activities. The results of this evaluation can be scaled for comparison against specific activities inside of CAES to determine bounding event consequences. The individual radionuclides may be evaluated for overall facility impact by implementing a sum of the fractions approach to dose assessment.

The sum of the fractions methodology requires establishment of a dose limit or threshold for the facility worker. As an example, the threshold value (TV) will be established as 1 rem. The dose as defined in Appendix A for 0.375 Ci of I-129, I-131, Cs-137 are shown in Table 3. Nominal values for evaluation of .1 Ci of each is defined for evaluation. The dose for a release involving all three radionuclides can be established by a sum of the fractions of dose due to the defined MAR. The example MAR equates to 18%.

Table 3. Example sum of the fractions.

Radionuclide	Dose from App. A (rem)	Fraction of MAR (Ci/Ci)	Fractional Dose (rem)	Sum of Fraction (rem)
I-129	0.644	$0.1 / 0.375 = 0.267$	1.719E-1	1.719E-1
I-131	0.011	$0.1 / 0.375 = 0.267$	2.933E-3	1.748E-1
Cs-137	0.0137	$0.1 / 0.375 = 0.267$	3.658E-3	1.785E-1
			Percent of TV (1 rem)	18%

## 10. REFERENCES

- <sup>1</sup>. INL/EXT-07-12950, *Center for Advanced Energy Studies Strategic Plan*, July 2007.
- <sup>2</sup>. Idaho State University (ISU) Radioactive Materials License (NRC license 11-27380-01).
- <sup>3</sup>. Environmental Protection Agency, "A Guide for Determining Compliance with the Clean Air Act Standards for Radionuclides Emissions from NRC-Licensed and Non-DOE Federal Facilities," EPA 520/1-89-002, January 1989.
- <sup>4</sup>. 10 CFR 32.210, "Registration of Product Information," *Code of Federal Regulations*, Office of the Federal Register.
- <sup>5</sup>. INL/EXT-09-15275, *Radiological Safety Analysis Computer (RSAC) Version 7 User Manual*, March 2009.

## **Appendix A**

### **RSAC-7 INPUT/OUTPUT AND DOSE RESULTS**

**SOURCE TERM :**

Idaho State University U.S. Nuclear Regulatory Commission Radioactive Materials License  
Number 11-27380-01 as amended (No.16) January 14, 2009.

It was assumed that sealed sources, as registered pursuant to 10 CFR 32.210 were exempt from release modeling.

**MODEL INPUT - MET Data (2007 data from NOAA Air Resources Lab, Idaho Falls):**

Stability Class F, Wind Speed 1.04 m/s.

**MODEL INPUT - SOURCE DATA:**

Ground-level point source modeled as single stack with height = 1 m, diameter = 1 m,  
exit velocity = 0 m/s

**MODEL INPUT - AGRICULTURAL DATA:**

“Rural” food source scenario

Default beef cattle density (7.19E-02 /km), milk cattle density (8.56E-03 /km), cultivated land fraction (7.15E-02)

Radiological Safety Analysis Computer Program (RSAC 7.0.3 )

Name: INL Company: Idaho National Laboratory

Serial:

Computer: INL413668 Run Date: 01/26/2010

Run Time: 11:00:09

File: CAES Baseline Analysis.rsac

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## Input

### \* Center for Advanced Energy Studies (CAES) Baseline Evaluation

# The CAES facility promotes energy focused research and may involve the use of  
# radioactive material. The NRC license for CAES is addressed in the Idaho  
# State University NRC license approval

#

#

# Direct Input of Atomic Numbers 3 to 83 Radionuclides from NRC license

2000,0,0

# Original file copied to temporary external file

2002,TempSrc1.txt

# 2002,C:\Documents and Settings\schrjb\My Documents\Rsac\Input Files\Baseline

2999

# Input of Actinides allowed on NRC License

2000,-1,1

Th-232,2000.

U-233,0.

U-235,5.

U-238,20400.

Pu-239,0.11

2999

# Fractionation per Title 40 Part 61 Appendix D

1000

1001,1,0.,0.

1004,-1,1.e-3,1.e-3,1.,1.e-3,1.e-3 \* . Purpose and Background

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Facility owners or operators may  
estimate radionuclide emissions to the  
atmosphere for dose calculations  
instead of measuring emissions.  
Particulate emissions from mill  
tailings piles should be estimated  
using the procedures listed in  
reference re #2. All other emissions  
may be estimated by using the  
"Procedures" listed below, or using the  
method described in reference #1.

### 2. Procedure

To estimate emissions to the  
atmosphere:

(a) Determine the amount (in curies)  
used at facilities for the period under  
consideration. Radioactive materials in  
sealed packages that remain unopened,  
and have not leaked during the  
assessment period should not be  
included in the calculation.

(b) Multiply the amount used by the  
following factors which depend on the  
physical state of the radionuclide.  
They are:

(i) 1 for gases;

(ii) 10<sup>-3</sup> for liquids or particulate  
solids; and

(iii) 10<sup>-6</sup> for solids.

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#
#
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#
1999
# Holdup for Transport Time in Facility
1000
1001,1,0.,0.
1003,600.,0.,0.
1999
# Met Cond for 95% conditions
5000,0
5001,1.,0.,400.,1.099E3,0.,1
5002,0.001,0.01,0.,0.001,0.001
5101,100.,500.,1000.
5201,1.,0.
5400,2,0.,0.
5410,1,6,0,0.
5999
# Inhalation Dose Adult ICRP 72
7000,1,-2,1,0,1,6
7001,3.33E-04,0.,0,0,1.
7999
RSAC-7 INPUT      01/26/2010      11:00
# Ingestion Dose Adult ICRP 72
7000,3,-2,1,0,1,6
7001,0,0.,15.,0
7999
# Ground Surface Dose
7000,5,-2,1,0,1,0
7001,0,0.,1.,0.7,1.
7999
# Summary by radionuclide
3000,8,6
10000

```

If any nuclide is heated to a temperature of 100 degrees Celsius or more, boils at a temperature of 100 degrees Celsius or less, or is intentionally dispersed into the environment, it must be considered to be a gas.



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**Direct Radionuclide Input**

ANY PREVIOUS INVENTORY HAS BEEN ZEROED  
RADIONUCLIDE INPUT READ FROM EXTERNAL FILE USER FILE TempSrc1.txt

NUCLIDE		HALF LIFE		CURIE
471060	Ag106	2.396E+01	m	3.750E-01
471061	Ag106m	8.280E+00	d	3.750E-01
471080	Ag108	2.370E+00	m	3.750E-01
471081	Ag108m	4.180E+02	yr	3.750E-01
471091	Ag109m	3.960E+01	s	3.750E-01
471100	Ag110	2.460E+01	s	3.750E-01
471101	Ag110m	2.498E+02	d	3.750E-01
471110	Ag111	7.450E+00	d	3.750E-01
471111	Ag111m	6.480E+01	s	3.750E-01
471120	Ag112	3.130E+00	h	3.750E-01
471130	Ag113	5.370E+00	h	3.750E-01
471131	Ag113m	6.870E+01	s	3.750E-01
471140	Ag114	4.600E+00	s	3.750E-01
471150	Ag115	2.000E+01	m	3.750E-01
471180	Ag118	3.760E+00	s	3.750E-01
471181	Ag118m	2.000E+00	s	3.750E-01
471190	Ag119	2.100E+00	s	3.750E-01
471200	Ag120	1.230E+00	s	3.750E-01
471210	Ag121	7.800E-01	s	3.750E-01
471230	Ag123	3.090E-01	s	3.750E-01
471240	Ag124	1.720E-01	s	3.750E-01
471250	Ag125	1.660E-01	s	3.750E-01
471260	Ag126	1.070E-01	s	3.750E-01
471280	Ag128	5.800E-02	s	3.750E-01
130260	Al 26	7.170E+05	yr	3.750E-01
180390	Ar 39	2.690E+02	yr	3.750E-01
180410	Ar 41	1.093E+02	m	3.750E-01
330720	As 72	2.600E+01	h	3.750E-01
330730	As 73	8.030E+01	d	3.750E-01
330740	As 74	1.777E+01	d	3.750E-01
330760	As 76	1.078E+00	d	3.750E-01
330770	As 77	3.883E+01	h	3.750E-01
330780	As 78	9.070E+01	m	3.750E-01
330790	As 79	9.010E+00	m	3.750E-01
330800	As 80	1.520E+01	s	3.750E-01
330810	As 81	3.330E+01	s	3.750E-01
330830	As 83	1.340E+01	s	3.750E-01
330840	As 84	4.500E+00	s	3.750E-01
330850	As 85	2.021E+00	s	3.750E-01
330860	As 86	9.450E-01	s	3.750E-01
330870	As 87	4.800E-01	s	3.750E-01
330880	As 88	1.300E-01	s	3.750E-01
330890	As 89	1.294E-01	s	3.750E-01
791940	Au194	3.802E+01	h	3.750E-01
791950	Au195	1.861E+02	d	3.750E-01
791951	Au195m	3.050E+01	s	3.750E-01
791980	Au198	2.695E+00	d	3.750E-01
791981	Au198m	2.270E+00	d	3.750E-01
791990	Au199	3.139E+00	d	3.750E-01
561310	Ba131	1.150E+01	d	3.750E-01
561330	Ba133	1.051E+01	yr	3.750E-01
561331	Ba133m	3.890E+01	h	3.750E-01
561351	Ba135m	2.870E+01	h	3.750E-01
561371	Ba137m	2.552E+00	m	3.750E-01
561390	Ba139	8.306E+01	m	3.750E-01
561400	Ba140	1.275E+01	d	3.750E-01
561410	Ba141	1.827E+01	m	3.750E-01
561420	Ba142	1.060E+01	m	3.750E-01
561430	Ba143	1.433E+01	s	3.750E-01
561440	Ba144	1.150E+01	s	3.750E-01
561450	Ba145	4.310E+00	s	3.750E-01
561460	Ba146	2.220E+00	s	3.750E-01
561470	Ba147	8.930E-01	s	3.750E-01
561480	Ba148	6.070E-01	s	3.750E-01
561490	Ba149	3.440E-01	s	3.750E-01
561520	Ba152	7.548E-01	s	3.750E-01

NUCLIDE	HALF LIFE	CURIE
40070 Be 7	5.312E+01 d	3.750E-01
40100 Be 10	1.510E+06 yr	3.750E-01
832060 Bi206	6.243E+00 d	3.750E-01
832070 Bi207	3.155E+01 yr	3.750E-01
832080 Bi208	3.680E+05 yr	3.750E-01
832100 Bi210	5.013E+00 d	3.750E-01
832101 Bi210m	3.040E+06 yr	3.750E-01
832110 Bi211	2.140E+00 m	3.750E-01
832120 Bi212	6.055E+01 m	3.750E-01
832130 Bi213	4.559E+01 m	3.750E-01
832140 Bi214	1.990E+01 m	3.750E-01
350770 Br 77	5.704E+01 h	3.750E-01
350800 Br 80	1.768E+01 m	3.750E-01
350801 Br 80m	4.420E+00 h	3.750E-01
350820 Br 82	3.530E+01 h	3.750E-01
350821 Br 82m	6.130E+00 m	3.750E-01
350830 Br 83	2.400E+00 h	3.750E-01
350840 Br 84	3.180E+01 m	3.750E-01
350841 Br 84m	6.000E+00 m	3.750E-01
350850 Br 85	2.900E+00 m	3.750E-01
350860 Br 86	5.510E+01 s	3.750E-01
350861 Br 86m	4.500E+00 s	3.750E-01
350870 Br 87	5.560E+01 m	3.750E-01
350880 Br 88	1.634E+01 s	3.750E-01
350890 Br 89	4.348E+00 s	3.750E-01
350900 Br 90	1.910E+00 s	3.750E-01
350910 Br 91	5.410E-01 s	3.750E-01
350920 Br 92	3.430E-01 s	3.750E-01
350930 Br 93	1.020E-01 s	3.750E-01
350940 Br 94	7.000E-02 s	3.750E-01
350950 Br 95	1.166E-01 s	3.750E-01
60110 C 11	2.039E+01 m	3.750E-01
60140 C 14	5.730E+03 yr	3.750E-01
200410 Ca 41	1.030E+05 yr	3.750E-01
200450 Ca 45	1.626E+02 d	3.750E-01
200470 Ca 47	4.536E+00 d	3.750E-01
200490 Ca 49	8.718E+00 m	3.750E-01
481090 Cd109	4.626E+02 d	3.750E-01
481111 Cd111m	4.854E+01 m	3.750E-01
481130 Cd113	7.700E+15 yr	3.750E-01
481131 Cd113m	1.410E+01 yr	3.750E-01
481150 Cd115	5.346E+01 h	3.750E-01
481151 Cd115m	4.460E+01 d	3.750E-01
481170 Cd117	2.490E+00 h	3.750E-01
481171 Cd117m	3.360E+00 h	3.750E-01
481180 Cd118	5.030E+01 m	3.750E-01
481190 Cd119	2.690E+00 m	3.750E-01
481191 Cd119m	2.200E+00 m	3.750E-01
481200 Cd120	5.080E+01 s	3.750E-01
481210 Cd121	1.350E+01 s	3.750E-01
481230 Cd123	2.100E+00 s	3.750E-01
481240 Cd124	1.250E+00 s	3.750E-01
481250 Cd125	6.500E-01 s	3.750E-01
481260 Cd126	5.060E-01 s	3.750E-01
481270 Cd127	3.700E-01 s	3.750E-01
481280 Cd128	3.400E-01 s	3.750E-01
481290 Cd129	2.700E-01 s	3.750E-01
481300 Cd130	2.000E-01 s	3.750E-01
481310 Cd131	1.193E-01 s	3.750E-01
481320 Cd132	1.448E-01 s	3.750E-01
581390 Ce139	1.376E+02 d	3.750E-01
581410 Ce141	3.250E+01 d	3.750E-01
581420 Ce142	5.000E+16 yr	3.750E-01
581430 Ce143	3.304E+01 h	3.750E-01
581440 Ce144	2.849E+02 d	3.750E-01
581450 Ce145	3.010E+00 m	3.750E-01
581460 Ce146	1.352E+01 m	3.750E-01
581470 Ce147	5.640E+01 s	3.750E-01
581480 Ce148	5.600E+01 s	3.750E-01
581490 Ce149	5.300E+00 s	3.750E-01

NUCLIDE	HALF LIFE	CURIE
581510 Ce151	1.020E+00 s	3.750E-01
581520 Ce152	1.400E+00 s	3.750E-01
581530 Ce153	1.725E+00 s	3.750E-01
581540 Ce154	3.590E-01 s	3.750E-01
581550 Ce155	7.125E-01 s	3.750E-01
581560 Ce156	1.162E+00 s	3.750E-01
581570 Ce157	3.618E-01 s	3.750E-01
170360 Cl 36	3.010E+05 yr	3.750E-01
170380 Cl 38	3.724E+01 m	3.750E-01
170390 Cl 39	5.560E+01 m	3.750E-01
270560 Co 56	7.727E+01 d	3.750E-01
270570 Co 57	2.718E+02 d	3.750E-01
270580 Co 58	7.086E+01 d	3.750E-01
270581 Co 58m	9.040E+00 h	3.750E-01
270600 Co 60	5.271E+00 yr	3.750E-01
270601 Co 60m	1.047E+01 m	3.750E-01
270610 Co 61	1.650E+00 h	3.750E-01
270621 Co 62m	1.391E+01 m	3.750E-01
270720 Co 72	9.000E-02 s	3.750E-01
270730 Co 73	1.155E-01 s	3.750E-01
270740 Co 74	1.075E-01 s	3.750E-01
270750 Co 75	8.016E-02 s	3.750E-01
240490 Cr 49	4.230E+01 m	3.750E-01
240510 Cr 51	2.770E+01 d	3.750E-01
551290 Cs129	3.206E+01 h	3.750E-01
551310 Cs131	9.689E+00 d	3.750E-01
551320 Cs132	6.479E+00 d	3.750E-01
551340 Cs134	2.065E+00 yr	3.750E-01
551341 Cs134m	2.903E+00 h	3.750E-01
551350 Cs135	2.300E+06 yr	3.750E-01
551351 Cs135m	5.300E+01 m	3.750E-01
551360 Cs136	1.316E+01 d	3.750E-01
551370 Cs137	3.007E+01 yr	1.000E+00
551380 Cs138	3.341E+01 m	3.750E-01
551381 Cs138m	2.910E+00 m	3.750E-01
551390 Cs139	9.270E+00 m	3.750E-01
551400 Cs140	6.370E+01 s	3.750E-01
551410 Cs141	2.494E+01 s	3.750E-01
551420 Cs142	1.700E+00 s	3.750E-01
551430 Cs143	1.780E+00 s	3.750E-01
551440 Cs144	1.010E+00 s	3.750E-01
551450 Cs145	5.940E-01 s	3.750E-01
551460 Cs146	3.210E-01 s	3.750E-01
551470 Cs147	2.250E-01 s	3.750E-01
551480 Cs148	1.580E-01 s	3.750E-01
290640 Cu 64	1.270E+01 h	3.750E-01
290670 Cu 67	6.183E+01 h	3.750E-01
290720 Cu 72	6.600E+00 s	3.750E-01
290730 Cu 73	3.900E+00 s	3.750E-01
290740 Cu 74	1.594E+00 s	3.750E-01
290750 Cu 75	1.224E+00 s	3.750E-01
290760 Cu 76	6.410E-01 s	3.750E-01
290770 Cu 77	4.690E-01 s	3.750E-01
290780 Cu 78	3.420E-01 s	3.750E-01
290790 Cu 79	1.880E-01 s	3.750E-01
290800 Cu 80	9.110E-02 s	3.750E-01
290810 Cu 81	7.447E-02 s	3.750E-01
661570 Dy157	8.140E+00 h	3.750E-01
661590 Dy159	1.444E+02 d	3.750E-01
661650 Dy165	2.334E+00 h	3.750E-01
661660 Dy166	8.160E+01 h	3.750E-01
681690 Er169	9.400E+00 d	3.750E-01
681710 Er171	7.516E+00 h	3.750E-01
631480 Eu148	5.450E+01 d	3.750E-01
631500 Eu150	3.690E+01 yr	3.750E-01
631503 Eu150b	1.280E+01 h	3.750E-01
631520 Eu152	1.354E+01 yr	3.750E-01
631521 Eu152m	9.312E+00 h	3.750E-01
631540 Eu154	8.593E+00 yr	3.750E-01
631550 Eu155	4.761E+00 yr	3.750E-01

NUCLIDE	HALF LIFE	CURIE
631560 Eu156	1.519E+01 d	3.750E-01
631570 Eu157	1.518E+01 h	3.750E-01
631580 Eu158	4.590E+01 m	3.750E-01
631590 Eu159	1.810E+01 m	3.750E-01
90180 F 18	1.098E+02 m	3.750E-01
260520 Fe 52	8.275E+00 h	3.750E-01
260550 Fe 55	2.730E+00 yr	3.750E-01
260590 Fe 59	4.450E+01 d	3.750E-01
260600 Fe 60	1.500E+06 yr	3.750E-01
310660 Ga 66	9.490E+00 h	3.750E-01
310670 Ga 67	3.261E+00 d	3.750E-01
310680 Ga 68	6.763E+01 m	3.750E-01
310700 Ga 70	2.114E+01 m	3.750E-01
310720 Ga 72	1.410E+01 h	3.750E-01
310730 Ga 73	4.860E+00 h	3.750E-01
310740 Ga 74	8.120E+00 m	3.750E-01
310750 Ga 75	1.260E+02 s	3.750E-01
310760 Ga 76	3.260E+01 s	3.750E-01
310770 Ga 77	1.320E+01 s	3.750E-01
310780 Ga 78	5.090E+00 s	3.750E-01
310790 Ga 79	2.847E+00 s	3.750E-01
310800 Ga 80	1.697E+00 s	3.750E-01
310810 Ga 81	1.217E+00 s	3.750E-01
310830 Ga 83	3.100E-01 s	3.750E-01
310840 Ga 84	8.500E-02 s	3.750E-01
641480 Gd148	7.460E+01 yr	3.750E-01
641490 Gd149	9.280E+00 d	3.750E-01
641520 Gd152	1.080E+14 yr	3.750E-01
641530 Gd153	2.404E+02 d	3.750E-01
641590 Gd159	1.848E+01 h	3.750E-01
320680 Ge 68	2.708E+02 d	3.750E-01
320690 Ge 69	3.905E+01 h	3.750E-01
320710 Ge 71	1.143E+01 d	3.750E-01
320750 Ge 75	8.278E+01 m	3.750E-01
320751 Ge 75m	4.770E+01 s	3.750E-01
320770 Ge 77	1.130E+01 h	3.750E-01
320771 Ge 77m	5.290E+01 s	3.750E-01
320780 Ge 78	8.800E+01 m	3.750E-01
320790 Ge 79	1.898E+01 s	3.750E-01
320800 Ge 80	2.950E+01 s	3.750E-01
320810 Ge 81	7.600E+00 s	3.750E-01
320830 Ge 83	1.850E+00 s	3.750E-01
320840 Ge 84	9.470E-01 s	3.750E-01
320850 Ge 85	5.350E-01 s	3.750E-01
320860 Ge 86	2.590E-01 s	3.750E-01
320870 Ge 87	1.255E-01 s	3.750E-01
320880 Ge 88	1.427E-01 s	3.750E-01
10030 H 3	1.233E+01 yr	1.500E+01
721750 Hf175	7.000E+01 d	3.750E-01
721771 Hf177m	5.140E+01 m	3.750E-01
721781 Hf178m	3.100E+01 yr	3.750E-01
721791 Hf179m	2.505E+01 d	3.750E-01
721810 Hf181	4.239E+01 d	3.750E-01
721820 Hf182	9.000E+06 yr	3.750E-01
721830 Hf183	1.067E+00 h	3.750E-01
801940 Hg194	4.440E+02 yr	3.750E-01
801970 Hg197	6.414E+01 h	3.750E-01
801971 Hg197m	2.380E+01 h	3.750E-01
801991 Hg199m	4.260E+01 m	3.750E-01
802030 Hg203	4.661E+01 d	3.750E-01
671640 Ho164	2.900E+01 m	3.750E-01
671641 Ho164m	3.750E+01 m	3.750E-01
671660 Ho166	2.683E+01 h	3.750E-01
671661 Ho166m	1.200E+03 yr	3.750E-01
531220 I122	3.630E+00 m	3.750E-01
531230 I123	1.327E+01 h	3.750E-01
531240 I124	4.176E+00 d	3.750E-01
531250 I125	5.941E+01 d	3.750E-01
531260 I126	1.311E+01 d	3.750E-01
531280 I128	2.499E+01 m	3.750E-01

NUCLIDE	HALF LIFE	CURIE
531290	I129 1.570E+07 yr	3.750E-01
531300	I130 1.236E+01 h	3.750E-01
531301	I130m 9.000E+00 m	3.750E-01
531310	I131 8.021E+00 d	3.750E-01
531320	I132 2.295E+00 h	3.750E-01
531330	I133 2.080E+01 h	3.750E-01
531331	I133m 9.000E+00 s	3.750E-01
531340	I134 5.250E+01 m	3.750E-01
531341	I134m 3.600E+00 m	3.750E-01
531350	I135 6.570E+00 h	3.750E-01
531360	I136 8.340E+01 s	3.750E-01
531361	I136m 4.690E+01 s	3.750E-01
531370	I137 2.450E+01 s	3.750E-01
531380	I138 6.490E+00 s	3.750E-01
531390	I139 2.290E+00 s	3.750E-01
531400	I140 8.600E-01 s	3.750E-01
531410	I141 4.300E-01 s	3.750E-01
531420	I142 1.960E-01 s	3.750E-01
531430	I143 3.280E-01 s	3.750E-01
531440	I144 1.327E-01 s	3.750E-01
491110	In111 2.805E+00 d	3.750E-01
491131	In113m 1.658E+00 h	3.750E-01
491140	In114 7.190E+01 s	3.750E-01
491141	In114m 4.951E+01 d	3.750E-01
491150	In115 4.410E+14 yr	3.750E-01
491151	In115m 4.486E+00 h	3.750E-01
491161	In116m 5.429E+01 m	3.750E-01
491170	In117 4.320E+01 h	3.750E-01
491171	In117m 1.162E+02 h	3.750E-01
491180	In118 5.000E+00 s	3.750E-01
491181	In118m 4.450E+00 m	3.750E-01
491191	In119m 1.800E+01 m	3.750E-01
491200	In120 3.080E+00 s	3.750E-01
491201	In120m 4.620E+01 s	3.750E-01
491210	In121 2.310E+01 s	3.750E-01
491211	In121m 3.880E+00 m	3.750E-01
491230	In123 5.980E+00 s	3.750E-01
491231	In123m 4.780E+01 s	3.750E-01
491240	In124 3.110E+00 s	3.750E-01
491250	In125 2.360E+00 s	3.750E-01
491251	In125m 1.220E+01 s	3.750E-01
491260	In126 1.600E+00 s	3.750E-01
491270	In127 1.090E+00 s	3.750E-01
491271	In127m 3.670E+00 s	3.750E-01
491280	In128 8.400E-01 s	3.750E-01
491290	In129 6.100E-01 s	3.750E-01
491300	In130 3.200E-01 s	3.750E-01
491310	In131 2.820E-01 s	3.750E-01
491320	In132 2.010E-01 s	3.750E-01
491330	In133 1.800E-01 s	3.750E-01
491340	In134 1.380E-01 s	3.750E-01
771900	Ir190 1.178E+01 d	3.750E-01
771901	Ir190m 1.200E+00 h	3.750E-01
771904	Ir190n 3.250E+00 h	3.750E-01
771920	Ir192 7.383E+01 d	3.750E-01
771921	Ir192m 2.410E+02 yr	3.750E-01
771940	Ir194 1.928E+01 h	3.750E-01
771941	Ir194m 1.710E+02 d	3.750E-01
190400	K 40 1.277E+09 yr	3.750E-01
190420	K 42 1.236E+01 h	3.750E-01
190430	K 43 2.230E+01 h	3.750E-01
360790	Kr 79 3.504E+01 h	3.750E-01
360810	Kr 81 2.290E+05 yr	3.750E-01
360831	Kr 83m 1.830E+00 h	3.750E-01
360850	Kr 85 1.076E+01 yr	3.750E-01
360851	Kr 85m 4.480E+00 h	3.750E-01
360870	Kr 87 7.630E+01 m	3.750E-01
360880	Kr 88 2.840E+00 h	3.750E-01
360890	Kr 89 3.150E+00 m	3.750E-01



NUCLIDE	HALF LIFE	CURIE
360900 Kr 90	3.232E+01 s	3.750E-01
360910 Kr 91	8.570E+00 s	3.750E-01
360920 Kr 92	1.840E+00 s	3.750E-01
360930 Kr 93	1.286E+00 s	3.750E-01
360940 Kr 94	2.000E-01 s	3.750E-01
360950 Kr 95	7.800E-01 s	3.750E-01
360970 Kr 97	1.485E-01 s	3.750E-01
360980 Kr 98	2.243E-01 s	3.750E-01
571370 La137	6.000E+04 yr	3.750E-01
571380 La138	1.050E+11 yr	3.750E-01
571400 La140	1.678E+00 d	3.750E-01
571410 La141	3.920E+00 h	3.750E-01
571420 La142	9.110E+01 m	3.750E-01
571430 La143	1.420E+01 m	3.750E-01
571440 La144	4.080E+01 s	3.750E-01
571450 La145	2.480E+01 s	3.750E-01
571460 La146	6.270E+00 s	3.750E-01
571470 La147	4.015E+00 s	3.750E-01
571480 La148	1.050E+00 s	3.750E-01
571490 La149	1.050E+00 s	3.750E-01
571510 La151	9.536E-01 s	3.750E-01
571520 La152	3.094E-01 s	3.750E-01
571530 La153	4.370E-01 s	3.750E-01
571540 La154	1.753E-01 s	3.750E-01
711740 Lu174	3.310E+00 yr	3.750E-01
711741 Lu174m	1.420E+02 d	3.750E-01
711760 Lu176	3.780E+10 yr	3.750E-01
711761 Lu176m	3.635E+00 h	3.750E-01
711770 Lu177	6.734E+00 d	3.750E-01
711771 Lu177m	1.604E+02 d	3.750E-01
711780 Lu178	2.840E+01 m	3.750E-01
711781 Lu178m	2.310E+01 m	3.750E-01
120280 Mg 28	2.091E+01 h	3.750E-01
250520 Mn 52	5.591E+00 d	3.750E-01
250521 Mn 52m	2.110E+01 m	3.750E-01
250530 Mn 53	3.740E+06 yr	3.750E-01
250540 Mn 54	3.123E+02 d	3.750E-01
250560 Mn 56	2.579E+00 h	3.750E-01
420930 Mo 93	4.000E+03 yr	3.750E-01
420931 Mo 93m	6.850E+00 h	3.750E-01
420990 Mo 99	6.594E+01 h	3.750E-01
421010 Mo101	1.461E+01 m	3.750E-01
421020 Mo102	1.130E+01 m	3.750E-01
421030 Mo103	6.750E+01 s	3.750E-01
421040 Mo104	6.000E+01 s	3.750E-01
421050 Mo105	3.560E+01 s	3.750E-01
421060 Mo106	8.400E+00 s	3.750E-01
421070 Mo107	3.500E+00 s	3.750E-01
421080 Mo108	1.090E+00 s	3.750E-01
421090 Mo109	5.300E-01 s	3.750E-01
421110 Mo111	3.000E-01 s	3.750E-01
421120 Mo112	6.890E-01 s	3.750E-01
421130 Mo113	1.970E-01 s	3.750E-01
421140 Mo114	3.215E-01 s	3.750E-01
110220 Na 22	2.602E+00 yr	3.750E-01
110240 Na 24	1.496E+01 h	3.750E-01
410931 Nb 93m	1.613E+01 yr	3.750E-01
410940 Nb 94	2.030E+04 yr	3.750E-01
410941 Nb 94m	6.263E+00 m	3.750E-01
410950 Nb 95	3.497E+01 d	3.750E-01
410951 Nb 95m	8.660E+01 h	3.750E-01
410960 Nb 96	2.335E+01 h	3.750E-01
410970 Nb 97	7.210E+01 m	3.750E-01
410971 Nb 97m	5.270E+01 s	3.750E-01
410980 Nb 98	2.860E+00 s	3.750E-01
410981 Nb 98m	5.130E+01 m	3.750E-01
410990 Nb 99	1.500E+01 s	3.750E-01
410991 Nb 99m	2.600E+00 m	3.750E-01
411000 Nb100	1.500E+00 s	3.750E-01
411001 Nb100m	2.990E+00 s	3.750E-01

NUCLIDE	HALF LIFE	CURIE
411010 Nb101	7.100E+00 s	3.750E-01
411020 Nb102	1.300E+00 s	3.750E-01
411030 Nb103	1.500E+00 s	3.750E-01
411040 Nb104	4.800E+00 s	3.750E-01
411050 Nb105	2.950E+00 s	3.750E-01
411060 Nb106	1.020E+00 s	3.750E-01
411070 Nb107	3.300E-01 s	3.750E-01
411080 Nb108	1.930E-01 s	3.750E-01
411090 Nb109	1.900E-01 s	3.750E-01
411110 Nb111	1.562E-01 s	3.750E-01
601410 Nd141	2.490E+00 h	3.750E-01
601440 Nd144	2.290E+15 yr	3.750E-01
601470 Nd147	1.098E+01 d	3.750E-01
601490 Nd149	1.728E+00 h	3.750E-01
601510 Nd151	1.244E+01 m	3.750E-01
601520 Nd152	1.140E+01 m	3.750E-01
601530 Nd153	3.160E+01 s	3.750E-01
601540 Nd154	2.590E+01 s	3.750E-01
601550 Nd155	8.900E+00 s	3.750E-01
601560 Nd156	5.470E+00 s	3.750E-01
601570 Nd157	4.150E+00 s	3.750E-01
601580 Nd158	7.890E+00 s	3.750E-01
601590 Nd159	1.410E+00 s	3.750E-01
280560 Ni 56	6.077E+00 d	3.750E-01
280570 Ni 57	3.560E+01 h	3.750E-01
280590 Ni 59	7.600E+04 yr	3.750E-01
280630 Ni 63	1.001E+02 yr	3.750E-01
280650 Ni 65	2.517E+00 h	3.750E-01
280720 Ni 72	2.100E+00 s	3.750E-01
280730 Ni 73	7.000E-01 s	3.750E-01
280740 Ni 74	5.400E-01 s	3.750E-01
280750 Ni 75	6.000E-01 s	3.750E-01
280760 Ni 76	2.450E-01 s	3.750E-01
280770 Ni 77	1.030E-01 s	3.750E-01
280780 Ni 78	1.376E-01 s	3.750E-01
761850 Os185	9.360E+01 d	3.750E-01
761891 Os189m	5.800E+00 h	3.750E-01
761901 Os190m	9.900E+00 m	3.750E-01
761910 Os191	1.540E+01 d	3.750E-01
761911 Os191m	1.310E+01 h	3.750E-01
761930 Os193	3.011E+01 h	3.750E-01
761940 Os194	6.000E+00 yr	3.750E-01
150320 P 32	1.426E+01 d	3.750E-01
150330 P 33	2.534E+01 d	3.750E-01
822020 Pb202	5.250E+04 yr	3.750E-01
822030 Pb203	5.187E+01 h	3.750E-01
822050 Pb205	1.530E+07 yr	3.750E-01
822090 Pb209	3.253E+00 h	3.750E-01
822100 Pb210	2.230E+01 yr	3.750E-01
822110 Pb211	3.610E+01 m	3.750E-01
822120 Pb212	1.064E+01 h	3.750E-01
822140 Pb214	2.680E+01 m	3.750E-01
461030 Pd103	1.699E+01 d	3.750E-01
461070 Pd107	6.500E+06 yr	3.750E-01
461071 Pd107m	2.130E+01 s	3.750E-01
461090 Pd109	1.370E+01 h	3.750E-01
461091 Pd109m	4.696E+00 m	3.750E-01
461110 Pd111	2.340E+01 m	3.750E-01
461111 Pd111m	5.500E+00 h	3.750E-01
461120 Pd112	2.103E+01 h	3.750E-01
461130 Pd113	9.300E+01 s	3.750E-01
461140 Pd114	2.420E+00 m	3.750E-01
461150 Pd115	2.500E+01 s	3.750E-01
461180 Pd118	1.900E+00 s	3.750E-01
461190 Pd119	9.200E-01 s	3.750E-01
461200 Pd120	5.000E-01 s	3.750E-01
461210 Pd121	6.222E-01 s	3.750E-01
461230 Pd123	3.100E-01 s	3.750E-01
461240 Pd124	5.600E-01 s	3.750E-01
461260 Pd126	2.870E-01 s	3.750E-01

NUCLIDE	HALF LIFE	CURIE
611430 Pm143	2.650E+02 d	3.750E-01
611440 Pm144	3.630E+02 d	3.750E-01
611450 Pm145	1.770E+01 yr	3.750E-01
611460 Pm146	5.530E+00 yr	3.750E-01
611470 Pm147	2.623E+00 yr	3.750E-01
611480 Pm148	5.370E+00 d	3.750E-01
611481 Pm148m	4.129E+01 d	3.750E-01
611490 Pm149	5.308E+01 h	3.750E-01
611500 Pm150	2.680E+00 h	3.750E-01
611510 Pm151	2.840E+01 h	3.750E-01
611520 Pm152	4.120E+00 m	3.750E-01
611521 Pm152m	7.520E+00 m	3.750E-01
611530 Pm153	5.250E+00 m	3.750E-01
611540 Pm154	1.730E+00 m	3.750E-01
611541 Pm154m	2.680E+00 m	3.750E-01
611550 Pm155	4.150E+01 s	3.750E-01
611560 Pm156	2.670E+01 s	3.750E-01
611570 Pm157	1.056E+01 s	3.750E-01
611580 Pm158	4.800E+00 s	3.750E-01
611590 Pm159	4.230E+00 s	3.750E-01
591420 Pr142	1.912E+01 h	3.750E-01
591430 Pr143	1.357E+01 d	3.750E-01
591440 Pr144	1.728E+01 m	3.750E-01
591441 Pr144m	7.200E+00 m	3.750E-01
591450 Pr145	5.984E+00 h	3.750E-01
591460 Pr146	2.415E+01 m	3.750E-01
591470 Pr147	1.340E+01 m	3.750E-01
591480 Pr148	2.270E+00 m	3.750E-01
591490 Pr149	2.260E+00 m	3.750E-01
591510 Pr151	1.890E+01 s	3.750E-01
591520 Pr152	3.630E+00 s	3.750E-01
591530 Pr153	4.300E+00 s	3.750E-01
591540 Pr154	2.300E+00 s	3.750E-01
591550 Pr155	1.890E+00 s	3.750E-01
591560 Pr156	5.104E-01 s	3.750E-01
591570 Pr157	6.780E-01 s	3.750E-01
591580 Pr158	2.630E-01 s	3.750E-01
591590 Pr159	3.140E-01 s	3.750E-01
781910 Pt191	2.802E+00 d	3.750E-01
781930 Pt193	5.000E+01 yr	3.750E-01
781931 Pt193m	4.330E+00 d	3.750E-01
781951 Pt195m	4.020E+00 d	3.750E-01
781970 Pt197	1.989E+01 h	3.750E-01
781971 Pt197m	9.541E+01 m	3.750E-01
370810 Rb 81	4.576E+00 h	3.750E-01
370820 Rb 82	1.273E+00 m	3.750E-01
370830 Rb 83	8.620E+01 d	3.750E-01
370840 Rb 84	3.277E+01 d	3.750E-01
370860 Rb 86	1.863E+01 d	3.750E-01
370870 Rb 87	4.750E+10 yr	3.750E-01
370880 Rb 88	1.778E+01 m	3.750E-01
370890 Rb 89	1.515E+01 m	3.750E-01
370900 Rb 90	1.580E+02 s	3.750E-01
370901 Rb 90m	2.580E+02 s	3.750E-01
370910 Rb 91	5.840E+01 s	3.750E-01
370920 Rb 92	4.492E+00 s	3.750E-01
370930 Rb 93	5.840E+00 s	3.750E-01
370940 Rb 94	2.702E+00 s	3.750E-01
370950 Rb 95	3.775E-01 s	3.750E-01
370970 Rb 97	1.699E-01 s	3.750E-01
370980 Rb 98	1.140E-01 s	3.750E-01
370990 Rb 99	5.030E-02 s	3.750E-01
371000 Rb100	5.100E-02 s	3.750E-01
751822 Re182a	1.270E+01 h	3.750E-01
751823 Re182b	6.400E+01 h	3.750E-01
751840 Re184	3.800E+01 d	3.750E-01
751841 Re184m	1.690E+02 d	3.750E-01
751860 Re186	3.718E+00 d	3.750E-01
751861 Re186m	2.000E+05 yr	3.750E-01
751870 Re187	4.350E+10 yr	3.750E-01



NUCLIDE	HALF LIFE	CURIE
751880 Re188	1.700E+01 h	3.750E-01
751881 Re188m	1.860E+01 m	3.750E-01
751890 Re189	2.430E+01 h	3.750E-01
451010 Rh101	3.300E+00 yr	3.750E-01
451011 Rh101m	4.340E+00 d	3.750E-01
451020 Rh102	2.070E+02 d	3.750E-01
451021 Rh102m	2.900E+00 yr	3.750E-01
451031 Rh103m	5.612E+01 m	3.750E-01
451050 Rh105	3.536E+01 h	3.750E-01
451051 Rh105m	4.500E+01 s	3.750E-01
451060 Rh106	2.980E+01 s	3.750E-01
451061 Rh106m	1.310E+02 m	3.750E-01
451070 Rh107	2.170E+01 m	3.750E-01
451080 Rh108	1.680E+01 s	3.750E-01
451081 Rh108m	6.000E+00 m	3.750E-01
451090 Rh109	8.000E+01 s	3.750E-01
451091 Rh109m	5.000E+01 s	3.750E-01
451110 Rh111	1.100E+01 s	3.750E-01
451120 Rh112	2.100E+00 s	3.750E-01
451130 Rh113	2.800E+00 s	3.750E-01
451140 Rh114	1.850E+00 s	3.750E-01
451180 Rh118	2.953E-01 s	3.750E-01
451190 Rh119	4.478E-01 s	3.750E-01
451200 Rh120	1.624E-01 s	3.750E-01
451210 Rh121	2.210E-01 s	3.750E-01
451230 Rh123	1.335E-01 s	3.750E-01
440970 Ru 97	2.900E+00 d	3.750E-01
441030 Ru103	3.926E+01 d	3.750E-01
441050 Ru105	4.440E+00 h	3.750E-01
441060 Ru106	3.736E+02 d	3.750E-01
441080 Ru108	4.550E+00 m	3.750E-01
441090 Ru109	3.450E+01 s	3.750E-01
441110 Ru111	2.120E+00 m	3.750E-01
441120 Ru112	1.750E+00 s	3.750E-01
441130 Ru113	8.000E-01 s	3.750E-01
441140 Ru114	5.300E-01 s	3.750E-01
441180 Ru118	6.160E-01 s	3.750E-01
441200 Ru120	2.932E-01 s	3.750E-01
160350 S 35	8.732E+01 d	3.750E-01
511170 Sb117	2.800E+00 h	3.750E-01
511203 Sb120b	5.760E+00 d	3.750E-01
511220 Sb122	2.724E+00 d	3.750E-01
511240 Sb124	6.020E+01 d	3.750E-01
511250 Sb125	2.758E+00 yr	3.750E-01
511260 Sb126	1.246E+01 d	3.750E-01
511261 Sb126m	1.915E+01 m	3.750E-01
511270 Sb127	3.850E+00 d	3.750E-01
511280 Sb128	9.010E+00 h	3.750E-01
511281 Sb128m	1.040E+01 m	3.750E-01
511290 Sb129	4.400E+00 h	3.750E-01
511300 Sb130	3.950E+01 m	3.750E-01
511301 Sb130m	6.300E+00 m	3.750E-01
511310 Sb131	2.303E+01 m	3.750E-01
511320 Sb132	2.790E+00 m	3.750E-01
511321 Sb132m	4.100E+00 m	3.750E-01
511330 Sb133	2.500E+00 m	3.750E-01
511340 Sb134	7.800E-01 s	3.750E-01
511341 Sb134m	1.023E+01 s	3.750E-01
511350 Sb135	1.710E+00 s	3.750E-01
511360 Sb136	8.200E-01 s	3.750E-01
511370 Sb137	2.837E-01 s	3.750E-01
511380 Sb138	1.304E-01 s	3.750E-01
511390 Sb139	1.720E-01 s	3.750E-01
210440 Sc 44	3.927E+00 h	3.750E-01
210441 Sc 44m	5.860E+01 h	3.750E-01
210460 Sc 46	8.379E+01 d	3.750E-01
210470 Sc 47	3.349E+00 d	3.750E-01
210480 Sc 48	4.367E+01 h	3.750E-01
210490 Sc 49	5.720E+01 m	3.750E-01
340730 Se 73	7.150E+00 h	3.750E-01

NUCLIDE	HALF LIFE	CURIE
340750 Se 75	1.198E+02 d	3.750E-01
340790 Se 79	1.130E+06 yr	3.750E-01
340791 Se 79m	3.920E+00 m	3.750E-01
340810 Se 81	1.845E+01 m	3.750E-01
340811 Se 81m	5.728E+01 m	3.750E-01
340830 Se 83	2.230E+01 m	3.750E-01
340831 Se 83m	7.010E+01 s	3.750E-01
340840 Se 84	3.100E+00 m	3.750E-01
340850 Se 85	3.170E+01 s	3.750E-01
340851 Se 85m	1.900E+01 s	3.750E-01
340860 Se 86	1.530E+01 s	3.750E-01
340870 Se 87	5.290E+00 s	3.750E-01
340880 Se 88	1.530E+00 s	3.750E-01
340890 Se 89	4.100E-01 s	3.750E-01
340900 Se 90	5.545E-01 s	3.750E-01
340910 Se 91	2.700E-01 s	3.750E-01
340920 Se 92	2.478E-01 s	3.750E-01
140310 Si 31	1.573E+02 m	3.750E-01
621460 Sm146	1.030E+08 yr	3.750E-01
621470 Sm147	1.060E+11 yr	3.750E-01
621480 Sm148	7.000E+15 yr	3.750E-01
621490 Sm149	2.000E+15 yr	3.750E-01
621510 Sm151	9.000E+01 yr	3.750E-01
621530 Sm153	4.628E+01 h	3.750E-01
621550 Sm155	2.230E+01 m	3.750E-01
621560 Sm156	9.400E+00 h	3.750E-01
621570 Sm157	4.820E+02 s	3.750E-01
621580 Sm158	5.300E+00 m	3.750E-01
621590 Sm159	1.137E+01 s	3.750E-01
501100 Sn110	4.110E+00 h	3.750E-01
501130 Sn113	1.151E+02 d	3.750E-01
501171 Sn117m	1.360E+01 d	3.750E-01
501191 Sn119m	2.931E+02 d	3.750E-01
501210 Sn121	2.706E+01 h	3.750E-01
501211 Sn121m	5.500E+01 yr	3.750E-01
501230 Sn123	1.292E+02 d	3.750E-01
501231 Sn123m	4.006E+01 m	3.750E-01
501250 Sn125	9.640E+00 d	3.750E-01
501251 Sn125m	9.520E+00 m	3.750E-01
501260 Sn126	1.000E+05 yr	3.750E-01
501270 Sn127	2.100E+00 h	3.750E-01
501271 Sn127m	4.130E+00 m	3.750E-01
501280 Sn128	5.907E+01 m	3.750E-01
501290 Sn129	2.230E+00 m	3.750E-01
501291 Sn129m	6.900E+00 m	3.750E-01
501300 Sn130	3.720E+00 m	3.750E-01
501310 Sn131	5.600E+01 s	3.750E-01
501320 Sn132	3.970E+01 s	3.750E-01
501330 Sn133	1.450E+00 s	3.750E-01
501340 Sn134	1.120E+00 s	3.750E-01
501350 Sn135	2.910E-01 s	3.750E-01
501360 Sn136	4.131E-01 s	3.750E-01
380820 Sr 82	2.555E+01 d	3.750E-01
380850 Sr 85	6.484E+01 d	3.750E-01
380851 Sr 85m	6.763E+01 m	3.750E-01
380871 Sr 87m	2.803E+00 h	3.750E-01
380890 Sr 89	5.053E+01 d	3.750E-01
380900 Sr 90	2.879E+01 yr	3.750E-01
380910 Sr 91	9.630E+00 h	3.750E-01
380920 Sr 92	2.710E+00 h	3.750E-01
380930 Sr 93	7.423E+00 m	3.750E-01
380940 Sr 94	7.530E+01 s	3.750E-01
380950 Sr 95	2.390E+01 s	3.750E-01
380970 Sr 97	4.260E-01 s	3.750E-01
380980 Sr 98	6.530E-01 s	3.750E-01
380990 Sr 99	2.690E-01 s	3.750E-01
381000 Sr100	2.020E-01 s	3.750E-01
381010 Sr101	1.180E-01 s	3.750E-01
381020 Sr102	6.900E-02 s	3.750E-01
381030 Sr103	1.386E-01 s	3.750E-01

NUCLIDE	HALF LIFE	CURIE
381040 Sr104	1.925E-01 s	3.750E-01
731790 Ta179	1.820E+00 yr	3.750E-01
731801 Ta180m	1.200E+15 yr	3.750E-01
731820 Ta182	1.144E+02 d	3.750E-01
731821 Ta182m	1.584E+01 m	3.750E-01
731830 Ta183	5.100E+00 d	3.750E-01
731840 Ta184	8.700E+00 h	3.750E-01
731850 Ta185	4.940E+01 m	3.750E-01
731860 Ta186	1.050E+01 m	3.750E-01
651570 Tb157	7.100E+01 yr	3.750E-01
651580 Tb158	1.800E+02 yr	3.750E-01
651600 Tb160	7.230E+01 d	3.750E-01
651610 Tb161	6.880E+00 d	3.750E-01
430960 Tc 96	4.280E+00 d	3.750E-01
430961 Tc 96m	5.150E+01 m	3.750E-01
430970 Tc 97	2.600E+06 yr	3.750E-01
430971 Tc 97m	9.010E+01 d	3.750E-01
430980 Tc 98	4.200E+06 yr	3.750E-01
430990 Tc 99	2.111E+05 yr	3.750E-01
430991 Tc 99m	6.010E+00 h	3.750E-01
431010 Tc101	1.422E+01 m	3.750E-01
431020 Tc102	5.280E+00 s	3.750E-01
431021 Tc102m	4.350E+00 m	3.750E-01
431030 Tc103	5.420E+01 s	3.750E-01
431040 Tc104	1.830E+01 m	3.750E-01
431050 Tc105	7.600E+00 m	3.750E-01
431060 Tc106	3.560E+01 s	3.750E-01
431070 Tc107	2.120E+01 s	3.750E-01
431080 Tc108	5.170E+00 s	3.750E-01
431090 Tc109	8.700E-01 s	3.750E-01
431110 Tc111	3.000E-01 s	3.750E-01
431120 Tc112	2.800E-01 s	3.750E-01
431130 Tc113	1.300E-01 s	3.750E-01
431140 Tc114	1.734E-01 s	3.750E-01
521210 Te121	1.678E+01 d	3.750E-01
521211 Te121m	1.540E+02 d	3.750E-01
521230 Te123	1.000E+13 yr	3.750E-01
521231 Te123m	1.197E+02 d	3.750E-01
521251 Te125m	5.740E+01 d	3.750E-01
521270 Te127	9.350E+00 h	3.750E-01
521271 Te127m	1.090E+02 d	3.750E-01
521290 Te129	6.960E+01 m	3.750E-01
521291 Te129m	3.360E+01 d	3.750E-01
521310 Te131	2.500E+01 m	3.750E-01
521311 Te131m	3.000E+01 h	3.750E-01
521320 Te132	3.204E+00 d	3.750E-01
521330 Te133	1.250E+01 m	3.750E-01
521331 Te133m	5.540E+01 m	3.750E-01
521340 Te134	4.180E+01 m	3.750E-01
521350 Te135	1.900E+01 s	3.750E-01
521360 Te136	1.750E+01 s	3.750E-01
521370 Te137	2.490E+00 s	3.750E-01
521380 Te138	1.400E+00 s	3.750E-01
521390 Te139	4.237E-01 s	3.750E-01
521400 Te140	7.520E-01 s	3.750E-01
521410 Te141	2.358E-01 s	3.750E-01
521420 Te142	4.912E-01 s	3.750E-01
220440 Ti 44	6.300E+01 yr	3.750E-01
220450 Ti 45	1.848E+02 m	3.750E-01
220510 Ti 51	5.760E+00 m	3.750E-01
812000 Tl200	2.610E+01 h	3.750E-01
812010 Tl201	7.291E+01 h	3.750E-01
812020 Tl202	1.223E+01 d	3.750E-01
812040 Tl204	3.780E+00 yr	3.750E-01
812060 Tl206	4.199E+00 m	3.750E-01
812070 Tl207	4.770E+00 m	3.750E-01
812080 Tl208	3.053E+00 m	3.750E-01
812090 Tl209	2.200E+00 m	3.750E-01
812100 Tl210	1.300E+00 m	3.750E-01
691700 Tm170	1.286E+02 d	3.750E-01

NUCLIDE		HALF LIFE		CURIE
691710	Tm171	1.920E+00	yr	3.750E-01
230480	V 48	1.597E+01	d	3.750E-01
230490	V 49	3.300E+02	d	3.750E-01
741790	w179	3.705E+01	m	3.750E-01
741810	w181	1.212E+02	d	3.750E-01
741850	w185	7.510E+01	d	3.750E-01
741870	w187	2.372E+01	h	3.750E-01
741880	w188	6.940E+01	d	3.750E-01
541220	Xe122	2.010E+01	h	3.750E-01
541230	Xe123	2.080E+00	h	3.750E-01
541250	Xe125	1.690E+01	h	3.750E-01
541270	Xe127	3.640E+01	d	3.750E-01
541291	Xe129m	8.880E+00	d	3.750E-01
541311	Xe131m	1.184E+01	d	3.750E-01
541330	Xe133	5.243E+00	d	3.750E-01
541331	Xe133m	2.190E+00	d	3.750E-01
541341	Xe134m	2.900E-01	s	3.750E-01
541350	Xe135	9.140E+00	h	3.750E-01
541351	Xe135m	1.529E+01	m	3.750E-01
541370	Xe137	3.818E+00	m	3.750E-01
541380	Xe138	1.408E+01	m	3.750E-01
541390	Xe139	3.968E+01	s	3.750E-01
541400	Xe140	1.360E+01	s	3.750E-01
541410	Xe141	1.730E+00	s	3.750E-01
541420	Xe142	1.220E+00	s	3.750E-01
541430	Xe143	3.000E-01	s	3.750E-01
541440	Xe144	1.150E+00	s	3.750E-01
541450	Xe145	9.000E-01	s	3.750E-01
541460	Xe146	9.372E-01	s	3.750E-01
541470	Xe147	2.638E-01	s	3.750E-01
390860	Y 86	1.474E+01	h	3.750E-01
390870	Y 87	7.980E+01	h	3.750E-01
390880	Y 88	1.067E+02	d	3.750E-01
390900	Y 90	6.400E+01	h	3.750E-01
390901	Y 90m	3.190E+00	h	3.750E-01
390910	Y 91	5.851E+01	d	3.750E-01
390911	Y 91m	4.971E+01	m	3.750E-01
390920	Y 92	3.540E+00	h	3.750E-01
390930	Y 93	1.018E+01	h	3.750E-01
390940	Y 94	1.870E+01	m	3.750E-01
390950	Y 95	1.030E+01	m	3.750E-01
390970	Y 97	3.750E+00	s	3.750E-01
390980	Y 98	5.480E-01	s	3.750E-01
390990	Y 99	1.470E+00	s	3.750E-01
391000	Y100	7.350E-01	s	3.750E-01
391010	Y101	4.480E-01	s	3.750E-01
391020	Y102	3.600E-01	s	3.750E-01
391030	Y103	2.300E-01	s	3.750E-01
391040	Y104	1.442E-01	s	3.750E-01
391050	Y105	1.736E-01	s	3.750E-01
391070	Y107	1.046E-01	s	3.750E-01
701690	Yb169	3.203E+01	d	3.750E-01
701750	Yb175	4.185E+00	d	3.750E-01
300620	Zn 62	9.186E+00	h	3.750E-01
300630	Zn 63	3.847E+01	m	3.750E-01
300650	Zn 65	2.443E+02	d	3.750E-01
300690	Zn 69	5.640E+01	m	3.750E-01
300691	Zn 69m	1.376E+01	h	3.750E-01
300711	Zn 71m	3.960E+00	h	3.750E-01
300720	Zn 72	4.650E+01	h	3.750E-01
300730	Zn 73	2.350E+01	s	3.750E-01
300740	Zn 74	9.560E+01	s	3.750E-01
300750	Zn 75	1.020E+01	s	3.750E-01
300760	Zn 76	5.700E+00	s	3.750E-01
300770	Zn 77	2.080E+00	s	3.750E-01
300780	Zn 78	1.470E+00	s	3.750E-01
300790	Zn 79	9.950E-01	s	3.750E-01
300800	Zn 80	5.450E-01	s	3.750E-01
300810	Zn 81	2.900E-01	s	3.750E-01
300830	Zn 83	8.386E-02	s	3.750E-01

NUCLIDE		HALF LIFE		CURIE
400860	Zr 86	1.650E+01	h	3.750E-01
400880	Zr 88	8.340E+01	d	3.750E-01
400890	Zr 89	7.841E+01	h	3.750E-01
400930	Zr 93	1.530E+06	yr	3.750E-01
400950	Zr 95	6.402E+01	d	3.750E-01
400970	Zr 97	1.691E+01	h	3.750E-01
400980	Zr 98	3.070E+01	s	3.750E-01
400990	Zr 99	2.100E+00	s	3.750E-01
401000	Zr100	7.100E+00	s	3.750E-01
401010	Zr101	2.300E+00	s	3.750E-01
401020	Zr102	2.900E+00	m	3.750E-01
401030	Zr103	1.300E+00	s	3.750E-01
401040	Zr104	1.200E+00	s	3.750E-01
401050	Zr105	6.000E-01	s	3.750E-01
401060	Zr106	9.800E-01	s	3.750E-01
401070	Zr107	2.485E-01	s	3.750E-01
401080	Zr108	4.075E-01	s	3.750E-01
401090	Zr109	1.387E-01	s	3.750E-01

### \*\*\* DIRECT RADIONUCLIDE INPUT

PREVIOUS INVENTORY INCREASED BY THE FOLLOWING VALUES

NUCLIDE		HALF LIFE		GRAM	CURIE	
902320	Th232	1.405E+10	yr	2.000E+03	2.193E-04	
922330	U233	1.592E+05	yr	0.000E+00	0.000E+00	WARNING-LESS THAN 1 ATOM
922350	U235	7.038E+08	yr	5.000E+00	1.081E-05	
922380	U238	4.468E+09	yr	2.040E+04	6.858E-03	
942390	Pu239	2.411E+04	yr	1.100E-01	6.824E-03	

### \*\*\* FISSION PRODUCT CALCULATION

FRACTIONATION BY ELEMENT GROUP

SOLIDS = 1.000E-03    HALOGENS = 1.000E-03    NOBLE GASES = 1.000E+00

CESIUM = 1.000E-03    RUTHENIUM = 1.000E-03

TOTAL RADIONUCLIDE REMAINING = 1.135E+12 D/S OR 3.068E+01 CI

### \*\*\* FISSION PRODUCT CALCULATION

RADIONUCLIDE INVENTORY HAS BEEN DECAYED FOR 6.000E+02 SECONDS

TOTAL RADIONUCLIDE REMAINING = 8.759E+11 D/S OR 2.367E+01 CI

### \*\*\* METEOROLOGICAL DATA

MEAN WIND SPEED = 1.000E+00 (m/s)    STACK HEIGHT = 0.000E+00 (m)

MIXING LAYER HEIGHT = 4.000E+02 (m)    AIR DENSITY = 1.099E+03 (g/cu m)

WET DEPOSITION SCAVENGING COEFFICIENT = 0.000E+00 (1/s)

DRY DEPOSITION VELOCITIES (m/s)

SOLIDS = 1.000E-03    HALOGENS = 1.000E-02    NOBLE GASES = 0.000E+00

CESIUM = 1.000E-03    RUTHENIUM = 1.000E-03

THERE IS 1 SET OF LEAKAGE CONSTANTS (K1,K2)

1.000E+00    0.000E+00

PLUME MEANDER FACTOR = 1.00E+00

PASQUILL CLASS F METEOROLOGY, H-G    SIGMA VALUES

NO BUILDING WAKE CORRECTION MADE

DOWNWIND DISTANCE	STACK HEIGHT (m)	SIGY (m)	SIGZ (m)	CHI/Q (s/m^3)
1.000E+02	0.000E+00	4.011E+00	2.372E+00	3.346E-02
5.000E+02	0.000E+00	1.826E+01	7.918E+00	2.201E-03
1.000E+03	0.000E+00	3.531E+01	1.290E+01	6.990E-04

PLUME DEPLETION BY FALLOUT IS INCLUDED

FRACTION OF PLUME REMAINING AIRBORNE FOLLOWING DEPLETION BY DEPOSITION

DOWNWIND DISTANCE	SOLIDS	HALOGENS	CESIUM	RUTHENIUM
1.000E+02	9.480E-01	5.862E-01	9.480E-01	9.480E-01
5.000E+02	9.451E-01	5.684E-01	9.451E-01	9.451E-01
1.000E+03	9.426E-01	5.538E-01	9.426E-01	9.426E-01



\*\*\* INHALATION DOSE CALCULATION  
 USING DOSE CONVERSION FACTORS FROM ICRP-72 FOR MEMBERS OF THE PUBLIC  
 RESPIRABLE FRACTION = 1.000E+00  
 BREATHING RATE = 3.330E-04 (m<sup>3</sup>/s)  
 RELEASE TIME FOR EXPONENTIAL DECAY FUNCTION = 1.000E+00 (s)  
 INTERNAL EXPOSURE TIME PERIOD = 5.000E+01 (yr)  
 DEFAULT ELEMENT LUNG ABSORPTION TYPES RECOMMENDED BY ICRP-72  
 INHALATION DOSE CALCULATIONS FOR ADULT AGE  
 INHALATION EQUIVALENT DOSE ORDERED BY ORGAN (rem)      FOR ADULT AGE

DOWNWIND DISTANCES (m)				
ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
-----				
ADRENALS	1	7.45E-02	4.89E-03	1.55E-03
B_WALL	2	1.59E-02	1.04E-03	3.30E-04
BSURFACE	3	1.89E+01	1.24E+00	3.92E-01
BRAIN	4	1.92E-02	1.26E-03	3.99E-04
BREAST	5	2.40E-02	1.57E-03	4.99E-04
COLON	6	3.90E-02	2.56E-03	8.10E-04
ESOPHAGU	7	2.65E-02	1.74E-03	5.50E-04
ET_AIR	8	6.94E-01	4.55E-02	1.44E-02
KIDNEYS	9	1.69E-01	1.11E-02	3.52E-03
LIVER	10	4.80E+00	3.15E-01	9.97E-02
LLI_WALL	11	3.96E-02	2.60E-03	8.23E-04
LUNGS	12	1.79E+00	1.17E-01	3.71E-02
MUSCLE	13	2.80E-02	1.84E-03	5.82E-04
OVARIES	14	3.56E-02	2.33E-03	7.39E-04
PANCREAS	15	6.75E-02	4.43E-03	1.40E-03
R_MARROW	16	1.54E+00	1.01E-01	3.19E-02
SI_WALL	17	2.85E-02	1.87E-03	5.92E-04
SKIN	18	1.68E-02	1.10E-03	3.50E-04
SPLEEN	19	5.67E-02	3.72E-03	1.18E-03
ST_WALL	20	2.99E-02	1.97E-03	6.27E-04
TESTES	21	2.57E-02	1.69E-03	5.34E-04
THYMUS	22	2.65E-02	1.74E-03	5.50E-04
THYROID	23	4.11E-02	2.71E-03	8.61E-04
ULI_WALL	24	4.07E-02	2.67E-03	8.45E-04
UTERUS	25	1.93E-02	1.27E-03	4.01E-04

INHALATION EQUIVALENT DOSE ORDERED BY DOSE (rem)      FOR ADULT AGE

DOWNWIND DISTANCES (m)				
ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
-----				
BSURFACE	3	1.89E+01	1.24E+00	3.92E-01
LIVER	10	4.80E+00	3.15E-01	9.97E-02
LUNGS	12	1.79E+00	1.17E-01	3.71E-02
R_MARROW	16	1.54E+00	1.01E-01	3.19E-02
ET_AIR	8	6.94E-01	4.55E-02	1.44E-02
KIDNEYS	9	1.69E-01	1.11E-02	3.52E-03
ADRENALS	1	7.45E-02	4.89E-03	1.55E-03
PANCREAS	15	6.75E-02	4.43E-03	1.40E-03
SPLEEN	19	5.67E-02	3.72E-03	1.18E-03
THYROID	23	4.11E-02	2.71E-03	8.61E-04
ULI_WALL	24	4.07E-02	2.67E-03	8.45E-04
LLI_WALL	11	3.96E-02	2.60E-03	8.23E-04
COLON	6	3.90E-02	2.56E-03	8.10E-04
OVARIES	14	3.56E-02	2.33E-03	7.39E-04
ST_WALL	20	2.99E-02	1.97E-03	6.27E-04
SI_WALL	17	2.85E-02	1.87E-03	5.92E-04
MUSCLE	13	2.80E-02	1.84E-03	5.82E-04
ESOPHAGU	7	2.65E-02	1.74E-03	5.50E-04
THYMUS	22	2.65E-02	1.74E-03	5.50E-04
TESTES	21	2.57E-02	1.69E-03	5.34E-04
BREAST	5	2.40E-02	1.57E-03	4.99E-04
UTERUS	25	1.93E-02	1.27E-03	4.01E-04
BRAIN	4	1.92E-02	1.26E-03	3.99E-04
SKIN	18	1.68E-02	1.10E-03	3.50E-04
B_WALL	2	1.59E-02	1.04E-03	3.30E-04

# INHALATION EFFECTIVE DOSE ORDERED BY DOSE (rem)      FOR ADULT AGE

DOWNWIND ORGAN	DISTANCES (m) NO.	1.00E+02	5.00E+02	1.00E+03
ADRENALS	1	3.73E-03	2.45E-04	7.74E-05
B_WALL	2	7.94E-04	5.21E-05	1.65E-05
BSURFACE	3	1.89E-01	1.24E-02	3.92E-03
BRAIN	4	9.60E-04	6.30E-05	2.00E-05
BREAST	5	1.20E-03	7.87E-05	2.49E-05
COLON	6	4.68E-03	3.07E-04	9.72E-05
ESOPHAGU	7	1.32E-03	8.69E-05	2.75E-05
ET_AIR	8	3.47E-02	2.27E-03	7.19E-04
KIDNEYS	9	8.47E-03	5.56E-04	1.76E-04
LIVER	10	2.40E-01	1.57E-02	4.98E-03
LLI_WALL	11	1.98E-03	1.30E-04	4.11E-05
LUNGS	12	2.15E-01	1.41E-02	4.45E-03
MUSCLE	13	1.40E-03	9.19E-05	2.91E-05
OVARIES	14	1.78E-03	1.17E-04	3.70E-05
PANCREAS	15	3.38E-03	2.21E-04	7.01E-05
R_MARROW	16	1.84E-01	1.21E-02	3.83E-03
SI_WALL	17	1.42E-03	9.35E-05	2.96E-05
SKIN	18	1.68E-04	1.10E-05	3.50E-06
SPLEEN	19	2.83E-03	1.86E-04	5.89E-05
ST_WALL	20	5.98E-03	3.95E-04	1.25E-04
TESTES	21	1.29E-03	8.43E-05	2.67E-05
THYMUS	22	1.32E-03	8.69E-05	2.75E-05
THYROID	23	2.05E-03	1.35E-04	4.31E-05
ULI_WALL	24	2.04E-03	1.33E-04	4.23E-05
UTERUS	25	9.66E-04	6.33E-05	2.01E-05
E_50	26	8.51E-01	5.58E-02	1.77E-02

## \*\*\* INGESTION DOSE CALCULATION

USING DOSE CONVERSION FACTORS FROM ICRP-72 FOR MEMBERS OF THE PUBLIC

RELEASE TIME FOR EXPONENTIAL DECAY FUNCTION = 1.000E+00 (s)

INTERNAL EXPOSURE TIME PERIOD = 5.000E+01 (yr)

INGESTION CALCULATIONS MADE USING CODE CALCULATED CONSTANTS

### INGESTION CONSTANTS:

5.20E+02 STORED VEGETABLE USAGE FACTOR (KG/YR)  
6.40E+01 FRESH VEGETABLE USAGE FACTOR (KG/YR)  
1.10E+02 MEAT USAGE FACTOR (KG/YR)  
3.10E+02 MILK USAGE FACTOR (L/YR)  
7.60E-01 FRACTION OF STORED VEGETABLES FROM GARDEN  
1.00E+00 FRACTION OF FRESH VEGETABLES FROM GARDEN  
5.70E-01 RETENTION FACTOR FOR ACTIVITY ON FORAGE  
2.00E-01 RETENTION FACTOR FOR ACTIVITY ON VEGETABLES  
1.00E+00 RETENTION FACTOR FOR IODINES  
2.10E-03 REMOVAL RATE CONSTANT FOR CROPS (1/H)  
6.00E+01 VEGETABLE EXPOSURE TIME TO PLUME FOR CHRONIC RELEASE (D)  
3.00E+01 FORAGE EXPOSURE TIME TO PLUME FOR CHRONIC RELEASE (D)  
1.00E+00 HTO REMOVAL HALF TIME (D)  
2.25E+02 EFFECTIVE SURFACE SOIL DENSITY (KG/SQ M)  
6.00E+01 STORED VEGETABLE HOLDUP TIME AFTER HARVEST (D)  
1.00E+00 FRESH VEGETABLE HOLDUP TIME AFTER HARVEST (D)  
1.60E+01 ANIMALS DAILY FORAGE FEED (KG/D)  
2.00E+00 FEED-MILK-RECEPTOR TRANSFER TIME (D)  
2.00E+01 SLAUGHTER TO CONSUMPTION TIME (D)  
4.00E-01 FRACTION OF YEAR ON PASTURE  
4.30E-01 PASTURE FEED FRACTION  
9.00E+01 STORED FEED STORAGE TIME  
2.00E+00 VEGETABLE VEGETATION YIELD (KG/SQ M)  
2.80E-01 FORAGE VEGETATION YIELD (KG/SQ M)  
4.90E+00 ABSOLUTE HUMIDITY (G/CU M)  
CHRONIC RELEASE - ANNUAL DOSE  
ACTIVITY BUILDUP IN SOIL OVER 1.500E+01 (YR)

ICRP-72 INGESTION DOSE CALCULATIONS FOR ADULT AGE  
 DOWNWIND DISTANCES (m) INGESTION EQUIVALENT DOSE ORDERED BY ORGAN (rem) FOR ADULT AGE

ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
ADRENALS	1	6.77E-01	4.37E-02	1.36E-02
B_WALL	2	1.35E+00	8.64E-02	2.68E-02
BSURFACE	3	4.38E+00	2.87E-01	9.06E-02
BRAIN	4	9.09E-01	5.89E-02	1.85E-02
BREAST	5	6.05E-01	3.89E-02	1.21E-02
COLON	6	1.02E+00	6.61E-02	2.07E-02
ESOPHAGU	7	6.26E-01	4.03E-02	1.26E-02
ET_AIR	8	6.37E-01	4.10E-02	1.28E-02
KIDNEYS	9	1.87E+00	1.22E-01	3.83E-02
LIVER	10	1.24E+00	8.05E-02	2.53E-02
LLI_WALL	11	1.26E+00	8.15E-02	2.55E-02
LUNGS	12	6.29E-01	4.05E-02	1.26E-02
MUSCLE	13	6.29E-01	4.05E-02	1.26E-02
OVARIES	14	6.66E-01	4.30E-02	1.34E-02
PANCREAS	15	6.75E-01	4.36E-02	1.36E-02
R_MARROW	16	1.15E+00	7.46E-02	2.34E-02
SI_WALL	17	6.84E-01	4.41E-02	1.38E-02
SKIN	18	6.03E-01	3.88E-02	1.21E-02
SPLEEN	19	1.26E+00	8.19E-02	2.57E-02
ST_WALL	20	8.52E-01	5.49E-02	1.71E-02
TESTES	21	6.16E-01	3.97E-02	1.24E-02
THYMUS	22	6.26E-01	4.03E-02	1.26E-02
THYROID	23	1.49E+01	9.78E-01	3.09E-01
ULI_WALL	24	8.49E-01	5.48E-02	1.72E-02
UTERUS	25	6.51E-01	4.20E-02	1.31E-02

INGESTION EQUIVALENT DOSE ORDERED BY DOSE (rem) FOR ADULT AGE

ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
THYROID	23	1.49E+01	9.78E-01	3.09E-01
BSURFACE	3	4.38E+00	2.87E-01	9.06E-02
KIDNEYS	9	1.87E+00	1.22E-01	3.83E-02
B_WALL	2	1.35E+00	8.64E-02	2.68E-02
SPLEEN	19	1.26E+00	8.19E-02	2.57E-02
LLI_WALL	11	1.26E+00	8.15E-02	2.55E-02
LIVER	10	1.24E+00	8.05E-02	2.53E-02
R_MARROW	16	1.15E+00	7.46E-02	2.34E-02
COLON	6	1.02E+00	6.61E-02	2.07E-02
BRAIN	4	9.09E-01	5.89E-02	1.85E-02
ST_WALL	20	8.52E-01	5.49E-02	1.71E-02
ULI_WALL	24	8.49E-01	5.48E-02	1.72E-02
SI_WALL	17	6.84E-01	4.41E-02	1.38E-02
ADRENALS	1	6.77E-01	4.37E-02	1.36E-02
PANCREAS	15	6.75E-01	4.36E-02	1.36E-02
OVARIES	14	6.66E-01	4.30E-02	1.34E-02
UTERUS	25	6.51E-01	4.20E-02	1.31E-02
ET_AIR	8	6.37E-01	4.10E-02	1.28E-02
MUSCLE	13	6.29E-01	4.05E-02	1.26E-02
LUNGS	12	6.29E-01	4.05E-02	1.26E-02
ESOPHAGU	7	6.26E-01	4.03E-02	1.26E-02
THYMUS	22	6.26E-01	4.03E-02	1.26E-02
TESTES	21	6.16E-01	3.97E-02	1.24E-02
BREAST	5	6.05E-01	3.89E-02	1.21E-02
SKIN	18	6.03E-01	3.88E-02	1.21E-02



# INGESTION EFFECTIVE DOSE ORDERED BY DOSE (rem) FOR ADULT AGE

DOWNWIND DISTANCES (m)				
ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
ADRENALS	1	3.38E-02	2.18E-03	6.82E-04
B_WALL	2	6.74E-02	4.32E-03	1.34E-03
BSURFACE	3	4.38E-02	2.87E-03	9.06E-04
BRAIN	4	4.55E-02	2.95E-03	9.23E-04
BREAST	5	3.02E-02	1.95E-03	6.07E-04
COLON	6	1.23E-01	7.93E-03	2.48E-03
ESOPHAGU	7	3.13E-02	2.02E-03	6.29E-04
ET_AIR	8	3.18E-02	2.05E-03	6.40E-04
KIDNEYS	9	9.33E-02	6.08E-03	1.92E-03
LIVER	10	6.19E-02	4.02E-03	1.26E-03
LLI_WALL	11	6.29E-02	4.08E-03	1.28E-03
LUNGS	12	7.55E-02	4.86E-03	1.52E-03
MUSCLE	13	3.14E-02	2.03E-03	6.32E-04
OVARIES	14	3.33E-02	2.15E-03	6.71E-04
PANCREAS	15	3.38E-02	2.18E-03	6.80E-04
R_MARROW	16	1.38E-01	8.95E-03	2.81E-03
SI_WALL	17	3.42E-02	2.21E-03	6.89E-04
SKIN	18	6.03E-03	3.88E-04	1.21E-04
SPLEEN	19	6.30E-02	4.09E-03	1.29E-03
ST_WALL	20	1.70E-01	1.10E-02	3.42E-03
TESTES	21	3.08E-02	1.98E-03	6.19E-04
THYMUS	22	3.13E-02	2.02E-03	6.29E-04
THYROID	23	7.46E-01	4.89E-02	1.55E-02
ULI_WALL	24	4.24E-02	2.74E-03	8.58E-04
UTERUS	25	3.26E-02	2.10E-03	6.55E-04
E_50	26	1.64E+00	1.07E-01	3.37E-02

## \*\*\* GROUND SURFACE DOSE CALCULATION

OCCUPANCY FACTOR = 1.000E+00

TIME RECEPTOR IS EXPOSED TO CONTAMINATED SOIL = 1.000E+00 (yr)

BUILDING SHIELDING FACTOR = 7.000E-01

RELEASE TIME FOR EXPONENTIAL DECAY FUNCTION = 1.000E+00 s

GROUND SURFACE DOSE

DOWNWIND DISTANCE = 1.00E+02 (m)

GROUND SURFACE DOSE

DOWNWIND DISTANCE = 5.00E+02 (m)

GROUND SURFACE DOSE

DOWNWIND DISTANCE = 1.00E+03 (m)

CHI/Q = 3.346E-02 (s/m^3)

PLUME TRAVEL TIME = 1.00E+02 (s)

CHI/Q = 2.201E-03 (s/m^3)

PLUME TRAVEL TIME = 5.00E+02 (s)

CHI/Q = 6.990E-04 (s/m^3)

PLUME TRAVEL TIME = 1.00E+03 (s)

## GROUND SURFACE EFFECTIVE DOSE ORDERED BY ORGAN (rem)

DOWNWIND DISTANCES (M)

ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
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Lungs	1	8.68E-02	5.69E-03	1.80E-03
S wall	2	8.20E-02	5.37E-03	1.70E-03
SI wall	3	7.96E-02	5.22E-03	1.65E-03
ULI wall	4	8.11E-02	5.31E-03	1.68E-03
LLI wall	5	8.26E-02	5.41E-03	1.71E-03
Testes	6	9.70E-02	6.36E-03	2.01E-03
Breast	7	9.36E-02	6.13E-03	1.94E-03
BSurface	8	1.38E-01	9.06E-03	2.86E-03
R Marrow	9	8.76E-02	5.74E-03	1.81E-03
Thyroid	10	9.00E-02	5.90E-03	1.86E-03
Kidney	11	8.33E-02	5.45E-03	1.72E-03
Liver	12	8.23E-02	5.39E-03	1.70E-03
Spleen	13	8.24E-02	5.40E-03	1.71E-03
Pancreas	14	7.66E-02	5.02E-03	1.59E-03
Muscle	15	7.52E-02	4.92E-03	1.56E-03
Skin	16	6.30E-01	4.12E-02	1.30E-02
Brain	17	8.11E-02	5.31E-03	1.68E-03
Thymus	18	8.24E-02	5.40E-03	1.71E-03
U Bladd	19	8.35E-02	5.47E-03	1.73E-03
Adrenal	20	9.49E-02	6.22E-03	1.97E-03
Esophagu	21	7.32E-02	4.80E-03	1.52E-03
Ovaries	22	8.25E-02	5.40E-03	1.71E-03
Uterus	23	7.92E-02	5.19E-03	1.64E-03

## GROUND SURFACE EFFECTIVE DOSE ORDERED BY DOSE (rem)

DOWNWIND DISTANCES (M)

ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
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Skin	16	6.30E-01	4.12E-02	1.30E-02
BSurface	8	1.38E-01	9.06E-03	2.86E-03
Testes	6	9.70E-02	6.36E-03	2.01E-03
Adrenal	20	9.49E-02	6.22E-03	1.97E-03
Breast	7	9.36E-02	6.13E-03	1.94E-03
Thyroid	10	9.00E-02	5.90E-03	1.86E-03
R Marrow	9	8.76E-02	5.74E-03	1.81E-03
Lungs	1	8.68E-02	5.69E-03	1.80E-03
U Bladd	19	8.35E-02	5.47E-03	1.73E-03
Kidney	11	8.33E-02	5.45E-03	1.72E-03
LLI wall	5	8.26E-02	5.41E-03	1.71E-03
Ovaries	22	8.25E-02	5.40E-03	1.71E-03
Spleen	13	8.24E-02	5.40E-03	1.71E-03
Thymus	18	8.24E-02	5.40E-03	1.71E-03
Liver	12	8.23E-02	5.39E-03	1.70E-03
S wall	2	8.20E-02	5.37E-03	1.70E-03
Brain	17	8.11E-02	5.31E-03	1.68E-03
ULI wall	4	8.11E-02	5.31E-03	1.68E-03
SI wall	3	7.96E-02	5.22E-03	1.65E-03
Uterus	23	7.92E-02	5.19E-03	1.64E-03
Pancreas	14	7.66E-02	5.02E-03	1.59E-03
Muscle	15	7.52E-02	4.92E-03	1.56E-03
Esophagu	21	7.32E-02	4.80E-03	1.52E-03

## GROUND SURFACE EFFECTIVE DOSE EQUIVALENT (rem)

DOWNWIND DISTANCES (M)

ORGAN	NO.	1.00E+02	5.00E+02	1.00E+03
Lungs	1	1.04E-02	6.82E-04	2.16E-04
S wall	2	4.92E-03	3.22E-04	1.02E-04
SI wall	3	4.78E-03	3.13E-04	9.89E-05
ULI wall	4	4.86E-03	3.19E-04	1.01E-04
LLI wall	5	4.95E-03	3.24E-04	1.03E-04
Testes	6	2.43E-02	1.59E-03	5.02E-04
Breast	7	1.40E-02	9.19E-04	2.91E-04
BSurface	8	4.15E-03	2.72E-04	8.59E-05
R Marrow	9	1.05E-02	6.89E-04	2.18E-04
Thyroid	10	2.70E-03	1.77E-04	5.59E-05
Kidney	11	5.00E-03	3.27E-04	1.03E-04
Liver	12	4.94E-03	3.23E-04	1.02E-04
Spleen	13	4.95E-03	3.24E-04	1.02E-04
Pancreas	14	4.60E-03	3.01E-04	9.52E-05
Muscle	15	4.51E-03	2.95E-04	9.34E-05
Skin	16	6.30E-03	4.12E-04	1.30E-04
Brain	17	4.86E-03	3.19E-04	1.01E-04
Thymus	18	4.94E-03	3.24E-04	1.02E-04
U Bladd	19	5.01E-03	3.28E-04	1.04E-04
Adrenal	20	5.69E-03	3.73E-04	1.18E-04
Esophagu	21	4.39E-03	2.88E-04	9.09E-05
Ovaries	22	2.06E-02	1.35E-03	4.27E-04
Uterus	23	4.75E-03	3.11E-04	9.84E-05
EXT EDE	24	9.18E-02	6.01E-03	1.90E-03

## \*\*\* DOSE SUMMARY

ICRP-72 INHALATION DOSE CALCULATIONS MADE WITH ADULT INTAKE AGE

ICRP-72 INGESTION DOSE CALCULATIONS MADE WITH ADULT INTAKE AGE

SUM OF CONTRIBUTIONS TO THE EFFECTIVE DOSE (rem)

DOWNWIND DISTANCE = 1.00E+02 (m)

SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
531290 I-129	6.44E-01	-	6.44E-01	2.58E+01
170360 Cl- 36	4.92E-01	-	4.92E-01	1.97E+01
621460 Sm-146	1.69E-01	-	1.69E-01	6.76E+00
641480 Gd-148	1.68E-01	-	1.68E-01	6.75E+00
822100 Pb-210	1.61E-01	-	1.61E-01	6.46E+00
621470 Sm-147	1.48E-01	-	1.48E-01	5.91E+00
641520 Gd-152	1.23E-01	-	1.23E-01	4.91E+00
10030 H- 3	8.70E-02	-	8.70E-02	3.48E+00
801940 Hg-194	6.42E-02	-	6.42E-02	2.57E+00
531250 I-125	6.38E-02	-	6.38E-02	2.56E+00
571370 La-137	5.28E-02	-	5.28E-02	2.11E+00
832101 Bi-210m	5.16E-02	-	5.16E-02	2.07E+00
942390 Pu-239	3.21E-02	-	3.21E-02	1.29E+00
260600 Fe- 60	3.09E-02	-	3.09E-02	1.24E+00
531260 I-126	2.08E-02	-	2.08E-02	8.33E-01
551370 Cs-137	1.37E-02	-	1.37E-02	5.49E-01
842100 Po-210	1.36E-02	-	1.36E-02	5.43E-01
531310 I-131	1.11E-02	-	1.11E-02	4.43E-01
380900 Sr- 90	8.81E-03	-	8.81E-03	3.53E-01
761940 Os-194	7.95E-03	-	7.95E-03	3.18E-01
491150 In-115	7.47E-03	-	7.47E-03	2.99E-01
481130 Cd-113	7.33E-03	-	7.33E-03	2.94E-01
430980 Tc- 98	6.68E-03	-	6.68E-03	2.68E-01
320680 Ge- 68	6.49E-03	-	6.49E-03	2.60E-01
551340 Cs-134	6.09E-03	-	6.09E-03	2.44E-01
481131 Cd-113m	6.05E-03	-	6.05E-03	2.42E-01
190400 K- 40	5.60E-03	-	5.60E-03	2.24E-01
220440 Ti- 44	4.63E-03	-	4.63E-03	1.85E-01
410940 Nb- 94	4.43E-03	-	4.43E-03	1.78E-01
531240 I-124	3.62E-03	-	3.62E-03	1.45E-01
501260 Sn-126	3.58E-03	-	3.58E-03	1.43E-01
791940 Au-194	3.50E-03	-	3.50E-03	1.40E-01
110220 Na- 22	3.47E-03	-	3.47E-03	1.39E-01

SORTED BY PERCENT OF EFFECTIVE DOSE					
NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent	
822120 Pb-212	3.19E-03	-	3.19E-03	1.28E-01	
300650 Zn- 65	3.19E-03	-	3.19E-03	1.28E-01	
721781 Hf-178m	2.28E-03	-	2.28E-03	9.14E-02	
922380 U-238	2.24E-03	-	2.24E-03	8.99E-02	
721820 Hf-182	2.24E-03	-	2.24E-03	8.98E-02	
430990 Tc- 99	2.12E-03	-	2.12E-03	8.49E-02	
471081 Ag-108m	2.10E-03	-	2.10E-03	8.43E-02	
671661 Ho-166m	2.03E-03	-	2.03E-03	8.15E-02	
832100 Bi-210	1.51E-03	-	1.51E-03	6.05E-02	
270600 Co- 60	1.41E-03	-	1.41E-03	5.65E-02	
471101 Ag-110m	1.32E-03	-	1.32E-03	5.28E-02	
751861 Re-186m	1.24E-03	-	1.24E-03	4.96E-02	
822020 Pb-202	1.20E-03	-	1.20E-03	4.82E-02	
711760 Lu-176	1.07E-03	-	1.07E-03	4.28E-02	
571380 La-138	1.06E-03	-	1.06E-03	4.24E-02	
631540 Eu-154	1.05E-03	-	1.05E-03	4.21E-02	
581440 Ce-144	9.88E-04	-	9.88E-04	3.96E-02	
340790 Se- 79	9.64E-04	-	9.64E-04	3.86E-02	
631500 Eu-150	9.58E-04	-	9.58E-04	3.84E-02	
501230 Sn-123	9.46E-04	-	9.46E-04	3.79E-02	
451020 Rh-102	8.82E-04	-	8.82E-04	3.54E-02	
651580 Tb-158	8.25E-04	-	8.25E-04	3.31E-02	
631520 Eu-152	8.09E-04	-	8.09E-04	3.24E-02	
761850 Os-185	7.28E-04	-	7.28E-04	2.92E-02	
420930 Mo- 93	7.18E-04	-	7.18E-04	2.88E-02	
130260 Al- 26	7.08E-04	-	7.08E-04	2.84E-02	
40100 Be- 10	6.36E-04	-	6.36E-04	2.55E-02	
771921 Ir-192m	6.10E-04	-	6.10E-04	2.44E-02	
410950 Nb- 95	5.71E-04	-	5.71E-04	2.29E-02	
751860 Re-186	5.43E-04	-	5.43E-04	2.18E-02	
802030 Hg-203	5.40E-04	-	5.40E-04	2.16E-02	
441060 Ru-106	4.74E-04	-	4.74E-04	1.90E-02	
812040 Tl-204	4.74E-04	-	4.74E-04	1.90E-02	
832120 Bi-212	4.73E-04	-	4.73E-04	1.89E-02	
340750 Se- 75	4.69E-04	-	4.69E-04	1.88E-02	
451021 Rh-102m	4.66E-04	-	4.66E-04	1.87E-02	
270560 Co- 56	4.34E-04	-	4.34E-04	1.74E-02	
521211 Te-121m	4.09E-04	-	4.09E-04	1.64E-02	
711771 Lu-177m	4.01E-04	-	4.01E-04	1.61E-02	
370830 Rb- 83	3.98E-04	-	3.98E-04	1.60E-02	
521230 Te-123	3.84E-04	-	3.84E-04	1.54E-02	
771941 Ir-194m	3.72E-04	-	3.72E-04	1.49E-02	
611460 Pm-146	3.71E-04	-	3.71E-04	1.49E-02	
481090 Cd-109	3.68E-04	-	3.68E-04	1.48E-02	
832130 Bi-213	3.68E-04	-	3.68E-04	1.48E-02	
741880 W-188	3.64E-04	-	3.64E-04	1.46E-02	
521271 Te-127m	3.51E-04	-	3.51E-04	1.41E-02	
491141 In-114m	3.25E-04	-	3.25E-04	1.30E-02	
561330 Ba-133	3.21E-04	-	3.21E-04	1.29E-02	
501211 Sn-121m	3.21E-04	-	3.21E-04	1.28E-02	
551350 Cs-135	3.12E-04	-	3.12E-04	1.25E-02	
751841 Re-184m	3.12E-04	-	3.12E-04	1.25E-02	
390900 Y- 90	3.11E-04	-	3.11E-04	1.25E-02	
501130 Sn-113	3.10E-04	-	3.10E-04	1.24E-02	
511250 Sb-125	3.00E-04	-	3.00E-04	1.20E-02	
410931 Nb- 93m	2.88E-04	-	2.88E-04	1.15E-02	
771920 Ir-192	2.67E-04	-	2.67E-04	1.07E-02	
380820 Sr- 82	2.64E-04	-	2.64E-04	1.06E-02	
370840 Rb- 84	2.58E-04	-	2.58E-04	1.04E-02	
511240 Sb-124	2.58E-04	-	2.58E-04	1.03E-02	
210460 Sc- 46	2.56E-04	-	2.56E-04	1.03E-02	
60140 C- 14	2.55E-04	-	2.55E-04	1.02E-02	
390910 Y- 91	2.49E-04	-	2.49E-04	9.99E-03	
451010 Rh-101	2.47E-04	-	2.47E-04	9.90E-03	
832070 Bi-207	2.36E-04	-	2.36E-04	9.47E-03	
481151 Cd-115m	2.31E-04	-	2.31E-04	9.24E-03	
370870 Rb- 87	2.29E-04	-	2.29E-04	9.19E-03	
902320 Th-232	2.28E-04	-	2.28E-04	9.15E-03	
611440 Pm-144	2.26E-04	-	2.26E-04	9.05E-03	

SORTED BY PERCENT OF EFFECTIVE DOSE					
NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent	
521231 Te-123m	2.23E-04	-	2.23E-04	8.93E-03	
200450 Ca- 45	2.21E-04	-	2.21E-04	8.88E-03	
691700 Tm-170	2.20E-04	-	2.20E-04	8.82E-03	
430970 Tc- 97	2.17E-04	-	2.17E-04	8.71E-03	
651600 Tb-160	2.11E-04	-	2.11E-04	8.45E-03	
501191 Sn-119m	2.10E-04	-	2.10E-04	8.41E-03	
511260 Sb-126	2.06E-04	-	2.06E-04	8.27E-03	
400930 Zr- 93	2.05E-04	-	2.05E-04	8.20E-03	
200410 Ca- 41	1.97E-04	-	1.97E-04	7.88E-03	
521291 Te-129m	1.94E-04	-	1.94E-04	7.77E-03	
380890 Sr- 89	1.92E-04	-	1.92E-04	7.68E-03	
731820 Ta-182	1.88E-04	-	1.88E-04	7.53E-03	
150320 P- 32	1.86E-04	-	1.86E-04	7.45E-03	
430971 Tc- 97m	1.85E-04	-	1.85E-04	7.40E-03	
390880 Y- 88	1.82E-04	-	1.82E-04	7.28E-03	
822140 Pb-214	1.63E-04	-	1.63E-04	6.51E-03	
260590 Fe- 59	1.61E-04	-	1.61E-04	6.46E-03	
751840 Re-184	1.61E-04	-	1.61E-04	6.44E-03	
611481 Pm-148m	1.58E-04	-	1.58E-04	6.32E-03	
400950 Zr- 95	1.48E-04	-	1.48E-04	5.93E-03	
771940 Ir-194	1.46E-04	-	1.46E-04	5.86E-03	
631550 Eu-155	1.44E-04	-	1.44E-04	5.78E-03	
822110 Pb-211	1.41E-04	-	1.41E-04	5.63E-03	
370860 Rb- 86	1.39E-04	-	1.39E-04	5.58E-03	
832140 Bi-214	1.37E-04	-	1.37E-04	5.47E-03	
270580 Co- 58	1.22E-04	-	1.22E-04	4.89E-03	
551360 Cs-136	1.18E-04	-	1.18E-04	4.74E-03	
721810 Hf-181	1.16E-04	-	1.16E-04	4.65E-03	
761910 Os-191	1.15E-04	-	1.15E-04	4.59E-03	
711741 Lu-174m	1.11E-04	-	1.11E-04	4.46E-03	
631480 Eu-148	1.11E-04	-	1.11E-04	4.45E-03	
561400 Ba-140	1.11E-04	-	1.11E-04	4.43E-03	
611470 Pm-147	1.06E-04	-	1.06E-04	4.25E-03	
501250 Sn-125	1.05E-04	-	1.05E-04	4.20E-03	
812020 Tl-202	1.04E-04	-	1.04E-04	4.16E-03	
551380 Cs-138	1.02E-04	-	1.02E-04	4.11E-03	
711740 Lu-174	9.76E-05	-	9.76E-05	3.91E-03	
250540 Mn- 54	9.27E-05	-	9.27E-05	3.71E-03	
521251 Te-125m	9.20E-05	-	9.20E-05	3.69E-03	
611480 Pm-148	8.95E-05	-	8.95E-05	3.59E-03	
751880 Re-188	8.74E-05	-	8.74E-05	3.50E-03	
400880 Zr- 88	8.73E-05	-	8.73E-05	3.50E-03	
260550 Fe- 55	8.66E-05	-	8.66E-05	3.47E-03	
521320 Te-132	8.42E-05	-	8.42E-05	3.37E-03	
370880 Rb- 88	8.37E-05	-	8.37E-05	3.36E-03	
721791 Hf-179m	8.17E-05	-	8.17E-05	3.28E-03	
741850 W-185	8.10E-05	-	8.10E-05	3.25E-03	
160350 S- 35	8.00E-05	-	8.00E-05	3.20E-03	
631560 Eu-156	7.72E-05	-	7.72E-05	3.09E-03	
621510 Sm-151	7.24E-05	-	7.24E-05	2.90E-03	
581410 Ce-141	6.76E-05	-	6.76E-05	2.71E-03	
701690 Yb-169	6.68E-05	-	6.68E-05	2.68E-03	
471061 Ag-106m	6.39E-05	-	6.39E-05	2.56E-03	
471110 Ag-111	6.32E-05	-	6.32E-05	2.53E-03	
270570 Co- 57	6.11E-05	-	6.11E-05	2.45E-03	
501171 Sn-117m	6.04E-05	-	6.04E-05	2.42E-03	
230480 V- 48	6.01E-05	-	6.01E-05	2.41E-03	
531330 I-133	5.94E-05	-	5.94E-05	2.38E-03	
641530 Gd-153	5.88E-05	-	5.88E-05	2.36E-03	
791950 Au-195	5.51E-05	-	5.51E-05	2.21E-03	
521210 Te-121	5.46E-05	-	5.46E-05	2.19E-03	
150330 P- 33	4.95E-05	-	4.95E-05	1.99E-03	
330740 As- 74	4.94E-05	-	4.94E-05	1.98E-03	
611450 Pm-145	4.90E-05	-	4.90E-05	1.96E-03	
280630 Ni- 63	4.89E-05	-	4.89E-05	1.96E-03	
200470 Ca- 47	4.82E-05	-	4.82E-05	1.93E-03	
711770 Lu-177	4.78E-05	-	4.78E-05	1.91E-03	
591430 Pr-143	4.68E-05	-	4.68E-05	1.87E-03	
611430 Pm-143	4.66E-05	-	4.66E-05	1.87E-03	



SORTED BY PERCENT OF EFFECTIVE DOSE					
NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent	
822050 Pb-205	4.51E-05	-	4.51E-05	1.81E-03	
771900 Ir-190	4.51E-05	-	4.51E-05	1.81E-03	
601470 Nd-147	4.33E-05	-	4.33E-05	1.74E-03	
721750 Hf-175	4.11E-05	-	4.11E-05	1.65E-03	
210440 Sc- 44	4.03E-05	-	4.03E-05	1.61E-03	
581390 Ce-139	3.69E-05	-	3.69E-05	1.48E-03	
731830 Ta-183	3.55E-05	-	3.55E-05	1.42E-03	
531320 I-132	3.52E-05	-	3.52E-05	1.41E-03	
521311 Te-131m	3.51E-05	-	3.51E-05	1.41E-03	
691710 Tm-171	3.43E-05	-	3.43E-05	1.38E-03	
832060 Bi-206	3.41E-05	-	3.41E-05	1.37E-03	
571400 La-140	3.40E-05	-	3.40E-05	1.36E-03	
511270 Sb-127	3.27E-05	-	3.27E-05	1.31E-03	
661660 Dy-166	3.18E-05	-	3.18E-05	1.27E-03	
330730 As- 73	3.17E-05	-	3.17E-05	1.27E-03	
791981 Au-198m	3.13E-05	-	3.13E-05	1.26E-03	
380850 Sr- 85	3.03E-05	-	3.03E-05	1.21E-03	
250520 Mn- 52	2.82E-05	-	2.82E-05	1.13E-03	
370890 Rb- 89	2.76E-05	-	2.76E-05	1.10E-03	
441030 Ru-103	2.69E-05	-	2.69E-05	1.08E-03	
350820 Br- 82	2.61E-05	-	2.61E-05	1.05E-03	
210441 Sc- 44m	2.47E-05	-	2.47E-05	9.88E-04	
300720 Zn- 72	2.44E-05	-	2.44E-05	9.78E-04	
651610 Tb-161	2.26E-05	-	2.26E-05	9.07E-04	
651570 Tb-157	2.22E-05	-	2.22E-05	8.91E-04	
461070 Pd-107	2.22E-05	-	2.22E-05	8.91E-04	
430960 Tc- 96	2.20E-05	-	2.20E-05	8.80E-04	
410951 Nb- 95m	2.18E-05	-	2.18E-05	8.75E-04	
751823 Re-182b	2.11E-05	-	2.11E-05	8.46E-04	
511203 Sb-120b	2.11E-05	-	2.11E-05	8.45E-04	
390901 Y- 90m	1.96E-05	-	1.96E-05	7.87E-04	
511220 Sb-122	1.95E-05	-	1.95E-05	7.81E-04	
280560 Ni- 56	1.94E-05	-	1.94E-05	7.76E-04	
280590 Ni- 59	1.91E-05	-	1.91E-05	7.66E-04	
741810 W-181	1.88E-05	-	1.88E-05	7.55E-04	
120280 Mg- 28	1.88E-05	-	1.88E-05	7.54E-04	
210480 Sc- 48	1.81E-05	-	1.81E-05	7.27E-04	
681690 Er-169	1.72E-05	-	1.72E-05	6.88E-04	
531230 I-123	1.69E-05	-	1.69E-05	6.76E-04	
561310 Ba-131	1.65E-05	-	1.65E-05	6.61E-04	
420990 Mo- 99	1.61E-05	-	1.61E-05	6.44E-04	
661590 Dy-159	1.53E-05	-	1.53E-05	6.12E-04	
731790 Ta-179	1.48E-05	-	1.48E-05	5.92E-04	
791980 Au-198	1.48E-05	-	1.48E-05	5.92E-04	
330720 As- 72	1.42E-05	-	1.42E-05	5.68E-04	
641490 Gd-149	1.37E-05	-	1.37E-05	5.48E-04	
461030 Pd-103	1.35E-05	-	1.35E-05	5.41E-04	
531300 I-130	1.33E-05	-	1.33E-05	5.34E-04	
671660 Ho-166	1.31E-05	-	1.31E-05	5.24E-04	
400970 Zr- 97	1.30E-05	-	1.30E-05	5.20E-04	
521270 Te-127	1.28E-05	-	1.28E-05	5.15E-04	
210470 Sc- 47	1.27E-05	-	1.27E-05	5.10E-04	
791990 Au-199	1.26E-05	-	1.26E-05	5.04E-04	
611490 Pm-149	1.22E-05	-	1.22E-05	4.91E-04	
581430 Ce-143	1.22E-05	-	1.22E-05	4.88E-04	
701750 Yb-175	1.20E-05	-	1.20E-05	4.83E-04	
410960 Nb- 96	1.11E-05	-	1.11E-05	4.43E-04	
551320 Cs-132	1.09E-05	-	1.09E-05	4.36E-04	
330760 As- 76	1.08E-05	-	1.08E-05	4.33E-04	
621530 Sm-153	1.02E-05	-	1.02E-05	4.09E-04	
400890 Zr- 89	9.95E-06	-	9.95E-06	3.99E-04	
290670 Cu- 67	9.75E-06	-	9.75E-06	3.91E-04	
310680 Ga- 68	9.50E-06	-	9.50E-06	3.81E-04	
310720 Ga- 72	9.24E-06	-	9.24E-06	3.70E-04	
280570 Ni- 57	8.68E-06	-	8.68E-06	3.48E-04	
761930 Os-193	8.64E-06	-	8.64E-06	3.46E-04	
300620 Zn- 62	8.03E-06	-	8.03E-06	3.22E-04	
591420 Pr-142	8.00E-06	-	8.00E-06	3.21E-04	
781930 Pt-193	7.93E-06	-	7.93E-06	3.18E-04	

SORTED BY PERCENT OF EFFECTIVE DOSE					
NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent	
801971 Hg-197m	7.91E-06	-	7.91E-06	3.17E-04	
481150 Cd-115	7.74E-06	-	7.74E-06	3.10E-04	
320690 Ge- 69	7.63E-06	-	7.63E-06	3.06E-04	
380910 Sr- 91	7.41E-06	-	7.41E-06	2.97E-04	
561331 Ba-133m	7.32E-06	-	7.32E-06	2.93E-04	
60110 C- 11	7.13E-06	-	7.13E-06	2.86E-04	
390870 Y- 87	7.04E-06	-	7.04E-06	2.82E-04	
390860 Y- 86	6.89E-06	-	6.89E-06	2.76E-04	
751890 Re-189	6.76E-06	-	6.76E-06	2.71E-04	
611510 Pm-151	6.73E-06	-	6.73E-06	2.70E-04	
781951 Pt-195m	6.58E-06	-	6.58E-06	2.64E-04	
731801 Ta-180m	6.56E-06	-	6.56E-06	2.63E-04	
400860 Zr- 86	6.48E-06	-	6.48E-06	2.60E-04	
310660 Ga- 66	6.36E-06	-	6.36E-06	2.55E-04	
390930 Y- 93	6.26E-06	-	6.26E-06	2.51E-04	
731840 Ta-184	6.20E-06	-	6.20E-06	2.49E-04	
330770 As- 77	6.15E-06	-	6.15E-06	2.46E-04	
511280 Sb-128	6.11E-06	-	6.11E-06	2.45E-04	
451050 Rh-105	5.72E-06	-	5.72E-06	2.29E-04	
260520 Fe- 52	5.69E-06	-	5.69E-06	2.28E-04	
561351 Ba-135m	5.56E-06	-	5.56E-06	2.23E-04	
320770 Ge- 77	5.53E-06	-	5.53E-06	2.21E-04	
461090 Pd-109	5.49E-06	-	5.49E-06	2.20E-04	
591440 Pr-144	5.44E-06	-	5.44E-06	2.18E-04	
451011 Rh-101m	5.36E-06	-	5.36E-06	2.15E-04	
250530 Mn- 53	5.10E-06	-	5.10E-06	2.05E-04	
801970 Hg-197	4.82E-06	-	4.82E-06	1.93E-04	
781931 Pt-193m	4.81E-06	-	4.81E-06	1.93E-04	
511261 Sb-126m	4.68E-06	-	4.68E-06	1.88E-04	
531350 I-135	4.68E-06	-	4.68E-06	1.88E-04	
561390 Ba-139	4.44E-06	-	4.44E-06	1.78E-04	
110240 Na- 24	4.30E-06	-	4.30E-06	1.73E-04	
631570 Eu-157	4.07E-06	-	4.07E-06	1.63E-04	
300691 Zn- 69m	4.03E-06	-	4.03E-06	1.61E-04	
491110 In-111	3.97E-06	-	3.97E-06	1.59E-04	
310670 Ga- 67	3.97E-06	-	3.97E-06	1.59E-04	
641590 Gd-159	3.95E-06	-	3.95E-06	1.58E-04	
380920 Sr- 92	3.81E-06	-	3.81E-06	1.53E-04	
511290 Sb-129	3.65E-06	-	3.65E-06	1.46E-04	
922350 U-235	3.63E-06	-	3.63E-06	1.45E-04	
822030 Pb-203	3.59E-06	-	3.59E-06	1.44E-04	
501210 Sn-121	3.38E-06	-	3.38E-06	1.36E-04	
320710 Ge- 71	3.28E-06	-	3.28E-06	1.31E-04	
631521 Eu-152m	3.21E-06	-	3.21E-06	1.29E-04	
621560 Sm-156	3.18E-06	-	3.18E-06	1.27E-04	
681710 Er-171	3.18E-06	-	3.18E-06	1.27E-04	
741870 W-187	3.10E-06	-	3.10E-06	1.24E-04	
781910 Pt-191	3.02E-06	-	3.02E-06	1.21E-04	
340730 Se- 73	3.02E-06	-	3.02E-06	1.21E-04	
751822 Re-182a	2.95E-06	-	2.95E-06	1.18E-04	
631503 Eu-150b	2.81E-06	-	2.81E-06	1.13E-04	
521331 Te-133m	2.79E-06	-	2.79E-06	1.12E-04	
390920 Y- 92	2.65E-06	-	2.65E-06	1.06E-04	
441050 Ru-105	2.61E-06	-	2.61E-06	1.05E-04	
751870 Re-187	2.55E-06	-	2.55E-06	1.02E-04	
591450 Pr-145	2.55E-06	-	2.55E-06	1.02E-04	
471120 Ag-112	2.49E-06	-	2.49E-06	9.98E-05	
420931 Mo- 93m	2.45E-06	-	2.45E-06	9.80E-05	
230490 V- 49	2.38E-06	-	2.38E-06	9.53E-05	
521290 Te-129	2.35E-06	-	2.35E-06	9.43E-05	
761911 Os-191m	2.34E-06	-	2.34E-06	9.39E-05	
551310 Cs-131	2.34E-06	-	2.34E-06	9.37E-05	
571410 La-141	2.28E-06	-	2.28E-06	9.12E-05	
501100 Sn-110	2.27E-06	-	2.27E-06	9.10E-05	
300711 Zn- 71m	2.27E-06	-	2.27E-06	9.08E-05	
190430 K- 43	2.26E-06	-	2.26E-06	9.05E-05	
491131 In-113m	2.25E-06	-	2.25E-06	9.02E-05	
40070 Be- 7	2.13E-06	-	2.13E-06	8.52E-05	
440970 Ru- 97	2.07E-06	-	2.07E-06	8.30E-05	

SORTED BY PERCENT OF EFFECTIVE DOSE					
NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent	
350770 Br- 77	2.05E-06	-	2.05E-06	8.23E-05	
310730 Ga- 73	2.00E-06	-	2.00E-06	8.01E-05	
812000 Tl-200	1.93E-06	-	1.93E-06	7.73E-05	
190420 K- 42	1.83E-06	-	1.83E-06	7.34E-05	
611500 Pm-150	1.81E-06	-	1.81E-06	7.26E-05	
501270 Sn-127	1.79E-06	-	1.79E-06	7.16E-05	
240510 Cr- 51	1.78E-06	-	1.78E-06	7.15E-05	
290640 Cu- 64	1.76E-06	-	1.76E-06	7.05E-05	
711761 Lu-176m	1.69E-06	-	1.69E-06	6.79E-05	
250560 Mn- 56	1.67E-06	-	1.67E-06	6.69E-05	
451061 Rh-106m	1.52E-06	-	1.52E-06	6.07E-05	
491171 In-117m	1.50E-06	-	1.50E-06	6.02E-05	
571420 La-142	1.42E-06	-	1.42E-06	5.68E-05	
781970 Pt-197	1.33E-06	-	1.33E-06	5.35E-05	
481171 Cd-117m	1.32E-06	-	1.32E-06	5.30E-05	
220450 Ti- 45	1.30E-06	-	1.30E-06	5.23E-05	
330780 As- 78	1.30E-06	-	1.30E-06	5.21E-05	
320780 Ge- 78	1.27E-06	-	1.27E-06	5.10E-05	
280650 Ni- 65	1.25E-06	-	1.25E-06	5.01E-05	
601490 Nd-149	1.23E-06	-	1.23E-06	4.94E-05	
551290 Cs-129	1.23E-06	-	1.23E-06	4.91E-05	
501280 Sn-128	1.18E-06	-	1.18E-06	4.71E-05	
771904 Ir-190n	1.17E-06	-	1.17E-06	4.68E-05	
721771 Hf-177m	1.13E-06	-	1.13E-06	4.52E-05	
140310 Si- 31	1.10E-06	-	1.10E-06	4.41E-05	
350801 Br- 80m	1.09E-06	-	1.09E-06	4.35E-05	
521340 Te-134	1.02E-06	-	1.02E-06	4.08E-05	
521310 Te-131	1.00E-06	-	1.00E-06	4.03E-05	
491151 In-115m	9.99E-07	-	9.99E-07	4.01E-05	
481170 Cd-117	9.81E-07	-	9.81E-07	3.93E-05	
812010 Tl-201	9.53E-07	-	9.53E-07	3.82E-05	
822090 Pb-209	9.00E-07	-	9.00E-07	3.61E-05	
561410 Ba-141	8.45E-07	-	8.45E-07	3.39E-05	
551341 Cs-134m	8.39E-07	-	8.39E-07	3.36E-05	
661650 Dy-165	8.30E-07	-	8.30E-07	3.33E-05	
721830 Hf-183	7.36E-07	-	7.36E-07	2.95E-05	
350830 Br- 83	7.03E-07	-	7.03E-07	2.82E-05	
270610 Co- 61	6.89E-07	-	6.89E-07	2.76E-05	
531340 I-134	6.87E-07	-	6.87E-07	2.75E-05	
410970 Nb- 97	6.67E-07	-	6.67E-07	2.67E-05	
340811 Se- 81m	6.49E-07	-	6.49E-07	2.60E-05	
631580 Eu-158	6.35E-07	-	6.35E-07	2.55E-05	
511300 Sb-130	6.33E-07	-	6.33E-07	2.54E-05	
731850 Ta-185	5.97E-07	-	5.97E-07	2.39E-05	
521330 Te-133	5.75E-07	-	5.75E-07	2.30E-05	
491161 In-116m	5.68E-07	-	5.68E-07	2.28E-05	
210490 Sc- 49	5.59E-07	-	5.59E-07	2.24E-05	
491170 In-117	5.31E-07	-	5.31E-07	2.13E-05	
90180 F- 18	4.97E-07	-	4.97E-07	1.99E-05	
320750 Ge- 75	4.96E-07	-	4.96E-07	1.99E-05	
370810 Rb- 81	4.84E-07	-	4.84E-07	1.94E-05	
511310 Sb-131	4.73E-07	-	4.73E-07	1.90E-05	
882280 Ra-228	4.63E-07	-	4.63E-07	1.86E-05	
350840 Br- 84	4.63E-07	-	4.63E-07	1.85E-05	
561420 Ba-142	4.40E-07	-	4.40E-07	1.76E-05	
300630 Zn- 63	4.39E-07	-	4.39E-07	1.76E-05	
661570 Dy-157	4.32E-07	-	4.32E-07	1.73E-05	
250521 Mn- 52m	4.24E-07	-	4.24E-07	1.70E-05	
240490 Cr- 49	4.24E-07	-	4.24E-07	1.70E-05	
300690 Zn- 69	4.10E-07	-	4.10E-07	1.64E-05	
801991 Hg-199m	3.88E-07	-	3.88E-07	1.55E-05	
380871 Sr- 87m	3.80E-07	-	3.80E-07	1.52E-05	
170390 Cl- 39	3.60E-07	-	3.60E-07	1.44E-05	
340830 Se- 83	3.48E-07	-	3.48E-07	1.39E-05	
711781 Lu-178m	3.41E-07	-	3.41E-07	1.37E-05	
390940 Y- 94	3.37E-07	-	3.37E-07	1.35E-05	
170380 Cl- 38	3.28E-07	-	3.28E-07	1.31E-05	
501231 Sn-123m	3.24E-07	-	3.24E-07	1.30E-05	
781971 Pt-197m	3.23E-07	-	3.23E-07	1.29E-05	



SORTED BY PERCENT OF EFFECTIVE DOSE					
NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent	
431040 Tc-104	2.91E-07	-	2.91E-07	1.16E-05	
471150 Ag-115	2.88E-07	-	2.88E-07	1.15E-05	
430991 Tc- 99m	2.87E-07	-	2.87E-07	1.15E-05	
711780 Lu-178	2.87E-07	-	2.87E-07	1.15E-05	
390950 Y- 95	2.52E-07	-	2.52E-07	1.01E-05	
270581 Co- 58m	2.47E-07	-	2.47E-07	9.90E-06	
912340 Pa-234	2.40E-07	-	2.40E-07	9.62E-06	
571430 La-143	2.40E-07	-	2.40E-07	9.62E-06	
511170 Sb-117	2.37E-07	-	2.37E-07	9.51E-06	
421010 Mo-101	2.21E-07	-	2.21E-07	8.88E-06	
340810 Se- 81	2.20E-07	-	2.20E-07	8.81E-06	
511281 Sb-128m	2.11E-07	-	2.11E-07	8.46E-06	
551351 Cs-135m	2.01E-07	-	2.01E-07	8.07E-06	
491191 In-119m	1.85E-07	-	1.85E-07	7.42E-06	
731821 Ta-182m	1.85E-07	-	1.85E-07	7.40E-06	
621550 Sm-155	1.80E-07	-	1.80E-07	7.23E-06	
451031 Rh-103m	1.77E-07	-	1.77E-07	7.08E-06	
451070 Rh-107	1.75E-07	-	1.75E-07	7.01E-06	
270621 Co- 62m	1.72E-07	-	1.72E-07	6.89E-06	
471060 Ag-106	1.67E-07	-	1.67E-07	6.70E-06	
310700 Ga- 70	1.60E-07	-	1.60E-07	6.41E-06	
431010 Tc-101	1.57E-07	-	1.57E-07	6.30E-06	
591470 Pr-147	1.56E-07	-	1.56E-07	6.26E-06	
631490 Eu-149	1.49E-07	-	1.49E-07	5.97E-06	
671641 Ho-164m	1.42E-07	-	1.42E-07	5.68E-06	
531280 I-128	1.38E-07	-	1.38E-07	5.52E-06	
390911 Y- 91m	1.37E-07	-	1.37E-07	5.49E-06	
350800 Br- 80	1.37E-07	-	1.37E-07	5.49E-06	
601510 Nd-151	1.34E-07	-	1.34E-07	5.36E-06	
771901 Ir-190m	1.32E-07	-	1.32E-07	5.28E-06	
751881 Re-188m	1.23E-07	-	1.23E-07	4.94E-06	
731860 Ta-186	1.22E-07	-	1.22E-07	4.89E-06	
671640 Ho-164	1.20E-07	-	1.20E-07	4.81E-06	
430961 Tc- 96m	9.39E-08	-	9.39E-08	3.76E-06	
761891 Os-189m	7.64E-08	-	7.64E-08	3.06E-06	
491101 In-110m	7.49E-08	-	7.49E-08	3.00E-06	
270601 Co- 60m	7.07E-08	-	7.07E-08	2.83E-06	
601410 Nd-141	6.94E-08	-	6.94E-08	2.78E-06	
380851 Sr- 85m	5.59E-08	-	5.59E-08	2.24E-06	
741790 W-179	1.08E-08	-	1.08E-08	4.34E-07	
902310 Th-231	2.51E-10	-	2.51E-10	1.00E-08	
892280 Ac-228	2.39E-10	-	2.39E-10	9.59E-09	
922340 U-234	3.85E-11	-	3.85E-11	1.54E-09	
912310 Pa-231	3.52E-12	-	3.52E-12	1.41E-10	
410980 Nb- 98	1.11E-12	-	1.11E-12	4.44E-11	
882260 Ra-226	7.15E-16	-	7.15E-16	2.87E-14	
902300 Th-230	9.00E-17	-	9.00E-17	3.61E-15	
TOTALS	2.50E+00	-	2.50E+00	1.00E+02	

## SUM OF CONTRIBUTIONS TO THE EFFECTIVE DOSE (rem)

DOWNWIND DISTANCE = 5.00E+02 (m)

SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
531290 I-129	4.23E-02	-	4.23E-02	2.60E+01
170360 Cl- 36	3.14E-02	-	3.14E-02	1.93E+01
621460 Sm-146	1.11E-02	-	1.11E-02	6.80E+00
641480 Gd-148	1.11E-02	-	1.11E-02	6.79E+00
822100 Pb-210	1.06E-02	-	1.06E-02	6.50E+00
621470 Sm-147	9.68E-03	-	9.68E-03	5.95E+00
641520 Gd-152	8.04E-03	-	8.04E-03	4.94E+00
10030 H- 3	5.72E-03	-	5.72E-03	3.51E+00
801940 Hg-194	4.21E-03	-	4.21E-03	2.58E+00
531250 I-125	4.19E-03	-	4.19E-03	2.57E+00
571370 La-137	3.46E-03	-	3.46E-03	2.13E+00
832101 Bi-210m	3.39E-03	-	3.39E-03	2.08E+00
942390 Pu-239	2.10E-03	-	2.10E-03	1.29E+00
260600 Fe- 60	2.03E-03	-	2.03E-03	1.25E+00
531260 I-126	1.36E-03	-	1.36E-03	8.37E-01
551370 Cs-137	8.99E-04	-	8.99E-04	5.52E-01
842100 Po-210	8.89E-04	-	8.89E-04	5.46E-01
531310 I-131	7.25E-04	-	7.25E-04	4.45E-01
380900 Sr- 90	5.78E-04	-	5.78E-04	3.55E-01
761940 Os-194	5.21E-04	-	5.21E-04	3.20E-01
491150 In-115	4.90E-04	-	4.90E-04	3.01E-01
481130 Cd-113	4.81E-04	-	4.81E-04	2.95E-01
430980 Tc- 98	4.38E-04	-	4.38E-04	2.69E-01
320680 Ge- 68	4.25E-04	-	4.25E-04	2.61E-01
551340 Cs-134	4.00E-04	-	4.00E-04	2.46E-01
481131 Cd-113m	3.97E-04	-	3.97E-04	2.44E-01
190400 K- 40	3.67E-04	-	3.67E-04	2.26E-01
220440 Ti- 44	3.04E-04	-	3.04E-04	1.86E-01
410940 Nb- 94	2.91E-04	-	2.91E-04	1.79E-01
531240 I-124	2.37E-04	-	2.37E-04	1.46E-01
501260 Sn-126	2.35E-04	-	2.35E-04	1.44E-01
791940 Au-194	2.29E-04	-	2.29E-04	1.41E-01
110220 Na- 22	2.28E-04	-	2.28E-04	1.40E-01
300650 Zn- 65	2.09E-04	-	2.09E-04	1.28E-01
822120 Pb-212	2.08E-04	-	2.08E-04	1.28E-01
721781 Hf-178m	1.50E-04	-	1.50E-04	9.19E-02
922380 U-238	1.47E-04	-	1.47E-04	9.03E-02
721820 Hf-182	1.47E-04	-	1.47E-04	9.03E-02
430990 Tc- 99	1.39E-04	-	1.39E-04	8.53E-02
471081 Ag-108m	1.38E-04	-	1.38E-04	8.48E-02
671661 Ho-166m	1.33E-04	-	1.33E-04	8.19E-02
832100 Bi-210	9.91E-05	-	9.91E-05	6.09E-02
270600 Co- 60	9.25E-05	-	9.25E-05	5.68E-02
471101 Ag-110m	8.64E-05	-	8.64E-05	5.31E-02
751861 Re-186m	8.12E-05	-	8.12E-05	4.99E-02
822020 Pb-202	7.89E-05	-	7.89E-05	4.84E-02
711760 Lu-176	7.00E-05	-	7.00E-05	4.30E-02
571380 La-138	6.94E-05	-	6.94E-05	4.26E-02
631540 Eu-154	6.90E-05	-	6.90E-05	4.24E-02
581440 Ce-144	6.48E-05	-	6.48E-05	3.98E-02
340790 Se- 79	6.32E-05	-	6.32E-05	3.88E-02
631500 Eu-150	6.29E-05	-	6.29E-05	3.86E-02
501230 Sn-123	6.20E-05	-	6.20E-05	3.81E-02
451020 Rh-102	5.79E-05	-	5.79E-05	3.55E-02
651580 Tb-158	5.41E-05	-	5.41E-05	3.32E-02
631520 Eu-152	5.31E-05	-	5.31E-05	3.26E-02
761850 Os-185	4.78E-05	-	4.78E-05	2.93E-02
420930 Mo- 93	4.71E-05	-	4.71E-05	2.89E-02
130260 Al- 26	4.65E-05	-	4.65E-05	2.85E-02
40100 Be- 10	4.17E-05	-	4.17E-05	2.56E-02
771921 Ir-192m	4.00E-05	-	4.00E-05	2.46E-02
410950 Nb- 95	3.74E-05	-	3.74E-05	2.30E-02
751860 Re-186	3.56E-05	-	3.56E-05	2.19E-02
802030 Hg-203	3.54E-05	-	3.54E-05	2.17E-02
812040 Tl-204	3.11E-05	-	3.11E-05	1.91E-02
441060 Ru-106	3.11E-05	-	3.11E-05	1.91E-02
832120 Bi-212	3.10E-05	-	3.10E-05	1.90E-02

DOWNWIND DISTANCE = 5.00E+02 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE  
 NUCLIDE INTERNAL EXTERNAL

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
340750 Se- 75	3.08E-05	-	3.08E-05	1.89E-02
451021 Rh-102m	3.06E-05	-	3.06E-05	1.88E-02
270560 Co- 56	2.85E-05	-	2.85E-05	1.75E-02
521211 Te-121m	2.68E-05	-	2.68E-05	1.65E-02
711771 Lu-177m	2.63E-05	-	2.63E-05	1.61E-02
370830 Rb- 83	2.61E-05	-	2.61E-05	1.61E-02
521230 Te-123	2.52E-05	-	2.52E-05	1.55E-02
771941 Ir-194m	2.44E-05	-	2.44E-05	1.50E-02
611460 Pm-146	2.44E-05	-	2.44E-05	1.50E-02
481090 Cd-109	2.41E-05	-	2.41E-05	1.48E-02
741880 W-188	2.39E-05	-	2.39E-05	1.47E-02
521271 Te-127m	2.30E-05	-	2.30E-05	1.41E-02
832130 Bi-213	2.18E-05	-	2.18E-05	1.34E-02
491141 In-114m	2.13E-05	-	2.13E-05	1.31E-02
561330 Ba-133	2.11E-05	-	2.11E-05	1.30E-02
501211 Sn-121m	2.10E-05	-	2.10E-05	1.29E-02
551350 Cs-135	2.05E-05	-	2.05E-05	1.26E-02
751841 Re-184m	2.05E-05	-	2.05E-05	1.26E-02
390900 Y- 90	2.04E-05	-	2.04E-05	1.25E-02
501130 Sn-113	2.04E-05	-	2.04E-05	1.25E-02
511250 Sb-125	1.97E-05	-	1.97E-05	1.21E-02
410931 Nb- 93m	1.89E-05	-	1.89E-05	1.16E-02
771920 Ir-192	1.75E-05	-	1.75E-05	1.08E-02
380820 Sr- 82	1.73E-05	-	1.73E-05	1.06E-02
370840 Rb- 84	1.69E-05	-	1.69E-05	1.04E-02
511240 Sb-124	1.69E-05	-	1.69E-05	1.04E-02
210460 Sc- 46	1.68E-05	-	1.68E-05	1.03E-02
60140 C- 14	1.68E-05	-	1.68E-05	1.03E-02
390910 Y- 91	1.64E-05	-	1.64E-05	1.00E-02
451010 Rh-101	1.62E-05	-	1.62E-05	9.96E-03
832070 Bi-207	1.55E-05	-	1.55E-05	9.52E-03
481151 Cd-115m	1.51E-05	-	1.51E-05	9.29E-03
370870 Rb- 87	1.50E-05	-	1.50E-05	9.24E-03
902320 Th-232	1.50E-05	-	1.50E-05	9.20E-03
611440 Pm-144	1.48E-05	-	1.48E-05	9.10E-03
521231 Te-123m	1.46E-05	-	1.46E-05	8.98E-03
200450 Ca- 45	1.45E-05	-	1.45E-05	8.92E-03
691700 Tm-170	1.44E-05	-	1.44E-05	8.87E-03
430970 Tc- 97	1.43E-05	-	1.43E-05	8.75E-03
651600 Tb-160	1.38E-05	-	1.38E-05	8.49E-03
501191 Sn-119m	1.38E-05	-	1.38E-05	8.46E-03
511260 Sb-126	1.35E-05	-	1.35E-05	8.31E-03
400930 Zr- 93	1.34E-05	-	1.34E-05	8.24E-03
200410 Ca- 41	1.29E-05	-	1.29E-05	7.92E-03
521291 Te-129m	1.27E-05	-	1.27E-05	7.81E-03
380890 Sr- 89	1.26E-05	-	1.26E-05	7.77E-03
731820 Ta-182	1.23E-05	-	1.23E-05	7.57E-03
150320 P- 32	1.22E-05	-	1.22E-05	7.49E-03
430971 Tc- 97m	1.21E-05	-	1.21E-05	7.44E-03
390880 Y- 88	1.19E-05	-	1.19E-05	7.32E-03
260590 Fe- 59	1.06E-05	-	1.06E-05	6.49E-03
751840 Re-184	1.05E-05	-	1.05E-05	6.47E-03
611481 Pm-148m	1.03E-05	-	1.03E-05	6.36E-03
400950 Zr- 95	9.70E-06	-	9.70E-06	5.96E-03
771940 Ir-194	9.60E-06	-	9.60E-06	5.90E-03
631550 Eu-155	9.47E-06	-	9.47E-06	5.81E-03
370860 Rb- 86	9.14E-06	-	9.14E-06	5.61E-03
822140 Pb-214	8.97E-06	-	8.97E-06	5.51E-03
551380 Cs-138	8.40E-06	-	8.40E-06	5.16E-03
822110 Pb-211	8.11E-06	-	8.11E-06	4.98E-03
270580 Co- 58	8.00E-06	-	8.00E-06	4.92E-03
551360 Cs-136	7.76E-06	-	7.76E-06	4.77E-03
721810 Hf-181	7.61E-06	-	7.61E-06	4.68E-03
370880 Rb- 88	7.54E-06	-	7.54E-06	4.63E-03
761910 Os-191	7.51E-06	-	7.51E-06	4.61E-03
711741 Lu-174m	7.30E-06	-	7.30E-06	4.48E-03
631480 Eu-148	7.28E-06	-	7.28E-06	4.47E-03

DOWNWIND DISTANCE = 5.00E+02 (m)

SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
561400 Ba-140	7.26E-06	-	7.26E-06	4.46E-03
832140 Bi-214	7.10E-06	-	7.10E-06	4.36E-03
611470 Pm-147	6.96E-06	-	6.96E-06	4.27E-03
501250 Sn-125	6.87E-06	-	6.87E-06	4.22E-03
812020 Tl-202	6.81E-06	-	6.81E-06	4.18E-03
711740 Lu-174	6.40E-06	-	6.40E-06	3.93E-03
250540 Mn- 54	6.08E-06	-	6.08E-06	3.73E-03
521251 Te-125m	6.04E-06	-	6.04E-06	3.71E-03
611480 Pm-148	5.87E-06	-	5.87E-06	3.61E-03
751880 Re-188	5.74E-06	-	5.74E-06	3.53E-03
400880 Zr- 88	5.72E-06	-	5.72E-06	3.52E-03
260550 Fe- 55	5.68E-06	-	5.68E-06	3.49E-03
521320 Te-132	5.52E-06	-	5.52E-06	3.39E-03
721791 Hf-179m	5.36E-06	-	5.36E-06	3.29E-03
741850 W-185	5.31E-06	-	5.31E-06	3.26E-03
160350 S- 35	5.24E-06	-	5.24E-06	3.22E-03
631560 Eu-156	5.06E-06	-	5.06E-06	3.11E-03
621510 Sm-151	4.75E-06	-	4.75E-06	2.92E-03
581410 Ce-141	4.43E-06	-	4.43E-06	2.72E-03
701690 Yb-169	4.38E-06	-	4.38E-06	2.69E-03
471061 Ag-106m	4.19E-06	-	4.19E-06	2.57E-03
471110 Ag-111	4.14E-06	-	4.14E-06	2.55E-03
270570 Co- 57	4.01E-06	-	4.01E-06	2.46E-03
501171 Sn-117m	3.96E-06	-	3.96E-06	2.44E-03
230480 V- 48	3.94E-06	-	3.94E-06	2.42E-03
531330 I-133	3.89E-06	-	3.89E-06	2.39E-03
641530 Gd-153	3.85E-06	-	3.85E-06	2.37E-03
791950 Au-195	3.61E-06	-	3.61E-06	2.22E-03
521210 Te-121	3.58E-06	-	3.58E-06	2.20E-03
150330 P- 33	3.25E-06	-	3.25E-06	2.00E-03
330740 As- 74	3.24E-06	-	3.24E-06	1.99E-03
611450 Pm-145	3.21E-06	-	3.21E-06	1.97E-03
280630 Ni- 63	3.21E-06	-	3.21E-06	1.97E-03
200470 Ca- 47	3.16E-06	-	3.16E-06	1.94E-03
711770 Lu-177	3.13E-06	-	3.13E-06	1.92E-03
591430 Pr-143	3.07E-06	-	3.07E-06	1.88E-03
611430 Pm-143	3.06E-06	-	3.06E-06	1.88E-03
822050 Pb-205	2.96E-06	-	2.96E-06	1.82E-03
771900 Ir-190	2.96E-06	-	2.96E-06	1.82E-03
601470 Nd-147	2.84E-06	-	2.84E-06	1.74E-03
721750 Hf-175	2.69E-06	-	2.69E-06	1.65E-03
210440 Sc- 44	2.68E-06	-	2.68E-06	1.64E-03
581390 Ce-139	2.42E-06	-	2.42E-06	1.49E-03
731830 Ta-183	2.33E-06	-	2.33E-06	1.43E-03
531320 I-132	2.31E-06	-	2.31E-06	1.42E-03
521311 Te-131m	2.29E-06	-	2.29E-06	1.41E-03
691710 Tm-171	2.25E-06	-	2.25E-06	1.38E-03
832060 Bi-206	2.23E-06	-	2.23E-06	1.37E-03
571400 La-140	2.23E-06	-	2.23E-06	1.37E-03
511270 Sb-127	2.15E-06	-	2.15E-06	1.32E-03
661660 Dy-166	2.08E-06	-	2.08E-06	1.28E-03
330730 As- 73	2.08E-06	-	2.08E-06	1.28E-03
791981 Au-198m	2.05E-06	-	2.05E-06	1.26E-03
380850 Sr- 85	1.98E-06	-	1.98E-06	1.22E-03
250520 Mn- 52	1.85E-06	-	1.85E-06	1.13E-03
441030 Ru-103	1.77E-06	-	1.77E-06	1.09E-03
350820 Br- 82	1.71E-06	-	1.71E-06	1.05E-03
531230 I-123	1.65E-06	-	1.65E-06	1.01E-03
210441 Sc- 44m	1.62E-06	-	1.62E-06	9.92E-04
300720 Zn- 72	1.60E-06	-	1.60E-06	9.82E-04
651610 Tb-161	1.48E-06	-	1.48E-06	9.11E-04
370890 Rb- 89	1.47E-06	-	1.47E-06	9.03E-04
651570 Tb-157	1.46E-06	-	1.46E-06	8.96E-04
461070 Pd-107	1.46E-06	-	1.46E-06	8.96E-04
430960 Tc- 96	1.44E-06	-	1.44E-06	8.85E-04
410951 Nb- 95m	1.43E-06	-	1.43E-06	8.79E-04
511203 Sb-120b	1.38E-06	-	1.38E-06	8.49E-04

DOWNWIND DISTANCE = 5.00E+02 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE  
 NUCLIDE INTERNAL EXTERNAL

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
751823 Re-182b	1.38E-06	-	1.38E-06	8.49E-04
390901 Y- 90m	1.29E-06	-	1.29E-06	7.91E-04
511220 Sb-122	1.28E-06	-	1.28E-06	7.84E-04
280560 Ni- 56	1.27E-06	-	1.27E-06	7.80E-04
280590 Ni- 59	1.25E-06	-	1.25E-06	7.70E-04
741810 W-181	1.24E-06	-	1.24E-06	7.59E-04
120280 Mg- 28	1.23E-06	-	1.23E-06	7.56E-04
210480 Sc- 48	1.19E-06	-	1.19E-06	7.30E-04
681690 Er-169	1.12E-06	-	1.12E-06	6.91E-04
561310 Ba-131	1.08E-06	-	1.08E-06	6.64E-04
420990 Mo- 99	1.05E-06	-	1.05E-06	6.46E-04
661590 Dy-159	1.00E-06	-	1.00E-06	6.15E-04
731790 Ta-179	9.70E-07	-	9.70E-07	5.96E-04
791980 Au-198	9.69E-07	-	9.69E-07	5.95E-04
330720 As- 72	9.28E-07	-	9.28E-07	5.70E-04
641490 Gd-149	8.97E-07	-	8.97E-07	5.51E-04
461030 Pd-103	8.85E-07	-	8.85E-07	5.44E-04
531300 I-130	8.69E-07	-	8.69E-07	5.34E-04
671660 Ho-166	8.58E-07	-	8.58E-07	5.27E-04
521270 Te-127	8.48E-07	-	8.48E-07	5.21E-04
400970 Zr- 97	8.47E-07	-	8.47E-07	5.20E-04
210470 Sc- 47	8.35E-07	-	8.35E-07	5.13E-04
791990 Au-199	8.24E-07	-	8.24E-07	5.06E-04
611490 Pm-149	8.03E-07	-	8.03E-07	4.93E-04
581430 Ce-143	7.97E-07	-	7.97E-07	4.90E-04
701750 Yb-175	7.89E-07	-	7.89E-07	4.85E-04
410960 Nb- 96	7.23E-07	-	7.23E-07	4.44E-04
551320 Cs-132	7.13E-07	-	7.13E-07	4.38E-04
330760 As- 76	7.06E-07	-	7.06E-07	4.34E-04
621530 Sm-153	6.68E-07	-	6.68E-07	4.10E-04
400890 Zr- 89	6.52E-07	-	6.52E-07	4.00E-04
290670 Cu- 67	6.39E-07	-	6.39E-07	3.92E-04
310680 Ga- 68	6.23E-07	-	6.23E-07	3.83E-04
310720 Ga- 72	6.06E-07	-	6.06E-07	3.72E-04
280570 Ni- 57	5.68E-07	-	5.68E-07	3.49E-04
761930 Os-193	5.66E-07	-	5.66E-07	3.47E-04
591420 Pr-142	5.23E-07	-	5.23E-07	3.21E-04
300620 Zn- 62	5.23E-07	-	5.23E-07	3.21E-04
781930 Pt-193	5.20E-07	-	5.20E-07	3.20E-04
801971 Hg-197m	5.17E-07	-	5.17E-07	3.18E-04
481150 Cd-115	5.07E-07	-	5.07E-07	3.11E-04
320690 Ge- 69	5.00E-07	-	5.00E-07	3.07E-04
380910 Sr- 91	4.82E-07	-	4.82E-07	2.96E-04
561331 Ba-133m	4.79E-07	-	4.79E-07	2.94E-04
390870 Y- 87	4.61E-07	-	4.61E-07	2.83E-04
390860 Y- 86	4.52E-07	-	4.52E-07	2.77E-04
751890 Re-189	4.42E-07	-	4.42E-07	2.72E-04
611510 Pm-151	4.41E-07	-	4.41E-07	2.71E-04
781951 Pt-195m	4.32E-07	-	4.32E-07	2.65E-04
731801 Ta-180m	4.30E-07	-	4.30E-07	2.64E-04
400860 Zr- 86	4.23E-07	-	4.23E-07	2.60E-04
310660 Ga- 66	4.14E-07	-	4.14E-07	2.54E-04
390930 Y- 93	4.11E-07	-	4.11E-07	2.52E-04
731840 Ta-184	4.03E-07	-	4.03E-07	2.48E-04
330770 As- 77	4.03E-07	-	4.03E-07	2.48E-04
511280 Sb-128	3.97E-07	-	3.97E-07	2.44E-04
451050 Rh-105	3.75E-07	-	3.75E-07	2.30E-04
60110 C- 11	3.73E-07	-	3.73E-07	2.29E-04
260520 Fe- 52	3.70E-07	-	3.70E-07	2.27E-04
561351 Ba-135m	3.64E-07	-	3.64E-07	2.23E-04
320770 Ge- 77	3.60E-07	-	3.60E-07	2.21E-04
461090 Pd-109	3.58E-07	-	3.58E-07	2.20E-04
591440 Pr-144	3.58E-07	-	3.58E-07	2.20E-04
561390 Ba-139	3.54E-07	-	3.54E-07	2.17E-04
451011 Rh-101m	3.51E-07	-	3.51E-07	2.16E-04
250530 Mn- 53	3.35E-07	-	3.35E-07	2.06E-04
801970 Hg-197	3.16E-07	-	3.16E-07	1.94E-04



DOWNWIND DISTANCE = 5.00E+02 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE  
 NUCLIDE INTERNAL EXTERNAL

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
781931 Pt-193m	3.15E-07	-	3.15E-07	1.93E-04
511261 Sb-126m	3.07E-07	-	3.07E-07	1.89E-04
531350 I-135	3.03E-07	-	3.03E-07	1.86E-04
110240 Na- 24	2.81E-07	-	2.81E-07	1.73E-04
631570 Eu-157	2.65E-07	-	2.65E-07	1.63E-04
300691 Zn- 69m	2.63E-07	-	2.63E-07	1.61E-04
310670 Ga- 67	2.60E-07	-	2.60E-07	1.60E-04
491110 In-111	2.60E-07	-	2.60E-07	1.60E-04
641590 Gd-159	2.59E-07	-	2.59E-07	1.59E-04
380920 Sr- 92	2.43E-07	-	2.43E-07	1.49E-04
922350 U-235	2.38E-07	-	2.38E-07	1.46E-04
511290 Sb-129	2.36E-07	-	2.36E-07	1.45E-04
822030 Pb-203	2.35E-07	-	2.35E-07	1.45E-04
501210 Sn-121	2.21E-07	-	2.21E-07	1.36E-04
320710 Ge- 71	2.15E-07	-	2.15E-07	1.32E-04
631521 Eu-152m	2.09E-07	-	2.09E-07	1.28E-04
621560 Sm-156	2.07E-07	-	2.07E-07	1.27E-04
681710 Er-171	2.06E-07	-	2.06E-07	1.27E-04
741870 W-187	2.03E-07	-	2.03E-07	1.25E-04
781910 Pt-191	1.98E-07	-	1.98E-07	1.22E-04
340730 Se- 73	1.96E-07	-	1.96E-07	1.20E-04
751822 Re-182a	1.92E-07	-	1.92E-07	1.18E-04
631503 Eu-150b	1.83E-07	-	1.83E-07	1.13E-04
390920 Y- 92	1.74E-07	-	1.74E-07	1.07E-04
441050 Ru-105	1.69E-07	-	1.69E-07	1.04E-04
521331 Te-133m	1.68E-07	-	1.68E-07	1.03E-04
751870 Re-187	1.68E-07	-	1.68E-07	1.03E-04
591450 Pr-145	1.66E-07	-	1.66E-07	1.02E-04
471120 Ag-112	1.63E-07	-	1.63E-07	1.00E-04
420931 Mo- 93m	1.59E-07	-	1.59E-07	9.74E-05
521290 Te-129	1.58E-07	-	1.58E-07	9.69E-05
230490 V- 49	1.56E-07	-	1.56E-07	9.58E-05
551310 Cs-131	1.53E-07	-	1.53E-07	9.42E-05
761911 Os-191m	1.53E-07	-	1.53E-07	9.38E-05
571410 La-141	1.51E-07	-	1.51E-07	9.25E-05
491131 In-113m	1.48E-07	-	1.48E-07	9.07E-05
190430 K- 43	1.48E-07	-	1.48E-07	9.06E-05
501100 Sn-110	1.46E-07	-	1.46E-07	8.98E-05
300711 Zn- 71m	1.46E-07	-	1.46E-07	8.96E-05
40070 Be- 7	1.40E-07	-	1.40E-07	8.57E-05
440970 Ru- 97	1.36E-07	-	1.36E-07	8.33E-05
350770 Br- 77	1.34E-07	-	1.34E-07	8.26E-05
310730 Ga- 73	1.29E-07	-	1.29E-07	7.93E-05
812000 Tl-200	1.26E-07	-	1.26E-07	7.75E-05
190420 K- 42	1.19E-07	-	1.19E-07	7.33E-05
240510 Cr- 51	1.17E-07	-	1.17E-07	7.18E-05
611500 Pm-150	1.15E-07	-	1.15E-07	7.09E-05
290640 Cu- 64	1.15E-07	-	1.15E-07	7.05E-05
501270 Sn-127	1.13E-07	-	1.13E-07	6.94E-05
711761 Lu-176m	1.09E-07	-	1.09E-07	6.69E-05
250560 Mn- 56	1.06E-07	-	1.06E-07	6.53E-05
491171 In-117m	9.85E-08	-	9.85E-08	6.05E-05
451061 Rh-106m	9.60E-08	-	9.60E-08	5.89E-05
571420 La-142	9.31E-08	-	9.31E-08	5.72E-05
781970 Pt-197	8.74E-08	-	8.74E-08	5.37E-05
481171 Cd-117m	8.49E-08	-	8.49E-08	5.21E-05
330780 As- 78	8.48E-08	-	8.48E-08	5.21E-05
220450 Ti- 45	8.35E-08	-	8.35E-08	5.13E-05
551290 Cs-129	8.02E-08	-	8.02E-08	4.93E-05
280650 Ni- 65	7.95E-08	-	7.95E-08	4.89E-05
320780 Ge- 78	7.91E-08	-	7.91E-08	4.86E-05
601490 Nd-149	7.74E-08	-	7.74E-08	4.76E-05
771904 Ir-190n	7.48E-08	-	7.48E-08	4.59E-05
501280 Sn-128	7.13E-08	-	7.13E-08	4.38E-05
140310 Si- 31	7.00E-08	-	7.00E-08	4.30E-05
350801 Br- 80m	7.00E-08	-	7.00E-08	4.30E-05
721771 Hf-177m	6.76E-08	-	6.76E-08	4.15E-05

DOWNWIND DISTANCE = 5.00E+02 (m)

SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
491151 In-115m	6.56E-08	-	6.56E-08	4.03E-05
481170 Cd-117	6.42E-08	-	6.42E-08	3.95E-05
521310 Te-131	6.40E-08	-	6.40E-08	3.93E-05
812010 Tl-201	6.25E-08	-	6.25E-08	3.84E-05
521340 Te-134	5.99E-08	-	5.99E-08	3.68E-05
822090 Pb-209	5.88E-08	-	5.88E-08	3.61E-05
551341 Cs-134m	5.36E-08	-	5.36E-08	3.29E-05
661650 Dy-165	5.27E-08	-	5.27E-08	3.24E-05
350830 Br- 83	4.56E-08	-	4.56E-08	2.80E-05
721830 Hf-183	4.49E-08	-	4.49E-08	2.76E-05
531340 I-134	4.43E-08	-	4.43E-08	2.72E-05
410970 Nb- 97	4.37E-08	-	4.37E-08	2.68E-05
270610 Co- 61	4.31E-08	-	4.31E-08	2.65E-05
561410 Ba-141	4.30E-08	-	4.30E-08	2.64E-05
340811 Se- 81m	3.93E-08	-	3.93E-08	2.41E-05
631580 Eu-158	3.83E-08	-	3.83E-08	2.36E-05
511300 Sb-130	3.69E-08	-	3.69E-08	2.27E-05
731850 Ta-185	3.57E-08	-	3.57E-08	2.19E-05
491170 In-117	3.48E-08	-	3.48E-08	2.14E-05
210490 Sc- 49	3.47E-08	-	3.47E-08	2.13E-05
491161 In-116m	3.42E-08	-	3.42E-08	2.10E-05
370810 Rb- 81	3.12E-08	-	3.12E-08	1.92E-05
320750 Ge- 75	3.08E-08	-	3.08E-08	1.89E-05
882280 Ra-228	3.04E-08	-	3.04E-08	1.87E-05
90180 F- 18	3.04E-08	-	3.04E-08	1.87E-05
521330 Te-133	2.81E-08	-	2.81E-08	1.73E-05
661570 Dy-157	2.81E-08	-	2.81E-08	1.73E-05
250521 Mn- 52m	2.77E-08	-	2.77E-08	1.70E-05
300690 Zn- 69	2.69E-08	-	2.69E-08	1.65E-05
350840 Br- 84	2.64E-08	-	2.64E-08	1.62E-05
300630 Zn- 63	2.56E-08	-	2.56E-08	1.57E-05
511310 Sb-131	2.54E-08	-	2.54E-08	1.56E-05
380871 Sr- 87m	2.49E-08	-	2.49E-08	1.53E-05
240490 Cr- 49	2.49E-08	-	2.49E-08	1.53E-05
801991 Hg-199m	2.28E-08	-	2.28E-08	1.40E-05
170390 Cl- 39	2.12E-08	-	2.12E-08	1.30E-05
781971 Pt-197m	2.02E-08	-	2.02E-08	1.24E-05
501231 Sn-123m	1.90E-08	-	1.90E-08	1.16E-05
561420 Ba-142	1.87E-08	-	1.87E-08	1.15E-05
430991 Tc- 99m	1.86E-08	-	1.86E-08	1.14E-05
340830 Se- 83	1.86E-08	-	1.86E-08	1.14E-05
170380 Cl- 38	1.85E-08	-	1.85E-08	1.14E-05
711781 Lu-178m	1.83E-08	-	1.83E-08	1.12E-05
390940 Y- 94	1.73E-08	-	1.73E-08	1.06E-05
270581 Co- 58m	1.61E-08	-	1.61E-08	9.87E-06
711780 Lu-178	1.60E-08	-	1.60E-08	9.81E-06
912340 Pa-234	1.58E-08	-	1.58E-08	9.72E-06
511170 Sb-117	1.52E-08	-	1.52E-08	9.31E-06
471150 Ag-115	1.50E-08	-	1.50E-08	9.21E-06
431040 Tc-104	1.48E-08	-	1.48E-08	9.09E-06
340810 Se- 81	1.39E-08	-	1.39E-08	8.53E-06
511281 Sb-128m	1.32E-08	-	1.32E-08	8.11E-06
451031 Rh-103m	1.21E-08	-	1.21E-08	7.44E-06
551351 Cs-135m	1.21E-08	-	1.21E-08	7.43E-06
571430 La-143	1.14E-08	-	1.14E-08	6.98E-06
421010 Mo-101	1.06E-08	-	1.06E-08	6.50E-06
390950 Y- 95	1.05E-08	-	1.05E-08	6.48E-06
631490 Eu-149	9.79E-09	-	9.79E-09	6.01E-06
621550 Sm-155	9.62E-09	-	9.62E-09	5.91E-06
491191 In-119m	9.48E-09	-	9.48E-09	5.83E-06
451070 Rh-107	9.28E-09	-	9.28E-09	5.70E-06
471060 Ag-106	9.05E-09	-	9.05E-09	5.56E-06
731821 Ta-182m	9.05E-09	-	9.05E-09	5.56E-06
431010 Tc-101	9.03E-09	-	9.03E-09	5.55E-06
350800 Br- 80	8.91E-09	-	8.91E-09	5.48E-06
310700 Ga- 70	8.43E-09	-	8.43E-09	5.18E-06
671641 Ho-164m	8.22E-09	-	8.22E-09	5.05E-06

DOWNWIND DISTANCE = 5.00E+02 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
390911 Y- 91m	8.19E-09	-	8.19E-09	5.03E-06
771901 Ir-190m	8.13E-09	-	8.13E-09	4.99E-06
270621 Co- 62m	8.09E-09	-	8.09E-09	4.97E-06
671640 Ho-164	7.61E-09	-	7.61E-09	4.67E-06
531280 I-128	7.51E-09	-	7.51E-09	4.61E-06
491101 In-110m	7.40E-09	-	7.40E-09	4.54E-06
591470 Pr-147	7.25E-09	-	7.25E-09	4.46E-06
751881 Re-188m	6.31E-09	-	6.31E-09	3.87E-06
601510 Nd-151	6.05E-09	-	6.05E-09	3.72E-06
430961 Tc- 96m	5.63E-09	-	5.63E-09	3.46E-06
731860 Ta-186	5.16E-09	-	5.16E-09	3.17E-06
761891 Os-189m	4.96E-09	-	4.96E-09	3.05E-06
270601 Co- 60m	4.64E-09	-	4.64E-09	2.85E-06
601410 Nd-141	4.41E-09	-	4.41E-09	2.71E-06
380851 Sr- 85m	3.42E-09	-	3.42E-09	2.10E-06
741790 W-179	6.27E-10	-	6.27E-10	3.85E-07
902310 Th-231	1.65E-11	-	1.65E-11	1.01E-08
892280 Ac-228	1.57E-11	-	1.57E-11	9.64E-09
922340 U-234	2.53E-12	-	2.53E-12	1.55E-09
912310 Pa-231	2.31E-13	-	2.31E-13	1.42E-10
882260 Ra-226	4.81E-17	-	4.81E-17	2.96E-14
902300 Th-230	6.19E-18	-	6.19E-18	3.80E-15
TOTALS	1.63E-01	-	1.63E-01	1.00E+02



SUM OF CONTRIBUTIONS TO THE EFFECTIVE DOSE (rem)

DOWNWIND DISTANCE = 1.00E+03 (m)

SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
531290 I-129	1.34E-02	-	1.34E-02	2.61E+01
170360 Cl- 36	9.71E-03	-	9.71E-03	1.89E+01
621460 Sm-146	3.51E-03	-	3.51E-03	6.83E+00
641480 Gd-148	3.50E-03	-	3.50E-03	6.82E+00
822100 Pb-210	3.35E-03	-	3.35E-03	6.53E+00
621470 Sm-147	3.07E-03	-	3.07E-03	5.97E+00
641520 Gd-152	2.55E-03	-	2.55E-03	4.96E+00
10030 H- 3	1.82E-03	-	1.82E-03	3.54E+00
801940 Hg-194	1.33E-03	-	1.33E-03	2.60E+00
531250 I-125	1.33E-03	-	1.33E-03	2.58E+00
571370 La-137	1.10E-03	-	1.10E-03	2.13E+00
832101 Bi-210m	1.07E-03	-	1.07E-03	2.09E+00
942390 Pu-239	6.66E-04	-	6.66E-04	1.30E+00
260600 Fe- 60	6.42E-04	-	6.42E-04	1.25E+00
531260 I-126	4.31E-04	-	4.31E-04	8.40E-01
551370 Cs-137	2.85E-04	-	2.85E-04	5.55E-01
842100 Po-210	2.82E-04	-	2.82E-04	5.49E-01
531310 I-131	2.30E-04	-	2.30E-04	4.48E-01
380900 Sr- 90	1.83E-04	-	1.83E-04	3.56E-01
761940 Os-194	1.65E-04	-	1.65E-04	3.22E-01
491150 In-115	1.55E-04	-	1.55E-04	3.02E-01
481130 Cd-113	1.52E-04	-	1.52E-04	2.96E-01
430980 Tc- 98	1.39E-04	-	1.39E-04	2.70E-01
320680 Ge- 68	1.35E-04	-	1.35E-04	2.62E-01
551340 Cs-134	1.27E-04	-	1.27E-04	2.47E-01
481131 Cd-113m	1.26E-04	-	1.26E-04	2.45E-01
190400 K- 40	1.16E-04	-	1.16E-04	2.27E-01
220440 Ti- 44	9.61E-05	-	9.61E-05	1.87E-01
410940 Nb- 94	9.21E-05	-	9.21E-05	1.79E-01
531240 I-124	7.51E-05	-	7.51E-05	1.46E-01
501260 Sn-126	7.43E-05	-	7.43E-05	1.45E-01
791940 Au-194	7.25E-05	-	7.25E-05	1.41E-01
110220 Na- 22	7.21E-05	-	7.21E-05	1.40E-01
300650 Zn- 65	6.62E-05	-	6.62E-05	1.29E-01
822120 Pb-212	6.52E-05	-	6.52E-05	1.27E-01
721781 Hf-178m	4.74E-05	-	4.74E-05	9.23E-02
922380 U-238	4.66E-05	-	4.66E-05	9.07E-02
721820 Hf-182	4.65E-05	-	4.65E-05	9.07E-02
430990 Tc- 99	4.40E-05	-	4.40E-05	8.57E-02
471081 Ag-108m	4.37E-05	-	4.37E-05	8.51E-02
671661 Ho-166m	4.22E-05	-	4.22E-05	8.23E-02
832100 Bi-210	3.14E-05	-	3.14E-05	6.11E-02
270600 Co- 60	2.93E-05	-	2.93E-05	5.71E-02
471101 Ag-110m	2.74E-05	-	2.74E-05	5.33E-02
751861 Re-186m	2.57E-05	-	2.57E-05	5.01E-02
822020 Pb-202	2.50E-05	-	2.50E-05	4.87E-02
711760 Lu-176	2.22E-05	-	2.22E-05	4.32E-02
571380 La-138	2.20E-05	-	2.20E-05	4.28E-02
631540 Eu-154	2.18E-05	-	2.18E-05	4.25E-02
581440 Ce-144	2.05E-05	-	2.05E-05	4.00E-02
340790 Se- 79	2.00E-05	-	2.00E-05	3.90E-02
631500 Eu-150	1.99E-05	-	1.99E-05	3.88E-02
501230 Sn-123	1.96E-05	-	1.96E-05	3.83E-02
451020 Rh-102	1.83E-05	-	1.83E-05	3.57E-02
651580 Tb-158	1.71E-05	-	1.71E-05	3.34E-02
631520 Eu-152	1.68E-05	-	1.68E-05	3.28E-02
761850 Os-185	1.51E-05	-	1.51E-05	2.95E-02
420930 Mo- 93	1.49E-05	-	1.49E-05	2.91E-02
130260 Al- 26	1.47E-05	-	1.47E-05	2.87E-02
40100 Be- 10	1.32E-05	-	1.32E-05	2.57E-02
771921 Ir-192m	1.27E-05	-	1.27E-05	2.47E-02
410950 Nb- 95	1.19E-05	-	1.19E-05	2.31E-02
751860 Re-186	1.13E-05	-	1.13E-05	2.20E-02
802030 Hg-203	1.12E-05	-	1.12E-05	2.18E-02
812040 Tl-204	9.86E-06	-	9.86E-06	1.92E-02
441060 Ru-106	9.85E-06	-	9.85E-06	1.92E-02
832120 Bi-212	9.79E-06	-	9.79E-06	1.91E-02

DOWNWIND DISTANCE = 1.00E+03 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
340750 Se- 75	9.75E-06	-	9.75E-06	1.90E-02
451021 Rh-102m	9.69E-06	-	9.69E-06	1.89E-02
270560 Co- 56	9.02E-06	-	9.02E-06	1.76E-02
521211 Te-121m	8.50E-06	-	8.50E-06	1.66E-02
711771 Lu-177m	8.32E-06	-	8.32E-06	1.62E-02
370830 Rb- 83	8.28E-06	-	8.28E-06	1.61E-02
521230 Te-123	7.98E-06	-	7.98E-06	1.55E-02
771941 Ir-194m	7.73E-06	-	7.73E-06	1.51E-02
611460 Pm-146	7.71E-06	-	7.71E-06	1.50E-02
481090 Cd-109	7.65E-06	-	7.65E-06	1.49E-02
741880 W-188	7.56E-06	-	7.56E-06	1.47E-02
521271 Te-127m	7.29E-06	-	7.29E-06	1.42E-02
491141 In-114m	6.76E-06	-	6.76E-06	1.32E-02
561330 Ba-133	6.68E-06	-	6.68E-06	1.30E-02
501211 Sn-121m	6.66E-06	-	6.66E-06	1.30E-02
551350 Cs-135	6.49E-06	-	6.49E-06	1.26E-02
751841 Re-184m	6.48E-06	-	6.48E-06	1.26E-02
390900 Y- 90	6.47E-06	-	6.47E-06	1.26E-02
501130 Sn-113	6.45E-06	-	6.45E-06	1.26E-02
511250 Sb-125	6.23E-06	-	6.23E-06	1.21E-02
832130 Bi-213	6.09E-06	-	6.09E-06	1.19E-02
410931 Nb- 93m	5.98E-06	-	5.98E-06	1.17E-02
771920 Ir-192	5.54E-06	-	5.54E-06	1.08E-02
380820 Sr- 82	5.49E-06	-	5.49E-06	1.07E-02
370840 Rb- 84	5.36E-06	-	5.36E-06	1.05E-02
511240 Sb-124	5.35E-06	-	5.35E-06	1.04E-02
210460 Sc- 46	5.32E-06	-	5.32E-06	1.04E-02
60140 C- 14	5.31E-06	-	5.31E-06	1.03E-02
390910 Y- 91	5.18E-06	-	5.18E-06	1.01E-02
451010 Rh-101	5.13E-06	-	5.13E-06	1.00E-02
832070 Bi-207	4.91E-06	-	4.91E-06	9.57E-03
481151 Cd-115m	4.79E-06	-	4.79E-06	9.33E-03
370870 Rb- 87	4.76E-06	-	4.76E-06	9.28E-03
902320 Th-232	4.74E-06	-	4.74E-06	9.24E-03
611440 Pm-144	4.69E-06	-	4.69E-06	9.14E-03
521231 Te-123m	4.63E-06	-	4.63E-06	9.02E-03
200450 Ca- 45	4.60E-06	-	4.60E-06	8.96E-03
691700 Tm-170	4.57E-06	-	4.57E-06	8.91E-03
430970 Tc- 97	4.51E-06	-	4.51E-06	8.79E-03
651600 Tb-160	4.38E-06	-	4.38E-06	8.53E-03
501191 Sn-119m	4.36E-06	-	4.36E-06	8.50E-03
511260 Sb-126	4.29E-06	-	4.29E-06	8.35E-03
400930 Zr- 93	4.25E-06	-	4.25E-06	8.28E-03
200410 Ca- 41	4.09E-06	-	4.09E-06	7.96E-03
380890 Sr- 89	4.03E-06	-	4.03E-06	7.85E-03
521291 Te-129m	4.03E-06	-	4.03E-06	7.85E-03
731820 Ta-182	3.90E-06	-	3.90E-06	7.61E-03
150320 P- 32	3.86E-06	-	3.86E-06	7.52E-03
430971 Tc- 97m	3.84E-06	-	3.84E-06	7.47E-03
390880 Y- 88	3.77E-06	-	3.77E-06	7.35E-03
260590 Fe- 59	3.35E-06	-	3.35E-06	6.52E-03
751840 Re-184	3.34E-06	-	3.34E-06	6.50E-03
611481 Pm-148m	3.28E-06	-	3.28E-06	6.38E-03
400950 Zr- 95	3.07E-06	-	3.07E-06	5.99E-03
771940 Ir-194	3.04E-06	-	3.04E-06	5.92E-03
631550 Eu-155	3.00E-06	-	3.00E-06	5.84E-03
370880 Rb- 88	2.96E-06	-	2.96E-06	5.76E-03
551380 Cs-138	2.93E-06	-	2.93E-06	5.70E-03
370860 Rb- 86	2.89E-06	-	2.89E-06	5.64E-03
270580 Co- 58	2.53E-06	-	2.53E-06	4.94E-03
551360 Cs-136	2.46E-06	-	2.46E-06	4.79E-03
721810 Hf-181	2.41E-06	-	2.41E-06	4.70E-03
761910 Os-191	2.38E-06	-	2.38E-06	4.64E-03
711741 Lu-174m	2.31E-06	-	2.31E-06	4.50E-03
631480 Eu-148	2.31E-06	-	2.31E-06	4.49E-03
561400 Ba-140	2.30E-06	-	2.30E-06	4.47E-03
822140 Pb-214	2.29E-06	-	2.29E-06	4.46E-03

DOWNWIND DISTANCE = 1.00E+03 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE  
 NUCLIDE INTERNAL EXTERNAL

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
611470 Pm-147	2.20E-06	-	2.20E-06	4.29E-03
822110 Pb-211	2.19E-06	-	2.19E-06	4.26E-03
501250 Sn-125	2.17E-06	-	2.17E-06	4.24E-03
812020 Tl-202	2.16E-06	-	2.16E-06	4.20E-03
711740 Lu-174	2.03E-06	-	2.03E-06	3.95E-03
250540 Mn- 54	1.93E-06	-	1.93E-06	3.75E-03
521251 Te-125m	1.91E-06	-	1.91E-06	3.72E-03
611480 Pm-148	1.86E-06	-	1.86E-06	3.62E-03
751880 Re-188	1.82E-06	-	1.82E-06	3.55E-03
400880 Zr- 88	1.81E-06	-	1.81E-06	3.53E-03
260550 Fe- 55	1.80E-06	-	1.80E-06	3.51E-03
521320 Te-132	1.74E-06	-	1.74E-06	3.40E-03
721791 Hf-179m	1.70E-06	-	1.70E-06	3.31E-03
832140 Bi-214	1.68E-06	-	1.68E-06	3.28E-03
741850 W-185	1.68E-06	-	1.68E-06	3.28E-03
160350 S- 35	1.66E-06	-	1.66E-06	3.24E-03
631560 Eu-156	1.60E-06	-	1.60E-06	3.12E-03
621510 Sm-151	1.50E-06	-	1.50E-06	2.93E-03
581410 Ce-141	1.40E-06	-	1.40E-06	2.73E-03
701690 Yb-169	1.39E-06	-	1.39E-06	2.70E-03
471061 Ag-106m	1.33E-06	-	1.33E-06	2.58E-03
471110 Ag-111	1.31E-06	-	1.31E-06	2.56E-03
270570 Co- 57	1.27E-06	-	1.27E-06	2.47E-03
501171 Sn-117m	1.26E-06	-	1.26E-06	2.45E-03
230480 V- 48	1.25E-06	-	1.25E-06	2.43E-03
531330 I-133	1.23E-06	-	1.23E-06	2.40E-03
641530 Gd-153	1.22E-06	-	1.22E-06	2.38E-03
791950 Au-195	1.14E-06	-	1.14E-06	2.23E-03
521210 Te-121	1.13E-06	-	1.13E-06	2.21E-03
150330 P- 33	1.03E-06	-	1.03E-06	2.00E-03
330740 As- 74	1.03E-06	-	1.03E-06	2.00E-03
611450 Pm-145	1.02E-06	-	1.02E-06	1.98E-03
280630 Ni- 63	1.02E-06	-	1.02E-06	1.98E-03
200470 Ca- 47	1.00E-06	-	1.00E-06	1.95E-03
711770 Lu-177	9.92E-07	-	9.92E-07	1.93E-03
591430 Pr-143	9.72E-07	-	9.72E-07	1.89E-03
611430 Pm-143	9.68E-07	-	9.68E-07	1.89E-03
822050 Pb-205	9.37E-07	-	9.37E-07	1.83E-03
771900 Ir-190	9.36E-07	-	9.36E-07	1.82E-03
601470 Nd-147	8.99E-07	-	8.99E-07	1.75E-03
210440 Sc- 44	8.61E-07	-	8.61E-07	1.68E-03
721750 Hf-175	8.53E-07	-	8.53E-07	1.66E-03
581390 Ce-139	7.67E-07	-	7.67E-07	1.49E-03
731830 Ta-183	7.37E-07	-	7.37E-07	1.44E-03
531320 I-132	7.31E-07	-	7.31E-07	1.42E-03
531230 I-123	7.26E-07	-	7.26E-07	1.41E-03
521311 Te-131m	7.24E-07	-	7.24E-07	1.41E-03
691710 Tm-171	7.13E-07	-	7.13E-07	1.39E-03
832060 Bi-206	7.07E-07	-	7.07E-07	1.38E-03
571400 La-140	7.06E-07	-	7.06E-07	1.38E-03
511270 Sb-127	6.80E-07	-	6.80E-07	1.33E-03
661660 Dy-166	6.59E-07	-	6.59E-07	1.28E-03
330730 As- 73	6.58E-07	-	6.58E-07	1.28E-03
791981 Au-198m	6.49E-07	-	6.49E-07	1.26E-03
380850 Sr- 85	6.29E-07	-	6.29E-07	1.22E-03
250520 Mn- 52	5.84E-07	-	5.84E-07	1.14E-03
441030 Ru-103	5.60E-07	-	5.60E-07	1.09E-03
350820 Br- 82	5.40E-07	-	5.40E-07	1.05E-03
210441 Sc- 44m	5.11E-07	-	5.11E-07	9.95E-04
300720 Zn- 72	5.05E-07	-	5.05E-07	9.84E-04
651610 Tb-161	4.70E-07	-	4.70E-07	9.15E-04
651570 Tb-157	4.62E-07	-	4.62E-07	9.00E-04
461070 Pd-107	4.62E-07	-	4.62E-07	9.00E-04
430960 Tc- 96	4.56E-07	-	4.56E-07	8.88E-04
410951 Nb- 95m	4.53E-07	-	4.53E-07	8.82E-04
511203 Sb-120b	4.38E-07	-	4.38E-07	8.53E-04
751823 Re-182b	4.37E-07	-	4.37E-07	8.52E-04

DOWNWIND DISTANCE = 1.00E+03 (m)

SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
390901 Y- 90m	4.08E-07	-	4.08E-07	7.95E-04
511220 Sb-122	4.04E-07	-	4.04E-07	7.87E-04
280560 Ni- 56	4.02E-07	-	4.02E-07	7.83E-04
280590 Ni- 59	3.97E-07	-	3.97E-07	7.74E-04
741810 W-181	3.91E-07	-	3.91E-07	7.63E-04
120280 Mg- 28	3.88E-07	-	3.88E-07	7.55E-04
210480 Sc- 48	3.75E-07	-	3.75E-07	7.31E-04
681690 Er-169	3.56E-07	-	3.56E-07	6.94E-04
561310 Ba-131	3.42E-07	-	3.42E-07	6.67E-04
420990 Mo- 99	3.33E-07	-	3.33E-07	6.48E-04
370890 Rb- 89	3.28E-07	-	3.28E-07	6.39E-04
661590 Dy-159	3.17E-07	-	3.17E-07	6.18E-04
731790 Ta-179	3.07E-07	-	3.07E-07	5.98E-04
791980 Au-198	3.07E-07	-	3.07E-07	5.98E-04
330720 As- 72	2.93E-07	-	2.93E-07	5.70E-04
641490 Gd-149	2.84E-07	-	2.84E-07	5.53E-04
461030 Pd-103	2.80E-07	-	2.80E-07	5.46E-04
531300 I-130	2.74E-07	-	2.74E-07	5.33E-04
671660 Ho-166	2.72E-07	-	2.72E-07	5.30E-04
521270 Te-127	2.70E-07	-	2.70E-07	5.27E-04
400970 Zr- 97	2.67E-07	-	2.67E-07	5.20E-04
210470 Sc- 47	2.64E-07	-	2.64E-07	5.15E-04
791990 Au-199	2.61E-07	-	2.61E-07	5.08E-04
611490 Pm-149	2.54E-07	-	2.54E-07	4.95E-04
581430 Ce-143	2.52E-07	-	2.52E-07	4.91E-04
701750 Yb-175	2.50E-07	-	2.50E-07	4.86E-04
410960 Nb- 96	2.28E-07	-	2.28E-07	4.44E-04
551320 Cs-132	2.26E-07	-	2.26E-07	4.40E-04
330760 As- 76	2.23E-07	-	2.23E-07	4.34E-04
621530 Sm-153	2.11E-07	-	2.11E-07	4.11E-04
400890 Zr- 89	2.06E-07	-	2.06E-07	4.02E-04
290670 Cu- 67	2.02E-07	-	2.02E-07	3.93E-04
310680 Ga- 68	1.97E-07	-	1.97E-07	3.84E-04
310720 Ga- 72	1.92E-07	-	1.92E-07	3.74E-04
280570 Ni- 57	1.80E-07	-	1.80E-07	3.50E-04
761930 Os-193	1.79E-07	-	1.79E-07	3.48E-04
591420 Pr-142	1.65E-07	-	1.65E-07	3.21E-04
781930 Pt-193	1.65E-07	-	1.65E-07	3.21E-04
300620 Zn- 62	1.64E-07	-	1.64E-07	3.19E-04
801971 Hg-197m	1.63E-07	-	1.63E-07	3.18E-04
481150 Cd-115	1.60E-07	-	1.60E-07	3.12E-04
320690 Ge- 69	1.58E-07	-	1.58E-07	3.08E-04
561331 Ba-133m	1.51E-07	-	1.51E-07	2.95E-04
380910 Sr- 91	1.51E-07	-	1.51E-07	2.94E-04
390870 Y- 87	1.46E-07	-	1.46E-07	2.84E-04
390860 Y- 86	1.43E-07	-	1.43E-07	2.79E-04
751890 Re-189	1.40E-07	-	1.40E-07	2.72E-04
611510 Pm-151	1.39E-07	-	1.39E-07	2.71E-04
781951 Pt-195m	1.37E-07	-	1.37E-07	2.66E-04
731801 Ta-180m	1.36E-07	-	1.36E-07	2.65E-04
400860 Zr- 86	1.33E-07	-	1.33E-07	2.59E-04
310660 Ga- 66	1.30E-07	-	1.30E-07	2.53E-04
390930 Y- 93	1.29E-07	-	1.29E-07	2.52E-04
330770 As- 77	1.28E-07	-	1.28E-07	2.49E-04
731840 Ta-184	1.26E-07	-	1.26E-07	2.46E-04
511280 Sb-128	1.25E-07	-	1.25E-07	2.43E-04
561390 Ba-139	1.22E-07	-	1.22E-07	2.38E-04
451050 Rh-105	1.19E-07	-	1.19E-07	2.31E-04
260520 Fe- 52	1.16E-07	-	1.16E-07	2.26E-04
561351 Ba-135m	1.15E-07	-	1.15E-07	2.24E-04
320770 Ge- 77	1.13E-07	-	1.13E-07	2.20E-04
461090 Pd-109	1.13E-07	-	1.13E-07	2.20E-04
591440 Pr-144	1.11E-07	-	1.11E-07	2.17E-04
451011 Rh-101m	1.11E-07	-	1.11E-07	2.16E-04
250530 Mn- 53	1.06E-07	-	1.06E-07	2.07E-04
801970 Hg-197	1.00E-07	-	1.00E-07	1.95E-04
781931 Pt-193m	9.97E-08	-	9.97E-08	1.94E-04



DOWNWIND DISTANCE = 1.00E+03 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE  
 NUCLIDE INTERNAL EXTERNAL

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
511261 Sb-126m	9.73E-08	-	9.73E-08	1.90E-04
531350 I-135	9.47E-08	-	9.47E-08	1.84E-04
60110 C- 11	8.89E-08	-	8.89E-08	1.73E-04
110240 Na- 24	8.84E-08	-	8.84E-08	1.72E-04
631570 Eu-157	8.35E-08	-	8.35E-08	1.63E-04
300691 Zn- 69m	8.26E-08	-	8.26E-08	1.61E-04
310670 Ga- 67	8.22E-08	-	8.22E-08	1.60E-04
491110 In-111	8.22E-08	-	8.22E-08	1.60E-04
641590 Gd-159	8.17E-08	-	8.17E-08	1.59E-04
922350 U-235	7.54E-08	-	7.54E-08	1.47E-04
822030 Pb-203	7.44E-08	-	7.44E-08	1.45E-04
380920 Sr- 92	7.43E-08	-	7.43E-08	1.45E-04
511290 Sb-129	7.33E-08	-	7.33E-08	1.43E-04
501210 Sn-121	6.99E-08	-	6.99E-08	1.36E-04
320710 Ge- 71	6.81E-08	-	6.81E-08	1.33E-04
631521 Eu-152m	6.55E-08	-	6.55E-08	1.28E-04
621560 Sm-156	6.49E-08	-	6.49E-08	1.26E-04
681710 Er-171	6.45E-08	-	6.45E-08	1.26E-04
741870 W-187	6.39E-08	-	6.39E-08	1.25E-04
781910 Pt-191	6.27E-08	-	6.27E-08	1.22E-04
340730 Se- 73	6.12E-08	-	6.12E-08	1.19E-04
751822 Re-182a	6.04E-08	-	6.04E-08	1.18E-04
631503 Eu-150b	5.77E-08	-	5.77E-08	1.12E-04
390920 Y- 92	5.54E-08	-	5.54E-08	1.08E-04
751870 Re-187	5.31E-08	-	5.31E-08	1.03E-04
441050 Ru-105	5.26E-08	-	5.26E-08	1.02E-04
471120 Ag-112	5.17E-08	-	5.17E-08	1.01E-04
591450 Pr-145	5.17E-08	-	5.17E-08	1.01E-04
521290 Te-129	5.12E-08	-	5.12E-08	9.97E-05
420931 Mo- 93m	4.95E-08	-	4.95E-08	9.65E-05
230490 V- 49	4.94E-08	-	4.94E-08	9.62E-05
551310 Cs-131	4.86E-08	-	4.86E-08	9.46E-05
521331 Te-133m	4.80E-08	-	4.80E-08	9.35E-05
761911 Os-191m	4.80E-08	-	4.80E-08	9.35E-05
571410 La-141	4.78E-08	-	4.78E-08	9.31E-05
491131 In-113m	4.68E-08	-	4.68E-08	9.11E-05
190430 K- 43	4.65E-08	-	4.65E-08	9.07E-05
501100 Sn-110	4.52E-08	-	4.52E-08	8.81E-05
300711 Zn- 71m	4.51E-08	-	4.51E-08	8.78E-05
40070 Be- 7	4.42E-08	-	4.42E-08	8.61E-05
440970 Ru- 97	4.29E-08	-	4.29E-08	8.36E-05
350770 Br- 77	4.25E-08	-	4.25E-08	8.28E-05
310730 Ga- 73	4.01E-08	-	4.01E-08	7.81E-05
812000 Tl-200	3.98E-08	-	3.98E-08	7.76E-05
190420 K- 42	3.75E-08	-	3.75E-08	7.31E-05
240510 Cr- 51	3.70E-08	-	3.70E-08	7.22E-05
290640 Cu- 64	3.61E-08	-	3.61E-08	7.03E-05
611500 Pm-150	3.53E-08	-	3.53E-08	6.87E-05
501270 Sn-127	3.42E-08	-	3.42E-08	6.66E-05
711761 Lu-176m	3.36E-08	-	3.36E-08	6.54E-05
250560 Mn- 56	3.24E-08	-	3.24E-08	6.32E-05
491171 In-117m	3.12E-08	-	3.12E-08	6.08E-05
451061 Rh-106m	2.91E-08	-	2.91E-08	5.67E-05
571420 La-142	2.88E-08	-	2.88E-08	5.61E-05
781970 Pt-197	2.77E-08	-	2.77E-08	5.39E-05
330780 As- 78	2.66E-08	-	2.66E-08	5.18E-05
481171 Cd-117m	2.61E-08	-	2.61E-08	5.09E-05
220450 Ti- 45	2.56E-08	-	2.56E-08	4.99E-05
551290 Cs-129	2.53E-08	-	2.53E-08	4.94E-05
280650 Ni- 65	2.42E-08	-	2.42E-08	4.72E-05
320780 Ge- 78	2.35E-08	-	2.35E-08	4.57E-05
601490 Nd-149	2.32E-08	-	2.32E-08	4.52E-05
771904 Ir-190n	2.30E-08	-	2.30E-08	4.48E-05
350801 Br- 80m	2.17E-08	-	2.17E-08	4.23E-05
140310 Si- 31	2.14E-08	-	2.14E-08	4.17E-05
491151 In-115m	2.08E-08	-	2.08E-08	4.04E-05
501280 Sn-128	2.05E-08	-	2.05E-08	3.99E-05

DOWNWIND DISTANCE = 1.00E+03 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
481170 Cd-117	2.03E-08	-	2.03E-08	3.95E-05
812010 Tl-201	1.98E-08	-	1.98E-08	3.85E-05
521310 Te-131	1.91E-08	-	1.91E-08	3.73E-05
721771 Hf-177m	1.91E-08	-	1.91E-08	3.72E-05
822090 Pb-209	1.85E-08	-	1.85E-08	3.60E-05
521340 Te-134	1.65E-08	-	1.65E-08	3.22E-05
551341 Cs-134m	1.64E-08	-	1.64E-08	3.20E-05
661650 Dy-165	1.60E-08	-	1.60E-08	3.12E-05
350830 Br- 83	1.42E-08	-	1.42E-08	2.76E-05
410970 Nb- 97	1.38E-08	-	1.38E-08	2.69E-05
531340 I-134	1.36E-08	-	1.36E-08	2.65E-05
721830 Hf-183	1.30E-08	-	1.30E-08	2.53E-05
270610 Co- 61	1.29E-08	-	1.29E-08	2.51E-05
340811 Se- 81m	1.12E-08	-	1.12E-08	2.19E-05
491170 In-117	1.10E-08	-	1.10E-08	2.14E-05
631580 Eu-158	1.08E-08	-	1.08E-08	2.10E-05
210490 Sc- 49	1.01E-08	-	1.01E-08	1.97E-05
511300 Sb-130	1.01E-08	-	1.01E-08	1.97E-05
731850 Ta-185	1.00E-08	-	1.00E-08	1.96E-05
561410 Ba-141	9.94E-09	-	9.94E-09	1.94E-05
491161 In-116m	9.74E-09	-	9.74E-09	1.90E-05
370810 Rb- 81	9.68E-09	-	9.68E-09	1.89E-05
882280 Ra-228	9.64E-09	-	9.64E-09	1.88E-05
320750 Ge- 75	9.10E-09	-	9.10E-09	1.77E-05
90180 F- 18	8.92E-09	-	8.92E-09	1.74E-05
661570 Dy-157	8.79E-09	-	8.79E-09	1.71E-05
250521 Mn- 52m	8.72E-09	-	8.72E-09	1.70E-05
300690 Zn- 69	8.50E-09	-	8.50E-09	1.66E-05
380871 Sr- 87m	7.90E-09	-	7.90E-09	1.54E-05
350840 Br- 84	6.99E-09	-	6.99E-09	1.36E-05
300630 Zn- 63	6.97E-09	-	6.97E-09	1.36E-05
240490 Cr- 49	6.88E-09	-	6.88E-09	1.34E-05
801991 Hg-199m	6.31E-09	-	6.31E-09	1.23E-05
511310 Sb-131	6.26E-09	-	6.26E-09	1.22E-05
521330 Te-133	6.24E-09	-	6.24E-09	1.22E-05
781971 Pt-197m	6.02E-09	-	6.02E-09	1.17E-05
170390 Cl- 39	5.90E-09	-	5.90E-09	1.15E-05
430991 Tc- 99m	5.79E-09	-	5.79E-09	1.13E-05
501231 Sn-123m	5.20E-09	-	5.20E-09	1.01E-05
912340 Pa-234	5.04E-09	-	5.04E-09	9.82E-06
270581 Co- 58m	5.04E-09	-	5.04E-09	9.81E-06
170380 Cl- 38	4.90E-09	-	4.90E-09	9.54E-06
511170 Sb-117	4.64E-09	-	4.64E-09	9.03E-06
340830 Se- 83	4.54E-09	-	4.54E-09	8.84E-06
711781 Lu-178m	4.51E-09	-	4.51E-09	8.79E-06
270601 Co- 60m	4.26E-09	-	4.26E-09	8.29E-06
340810 Se- 81	4.15E-09	-	4.15E-09	8.08E-06
711780 Lu-178	4.13E-09	-	4.13E-09	8.04E-06
451031 Rh-103m	4.02E-09	-	4.02E-09	7.84E-06
390940 Y- 94	4.02E-09	-	4.02E-09	7.82E-06
511281 Sb-128m	3.89E-09	-	3.89E-09	7.57E-06
471150 Ag-115	3.56E-09	-	3.56E-09	6.93E-06
551351 Cs-135m	3.44E-09	-	3.44E-09	6.69E-06
561420 Ba-142	3.43E-09	-	3.43E-09	6.68E-06
431040 Tc-104	3.42E-09	-	3.42E-09	6.66E-06
491101 In-110m	3.23E-09	-	3.23E-09	6.29E-06
631490 Eu-149	3.10E-09	-	3.10E-09	6.05E-06
350800 Br- 80	2.79E-09	-	2.79E-09	5.43E-06
571430 La-143	2.40E-09	-	2.40E-09	4.67E-06
771901 Ir-190m	2.39E-09	-	2.39E-09	4.65E-06
621550 Sm-155	2.35E-09	-	2.35E-09	4.58E-06
431010 Tc-101	2.33E-09	-	2.33E-09	4.53E-06
390911 Y- 91m	2.31E-09	-	2.31E-09	4.50E-06
671640 Ho-164	2.28E-09	-	2.28E-09	4.44E-06
421010 Mo-101	2.26E-09	-	2.26E-09	4.40E-06
471060 Ag-106	2.25E-09	-	2.25E-09	4.39E-06
451070 Rh-107	2.25E-09	-	2.25E-09	4.39E-06

DOWNWIND DISTANCE = 1.00E+03 (m)  
 SORTED BY PERCENT OF EFFECTIVE DOSE

NUCLIDE	INTERNAL	EXTERNAL	TOTAL	Percent
671641 Ho-164m	2.23E-09	-	2.23E-09	4.35E-06
491191 In-119m	2.18E-09	-	2.18E-09	4.26E-06
310700 Ga- 70	2.03E-09	-	2.03E-09	3.96E-06
731821 Ta-182m	1.99E-09	-	1.99E-09	3.88E-06
390950 Y- 95	1.91E-09	-	1.91E-09	3.71E-06
531280 I-128	1.89E-09	-	1.89E-09	3.68E-06
270621 Co- 62m	1.69E-09	-	1.69E-09	3.30E-06
430961 Tc- 96m	1.59E-09	-	1.59E-09	3.11E-06
761891 Os-189m	1.55E-09	-	1.55E-09	3.02E-06
591470 Pr-147	1.49E-09	-	1.49E-09	2.91E-06
751881 Re-188m	1.46E-09	-	1.46E-09	2.85E-06
601410 Nd-141	1.34E-09	-	1.34E-09	2.62E-06
601510 Nd-151	1.20E-09	-	1.20E-09	2.35E-06
380851 Sr- 85m	9.96E-10	-	9.96E-10	1.94E-06
731860 Ta-186	9.42E-10	-	9.42E-10	1.83E-06
741790 W-179	1.70E-10	-	1.70E-10	3.31E-07
902310 Th-231	5.22E-12	-	5.22E-12	1.02E-08
892280 Ac-228	4.97E-12	-	4.97E-12	9.68E-09
922340 U-234	8.00E-13	-	8.00E-13	1.56E-09
912310 Pa-231	7.31E-14	-	7.31E-14	1.42E-10
882260 Ra-226	1.79E-17	-	1.79E-17	3.48E-14
902300 Th-230	2.04E-18	-	2.04E-18	3.98E-15
TOTALS	5.13E-02	-	5.13E-02	1.00E+02

#### WARNINGS

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 NO AIR IMMERSION OR CLOUD GAMMA DOSE CALCULATIONS WERE MADE  
 EXECUTION TIME  
 1.50E+00 SECONDS