Project	Calculation Number	Project Number
None	K-CLC-G-00077	Not Applicable
Title: Radionuclide Preliminary Remediation Goals (RAD PRGs)	Functional Classification: Not Applicable Discipline: S&GCP	Sheet 1 of 108

Confirmed Calculation

Computer Program No. (s)	Version/Release No.
None	Not Applicable

Purpose and Objective

The purpose of this calculation package is to document the equations and assumptions used to calculate radionuclide preliminary remediation goals (RAD PRGs) to be used in support of the SRS environmental restoration program. The scope is limited to evaluating pathways that are realistic and significantly contribute to risk.

Summary of Conclusion

Not applicable

Revisions

Rev. No.	Revision Description
0	Original Issue
1	Industrial Soil Rad PRGs revised based on regulator comments

Sign Off

Rev No.	Originator (Print) Sign / Date	Verification / Checking Method	Verifier / Checker (Print) Sign / Date	Manager (Print) Sign / Date
0	B.A. Hamm 12/30/02	Hand Checking	W. L. Frazier	J. M. Clark
1	D.J. Martinson 4/24/03 7/24/03	Hand Checking	W.L. Frazier 24 Jul 03	J.M. Clark 7/24/03

Classification

Unclassified (W. L. Frazier, 12/30/02)

UNCLASSIFIED
DOES NOT CONTAIN
UNCLASSIFIED CONTROLLED
NUCLEAR INFORMATION

ADC & Reviewing Official: Willie Frazier (Name and Title)
Date: 24 Jul 03

CALC-NOTE CHECKLIST

REVIEWER(S) NAME (PRINT OR TYPE)	SIGNATURE	DATE
WILLIE L. FRAZIER	Willie L Frazier	7 July 03

		CIRCLE ONE	
1.	Is the Subject and/or Purpose clearly stated?	(YES)	NO
2.	Are the required Input Data and their references and source provided and are they consistent with the Calc-note purpose?	(YES)	NO
3.	Are the Assumptions clearly identified, valid, and consistent with the calc-note purpose?	(YES)	NO
4.	Are the Analytical Methods clearly identified?	(YES)	NO
5.	Are all pages consecutively numbered and identified by the calc-note number?	(YES)	NO
6.	Is/are the version(s) of the computer program(s) used identified?	YES (N/A)	NO
7.	Are input listings for all computer programs documented in this calc-note?	YES (N/A)	NO
8.	Are the Results and Conclusions clearly stated?	(YES)	NO
9.	Are all OUTPUT documents (if not part of the calculation) clearly referenced in the results section?	(YES) N/A	NO

IF NO TO ANY OF THE ABOVE, SHEET NUMBER(S) WITH JUSTIFICATION:

REVIEWER'S NOTES (use additional pages as necessary)
Review method used: Alternate calculation X Attached? Y____ N____
Approximated Originator steps_____

Introduction

The US EPA has issued updated guidance on the calculation methods to be used for determining screening radionuclide activity levels (Ref 1). The new methods and guidance are presented in the form of website with a 'calculator' which can be used to determine site specific levels (Ref 2). The methods and assumptions from the new guidance have been applied to SRS risk assessment scenarios to generate SRS specific values.

The purpose of this calculation package is to document the methods and assumptions used to calculate radionuclide preliminary remediation goals (RAD PRGs) to be used in support of the SRS environmental restoration program. These RAD PRGs replace the Calc Note K-CLC-G-00023, Rev 4 Risk Based Activity Level Calculation.

RAD PRGs are provided for tap water, residential soils, and industrial soils and are all calculated at the 1 x 10-6 risk level.

The RAD PRGs are similar to the previously determined RBA but include the following changes per the new EPA guidance:

- Use of an Area Correction Factor (ACF) of 0.9 to correct for small lot size.
- Change of the assumption of indoor time spent by the resident from 15 hours to 16.4 hours and the addition of 105 minutes of outdoor time.
- Change of the Gamma Shielding Factor from 0.8 to 0.4.
- Use of the adult only slope factor for soil ingestion for the industrial worker.
- Incorporation of a first order radioactive decay term over the exposure duration for radionuclides in soil.
- Addition of an inhalation exposure route for soils due to windblown dust with the use of an indoor air dilution factor of 0.4.
- Addition of inhalation exposure route for H-3, C-14, Ra-224, Ra-226, and Ra-226 +D in the tapwater calculations.

A more thorough discussion of the new methods can be found in the EPA soil screening guidance documents (Ref 3 and 4).

Inputs / Assumptions

SRS Scenarios

SRS uses two hypothetical scenarios, a resident and an industrial worker, for risk based soil screening purposes for both chemicals and radionuclides. The purpose of the screening value is to provide a criteria for decision making and is not intended to estimate actual risk to an individual in the way that a health protection or occupational safety assessment would be made.

The SRS hypothetical resident is assumed to live on the unit for 6 years as a child and for 24 years as an adult. Three exposure routes are evaluated for soil and are 1.) incidental ingestion of soil, 2.) inhalation of windblown dust, and 3.) external exposure. The resident is assumed to be on the unit for 350 days per year. Incidental ingestion of soil is assumed to be at the rate of 200 mg/day while a child and 100 mg/day while an adult. The age adjusted ingestion rate is 120 mg/day. The inhalation rate is assumed to be 20 cubic meters per day for the adult and 10 cubic meters per day for the child. The age adjusted inhalation rate is 18 cubic meters/day.

The resident is assumed to spend 16.4 hours a day indoors and 1.75 hours per day outdoors. Based on these assumptions, the fraction of a 24 hour day spent indoors is 0.683 and the fraction of a 24 hour day spent outdoors is 0.073

The SRS hypothetical industrial worker is assumed to work outdoors for 100% of his time. The incidental ingestion of soil rate was set at the 100 mg/d value used for the standard EPA outdoor worker. The worker will be on the worksite for 225 days per year for 25 years. The worker is at work for 8 hours per day. Three exposure routes are evaluated for soil and are 1.) incidental ingestion of soil, 2.) inhalation of windblown dust, and 3.) external exposure. The inhalation rate is assumed to be 20 cubic meters per day.

Based on the assumption of 100% of the time outdoors, the hypothetical industrial worker spends 8 hours outdoors. Based on these assumptions, the fraction of an 8 hour day spent outdoors is 0.333.

Tapwater screening values are also determined using a hypothetical water consumer who uses water from the source for 30 years, 350 days/year, and ingests 2 L/day. The inhalation rate is assumed to be 20 cubic meters per day.

The location for the calculation of the Particulate Emission Factor (PEF) was set to Charleston, SC.

The assumptions used for each scenario are summarized in Table 1.

Other Inputs
Additional inputs to the calculations consist of radioisotope half-life (Table 2) and cancer potency slope factors. The cancer potency slope factors are included on the results tables (Tables 4, 5, and 6). The values can also be found at the EPA web site [2].

Analytical Methods and Computations

The risk based activity calculation has been performed using the methods documented on the EPA website (Ref 2). The equations are documented on the website and shown in Table 4. They are as follows:

Tap Water Scenario (Ingestion and inhalation)
(Note that H-3, C-14, Ra-224, Ra-226, and Ra-226 +D are the only isotopes that include inhalation and that this calculation is not decay corrected)

$$PRG\ (pCi/L) = TR / [(EF \times ED \times SFw \times IRw) + (SFi \times IRi \times K)]$$

Where:

TR is the target risk value
EF is the exposure frequency in days per year
ED is the exposure duration in years
SFw is the slope factor for water ingestion in risk/pCi
IRw is the ingestion rate of water in liters/day
SFi is the slope factor for inhalation in risk/pCi
K is the Andelman volatilization factor in L/cubic meter (0.5 for tritium and carbon-14, zero for all other radionuclides)

Soil Scenarios (Incidental ingestion, wind blown dust inhalation, and external radiation exposure)

$$PRG\ (pCi/g) = (TR \times t \times lambda) \times 1/ [ED \times (1\text{-}exp\ (\text{-}lambda \times t) \times (INGs + INHs + EXTs)]$$

$$INGs = SFs \times IRs \times 0.001 g/mg \times EF$$

$$INHs = SFi \times IRi \times (1000\ g/kg / PEF) \times EF \times [ETo + (ETi \times DFi)]$$

$$EXTs = SFe \times (EF / 365\ days\ per\ year) \times ACF \times [ETo + (ETi \times GSFi)]$$

Where:

Lamba - defined as 0.693/radionuclide half life
t is the exposure duration over which the radionuclide decays in years

TR is the target risk level
ED is the exposure duration in years

INGs is the intake term for incidental ingestion of soil
INHs is the intake term for inhalation of windblown dust
EXTs is the intake term for external radiation

SFs is the slope factor for incidental soil ingestion in risk/pCi
SFi is the slope factor for inhalation in risk/pCi
SFe is the slope factor for external radiation risk/yr per pCi/g

IRs is the rate of incidental soil ingestion in mg/day
IRi is the inhalation rate in cubic meters/day

ACF is the area correction factor of small lot size
EF is the exposure frequency in days per year
ETo is the fraction of time the receptor spends outdoors
ETi is the fraction of time the receptor spends indoors
GSF is the gamma shielding factor (unitless)
PEF is the particulate Emission Factor calculated for the southeast.

Results

The results of the calculations using the exposure parameters for each scenario are shown in the following tables:

- Table 4: Tap Water RAD PRGs
- Table 5: Industrial Soil RAD PRGs
- Table 6: Residential Soil RAD PRGs

References

1. Distribution of OSWER of Radionuclide Preliminary Remediation Goals (PRGs) for Superfund Electronic Calculator, US EPA, OSWER No. 9355.01-83A

2. EPA and ORNL web site for PRG CALCULATOR, http://epa-prgs.ornl.gov/radionuclides/

3. Document Change Impact Assessment, Implementation of New Radionuclide Slope Values, ERD-DCI-00013, April 2003..

4. Soil Screening Guidance for Radionuclides: Users Guide (EPA540-R-00-007), http://www.epa.gov/superfund/resources/radiation/radssg.htm#guide

5. Soil Screening Guidance for Radionuclides: Technical Background Document (EPA540-R-00-006), http://www.epa.gov/superfund/resources/radiation/radssg.htm#guide

6. SRS Calculation Note, "Radionuclide Preliminary Remediation Goals (RAD PRGs), K-CLC-G-00077, Rev 0", November 2002

TABLES

Table 1. Exposure Parameters for SRS Scenarios

Parameter	Explanation	Tap water	Worker Soil	Resident Soil
IRw	Ingestion rate of water in liters/day	2	-	-
TR	Target risk (unitless)	1E-6	1E-6	1E-6
IR	Inhalation rate in cubic meters/day	20	20	18
ED	Exposure duration in years	30	25	30
T	Time of exposure	-	25	30
K	Andelman volatilization factor in liters/cubic meter	0.5	-	-
ETo	Outdoor exposure time fraction (unitless)	-	0.333	0.073
ETi	Indoor exposure time fraction (unitless)	-	0	0.683
DFi	Indoor dilution factor (unitless)	-	0.4	0.4
ACF	Area correction factor (unitless)	-	0.9	0.9
PEF	Particulate Emission Factor for southeast in cubic meters per kg	-	9.44E9	9.44E9
EF	Exposure frequency in days/year	350	225	350
GSF	Gamma shielding factor (unitless)	-	0.4	0.4
Lambda	Ln 2/ radionuclide half life (radionuclide specific)	-	-	-
IRs	Ingestion rate for soil in mg/day	-	100	120

Note: The ingestion rate of soil and the inhalation rate for the residential scenario are the age adjusted values.

Table 2. Radionuclide Half-life Values

Isotope	Half-life (yrs)
Ac-223	4.19E-06
Ac-224	3.32E-04
Ac-225	2.74E-02
Ac-226	3.32E-03
Ac-227	2.18E+01
Ac-227+D	2.18E+01
Ac-228	6.99E-04
Ag-102	2.45E-05
Ag-103	1.25E-04
Ag-104	1.32E-04
Ag-104m	6.38E-05
Ag-105	1.12E-01
Ag-106	4.58E-05
Ag-106m	2.30E-02
Ag-108	4.52E-06
Ag-108m	1.27E+02
Ag-109m	1.25E-06
Ag-110	7.81E-07
Ag-110m	6.85E-01
Ag-111	2.04E-02
Ag-112	3.56E-04
Ag-115	3.81E-05
Al-26	7.15E+05
Al-28	4.27E-06
Am-237	1.39E-04
Am-238	1.87E-04
Am-239	1.36E-03
Am-240	5.81E-03
Am-241	4.33E+02
Am-242	1.83E-03
Am-242m	1.52E+02
Am-242m+D	1.52E+02
Am-243	7.37E+03
Am-243+D	7.37E+03
Am-244	1.15E-03
Am-244m	4.96E-05
Am-245	2.34E-04
Am-246	7.42E-05
Am-246m	4.77E-05
Ar-37	9.59E-02
Ar-39	2.69E+02
Ar-41	2.09E-04
As-69	2.90E-05
As-70	1.00E-04
As-71	7.40E-03
As-72	2.96E-03
As-73	2.20E-01
As-74	4.88E-02
As-76	3.01E-03
As-77	4.44E-03
As-78	1.73E-04
At-207	2.05E-04
At-211	8.22E-04
At-215	3.18E-12
At-216	9.51E-12
At-217	1.02E-09
At-218	6.33E-08
Au-193	2.02E-03
Au-194	4.52E-03
Au-195	5.01E-01
Au-195m	9.67E-07
Au-198	7.40E-03
Au-198m	6.30E-03
Au-199	8.60E-03
Au-200	9.21E-05
Au-200m	2.13E-03
Au-201	5.01E-05
Ba-126	1.84E-04
Ba-128	6.66E-03
Ba-131	3.23E-02
Ba-131m	2.77E-05
Ba-133	1.07E+01
Ba-133m	4.44E-03
Ba-135m	3.29E-03
Ba-137m	4.85E-06
Ba-139	1.57E-04
Ba-140	3.48E-02
Ba-141	3.48E-05
Ba-142	2.02E-05
Be-10	1.60E+06
Be-7	1.46E-01
Bi-200	6.93E-05
Bi-201	2.05E-04
Bi-202	1.91E-04
Bi-203	1.35E-03
Bi-205	4.19E-02
Bi-206	1.71E-02
Bi-207	3.81E+01
Bi-210	1.37E-02
Bi-210m	3.01E+06
Bi-211	4.08E-06
Bi-212	1.15E-04
Bi-213	8.68E-05
Bi-214	3.78E-05
Bk-245	1.35E-02
Bk-246	5.01E-03
Bk-247	1.38E+03
Bk-249	8.77E-01
Bk-250	3.67E-04
Br-74	4.82E-05
Br-74m	7.89E-05
Br-75	1.87E-04
Br-76	1.85E-03
Br-77	6.38E-03
Br-80	3.32E-05
Br-80m	5.04E-04
Br-82	4.03E-03
Br-83	2.73E-04
Br-84	6.05E-05
C-11	3.89E-05
C-14	5.73E+03
Ca-41	1.40E+05
Ca-45	4.47E-01
Ca-47	1.24E-02
Ca-49	1.66E-05
Cd-104	1.10E-04
Cd-107	7.40E-04
Cd-109	1.27E+00
Cd-113	9.29E+15
Cd-113m	1.36E+01
Cd-115	6.11E-03
Cd-115m	1.22E-01
Cd-117	2.85E-04
Cd-117m	3.84E-04
Ce-134	8.22E-03
Ce-135	2.01E-03
Ce-137	1.03E-03
Ce-137m	3.92E-03
Ce-139	3.78E-01
Ce-141	8.90E-02
Ce-143	3.78E-03
Ce-144	7.78E-01
Ce-144+D	7.78E-01
Cf-244	3.70E-05
Cf-246	4.08E-03

Table 2. Radionuclide Half-life Values (continued)

Isotope	Half-life (yrs)
Cf-248	9.15E-01
Cf-249	3.51E+02
Cf-250	1.31E+01
Cf-251	8.99E+02
Cf-252	2.64E+00
Cf-253	4.88E-02
Cf-254	1.66E-01
Cl-36	3.01E+05
Cl-38	7.07E-05
Cl-39	1.06E-04
Cm-238	2.74E-04
Cm-240	7.40E-02
Cm-241	8.99E-02
Cm-242	4.47E-01
Cm-243	2.85E+01
Cm-244	1.81E+01
Cm-245	8.49E+03
Cm-246	4.74E+03
Cm-247	1.56E+07
Cm-248	3.40E+05
Cm-249	1.22E-04
Co-55	2.00E-03
Co-56	2.16E-01
Co-57	7.42E-01
Co-58	1.94E-01
Co-58m	1.04E-03
Co-60	5.26E+00
Co-60m	2.00E-05
Co-61	1.88E-04
Co-62m	2.64E-05
Cr-48	2.62E-03
Cr-49	8.00E-05
Cr-51	7.59E-02
Cs-125	8.58E-05
Cs-126	3.12E-06
Cs-127	7.12E-04
Cs-128	7.42E-06
Cs-129	3.67E-03
Cs-130	5.70E-05
Cs-131	2.65E-02
Cs-132	1.78E-02
Cs-134	2.06E+00
Cs-134m	3.32E-04
Cs-135	2.30E+06
Cs-135m	1.01E-04

Isotope	Half-life (yrs)
Cs-136	3.59E-02
Cs-137	3.01E+01
Cs-137+D	3.01E+01
Cs-138	6.14E-05
Cu-60	4.41E-05
Cu-61	3.89E-04
Cu-62	1.85E-05
Cu-64	1.45E-03
Cu-66	9.70E-06
Cu-67	7.07E-03
Dy-155	1.14E-03
Dy-157	9.26E-04
Dy-159	3.95E-01
Dy-165	2.66E-04
Dy-166	9.32E-03
Er-161	3.70E-04
Er-165	1.19E-03
Er-169	2.55E-02
Er-171	8.58E-04
Er-172	5.62E-03
Es-250	2.40E-04
Es-251	3.78E-03
Es-253	5.62E-02
Es-254	7.56E-01
Es-254m	4.49E-03
Eu-145	1.63E-02
Eu-146	1.26E-02
Eu-147	6.58E-02
Eu-148	1.49E-01
Eu-149	2.55E-01
Eu-150a	1.44E-03
Eu-150b	3.42E+01
Eu-152	1.33E+01
Eu-152m	1.06E-03
Eu-154	8.79E+00
Eu-155	4.96E+00
Eu-156	4.16E-02
Eu-157	1.73E-03
Eu-158	8.74E-05
F-18	2.09E-04
Fe-52	9.45E-04
Fe-55	2.70E+00
Fe-59	1.22E-01
Fe-60	1.00E+05
Fm-252	2.59E-03

Isotope	Half-life (yrs)
Fm-253	8.22E-03
Fm-254	3.70E-04
Fm-255	2.30E-03
Fm-257	2.77E-01
Fr-219	6.66E-10
Fr-220	8.68E-07
Fr-221	9.12E-06
Fr-222	2.74E-05
Fr-223	4.14E-05
Ga-65	2.90E-05
Ga-66	1.07E-03
Ga-67	8.93E-03
Ga-68	1.29E-04
Ga-70	4.03E-05
Ga-72	1.61E-03
Ga-73	5.62E-04
Gd-145	4.36E-05
Gd-146	1.32E-01
Gd-147	4.36E-03
Gd-148	9.29E+01
Gd-149	2.58E-02
Gd-151	3.29E-01
Gd-152	1.08E+14
Gd-153	6.63E-01
Gd-159	2.12E-03
Ge-66	2.59E-04
Ge-67	3.56E-05
Ge-68	7.89E-01
Ge-69	4.47E-03
Ge-71	3.23E-02
Ge-75	1.58E-04
Ge-77	1.29E-03
Ge-78	1.65E-04
H-3	1.24E+01
Hf-170	1.83E-03
Hf-172	1.87E+00
Hf-173	2.74E-03
Hf-175	1.92E-01
Hf-177m	9.78E-05
Hf-178m	3.10E+01
Hf-179m	6.88E-02
Hf-180m	6.27E-04
Hf-181	1.16E-01
Hf-182	9.01E+06
Hf-182m	1.17E-04

Table 2. Radionuclide Half-life Values (continued)

Isotope	Half-life (yrs)
Hf-183	1.22E-04
Hf-184	4.71E-04
Hg-193	4.00E-04
Hg-193m	1.27E-03
Hg-194	2.60E+02
Hg-195	1.13E-03
Hg-195m	4.74E-03
Hg-197	7.32E-03
Hg-197m	2.72E-03
Hg-199m	8.11E-05
Hg-203	1.28E-01
Ho-155	9.12E-05
Ho-157	2.40E-05
Ho-159	6.27E-05
Ho-161	2.85E-04
Ho-162	2.85E-05
Ho-162m	1.29E-04
Ho-164	5.51E-05
Ho-164m	7.12E-05
Ho-166	3.07E-03
Ho-166m	1.20E+03
Ho-167	3.53E-04
I-120	1.54E-04
I-120m	1.01E-04
I-121	2.42E-04
I-122	6.88E-06
I-123	1.51E-03
I-124	1.15E-02
I-125	1.65E-01
I-126	3.56E-02
I-128	4.77E-05
I-129	1.57E+07
I-130	1.42E-03
I-131	2.20E-02
I-132	2.62E-04
I-132m	1.59E-04
I-133	2.38E-03
I-134	1.00E-04
I-135	7.53E-04
In-109	4.79E-04
In-110a	1.32E-04
In-110b	5.59E-04
In-111	7.75E-03
In-112	2.74E-05
In-113m	1.90E-04
In-114	2.28E-06
In-114m	1.36E-01
In-115	5.10E+15
In-115m	5.12E-04
In-116m	1.03E-04
In-117	8.33E-05
In-117m	2.23E-04
In-119	4.58E-06
In-119m	3.42E-05
Ir-182	2.85E-05
Ir-184	3.45E-04
Ir-185	1.60E-03
Ir-186a	1.80E-03
Ir-186b	2.00E-04
Ir-187	1.20E-03
Ir-188	4.74E-03
Ir-189	3.64E-02
Ir-190	3.32E-02
Ir-190m	1.37E-04
Ir-190n	3.53E-04
Ir-191m	1.57E-07
Ir-192	2.03E-01
Ir-192m	2.41E+02
Ir-194	2.19E-03
Ir-194m	4.68E-01
Ir-195	2.85E-04
Ir-195m	4.33E-04
K-38	1.45E-05
K-40	1.28E+09
K-42	1.42E-03
K-43	2.58E-03
K-44	4.19E-05
K-45	3.81E-05
Kr-74	2.19E-05
Kr-76	1.69E-03
Kr-77	1.42E-04
Kr-79	4.00E-03
Kr-81	2.10E+05
Kr-81m	4.11E-07
Kr-83m	2.09E-04
Kr-85	1.07E+01
Kr-85m	5.12E-04
Kr-87	1.45E-04
Kr-88	3.23E-04
La-131	1.12E-04
La-132	5.48E-04
La-134	1.27E-05
La-135	2.23E-03
La-137	6.00E+04
La-138	1.35E+11
La-140	4.60E-03
La-141	4.49E-04
La-142	1.76E-04
La-143	2.70E-05
Lu-169	3.89E-03
Lu-170	5.48E-03
Lu-171	2.25E-02
Lu-172	1.84E-02
Lu-173	1.37E+00
Lu-174	3.32E+00
Lu-174m	3.89E-01
Lu-176	3.59E+10
Lu-176m	4.19E-04
Lu-177	1.84E-02
Lu-177m	4.41E-01
Lu-178	5.40E-05
Lu-178m	4.33E-05
Lu-179	5.23E-04
Md-257	5.95E-04
Md-258	1.51E-01
Mg-28	2.39E-03
Mn-51	8.79E-05
Mn-52	1.53E-02
Mn-52m	4.03E-05
Mn-53	3.70E+06
Mn-54	8.58E-01
Mn-56	2.96E-04
Mo-101	2.77E-05
Mo-90	6.47E-04
Mo-93	3.51E+03
Mo-93m	7.81E-04
Mo-99	7.53E-03
N-13	1.90E-05
Na-22	2.60E+00
Na-24	1.71E-03
Nb-88	2.72E-05
Nb-89a	1.25E-04
Nb-89b	2.32E-04
Nb-90	1.67E-03
Nb-93m	1.36E+01

Table 2. Radionuclide Half-life Values (continued)

Isotope	Half-life (yrs)
Nb-94	2.03E+04
Nb-95	9.64E-02
Nb-95m	9.89E-03
Nb-96	2.67E-03
Nb-97	1.37E-04
Nb-97m	1.90E-06
Nb-98	9.81E-05
Nd-136	9.64E-05
Nd-138	5.75E-04
Nd-139	5.64E-05
Nd-139m	6.27E-04
Nd-141	2.85E-04
Nd-141m	1.98E-06
Nd-147	3.01E-02
Nd-149	1.98E-04
Nd-151	2.36E-05
Ne-19	5.45E-07
Ni-56	1.67E-02
Ni-57	4.11E-03
Ni-59	7.51E+04
Ni-63	9.59E+01
Ni-65	2.88E-04
Ni-66	6.25E-03
Np-232	2.79E-05
Np-233	6.88E-05
Np-234	1.21E-02
Np-235	1.08E+00
Np-236a	1.15E+05
Np-236b	2.57E-03
Np-237	2.14E+06
Np-237+D	2.14E+06
Np-238	5.81E-03
Np-239	6.47E-03
Np-240	1.24E-04
Np-240m	1.41E-05
O-15	3.86E-06
Os-180	4.19E-05
Os-181	2.00E-04
Os-182	2.51E-03
Os-185	2.58E-01
Os-189m	6.85E-04
Os-190m	1.88E-05
Os-191	4.22E-02
Os-191m	1.48E-03
Os-193	3.42E-03
Os-194	6.00E+00
P-30	4.77E-06
P-32	3.92E-02
P-33	6.96E-02
Pa-227	7.29E-05
Pa-228	2.51E-03
Pa-230	4.77E-02
Pa-231	3.29E+04
Pa-232	3.59E-03
Pa-233	7.40E-02
Pa-234	7.64E-04
Pa-234m	2.23E-06
Pb-195m	3.01E-05
Pb-198	2.74E-04
Pb-199	1.71E-04
Pb-200	2.45E-03
Pb-201	1.07E-03
Pb-202	3.01E+05
Pb-202m	4.14E-04
Pb-203	5.95E-03
Pb-205	1.43E+07
Pb-209	3.70E-04
Pb-210	2.23E+01
Pb-210+D	2.23E+01
Pb-211	6.88E-05
Pb-212	1.21E-03
Pb-214	5.10E-05
Pd-100	9.95E-03
Pd-101	9.45E-04
Pd-103	4.66E-02
Pd-107	6.49E+06
Pd-109	1.53E-03
Pm-141	3.97E-05
Pm-142	1.28E-06
Pm-143	7.26E-01
Pm-144	9.95E-01
Pm-145	1.77E+01
Pm-146	5.53E+00
Pm-147	2.62E+00
Pm-148	1.47E-02
Pm-148m	1.13E-01
Pm-149	6.05E-03
Pm-150	3.07E-04
Pm-151	3.23E-03
Po-203	6.99E-05
Po-205	2.05E-04
Po-207	6.66E-04
Po-210	3.78E-01
Po-211	1.64E-08
Po-212	9.67E-15
Po-213	1.33E-13
Po-214	5.21E-12
Po-215	5.64E-11
Po-216	4.77E-09
Po-218	5.81E-06
Pr-136	2.49E-05
Pr-137	1.46E-04
Pr-138	2.77E-06
Pr-138m	2.40E-04
Pr-139	5.15E-04
Pr-142	2.18E-03
Pr-142m	2.77E-05
Pr-143	3.73E-02
Pr-144	3.29E-05
Pr-144m	1.37E-05
Pr-145	6.82E-04
Pr-147	2.59E-05
Pt-186	2.28E-04
Pt-188	2.79E-02
Pt-189	1.24E-03
Pt-191	7.67E-03
Pt-193	5.01E+01
Pt-193m	1.19E-02
Pt-195m	1.10E-02
Pt-197	2.09E-03
Pt-197m	1.80E-04
Pt-199	5.86E-05
Pt-200	1.43E-03
Pu-234	1.01E-03
Pu-235	4.82E-05
Pu-236	2.85E+00
Pu-237	1.24E-01
Pu-238	8.77E+01
Pu-239	2.41E+04
Pu-240	6.55E+03
Pu-241	1.44E+01
Pu-242	3.75E+05
Pu-243	5.67E-04
Pu-244	8.25E+07
Pu-244+D	8.25E+07

Table 2. Radionuclide Half-life Values (continued)

Isotope	Half-life (yrs)
Pu-245	1.20E-03
Pu-246	2.99E-02
Ra-222	1.21E-06
Ra-223	3.12E-02
Ra-224	1.00E-02
Ra-225	4.05E-02
Ra-226	1.60E+03
Ra-226+D	1.60E+03
Ra-227	8.03E-05
Ra-228	5.75E+00
Ra-228+D	5.75E+00
Rb-79	4.36E-05
Rb-80	1.08E-06
Rb-81	5.23E-04
Rb-81m	6.08E-05
Rb-82	2.47E-06
Rb-82m	7.07E-04
Rb-83	2.36E-01
Rb-84	8.99E-02
Rb-86	5.12E-02
Rb-87	4.71E+10
Rb-88	3.40E-05
Rb-89	2.90E-05
Re-177	2.66E-05
Re-178	2.51E-05
Re-180	4.63E-06
Re-181	2.28E-03
Re-182a	1.45E-03
Re-182b	7.32E-03
Re-184	1.04E-01
Re-184m	4.52E-01
Re-186	1.04E-02
Re-186m	2.00E+05
Re-187	5.01E+10
Re-188	1.94E-03
Re-188m	3.53E-05
Re-189	2.77E-03
Rh-100	2.38E-03
Rh-101	3.21E+00
Rh-101m	1.19E-02
Rh-102	2.90E+00
Rh-102m	5.67E-01
Rh-103m	1.07E-04
Rh-105	4.05E-03
Rh-106	9.48E-07
Rh-106m	2.51E-04
Rh-107	4.14E-05
Rh-99	4.38E-02
Rh-99m	5.37E-04
Rn-218	1.11E-09
Rn-219	1.25E-07
Rn-220	1.76E-06
Rn-222	1.05E-02
Rn-222+D	1.05E-02
Ru-103	1.08E-01
Ru-105	5.07E-04
Ru-106	1.01E+00
Ru-106+D	1.01E+00
Ru-94	9.86E-05
Ru-97	7.95E-03
S-35	2.39E-01
Sb-115	6.05E-05
Sb-116	3.01E-05
Sb-116m	1.15E-04
Sb-117	3.21E-04
Sb-118m	5.70E-04
Sb-119	4.36E-03
Sb-120a	3.01E-05
Sb-120b	1.58E-02
Sb-122	7.40E-03
Sb-124	1.65E-01
Sb-124m	2.96E-06
Sb-124n	3.84E-05
Sb-125	2.77E+00
Sb-125+D	2.77E+00
Sb-126	3.40E-02
Sb-126m	3.62E-05
Sb-127	1.05E-02
Sb-128a	1.98E-05
Sb-128b	1.03E-03
Sb-129	4.93E-04
Sb-130	7.62E-05
Sb-131	4.38E-05
Sc-43	4.44E-04
Sc-44	4.49E-04
Sc-44m	6.68E-03
Sc-46	2.30E-01
Sc-47	9.18E-03
Sc-48	4.99E-03
Sc-49	1.09E-04
Se-70	7.81E-05
Se-73	8.16E-04
Se-73m	7.42E-05
Se-75	3.29E-01
Se-77m	5.56E-07
Se-79	6.49E+04
Se-81	3.51E-05
Se-81m	1.09E-04
Se-83	4.27E-05
Si-31	2.99E-04
Si-32	4.49E+02
Sm-141	1.94E-05
Sm-141m	4.30E-05
Sm-142	1.38E-04
Sm-145	9.32E-01
Sm-146	1.03E+08
Sm-147	1.06E+11
Sm-151	9.01E+01
Sm-153	5.34E-03
Sm-155	4.19E-05
Sm-156	1.07E-03
Sn-110	4.58E-04
Sn-111	6.71E-05
Sn-113	3.15E-01
Sn-117m	3.73E-02
Sn-119m	8.03E-01
Sn-121	3.10E-03
Sn-121m	5.51E+01
Sn-123	3.53E-01
Sn-123m	7.62E-05
Sn-125	2.64E-02
Sn-126	1.00E+05
Sn-127	2.40E-04
Sn-128	1.12E-04
Sr-80	1.90E-04
Sr-81	4.85E-05
Sr-82	6.85E-02
Sr-83	3.70E-03
Sr-85	1.78E-01
Sr-85m	1.32E-04
Sr-87m	3.21E-04
Sr-89	1.38E-01
Sr-90	2.90E+01
Sr-90+D	2.90E+01
Sr-91	1.08E-03

Table 2. Radionuclide Half-life Values (continued)

Isotope	Half-life (yrs)
Sr-92	3.10E-04
Ta-172	7.01E-05
Ta-173	4.16E-04
Ta-174	1.37E-04
Ta-175	1.20E-03
Ta-176	9.23E-04
Ta-177	6.47E-03
Ta-178a	1.77E-05
Ta-178b	2.51E-04
Ta-179	1.82E+00
Ta-180	1.00E+13
Ta-180m	9.26E-04
Ta-182	3.15E-01
Ta-182m	3.01E-05
Ta-183	1.40E-02
Ta-184	9.95E-04
Ta-185	9.32E-05
Ta-186	2.00E-05
Tb-147	1.88E-04
Tb-149	4.74E-04
Tb-150	3.73E-04
Tb-151	2.01E-03
Tb-153	6.41E-03
Tb-154	2.44E-03
Tb-155	1.46E-02
Tb-156	1.46E-02
Tb-156m	2.79E-03
Tb-156n	5.70E-04
Tb-157	1.50E+02
Tb-158	1.50E+02
Tb-160	1.98E-01
Tb-161	1.89E-02
Tc-101	2.70E-05
Tc-104	3.45E-05
Tc-93	3.15E-04
Tc-93m	8.27E-05
Tc-94	5.56E-04
Tc-94m	9.89E-05
Tc-95	2.28E-03
Tc-95m	1.67E-01
Tc-96	1.17E-02
Tc-96m	9.81E-05
Tc-97	2.60E+06
Tc-97m	2.38E-01
Tc-98	4.19E+06
Tc-99	2.13E+05
Tc-99m	6.88E-04
Te-116	2.85E-04
Te-121	4.66E-02
Te-121m	4.22E-01
Te-123	1.00E+13
Te-123m	3.29E-01
Te-125m	1.59E-01
Te-127	1.07E-03
Te-127m	2.99E-01
Te-129	1.32E-04
Te-129m	9.21E-02
Te-131	4.77E-05
Te-131m	3.42E-03
Te-132	8.93E-03
Te-133	2.38E-05
Te-133m	1.05E-04
Te-134	7.95E-05
Th-226	5.89E-05
Th-227	5.12E-02
Th-228	1.91E+00
Th-228+D	1.91E+00
Th-229	7.34E+03
Th-229+D	7.34E+03
Th-230	7.70E+04
Th-231	2.90E-03
Th-232	1.41E+10
Th-234	6.60E-02
Ti-44	4.74E+01
Ti-45	3.51E-04
Tl-194	6.27E-05
Tl-194m	6.25E-05
Tl-195	1.32E-04
Tl-197	3.23E-04
Tl-198	6.05E-04
Tl-198m	2.13E-04
Tl-199	8.47E-04
Tl-200	2.99E-03
Tl-201	8.33E-03
Tl-202	3.34E-02
Tl-204	3.78E+00
Tl-206	8.00E-06
Tl-207	9.07E-06
Tl-208	5.84E-06
Tl-209	4.19E-06
Tm-162	4.14E-05
Tm-166	8.79E-04
Tm-167	2.53E-02
Tm-170	3.53E-01
Tm-171	1.92E+00
Tm-172	7.26E-03
Tm-173	9.40E-04
Tm-175	2.90E-05
U-230	5.70E-02
U-231	1.15E-02
U-232	7.21E+01
U-233	1.59E+05
U-234	2.45E+05
U-235	7.04E+08
U-235+D	7.04E+08
U-236	2.34E+07
U-237	1.85E-02
U-238	4.47E+09
U-238+D	4.47E+09
U-239	4.47E-05
U-240	1.61E-03
V-47	6.19E-05
V-48	4.44E-02
V-49	9.04E-01
W-176	2.62E-04
W-177	2.57E-04
W-178	5.95E-02
W-179	7.12E-05
W-181	3.32E-01
W-185	2.06E-01
W-187	2.73E-03
W-188	1.90E-01
Xe-120	7.62E-05
Xe-121	7.62E-05
Xe-122	2.30E-03
Xe-123	2.38E-04
Xe-125	1.94E-03
Xe-127	9.97E-02
Xe-129m	2.19E-02
Xe-131m	3.26E-02
Xe-133	1.44E-02
Xe-133m	6.00E-03
Xe-135	1.04E-03
Xe-135m	2.90E-05
Xe-138	2.70E-05

Table 2. Radionuclide Half-life Values (continued)

Isotope	Half-life (yrs)
Y-86	1.68E-03
Y-86m	9.12E-05
Y-87	9.18E-03
Y-88	2.93E-01
Y-90	7.32E-03
Y-90m	3.64E-04
Y-91	1.60E-01
Y-91m	9.45E-05
Y-92	4.05E-04
Y-93	1.15E-03
Y-94	3.64E-05
Y-95	2.04E-05
Yb-162	3.59E-05
Yb-166	6.47E-03
Yb-167	3.34E-05
Yb-169	8.77E-02
Yb-175	1.15E-02
Yb-177	2.17E-04
Yb-178	1.41E-04
Zn-62	1.06E-03
Zn-63	7.26E-05
Zn-65	6.68E-01
Zn-69	1.08E-04
Zn-69m	1.58E-03
Zn-71m	4.47E-04
Zn-72	5.32E-03
Zr-86	1.88E-03
Zr-88	2.28E-01
Zr-89	8.96E-03
Zr-93	1.53E+06
Zr-95	1.75E-01
Zr-97	1.93E-03

Table 3. Risk Equations

Preliminary Remediation Goals for Radionuclides

Topic for Key OSWER Radiation Guidances and Reports

Carcinogenic Adjustment Factors:

$$IR_s = \frac{ED_c \times IR_c + ED_a \times IR_a}{ED} \qquad IR_i = \frac{ED_c \times IRA_c + ED_a \times IRA_a}{ED}$$

$$CR_v = \frac{ED_c \times CR_{vc} + ED_a \times CR_{va}}{ED} \qquad CR_f = \frac{ED_c \times CR_{fc} + ED_a \times CR_{fa}}{ED}$$

$$IR_f = \frac{ED_c \times IR_{fc} + ED_a \times IR_{fa}}{ED} \qquad IR_m = \frac{ED_c \times IR_{mc} + ED_a \times IR_{ma}}{ED}$$

$$IR_b = \frac{ED_c \times IR_{bc} + ED_a \times IR_{ba}}{ED} \qquad IR_p = \frac{ED_c \times IR_{pc} + ED_a \times IR_{pa}}{ED}$$

Residential Soil Equation:

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$$C_{(pCi/g)} = \frac{TR \times t \times \lambda}{ED \times (1 - e^{-\lambda t}) \times \left[\begin{array}{l} \left(SF_s \times IR_s \times 10^{-3}(g/mg) \times EF\right) + \left(SF_i \times IR_i \times \frac{10^3(g/kg)}{PEF} \times EF \times \left[ET_o + (ET_i \times DF_i)\right] \right) + \\ \left(SF_e \times \frac{EF}{365\,(d/yr)} \times ACF \times \left[ET_o + (ET_i \times GSF)\right] \right) + \left(SF_p \times (CR_f + CR_v) \times 10^3(g/kg) \times TF_p \times CPF\right) \end{array} \right]}$$

Agricultural Soil Equation:

$$C_{(pCi/g)} = \frac{TR \times t \times \lambda}{ED_r \times \left(1 - e^{-\lambda t}\right) \times \left[ING_s + INH_s + EXT_s + PROD + FISH + BEEF + MILK + SWINE + EGGS + POULTRY\right]}$$

Where:

$$ING_{s(g/pCi-yr)} = IR_s \times EF \times SF_s \times 10^{-3}(g/mg)$$

$$EXT_{s(g/pCi-yr)} = \frac{EF}{365\,d/yr} \times ACF \times \left[ET_o + (ET_i \times GSF)\right] \times SF_e$$

$$INH_{s(g/pCi-yr)} = IR_i \times EF \times \left[ET_o + (ET_i \times DF_i)\right] \times SF_i \times \frac{10^3(g/kg)}{PEF}$$

$$PROD_{(g/pCi-yr)} = (CR_f + CR_v) \times TF_p \times CPF \times SF_f \times 10^3(g/kg)$$

$$FISH_{(g/pCi-yr)} = SF_f \times IR_f \times 10^3(g/kg) \times \frac{1}{\left(K_d + \sigma \times \left(\frac{S}{\rho}\right)\right)} \times TF_f \times \frac{A_s}{A_w}$$

$$MILK_{(g/pCi-yr)} = IR_m \times \left(\left(TF_m \times FI_m \times TF_p\right) + \left(TF_m \times FI_{sm}\right) + \left(TF_m \times FI_{wm} \times \frac{1}{\left(K_d + \sigma \times \left(\frac{S}{\rho}\right)\right)} \times \frac{1}{DF_w} \right) \right) \times SF_f \times 10^3(g/kg)$$

$$MEAT_{(g/pCi-yr)} = (IR_b + IR_p) \times \left(\left(TF_b \times FI_b \times TF_p\right) + \left(TF_b \times FI_{sb}\right) + \left(TF_b \times FI_{wb} \times \frac{1}{\left(K_d + \sigma \times \left(\frac{S}{\rho}\right)\right)} \times \frac{1}{DF_w} \right) \right) \times SF_f \times 10^3(g/kg)$$

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Outdoor Worker Equation:

$$C_{(pCi/g)} = \frac{TR \times t \times \lambda}{ED \times EF \times (1 - e^{-\lambda t}) \times \left[\left(SF_s \times IR_s \times 10^{-3}(g/mg) \right) + \left(SF_i \times IR_i \times \frac{10^3(g/kg)}{PEF} \times \left[ET_o + (ET_i \times DF_i) \right] \right) + \left(SF_e \times \frac{1}{365(d/yr)} \times ACF \times \left[ET_o + (ET_i \times GSF) \right] \right) \right]}$$

Indoor Worker Equation:

$$C_{(pCi/g)} = \frac{TR \times t \times \lambda}{ED \times EF \times (1 - e^{-\lambda t}) \times \left[\left(SF_s \times IR_s \times 10^{-3}(g/mg) \right) + \left(SF_i \times IR_i \times \frac{10^3(g/kg)}{PEF} \times \left[ET_o + (ET_i \times DF_i) \right] \right) + \left(SF_e \times \frac{1}{365(d/yr)} \times ACF \times \left[ET_o + (ET_i \times GSF) \right] \right) \right]}$$

Tap Water Equation:

$$C_{(pCi/g)} = \frac{TR}{ED \times EF \times \left[(SF_w \times IR_w) + (SF_i \times IR_i \times K) \right]}$$

Fish Ingestion Equation:

$$C_{(pCi/g)} = \frac{TR}{ED \times EF \times SF_f \times IR_f}$$

Soil to Groundwater Equations:

Partitioning:

$$SSL_{DC} = C_w * 10^{-3} * \left(K_d + \frac{\theta_w}{\rho_b} \right) * \frac{t * \lambda}{(1 - e^{-\lambda t})}$$

[redacted]

Mass Loading:

$$SSL_{DC} = \frac{C_w * I * ED * 10^{-3} * t * \lambda}{\rho_b * d_s * (1 - e^{-\lambda t})}$$

$$DAF = 1 + \left(\frac{K * i * d}{I * L} \right)$$

$$d = (0.0112 * L^2)^{0.5} + d_a * \{1 - e^{[(-L*I)/(K*i*d_a)]}\}$$

Supporting Equation:

$$PEF = Q/C * \frac{3{,}600}{0.036 * (1 - V) * (U_m / U_t)^3 * F(x)}$$

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URL: http://epa-prgs.ornl.gov/radionuclides/equations.shtml

TAP WATER RADIONUCLIDE PRELIMINARY REMEDIATION GOALS

(Tap Water RAD PRGs)

Table 4. Top Water Rad PRGs

Preliminary Remediation Goals for Radionuclides

Topic for Key OSWER Radiation Guidances and Reports

Equation Values for Tap Water

Parameter	Value	Parameter	Value
Target Risk (unitless)	1.0E-6	Exposure Duration (yr)	30
Exposure Frequency (day/yr)	350	Water Intake Rate (L/day)	2
Inhalation Rate (m^3/day)	20	K (Andelman volatilization factor) (L/m^3)	0.5

(only for H-3, C-14, Ra-224, Ra-226, Ra-228)

Radionuclide Preliminary Remediation Goals for Tap Water

Chemical	Water Ingestion Slope Factor (Risk/pCi)	Inhalation Slope Factor (Risk/pCi)	PRG (pCi/L)	PRG (mg/L)
Ac-223				
Ac-224	5.59E-12	4.07E-10	8.52E+00	1.77E-15
Ac-225	1.89E-10	2.86E-08	2.52E-01	4.35E-15
Ac-226	6.92E-11	4.33E-09	6.88E-01	1.44E-15

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[redacted]	Ac-227	2.01E-10	1.49E-07	2.37E-01	3.28E-12
	Ac-227+D decaychain	4.86E-10	2.09E-07	9.80E-02	1.36E-12
	Ac-228	1.99E-12	4.92E-11	2.39E+01	1.07E-14
	Ag-102	7.25E-14	2.56E-14	6.57E+02	4.60E-15
	Ag-103	1.20E-13	6.07E-14	3.97E+02	1.43E-14
	Ag-104	1.65E-13	6.25E-14	2.89E+02	1.11E-14
	Ag-104m	1.21E-13	4.92E-14	3.94E+02	7.30E-15
	Ag-105	1.77E-12	2.83E-12	2.69E+01	8.88E-13
	Ag-106	5.92E-14	2.72E-14	8.04E+02	1.09E-14
	Ag-106m	4.81E-12	3.54E-12	9.90E+00	6.77E-14
	Ag-108				
	Ag-108m decaychain	8.14E-12	2.67E-11	5.85E+00	2.25E-10
	Ag-109m				
	Ag-110				
	Ag-110m decaychain	9.88E-12	2.83E-11	4.82E+00	1.02E-12
	Ag-111	8.21E-12	6.66E-12	5.80E+00	3.68E-14
	Ag-112	1.99E-12	7.25E-13	2.39E+01	2.67E-15
	Ag-115	1.40E-13	6.81E-14	3.40E+02	4.17E-15
	Al-26	1.73E-11	6.92E-11	2.75E+00	1.43E-07
	Al-28				
	Am-237	5.07E-14	5.77E-14	9.39E+02	8.66E-14
	Am-238	9.62E-14	9.51E-14	4.95E+02	6.15E-14
	Am-239	1.38E-12	8.40E-13	3.45E+01	3.14E-14
	Am-240	2.59E-12	1.41E-12	1.84E+01	7.16E-14
	Am-241 decaychain	1.04E-10	2.81E-08	4.58E-01	1.33E-10
	Am-242	1.79E-12	5.03E-11	2.66E+01	3.29E-14
	Am-242m	7.07E-11	1.56E-08	6.74E-01	6.94E-11
	Am-242m+D	1.04E-10	2.81E-08	4.58E-01	4.72E-11
	Am-243	1.03E-10	2.70E-08	4.62E-01	2.32E-09
	Am-243+D decaychain	1.08E-10	2.70E-08	4.41E-01	2.21E-09
	Am-244	2.52E-12	3.09E-12	1.89E+01	1.49E-14
	Am-244m	5.11E-14	1.02E-13	9.32E+02	3.15E-14
	Am-245	2.22E-13	1.56E-13	2.15E+02	3.44E-14
	Am-246	1.23E-13	1.31E-13	3.87E+02	1.98E-14
	Am-246m	6.59E-14	3.96E-14	7.23E+02	2.37E-14

[redacted]

Ar-37				
Ar-39				
Ar-41				
As-69	1.05E-13	4.29E-14	4.54E+02	2.53E-15
As-70	3.20E-13	1.37E-13	1.49E+02	2.92E-15
As-71	2.28E-12	1.52E-12	2.09E+01	3.07E-14
As-72	1.02E-11	4.29E-12	4.67E+00	2.79E-15
As-73	1.56E-12	3.88E-12	3.05E+01	1.37E-12
As-74	6.70E-12	8.44E-12	7.11E+00	7.18E-14
As-76	9.66E-12	4.14E-12	4.93E+00	3.15E-15
As-77	2.50E-12	1.76E-12	1.90E+01	1.82E-14
As-78	6.33E-13	2.69E-13	7.52E+01	2.84E-15
At-207	6.96E-13	7.77E-12	6.84E+01	8.15E-15
At-211	3.37E-11	3.58E-10	1.41E+00	6.87E-16
At-215				
At-216				
At-217				
At-218				
Au-193	7.36E-13	4.55E-13	6.47E+01	7.06E-14
Au-194	1.66E-12	7.92E-13	2.87E+01	7.03E-14
Au-195	1.50E-12	6.48E-12	3.17E+01	8.69E-12
Au-195m				
Au-198	6.29E-12	4.00E-12	7.57E+00	3.10E-14
Au-198m	7.44E-12	7.77E-12	6.40E+00	2.24E-14
Au-199	2.78E-12	3.12E-12	1.71E+01	8.21E-14
Au-200	1.55E-13	8.55E-14	3.07E+02	1.58E-14
Au-200m	5.44E-12	2.81E-12	8.75E+00	1.05E-14
Au-201	4.33E-14	3.30E-14	1.10E+03	3.11E-14
Ba-126	8.51E-13	3.49E-13	5.60E+01	3.62E-15
Ba-128	1.52E-11	7.22E-12	3.13E+00	7.48E-15
Ba-131	2.00E-12	2.91E-12	2.38E+01	2.82E-13
Ba-131m	9.25E-15	1.69E-14	5.15E+03	5.25E-14
Ba-133	6.81E-12	1.16E-11	6.99E+00	2.79E-11
Ba-133m	3.19E-12	2.04E-12	1.49E+01	2.47E-14
Ba-135m	2.56E-12	1.61E-12	1.86E+01	2.30E-14

[redacted]

Ba-137m				
Ba-139	3.70E-13	1.79E-13	1.29E+02	7.88E-15
Ba-140	1.49E-11	2.03E-11	3.20E+00	4.36E-14
Ba-141	2.14E-13	9.69E-14	2.23E+02	3.06E-15
Ba-142	9.29E-14	4.55E-14	5.13E+02	4.11E-15
Be-10	7.03E-12	9.40E-11	6.77E+00	3.03E-07
Be-7	8.66E-14	2.13E-13	5.50E+02	1.57E-12
Bi-200	1.52E-13	7.55E-14	3.13E+02	1.21E-14
Bi-201	4.22E-13	1.90E-13	1.13E+02	1.30E-14
Bi-202	2.65E-13	1.12E-13	1.80E+02	1.94E-14
Bi-203	1.92E-12	8.21E-13	2.48E+01	1.90E-14
Bi-205	3.32E-12	3.24E-12	1.43E+01	3.45E-13
Bi-206	7.73E-12	5.85E-12	6.16E+00	6.07E-14
Bi-207 decaychain	5.66E-12	2.10E-11	8.41E+00	1.85E-10
Bi-210	8.92E-12	3.17E-10	5.34E+00	4.31E-14
Bi-210m	5.51E-11	1.17E-08	8.64E-01	1.52E-06
Bi-211				
Bi-212	7.10E-13	7.77E-11	6.71E+01	4.59E-15
Bi-213	5.11E-13	6.85E-11	9.32E+01	4.83E-15
Bi-214	1.92E-13	2.90E-11	2.48E+02	5.63E-15
Bk-245	3.43E-12	7.22E-12	1.39E+01	1.29E-13
Bk-246	2.01E-12	9.25E-13	2.37E+01	8.18E-14
Bk-247	1.24E-10	3.26E-08	3.84E-01	3.67E-10
Bk-249	1.11E-12	5.14E-11	4.29E+01	2.62E-11
Bk-250	5.66E-13	1.03E-12	8.41E+01	2.16E-14
Br-74	1.50E-13	6.44E-14	3.17E+02	3.17E-15
Br-74m	2.46E-13	1.15E-13	1.94E+02	3.17E-15
Br-75	1.57E-13	1.13E-13	3.03E+02	1.19E-14
Br-76	1.45E-12	1.10E-12	3.28E+01	1.29E-14
Br-77	3.01E-13	2.06E-13	1.58E+02	2.18E-13
Br-80	4.70E-14	1.80E-14	1.01E+03	7.51E-15
Br-80m	2.82E-13	2.43E-13	1.69E+02	1.91E-14
Br-82	1.71E-12	1.66E-12	2.78E+01	2.58E-14
Br-83	8.44E-14	1.21E-13	5.64E+02	3.58E-14
Br-84	1.48E-13	7.18E-14	3.22E+02	4.58E-15

[redacted]

C-11	4.07E-14	2.78E-14	1.17E+03	1.40E-15
C-14 decaychain	1.55E-12	7.07E-12	1.29E+00	2.90E-10
Ca-41	3.53E-13	2.09E-13	1.35E+02	2.17E-06
Ca-45	2.47E-12	9.40E-12	1.93E+01	1.08E-12
Ca-47	7.55E-12	7.88E-12	6.31E+00	1.03E-14
Ca-49				
Cd-104	1.72E-13	7.66E-14	2.77E+02	8.85E-15
Cd-107	3.50E-13	3.10E-13	1.36E+02	3.02E-14
Cd-109 decaychain	5.00E-12	2.19E-11	9.52E+00	3.70E-12
Cd-113	2.28E-11	1.12E-10	2.09E+00	6.15E+03
Cd-113m	2.87E-11	1.30E-10	1.66E+00	7.14E-12
Cd-115	8.66E-12	5.14E-12	5.50E+00	1.08E-14
Cd-115m	1.70E-11	2.92E-11	2.80E+00	1.10E-13
Cd-117	1.37E-12	6.51E-13	3.48E+01	3.24E-15
Cd-117m	1.22E-12	6.55E-13	3.90E+01	4.90E-15
Ce-134	1.59E-11	6.96E-12	2.99E+00	9.24E-15
Ce-135	3.81E-12	1.75E-12	1.25E+01	9.49E-15
Ce-137	1.31E-13	4.11E-14	3.64E+02	1.43E-13
Ce-137m	3.47E-12	1.94E-12	1.37E+01	2.07E-14
Ce-139	1.35E-12	5.66E-12	3.53E+01	5.19E-12
Ce-141	4.63E-12	1.14E-11	1.03E+01	3.62E-13
Ce-143	7.10E-12	3.74E-12	6.71E+00	1.01E-14
Ce-144	3.52E-11	1.10E-10	1.35E+00	4.24E-13
Ce-144+D decaychain	3.53E-11	1.10E-10	1.35E+00	4.23E-13
Cf-244	1.25E-13	2.96E-11	3.81E+02	9.61E-15
Cf-246	2.11E-11	1.47E-09	2.26E+00	6.34E-15
Cf-248	4.44E-11	1.81E-08	1.07E+00	6.81E-13
Cf-249	1.27E-10	3.40E-08	3.75E-01	9.18E-11
Cf-250	8.62E-11	2.66E-08	5.52E-01	5.07E-12
Cf-251	1.32E-10	3.40E-08	3.61E-01	2.28E-10
Cf-252				
Cf-253	4.26E-12	4.22E-09	1.12E+01	3.86E-13
Cf-254				
Cl-36 decaychain	3.30E-12	2.50E-11	1.44E+01	4.38E-07
Cl-38	1.93E-13	9.40E-14	2.47E+02	1.86E-15

[redacted]	Cl-39	1.52E-13	9.36E-14	3.13E+02	3.62E-15
	Cm-238	3.28E-13	1.35E-11	1.45E+02	2.65E-14
	Cm-240	3.49E-11	9.51E-09	1.36E+00	6.78E-14
	Cm-241	4.85E-12	1.01E-10	9.82E+00	5.95E-13
	Cm-242	3.85E-11	1.51E-08	1.24E+00	3.74E-13
	Cm-243 decaychain	9.47E-11	2.69E-08	5.03E-01	9.75E-12
	Cm-244 decaychain	8.36E-11	2.53E-08	5.70E-01	7.04E-12
	Cm-245	1.04E-10	2.77E-08	4.58E-01	2.67E-09
	Cm-246	1.02E-10	2.77E-08	4.67E-01	1.52E-09
	Cm-247	9.95E-11	2.50E-08	4.79E-01	5.16E-06
	Cm-248 decaychain				
	Cm-249	8.40E-14	7.25E-14	5.67E+02	4.83E-14
	Co-55	4.63E-12	2.07E-12	1.03E+01	3.16E-15
	Co-56	1.01E-11	1.85E-11	4.71E+00	1.60E-13
	Co-57 decaychain	1.04E-12	2.09E-12	4.58E+01	5.43E-12
	Co-58	2.95E-12	5.99E-12	1.61E+01	5.08E-13
	Co-58m	1.26E-13	6.88E-14	3.78E+02	6.41E-14
	Co-60 decaychain	1.57E-11	3.58E-11	3.03E+00	2.69E-12
	Co-60m	2.66E-15	3.96E-15	1.79E+04	6.01E-14
	Co-61	2.43E-13	1.43E-13	1.96E+02	6.30E-15
	Co-62m	8.25E-14	3.17E-14	5.77E+02	2.65E-15
	Cr-48	7.44E-13	7.51E-13	6.40E+01	2.26E-14
	Cr-49	1.35E-13	7.36E-14	3.53E+02	3.88E-15
	Cr-51	1.85E-13	1.67E-13	2.57E+02	2.79E-12
	Cs-125	5.96E-14	1.64E-14	7.99E+02	2.39E-14
	Cs-126				
	Cs-127	6.51E-14	2.47E-14	7.31E+02	1.86E-13
	Cs-128				
	Cs-129	1.85E-13	7.44E-14	2.57E+02	3.41E-13
	Cs-130	4.74E-14	1.24E-14	1.00E+03	2.08E-14
	Cs-131	1.86E-13	7.51E-14	2.56E+02	2.49E-12
	Cs-132	1.46E-12	5.92E-13	3.26E+01	2.14E-13
	Cs-134 decaychain	4.22E-11	1.65E-11	1.13E+00	8.72E-13
	Cs-134m	4.14E-14	1.99E-14	1.15E+03	1.43E-13
	Cs-135 decaychain	4.74E-12	1.86E-12	1.00E+01	8.73E-06

[redacted]	Cs-135m	4.51E-14	1.32E-14	1.06E+03	4.02E-14
	Cs-136	8.66E-12	3.49E-12	5.50E+00	7.52E-14
	Cs-137	3.04E-11	1.19E-11	1.57E+00	1.80E-11
	Cs-137+D decaychain	3.04E-11	1.19E-11	1.57E+00	1.80E-11
	Cs-138	1.58E-13	4.00E-14	3.01E+02	7.13E-15
	Cu-60	1.37E-13	5.77E-14	3.48E+02	2.58E-15
	Cu-61	4.63E-13	2.41E-13	1.03E+02	6.84E-15
	Cu-62				
	Cu-64	6.40E-13	4.33E-13	7.44E+01	1.93E-14
	Cu-66				
	Cu-67	1.94E-12	2.35E-12	2.45E+01	3.25E-14
	Dy-155	5.25E-13	2.45E-13	9.07E+01	4.49E-14
	Dy-157	2.26E-13	8.33E-14	2.11E+02	8.56E-14
	Dy-159	5.29E-13	1.28E-12	9.00E+01	1.58E-11
	Dy-165	4.14E-13	2.10E-13	1.15E+02	1.41E-14
	Dy-166	1.11E-11	8.36E-12	4.29E+00	1.86E-14
	Er-161	3.15E-13	1.34E-13	1.51E+02	2.52E-14
	Er-165	8.95E-14	3.13E-14	5.32E+02	2.92E-13
	Er-169	2.53E-12	3.85E-12	1.88E+01	2.27E-13
	Er-171	2.02E-12	9.40E-13	2.36E+01	9.69E-15
	Er-172	5.99E-12	4.74E-12	7.95E+00	2.15E-14
	Es-250	5.96E-14	5.07E-13	7.99E+02	1.34E-13
	Es-251	1.02E-12	6.40E-12	4.67E+01	1.24E-13
	Es-253	3.49E-11	8.84E-09	1.36E+00	5.43E-14
	Es-254	5.51E-11	1.85E-08	8.64E-01	4.65E-13
	Es-254m	2.73E-11	1.53E-09	1.74E+00	5.57E-15
	Eu-145	2.73E-12	1.81E-12	1.74E+01	1.15E-13
	Eu-146	4.55E-12	2.59E-12	1.05E+01	5.40E-14
	Eu-147	2.02E-12	3.85E-12	2.36E+01	6.38E-13
	Eu-148	4.29E-12	9.92E-12	1.11E+01	6.87E-13
	Eu-149	5.14E-13	1.07E-12	9.26E+01	9.86E-12
	Eu-150a	2.38E-12	1.03E-12	2.00E+01	1.21E-14
	Eu-150b	4.33E-12	1.12E-10	1.10E+01	1.58E-10
	Eu-152 decaychain	6.07E-12	9.10E-11	7.84E+00	4.44E-11
	Eu-152m	2.98E-12	1.12E-12	1.60E+01	7.24E-15

[redacted]	Eu-154 decaychain	1.03E-11	1.15E-10	4.62E+00	1.75E-11
	Eu-155 decaychain	1.90E-12	1.48E-11	2.51E+01	5.40E-11
	Eu-156	1.27E-11	1.37E-11	3.75E+00	6.82E-14
	Eu-157	3.70E-12	1.57E-12	1.29E+01	9.82E-15
	Eu-158	2.14E-13	1.10E-13	2.23E+02	8.60E-15
	F-18	9.73E-14	1.21E-13	4.89E+02	5.16E-15
	Fe-52	7.07E-12	2.73E-12	6.74E+00	9.27E-16
	Fe-55 decaychain	8.62E-13	7.99E-13	5.52E+01	2.30E-11
	Fe-59	7.88E-12	1.33E-11	6.04E+00	1.22E-13
	Fe-60	1.80E-10	1.84E-10	2.65E-01	4.44E-09
	Fm-252	1.69E-11	1.03E-09	2.82E+00	5.15E-15
	Fm-253	5.14E-12	1.28E-09	9.26E+00	5.39E-14
	Fm-254	2.15E-12	1.98E-10	2.21E+01	5.83E-15
	Fm-255	1.65E-11	8.84E-10	2.89E+00	4.73E-15
	Fm-257	4.40E-11	2.04E-08	1.08E+00	2.16E-13
	Fr-219				
	Fr-220				
	Fr-221				
	Fr-222	1.48E-12	2.42E-11	3.22E+01	5.48E-16
	Fr-223	7.29E-12	3.06E-12	6.53E+00	1.69E-16
	Ga-65	6.33E-14	2.84E-14	7.52E+02	3.96E-15
	Ga-66	6.40E-12	2.18E-12	7.44E+00	1.48E-15
	Ga-67	1.04E-12	9.55E-13	4.58E+01	7.68E-14
	Ga-68	2.83E-13	1.28E-13	1.68E+02	4.14E-15
	Ga-70	5.22E-14	2.92E-14	9.12E+02	7.21E-15
	Ga-72	5.59E-12	2.17E-12	8.52E+00	2.76E-15
	Ga-73	1.39E-12	6.14E-13	3.43E+01	3.92E-15
	Gd-145	8.92E-14	3.63E-14	5.34E+02	9.44E-15
	Gd-146	5.03E-12	2.27E-11	9.47E+00	5.12E-13
	Gd-147	2.46E-12	1.34E-12	1.94E+01	3.47E-14
	Gd-148	4.22E-11	1.26E-08	1.13E+00	4.35E-11
	Gd-149	2.23E-12	2.76E-12	2.14E+01	2.29E-13
	Gd-151	1.14E-12	2.92E-12	4.18E+01	5.81E-12
	Gd-152	2.97E-11	9.10E-09	1.60E+00	7.37E+01
	Gd-153 decaychain	1.52E-12	6.55E-12	3.13E+01	8.90E-12

[redacted]	Gd-159	3.19E-12	1.46E-12	1.49E+01	1.41E-14
	Ge-66	3.70E-13	2.50E-13	1.29E+02	6.16E-15
	Ge-67	1.06E-13	4.59E-14	4.49E+02	3.00E-15
	Ge-68	6.96E-12	4.88E-11	6.84E+00	1.03E-12
	Ge-69	9.84E-13	8.81E-13	4.84E+01	4.17E-14
	Ge-71	6.48E-14	5.18E-14	7.35E+02	4.72E-12
	Ge-75	8.66E-14	8.44E-14	5.50E+02	1.82E-14
	Ge-77	1.22E-12	1.15E-12	3.90E+01	1.09E-14
	Ge-78	3.09E-13	2.48E-13	1.54E+02	5.57E-15
	H-3 decaychain	1.12E-13	1.99E-13	4.30E+01	4.48E-12
	Hf-170	2.19E-12	1.20E-12	2.17E+01	1.89E-14
	Hf-172	4.96E-12	6.92E-11	9.60E+00	8.65E-12
	Hf-173	1.06E-12	5.92E-13	4.49E+01	5.96E-14
	Hf-175	1.96E-12	4.29E-12	2.43E+01	2.28E-12
	Hf-177m	2.01E-13	1.81E-13	2.37E+02	1.15E-14
	Hf-178m	1.51E-11	3.70E-10	3.15E+00	4.87E-11
	Hf-179m	6.55E-12	1.38E-11	7.27E+00	2.51E-13
	Hf-180m	7.18E-13	4.14E-13	6.63E+01	2.10E-14
	Hf-181	6.36E-12	1.76E-11	7.49E+00	4.41E-13
	Hf-182	5.37E-12	3.41E-10	8.87E+00	4.07E-05
	Hf-182m	1.11E-13	1.04E-13	4.29E+02	2.56E-14
	Hf-183	2.39E-13	1.65E-13	1.99E+02	1.24E-14
	Hf-184	2.91E-12	1.38E-12	1.64E+01	3.97E-15
	Hg-193	4.11E-13	2.53E-13	1.16E+02	2.50E-14
	Hg-193m	1.97E-12	9.40E-13	2.42E+01	1.66E-14
	Hg-194	8.07E-11	2.88E-11	5.90E-01	8.33E-11
	Hg-195	5.07E-13	2.84E-13	9.39E+01	5.80E-14
	Hg-195m	3.36E-12	2.33E-12	1.42E+01	3.67E-14
	Hg-197	1.43E-12	1.25E-12	3.33E+01	1.34E-13
	Hg-197m	3.00E-12	2.28E-12	1.59E+01	2.38E-14
	Hg-199m	6.70E-14	6.33E-14	7.11E+02	3.21E-14
	Hg-203	5.70E-12	8.95E-12	8.35E+00	6.06E-13
	Ho-155	1.05E-13	5.29E-14	4.54E+02	1.80E-14
	Ho-157	1.54E-14	7.36E-15	3.09E+03	3.26E-14
	Ho-159	1.78E-14	1.22E-14	2.68E+03	7.48E-14

[redacted]	Ho-161	4.96E-14	1.98E-14	9.60E+02	1.24E-13
	Ho-162	5.96E-15	5.40E-15	7.99E+03	1.03E-13
	Ho-162m	7.47E-14	5.18E-14	6.37E+02	3.74E-14
	Ho-164	1.75E-14	1.65E-14	2.72E+03	6.89E-14
	Ho-164m	4.14E-14	3.48E-14	1.15E+03	3.77E-14
	Ho-166	9.21E-12	3.85E-12	5.17E+00	7.35E-15
	Ho-166m	8.03E-12	3.09E-10	5.93E+00	3.31E-09
	Ho-167	3.64E-13	2.25E-13	1.31E+02	2.16E-14
	I-120	9.03E-13	3.89E-13	5.27E+01	2.73E-15
	I-120m	5.03E-13	1.98E-13	9.47E+01	3.21E-15
	I-121	2.27E-13	9.81E-14	2.10E+02	1.72E-14
	I-122				
	I-123	6.96E-13	3.03E-13	6.84E+01	3.55E-14
	I-124	4.14E-11	1.76E-11	1.15E+00	4.57E-15
	I-125	2.54E-11	1.06E-11	1.87E+00	1.08E-13
	I-126	8.73E-11	3.70E-11	5.45E-01	6.85E-15
	I-128	8.14E-14	3.04E-14	5.85E+02	9.97E-15
	I-129 decaychain	1.48E-10	6.07E-11	3.22E-01	1.82E-06
	I-130	6.36E-12	2.76E-12	7.49E+00	3.86E-15
	I-131	4.55E-11	1.95E-11	1.05E+00	8.46E-15
	I-132	8.44E-13	3.74E-13	5.64E+01	5.48E-15
	I-132m	6.11E-13	2.70E-13	7.79E+01	4.58E-15
	I-133	1.44E-11	6.25E-12	3.31E+00	2.92E-15
	I-134	2.50E-13	1.02E-13	1.90E+02	7.15E-15
	I-135	3.05E-12	1.34E-12	1.56E+01	4.45E-15
	In-109	2.46E-13	1.11E-13	1.94E+02	2.83E-14
	In-110a	2.81E-13	1.17E-13	1.69E+02	6.86E-15
	In-110b	7.59E-13	2.65E-13	6.27E+01	1.08E-14
	In-111	1.29E-12	8.03E-13	3.69E+01	8.90E-14
	In-112	1.68E-14	1.10E-14	2.83E+03	2.44E-14
	In-113m	9.47E-14	5.18E-14	5.03E+02	3.01E-14
	In-114				
	In-114m	2.48E-11	3.00E-11	1.92E+00	8.31E-14
	In-115	3.38E-11	4.03E-10	1.41E+00	2.31E+03
	In-115m	4.40E-13	2.15E-13	1.08E+02	1.79E-14

	In-116m	1.62E-13	8.77E-14	2.94E+02	9.85E-15
	In-117	7.03E-14	5.59E-14	6.77E+02	1.85E-14
	In-117m	4.44E-13	2.33E-13	1.07E+02	7.82E-15
	In-119				
	In-119m	7.55E-14	3.34E-14	6.31E+02	7.20E-15
	Ir-182	9.95E-14	5.03E-14	4.79E+02	6.96E-15
	Ir-184	6.44E-13	3.30E-13	7.39E+01	1.31E-14
	Ir-185	1.32E-12	7.25E-13	3.61E+01	2.99E-14
	Ir-186a	2.08E-12	1.06E-12	2.29E+01	2.15E-14
	Ir-186b	2.00E-13	1.11E-13	2.38E+02	2.48E-14
	Ir-187	5.77E-13	2.87E-13	8.25E+01	5.18E-14
	Ir-188	2.52E-12	1.38E-12	1.89E+01	4.71E-14
	Ir-189	1.51E-12	2.33E-12	3.15E+01	6.08E-13
	Ir-190	5.66E-12	8.81E-12	8.41E+00	1.48E-13
	Ir-190m	3.17E-14	3.89E-14	1.50E+03	1.09E-13
	Ir-190n	4.26E-13	2.14E-13	1.12E+02	2.10E-14
	Ir-191m				
	Ir-192	7.36E-12	2.41E-11	6.47E+00	7.05E-13
	Ir-192m	9.81E-13	1.02E-10	4.85E+01	6.29E-09
	Ir-194	8.62E-12	3.40E-12	5.52E+00	6.58E-15
	Ir-194m	8.88E-12	4.59E-11	5.36E+00	1.36E-12
	Ir-195	3.96E-13	2.39E-13	1.20E+02	1.87E-14
	Ir-195m	1.03E-12	5.96E-13	4.62E+01	1.10E-14
	K-38				
	K-40 decaychain	2.47E-11	1.03E-11	1.93E+00	2.76E-04
	K-42	1.26E-12	4.33E-13	3.78E+01	6.29E-15
	K-43	7.88E-13	3.09E-13	6.04E+01	1.88E-14
	K-44	1.39E-13	3.39E-14	3.43E+02	1.77E-15
	K-45	8.95E-14	2.33E-14	5.32E+02	2.55E-15
	Kr-74				
	Kr-76				
	Kr-77				
	Kr-79				
	Kr-81				
	Kr-81m				

[redacted]

Kr-83m				
Kr-85				
Kr-85m				
Kr-87				
Kr-88				
La-131	9.32E-14	5.48E-14	5.11E+02	2.10E-14
La-132	1.78E-12	6.25E-13	2.68E+01	5.42E-15
La-134				
La-135	1.46E-13	5.03E-14	3.26E+02	2.74E-13
La-137	3.48E-13	1.39E-11	1.37E+02	3.15E-06
La-138	3.53E-12	3.05E-10	1.35E+01	7.04E-01
La-140	1.10E-11	4.77E-12	4.33E+00	7.81E-15
La-141	1.88E-12	7.44E-13	2.53E+01	4.49E-15
La-142	5.77E-13	2.42E-13	8.25E+01	5.77E-15
La-143	1.26E-13	5.66E-14	3.78E+02	4.09E-15
Lu-169	1.94E-12	1.33E-12	2.45E+01	4.52E-14
Lu-170	4.14E-12	2.25E-12	1.15E+01	3.00E-14
Lu-171	3.27E-12	3.50E-12	1.46E+01	1.57E-13
Lu-172	5.59E-12	6.03E-12	8.52E+00	7.53E-14
Lu-173	1.35E-12	8.70E-12	3.53E+01	2.34E-11
Lu-174	1.46E-12	1.42E-11	3.26E+01	5.26E-11
Lu-174m	3.38E-12	1.51E-11	1.41E+01	2.67E-12
Lu-176	9.29E-12	1.41E-10	5.13E+00	9.09E-02
Lu-176m	8.55E-13	4.55E-13	5.57E+01	1.15E-14
Lu-177	3.53E-12	4.66E-12	1.35E+01	1.23E-13
Lu-177m	9.36E-12	5.70E-11	5.09E+00	1.11E-12
Lu-178	8.62E-14	5.29E-14	5.52E+02	1.49E-14
Lu-178m	7.10E-14	5.85E-14	6.71E+02	1.44E-14
Lu-179	1.12E-12	5.14E-13	4.25E+01	1.12E-14
Md-257	5.88E-13	7.70E-11	8.10E+01	3.46E-14
Md-258	4.33E-11	1.68E-08	1.10E+00	1.20E-13
Mg-28	1.14E-11	5.14E-12	4.18E+00	7.81E-16
Mn-51	2.09E-13	9.55E-14	2.28E+02	2.86E-15
Mn-52	6.44E-12	4.40E-12	7.39E+00	1.65E-14
Mn-52m	1.27E-13	5.07E-14	3.75E+02	2.19E-15

Mn-53	1.56E-13	2.17E-13	3.05E+02	1.68E-04
Mn-54 decaychain	2.28E-12	5.88E-12	2.09E+01	2.71E-12
Mn-56	1.03E-12	4.14E-13	4.62E+01	2.14E-15
Mo-101	6.88E-14	4.33E-14	6.92E+02	5.44E-15
Mo-90	6.59E-13	1.24E-12	7.23E+01	1.18E-14
Mo-93	3.35E-12	1.27E-12	1.42E+01	1.30E-08
Mo-93m	3.20E-13	4.33E-13	1.49E+02	3.03E-14
Mo-99	1.60E-12	4.29E-12	2.98E+01	6.22E-14
N-13				
Na-22 decaychain	9.62E-12	3.89E-12	4.95E+00	7.93E-13
Na-24	1.23E-12	4.74E-13	3.87E+01	4.45E-15
Nb-88	1.13E-13	4.51E-14	4.21E+02	2.83E-15
Nb-89a	4.00E-13	1.74E-13	1.19E+02	3.73E-15
Nb-89b	1.04E-12	4.07E-13	4.58E+01	2.65E-15
Nb-90	5.70E-12	2.27E-12	8.35E+00	3.51E-15
Nb-93m	8.03E-13	1.90E-12	5.93E+01	2.10E-10
Nb-94 decaychain	7.77E-12	3.77E-11	6.13E+00	3.27E-08
Nb-95	2.45E-12	5.44E-12	1.94E+01	4.99E-13
Nb-95m	3.66E-12	3.27E-12	1.30E+01	3.42E-14
Nb-96	5.03E-12	2.28E-12	9.47E+00	6.80E-15
Nb-97	1.96E-13	1.07E-13	2.43E+02	9.05E-15
Nb-97m				
Nb-98	2.80E-13	1.23E-13	1.70E+02	4.57E-15
Nd-136	2.70E-13	1.34E-13	1.76E+02	6.48E-15
Nd-138	3.42E-12	1.24E-12	1.39E+01	3.10E-15
Nd-139	4.96E-14	2.37E-14	9.60E+02	2.11E-14
Nd-139m	1.08E-12	4.96E-13	4.41E+01	1.08E-14
Nd-141	3.09E-14	1.34E-14	1.54E+03	1.73E-13
Nd-141m				
Nd-147	6.96E-12	9.36E-12	6.84E+00	8.49E-14
Nd-149	5.44E-13	3.19E-13	8.75E+01	7.21E-15
Nd-151	7.36E-14	3.92E-14	6.47E+02	6.45E-15
Ne-19				
Ni-56	2.83E-12	2.88E-12	1.68E+01	4.41E-14
Ni-57	3.89E-12	1.78E-12	1.22E+01	8.05E-15

[redacted]	Ni-59 decaychain	2.74E-13	4.66E-13	1.74E+02	2.15E-06
	Ni-63 decaychain	6.70E-13	1.64E-12	7.11E+01	1.20E-09
	Ni-65	6.96E-13	3.03E-13	6.84E+01	3.58E-15
	Ni-66	2.00E-11	8.99E-12	2.38E+00	2.74E-15
	Np-232	1.97E-14	3.17E-14	2.42E+03	4.39E-14
	Np-233	5.03E-15	2.49E-15	9.47E+03	4.25E-13
	Np-234	3.40E-12	1.86E-12	1.40E+01	1.11E-13
	Np-235	3.46E-13	1.15E-12	1.38E+02	9.83E-11
	Np-236a	1.05E-11	9.77E-10	4.54E+00	3.45E-07
	Np-236b	1.11E-12	8.07E-12	4.29E+01	7.28E-14
	Np-237	6.18E-11	1.77E-08	7.71E-01	1.09E-06
	Np-237+D decaychain	6.74E-11	1.77E-08	7.07E-01	1.00E-06
	Np-238	5.40E-12	4.18E-12	8.82E+00	3.41E-14
	Np-239	5.14E-12	4.00E-12	9.26E+00	4.01E-14
	Np-240	2.23E-13	1.95E-13	2.14E+02	1.77E-14
	Np-240m				
	O-15				
	Os-180	3.63E-14	2.62E-14	1.31E+03	2.77E-14
	Os-181	3.54E-13	1.95E-13	1.35E+02	1.36E-14
	Os-182	2.59E-12	1.45E-12	1.84E+01	2.35E-14
	Os-185	1.92E-12	6.14E-12	2.48E+01	3.31E-12
	Os-189m	1.02E-13	3.44E-14	4.67E+02	1.69E-13
	Os-190m				
	Os-191	3.64E-12	7.10E-12	1.31E+01	2.95E-13
	Os-191m	6.11E-13	6.36E-13	7.79E+01	6.19E-14
	Os-193	5.29E-12	2.71E-12	9.00E+00	1.67E-14
	Os-194	1.53E-11	2.55E-10	3.11E+00	1.01E-11
	P-30				
	P-32	8.95E-12	1.22E-11	5.32E+00	1.87E-14
	P-33	9.81E-13	5.11E-12	4.85E+01	3.12E-13
	Pa-227	9.69E-13	2.12E-10	4.91E+01	2.28E-15
	Pa-228	3.60E-12	2.33E-10	1.32E+01	2.12E-14
	Pa-230	3.77E-12	2.58E-09	1.26E+01	3.88E-13
	Pa-231 decaychain	1.73E-10	4.55E-08	2.75E-01	5.84E-09
	Pa-232	3.48E-12	6.81E-12	1.37E+01	3.19E-14

[redacted]

Pa-233	5.55E-12	1.42E-11	8.58E+00	4.14E-13
Pa-234	2.56E-12	1.46E-12	1.86E+01	9.32E-15
Pa-234m				
Pb-195m	5.48E-14	4.37E-14	8.69E+02	1.43E-14
Pb-198	2.60E-13	1.43E-13	1.83E+02	2.78E-14
Pb-199	1.42E-13	7.44E-14	3.35E+02	3.20E-14
Pb-200	1.58E-12	1.16E-12	3.01E+01	4.14E-14
Pb-201	5.92E-13	3.50E-13	8.04E+01	4.86E-14
Pb-202	2.22E-11	1.43E-11	2.15E+00	3.64E-07
Pb-202m	4.18E-13	2.25E-13	1.14E+02	2.66E-14
Pb-203	1.02E-12	7.55E-13	4.67E+01	1.58E-13
Pb-205	6.33E-13	6.44E-13	7.52E+01	6.17E-04
Pb-209	2.41E-13	1.90E-13	1.98E+02	4.29E-14
Pb-210	8.81E-10	2.77E-09	5.41E-02	7.09E-13
Pb-210+D decaychain	1.27E-09	1.39E-08	3.75E-02	4.92E-13
Pb-211	4.11E-13	3.70E-11	1.16E+02	4.70E-15
Pb-212	2.50E-11	5.77E-10	1.90E+00	1.37E-15
Pb-214	3.44E-13	3.63E-11	1.38E+02	4.23E-15
Pd-100	4.03E-12	3.10E-12	1.18E+01	3.29E-14
Pd-101	4.22E-13	1.97E-13	1.13E+02	3.01E-14
Pd-103	1.25E-12	1.77E-12	3.81E+01	5.12E-13
Pd-107	2.50E-13	1.69E-12	1.90E+02	3.71E-04
Pd-109	3.50E-12	1.85E-12	1.36E+01	6.35E-15
Pm-141	6.66E-14	2.85E-14	7.15E+02	1.12E-14
Pm-142				
Pm-143	8.73E-13	5.37E-12	5.45E+01	1.59E-11
Pm-144	3.34E-12	2.76E-11	1.43E+01	5.72E-12
Pm-145	5.59E-13	6.59E-12	8.52E+01	6.12E-10
Pm-146	4.18E-12	5.40E-11	1.14E+01	2.58E-11
Pm-147 decaychain	1.69E-12	1.61E-11	2.82E+01	3.04E-11
Pm-148	1.72E-11	1.05E-11	2.77E+00	1.69E-14
Pm-148m	7.99E-12	2.12E-11	5.96E+00	2.79E-13
Pm-149	6.66E-12	3.66E-12	7.15E+00	1.81E-14
Pm-150	1.08E-12	4.63E-13	4.41E+01	5.67E-15
Pm-151	4.51E-12	2.36E-12	1.06E+01	1.45E-14

[redacted]

Po-203	1.63E-13	7.73E-14	2.92E+02	1.16E-14
Po-205	1.81E-13	1.72E-13	2.63E+02	3.10E-14
Po-207	5.18E-13	1.99E-13	9.19E+01	3.55E-14
Po-210	3.77E-10	1.08E-08	1.26E-01	2.81E-14
Po-211				
Po-212				
Po-213				
Po-214				
Po-215				
Po-216				
Po-218				
Pr-136	5.88E-14	2.15E-14	8.10E+02	7.69E-15
Pr-137	1.25E-13	5.55E-14	3.81E+02	2.13E-14
Pr-138				
Pr-138m	4.18E-13	1.76E-13	1.14E+02	1.06E-14
Pr-139	1.47E-13	6.96E-14	3.24E+02	6.49E-14
Pr-142	8.58E-12	3.38E-12	5.55E+00	4.81E-15
Pr-142m	1.10E-13	4.33E-14	4.33E+02	4.78E-15
Pr-143	7.92E-12	9.73E-12	6.01E+00	8.97E-14
Pr-144	8.10E-14	3.58E-14	5.88E+02	7.80E-15
Pr-144m				
Pr-145	2.29E-12	9.25E-13	2.08E+01	5.76E-15
Pr-147	5.85E-14	3.59E-14	8.14E+02	8.67E-15
Pt-186	3.92E-13	8.25E-14	1.21E+02	1.44E-14
Pt-188	3.77E-12	1.88E-12	1.26E+01	1.86E-13
Pt-189	5.92E-13	1.32E-13	8.04E+01	5.30E-14
Pt-191	1.76E-12	4.63E-13	2.71E+01	1.11E-13
Pt-193	2.11E-13	1.11E-13	2.26E+02	6.10E-09
Pt-193m	3.03E-12	7.73E-13	1.57E+01	1.01E-13
Pt-195m	4.11E-12	1.05E-12	1.16E+01	6.97E-14
Pt-197	2.62E-12	5.22E-13	1.82E+01	2.09E-14
Pt-197m	4.00E-13	8.66E-14	1.19E+02	1.18E-14
Pt-199	8.84E-14	2.48E-14	5.39E+02	1.76E-14
Pt-200	7.73E-12	1.48E-12	6.16E+00	4.92E-15
Pu-234	8.58E-13	6.85E-11	5.55E+01	3.65E-14

[redacted]	Pu-235	4.37E-15	2.39E-15	1.09E+04	3.45E-13
	Pu-236	7.47E-11	2.28E-08	6.37E-01	1.20E-12
	Pu-237	5.77E-13	1.27E-12	8.25E+01	6.80E-12
	Pu-238 decaychain	1.31E-10	3.36E-08	3.64E-01	2.12E-11
	Pu-239 decaychain	1.35E-10	3.33E-08	3.53E-01	5.69E-09
	Pu-240 decaychain	1.35E-10	3.33E-08	3.53E-01	1.55E-09
	Pu-241 decaychain	1.76E-12	3.34E-10	2.71E+01	2.63E-10
	Pu-242 decaychain	1.28E-10	3.13E-08	3.72E-01	9.48E-08
	Pu-243	4.74E-13	2.94E-13	1.00E+02	3.87E-14
	Pu-244	1.37E-10	2.93E-08	3.48E-01	1.96E-05
	Pu-244+D decaychain	1.44E-10	2.93E-08	3.31E-01	1.87E-05
	Pu-245	4.48E-12	2.07E-12	1.06E+01	8.74E-15
	Pu-246	1.73E-11	1.73E-11	2.75E+00	5.66E-14
	Ra-222				
	Ra-223	2.38E-10	2.50E-08	2.00E-01	3.90E-15
	Ra-224	1.67E-10	9.99E-09	9.50E-04	5.98E-18
	Ra-225	1.14E-10	2.10E-08	4.18E-01	1.07E-14
	Ra-226	3.85E-10	1.15E-08	8.23E-04	8.33E-13
	Ra-226+D decaychain	3.86E-10	1.16E-08	8.16E-04	8.26E-13
	Ra-227	1.05E-13	3.13E-13	4.54E+02	2.31E-14
	Ra-228	1.04E-09	5.18E-09	4.58E-02	1.68E-13
	Ra-228+D decaychain	1.04E-09	5.23E-09	4.58E-02	1.68E-13
	Rb-79	8.36E-14	2.37E-14	5.70E+02	5.49E-15
	Rb-80				
	Rb-81	1.28E-13	4.63E-14	3.72E+02	4.41E-14
	Rb-81m	2.05E-14	1.10E-14	2.32E+03	3.21E-14
	Rb-82				
	Rb-82m	3.51E-13	1.35E-13	1.36E+02	2.20E-14
	Rb-83	5.70E-12	2.32E-12	8.35E+00	4.59E-13
	Rb-84	8.81E-12	3.59E-12	5.41E+00	1.14E-13
	Rb-86	9.88E-12	4.00E-12	4.82E+00	5.95E-14
	Rb-87	5.22E-12	2.14E-12	9.12E+00	1.04E-01
	Rb-88	1.40E-13	3.17E-14	3.40E+02	2.84E-15
	Rb-89	7.88E-14	2.09E-14	6.04E+02	4.36E-15
	Re-177	4.55E-14	2.97E-14	1.05E+03	1.38E-14

[redacted]	Re-178	4.26E-14	2.33E-14	1.12E+03	1.40E-14
	Re-180				
	Re-181	1.41E-12	7.96E-13	3.38E+01	3.91E-14
	Re-182a	8.70E-13	5.51E-13	5.47E+01	4.04E-14
	Re-182b	4.96E-12	4.44E-12	9.60E+00	3.57E-14
	Re-184	3.16E-12	6.73E-12	1.51E+01	8.08E-13
	Re-184m	4.88E-12	2.26E-11	9.76E+00	2.27E-12
	Re-186	5.59E-12	4.26E-12	8.52E+00	4.59E-14
	Re-186m	7.33E-12	4.18E-11	6.50E+00	6.77E-07
	Re-187	1.79E-14	2.51E-14	2.66E+03	6.96E+01
	Re-188	4.88E-12	2.22E-12	9.76E+00	9.97E-15
	Re-188m	9.92E-14	5.07E-14	4.80E+02	8.94E-15
	Re-189	2.86E-12	1.73E-12	1.67E+01	2.44E-14
	Rh-100	2.65E-12	1.04E-12	1.80E+01	1.19E-14
	Rh-101	2.15E-12	1.81E-11	2.21E+01	2.00E-11
	Rh-101m	9.40E-13	7.14E-13	5.07E+01	1.70E-13
	Rh-102	7.70E-12	5.99E-11	6.18E+00	5.12E-12
	Rh-102m	6.07E-12	2.56E-11	7.84E+00	1.27E-12
	Rh-103m	9.40E-15	9.14E-15	5.07E+03	1.56E-13
	Rh-105	2.34E-12	1.59E-12	2.04E+01	2.42E-14
	Rh-106				
	Rh-106m	5.48E-13	2.71E-13	8.69E+01	6.48E-15
	Rh-107	4.18E-14	2.88E-14	1.14E+03	1.41E-14
	Rh-99	2.21E-12	3.33E-12	2.15E+01	2.62E-13
	Rh-99m	2.42E-13	9.99E-14	1.97E+02	2.93E-14
	Rn-218				
	Rn-219				
	Rn-220				
	Rn-222				
	Rn-222+D		7.57E-12	1.26E+00	8.18E-15
	Ru-103	3.85E-12	8.92E-12	1.24E+01	3.84E-13
	Ru-105	1.35E-12	6.48E-13	3.53E+01	5.26E-15
	Ru-106	4.22E-11	1.02E-10	1.13E+00	3.38E-13
	Ru-106+D decaychain	4.22E-11	1.02E-10	1.13E+00	3.38E-13
	Ru-94	3.06E-13	1.23E-13	1.56E+02	4.04E-15

[redacted]

Ru-97	6.36E-13	3.36E-13	7.49E+01	1.62E-13
S-35	5.14E-13	5.03E-12	9.26E+01	2.17E-12
Sb-115	5.14E-14	2.33E-14	9.26E+02	1.80E-14
Sb-116	4.96E-14	1.88E-14	9.60E+02	9.37E-15
Sb-116m	1.76E-13	8.81E-14	2.71E+02	1.01E-14
Sb-117	6.59E-14	4.07E-14	7.23E+02	7.57E-14
Sb-118m	6.99E-13	2.64E-13	6.81E+01	1.28E-14
Sb-119	4.77E-13	1.74E-13	9.98E+01	1.45E-13
Sb-120a	2.48E-14	1.12E-14	1.92E+03	1.95E-14
Sb-120b	4.44E-12	3.30E-12	1.07E+01	5.69E-14
Sb-122	1.06E-11	5.48E-12	4.49E+00	1.14E-14
Sb-124	1.29E-11	2.43E-11	3.69E+00	2.11E-13
Sb-124m				
Sb-124n	1.67E-14	1.15E-14	2.85E+03	3.80E-14
Sb-125	4.37E-12	1.66E-11	1.09E+01	1.06E-11
Sb-125+D decaychain	5.13E-12	1.93E-11	9.28E+00	9.00E-12
Sb-126	1.11E-11	1.15E-11	4.29E+00	5.14E-14
Sb-126m	6.66E-14	3.16E-14	7.15E+02	9.12E-15
Sb-127	1.01E-11	7.51E-12	4.71E+00	1.77E-14
Sb-128a	5.51E-14	2.12E-14	8.64E+02	6.13E-15
Sb-128b	3.45E-12	1.44E-12	1.38E+01	5.09E-15
Sb-129	2.19E-12	9.62E-13	2.17E+01	3.87E-15
Sb-130	2.07E-13	9.73E-14	2.30E+02	6.37E-15
Sb-131	2.56E-13	9.73E-14	1.86E+02	2.99E-15
Sc-43	8.18E-13	3.81E-13	5.82E+01	3.11E-15
Sc-44	1.56E-12	6.44E-13	3.05E+01	1.69E-15
Sc-44m	1.38E-11	6.96E-12	3.45E+00	2.84E-15
Sc-46	6.22E-12	2.47E-11	7.66E+00	2.26E-13
Sc-47	3.49E-12	3.05E-12	1.36E+01	1.65E-14
Sc-48	7.33E-12	3.96E-12	6.50E+00	4.36E-15
Sc-49	2.05E-13	1.07E-13	2.32E+02	3.48E-15
Se-70	2.95E-13	7.36E-14	1.61E+02	2.47E-15
Se-73	7.96E-13	1.99E-13	5.98E+01	9.98E-15
Se-73m	8.29E-14	2.06E-14	5.74E+02	8.71E-15
Se-75	8.14E-12	3.77E-12	5.85E+00	4.04E-13

[redacted]	Se-77m				
	Se-79	7.29E-12	3.33E-12	6.53E+00	9.39E-08
	Se-81	4.29E-14	1.27E-14	1.11E+03	8.86E-15
	Se-81m	1.30E-13	3.54E-14	3.66E+02	9.06E-15
	Se-83	1.02E-13	2.72E-14	4.67E+02	4.64E-15
	Si-31	6.48E-13	3.05E-13	7.35E+01	1.91E-15
	Si-32	3.44E-12	2.93E-10	1.38E+01	5.58E-10
	Sm-141	7.10E-14	2.79E-14	6.71E+02	5.14E-15
	Sm-141m	1.40E-13	6.29E-14	3.40E+02	5.77E-15
	Sm-142	5.37E-13	2.13E-13	8.87E+01	4.86E-15
	Sm-145	1.17E-12	4.51E-12	4.07E+01	1.54E-11
	Sm-146	4.11E-11	7.88E-09	1.16E+00	4.88E-05
	Sm-147 decaychain	3.74E-11	6.88E-09	1.27E+00	5.56E-02
	Sm-151 decaychain	5.55E-13	4.88E-12	8.58E+01	3.26E-09
	Sm-153	4.85E-12	2.95E-12	9.82E+00	2.24E-14
	Sm-155	4.96E-14	3.15E-14	9.60E+02	1.75E-14
	Sm-156	1.49E-12	9.69E-13	3.20E+01	1.50E-14
	Sn-110	1.87E-12	6.70E-13	2.55E+01	3.58E-15
	Sn-111	5.51E-14	2.83E-14	8.64E+02	1.80E-14
	Sn-113	4.33E-12	1.00E-11	1.10E+01	1.10E-12
	Sn-117m	4.37E-12	8.84E-12	1.09E+01	1.33E-13
	Sn-119m	2.21E-12	7.81E-12	2.15E+01	5.76E-12
	Sn-121	1.50E-12	1.02E-12	3.17E+01	3.33E-14
	Sn-121m	2.34E-12	1.54E-11	2.04E+01	3.79E-10
	Sn-123	1.40E-11	3.03E-11	3.40E+00	4.14E-13
	Sn-123m	7.96E-14	5.62E-14	5.98E+02	1.57E-14
	Sn-125	2.01E-11	1.41E-11	2.37E+00	2.19E-14
	Sn-126	2.56E-11	9.95E-11	1.86E+00	6.56E-08
	Sn-127	8.25E-13	4.40E-13	5.77E+01	4.92E-15
	Sn-128	4.33E-13	2.29E-13	1.10E+02	4.43E-15
	Sr-80	1.09E-12	4.51E-13	4.37E+01	1.86E-15
	Sr-81	1.71E-13	8.07E-14	2.78E+02	3.06E-15
	Sr-82	3.13E-11	3.69E-11	1.52E+00	2.39E-14
	Sr-83	2.21E-12	1.26E-12	2.15E+01	1.85E-14
	Sr-85	2.26E-12	2.56E-12	2.11E+01	8.90E-13

[redacted]	Sr-85m	1.67E-14	8.32E-15	2.85E+03	8.97E-14
	Sr-87m	1.07E-13	5.62E-14	4.45E+02	3.48E-14
	Sr-89	1.28E-11	2.34E-11	3.72E+00	1.28E-13
	Sr-90	5.59E-11	1.05E-10	8.52E-01	6.25E-12
	Sr-90+D decaychain	7.40E-11	1.13E-10	6.44E-01	4.72E-12
	Sr-91	3.22E-12	1.70E-12	1.48E+01	4.09E-15
	Sr-92	2.25E-12	1.03E-12	2.12E+01	1.69E-15
	Ta-172	1.14E-13	7.22E-14	4.18E+02	1.41E-14
	Ta-173	9.03E-13	4.44E-13	5.27E+01	1.06E-14
	Ta-174	1.62E-13	1.11E-13	2.94E+02	1.96E-14
	Ta-175	8.70E-13	4.37E-13	5.47E+01	3.21E-14
	Ta-176	1.25E-12	5.96E-13	3.81E+01	1.73E-14
	Ta-177	5.88E-13	4.44E-13	8.10E+01	2.59E-13
	Ta-178a				
	Ta-178b	2.49E-13	1.79E-13	1.91E+02	2.39E-14
	Ta-179	3.44E-13	2.05E-12	1.38E+02	1.26E-10
	Ta-180	4.44E-12	7.25E-11	1.07E+01	5.41E+01
	Ta-180m	3.03E-13	1.86E-13	1.57E+02	7.32E-14
	Ta-182	7.96E-12	3.74E-11	5.98E+00	9.61E-13
	Ta-182m	1.99E-14	3.41E-14	2.39E+03	3.67E-14
	Ta-183	8.33E-12	8.81E-12	5.72E+00	4.09E-14
	Ta-184	3.53E-12	1.73E-12	1.35E+01	6.90E-15
	Ta-185	1.57E-13	1.18E-13	3.03E+02	1.46E-14
	Ta-186	5.51E-14	2.69E-14	8.64E+02	8.99E-15
	Tb-147	5.33E-13	2.26E-13	8.93E+01	6.93E-15
	Tb-149	1.08E-12	1.65E-11	4.41E+01	8.71E-15
	Tb-150	1.08E-12	3.88E-13	4.41E+01	6.91E-15
	Tb-151	1.49E-12	7.73E-13	3.20E+01	2.71E-14
	Tb-153	1.28E-12	8.18E-13	3.72E+01	1.02E-13
	Tb-154	2.57E-12	1.14E-12	1.85E+01	1.95E-14
	Tb-155	1.08E-12	8.99E-13	4.41E+01	2.79E-13
	Tb-156	4.96E-12	4.22E-12	9.60E+00	6.14E-14
	Tb-156m	8.44E-13	8.47E-13	5.64E+01	6.86E-14
	Tb-156n	4.03E-13	3.77E-13	1.18E+02	2.95E-14
	Tb-157	1.86E-13	1.46E-12	2.56E+02	1.69E-08

[redacted]	Tb-158	4.88E-12	8.29E-11	9.76E+00	6.48E-10
	Tb-160	8.70E-12	2.45E-11	5.47E+00	4.86E-13
	Tb-161	4.77E-12	5.03E-12	9.98E+00	8.52E-14
	Tc-101	3.06E-14	1.85E-14	1.56E+03	1.19E-14
	Tc-104	1.38E-13	5.33E-14	3.45E+02	3.48E-15
	Tc-93	1.59E-13	6.36E-14	2.99E+02	2.45E-14
	Tc-93m	6.81E-14	3.17E-14	6.99E+02	1.51E-14
	Tc-94	6.36E-13	2.80E-13	7.49E+01	1.10E-14
	Tc-94m	2.36E-13	1.03E-13	2.02E+02	5.25E-15
	Tc-95	5.77E-13	2.63E-13	8.25E+01	5.01E-14
	Tc-95m	1.80E-12	3.40E-12	2.65E+01	1.18E-12
	Tc-96	3.42E-12	2.00E-12	1.39E+01	4.39E-14
	Tc-96m	3.59E-14	2.05E-14	1.33E+03	3.49E-14
	Tc-97	2.70E-13	8.51E-13	1.76E+02	1.25E-04
	Tc-97m	2.38E-12	1.12E-11	2.00E+01	1.30E-12
	Tc-98	7.10E-12	3.01E-11	6.71E+00	7.73E-06
	Tc-99 decaychain	2.75E-12	1.41E-11	1.73E+01	1.02E-06
	Tc-99m	7.96E-14	5.70E-14	5.98E+02	1.14E-13
	Te-116	6.73E-13	3.20E-13	7.08E+01	6.53E-15
	Te-121	1.46E-12	1.30E-12	3.26E+01	5.15E-13
	Te-121m	6.40E-12	1.44E-11	7.44E+00	1.06E-12
	Te-123	4.11E-12	2.50E-12	1.16E+01	3.99E+01
	Te-123m	4.14E-12	1.36E-11	1.15E+01	1.30E-12
	Te-125m	3.33E-12	1.17E-11	1.43E+01	7.95E-13
	Te-127	1.00E-12	6.11E-13	4.76E+01	1.81E-14
	Te-127m	8.62E-12	2.58E-11	5.52E+00	5.87E-13
	Te-129	1.71E-13	9.95E-14	2.78E+02	1.33E-14
	Te-129m	1.53E-11	2.49E-11	3.11E+00	1.03E-13
	Te-131	2.17E-13	6.40E-14	2.19E+02	3.83E-15
	Te-131m	8.25E-12	4.22E-12	5.77E+00	7.25E-15
	Te-132	1.70E-11	9.32E-12	2.80E+00	9.24E-15
	Te-133	1.92E-13	4.92E-14	2.48E+02	2.20E-15
	Te-133m	8.73E-13	2.64E-13	5.45E+01	2.14E-15
	Te-134	3.01E-13	1.60E-13	1.58E+02	4.72E-15
	Th-226	6.66E-13	1.56E-10	7.15E+01	2.66E-15

[redacted]	Th-227	4.74E-11	3.51E-08	1.00E+00	3.27E-14
	Th-228	1.07E-10	1.32E-07	4.45E-01	5.43E-13
	Th-228+D decaychain	3.00E-10	1.43E-07	1.59E-01	1.94E-13
	Th-229	2.24E-10	1.75E-07	2.13E-01	1.00E-09
	Th-229+D decaychain	5.28E-10	2.25E-07	9.02E-02	4.24E-10
	Th-230 decaychain	9.10E-11	2.85E-08	5.23E-01	2.59E-08
	Th-231	2.21E-12	1.52E-12	2.15E+01	4.06E-14
	Th-232 decaychain	1.01E-10	4.33E-08	4.71E-01	4.32E-03
	Th-234	2.31E-11	3.07E-11	2.06E+00	8.92E-14
	Ti-44	2.56E-11	3.41E-10	1.86E+00	1.08E-11
	Ti-45	6.44E-13	3.09E-13	7.39E+01	3.28E-15
	Tl-194	1.81E-14	5.11E-15	2.63E+03	8.97E-14
	Tl-194m	7.81E-14	2.50E-14	6.10E+02	2.07E-14
	Tl-195	6.40E-14	2.08E-14	7.44E+02	5.38E-14
	Tl-197	6.25E-14	2.39E-14	7.62E+02	1.36E-13
	Tl-198	2.06E-13	7.92E-14	2.31E+02	7.75E-14
	Tl-198m	1.30E-13	4.92E-14	3.66E+02	4.34E-14
	Tl-199	7.36E-14	2.89E-14	6.47E+02	3.05E-13
	Tl-200	6.14E-13	2.52E-13	7.76E+01	1.29E-13
	Tl-201	3.61E-13	1.49E-13	1.32E+02	6.18E-13
	Tl-202	1.49E-12	6.14E-13	3.20E+01	6.04E-13
	Tl-204 decaychain	5.85E-12	2.45E-12	8.14E+00	1.76E-11
	Tl-206				
	Tl-207				
	Tl-208				
	Tl-209				
	Tm-162	5.66E-14	2.72E-14	8.41E+02	1.58E-14
	Tm-166	1.12E-12	5.14E-13	4.25E+01	1.74E-14
	Tm-167	3.46E-12	4.37E-12	1.38E+01	1.63E-13
	Tm-170	8.92E-12	2.43E-11	5.34E+00	8.98E-13
	Tm-171	6.99E-13	3.33E-12	6.81E+01	6.26E-11
	Tm-172	1.08E-11	5.62E-12	4.41E+00	1.54E-14
	Tm-173	1.72E-12	7.73E-13	2.77E+01	1.26E-14
	Tm-175	5.22E-14	3.26E-14	9.12E+02	1.29E-14
	U-230	2.09E-10	4.55E-08	2.28E-01	8.36E-15

[redacted]

U-231	1.75E-12	1.80E-12	2.72E+01	2.03E-13
U-232 decaychain	2.92E-10	1.95E-08	1.63E-01	7.63E-12
U-233 decaychain	7.18E-11	1.16E-08	6.63E-01	6.88E-08
U-234 decaychain	7.07E-11	1.14E-08	6.74E-01	1.08E-07
U-235	6.96E-11	1.01E-08	6.84E-01	3.17E-04
U-235+D decaychain	7.18E-11	1.01E-08	6.63E-01	3.07E-04
U-236 decaychain	6.70E-11	1.05E-08	7.11E-01	1.10E-05
U-237	4.88E-12	6.44E-12	9.76E+00	1.20E-13
U-238	6.40E-11	9.32E-09	7.44E-01	2.22E-03
U-238+D decaychain	8.71E-11	9.35E-09	5.47E-01	1.63E-03
U-239	7.40E-14	5.70E-14	6.44E+02	1.93E-14
U-240	7.03E-12	2.96E-12	6.77E+00	7.33E-15
V-47	1.25E-13	5.96E-14	3.81E+02	3.11E-15
V-48	8.21E-12	9.29E-12	5.80E+00	3.46E-14
V-49	1.22E-13	1.47E-13	3.90E+02	4.84E-11
W-176	4.11E-13	1.24E-13	1.16E+02	1.50E-14
W-177	2.01E-13	5.99E-14	2.37E+02	3.02E-14
W-178	1.21E-12	3.85E-13	3.94E+01	1.17E-12
W-179	7.22E-15	1.83E-15	6.60E+03	2.36E-13
W-181	3.96E-13	1.35E-13	1.20E+02	2.02E-11
W-185	2.93E-12	9.36E-13	1.63E+01	1.73E-12
W-187	3.67E-12	1.11E-12	1.30E+01	1.85E-14
W-188	1.40E-11	4.63E-12	3.40E+00	3.40E-13
Xe-120				
Xe-121				
Xe-122				
Xe-123				
Xe-125				
Xe-127				
Xe-129m				
Xe-131m				
Xe-133				
Xe-133m				
Xe-135				
Xe-135m				

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Xe-138				
Y-86	4.07E-12	1.58E-12	1.17E+01	4.73E-15
Y-86m	2.35E-13	9.29E-14	2.03E+02	4.46E-15
Y-87	2.58E-12	1.49E-12	1.85E+01	4.12E-14
Y-88	4.18E-12	1.70E-11	1.14E+01	8.23E-13
Y-90	1.81E-11	8.40E-12	2.63E+00	4.84E-15
Y-90m	1.04E-12	4.81E-13	4.58E+01	4.20E-15
Y-91	1.60E-11	3.36E-11	2.98E+00	1.22E-13
Y-91m	3.52E-14	3.01E-14	1.35E+03	3.26E-14
Y-92	2.48E-12	9.32E-13	1.92E+01	2.00E-15
Y-93	7.18E-12	2.64E-12	6.63E+00	1.99E-15
Y-94	1.37E-13	5.51E-14	3.48E+02	3.32E-15
Y-95	7.25E-14	2.92E-14	6.57E+02	3.56E-15
Yb-162	5.22E-14	3.00E-14	9.12E+02	1.49E-14
Yb-166	4.37E-12	2.89E-12	1.09E+01	3.28E-14
Yb-167	1.56E-14	1.71E-14	3.05E+03	4.75E-14
Yb-169	4.00E-12	1.08E-11	1.19E+01	4.94E-13
Yb-175	2.87E-12	2.95E-12	1.66E+01	9.33E-14
Yb-177	3.46E-13	2.29E-13	1.38E+02	1.48E-14
Yb-178	3.89E-13	2.38E-13	1.22E+02	8.59E-15
Zn-62	4.96E-12	2.65E-12	9.60E+00	1.76E-15
Zn-63	1.61E-13	7.55E-14	2.96E+02	3.78E-15
Zn-65 decaychain	1.17E-11	5.81E-12	4.07E+00	4.95E-13
Zn-69	7.22E-14	6.11E-14	6.60E+02	1.38E-14
Zn-69m	1.86E-12	1.28E-12	2.56E+01	7.79E-15
Zn-71m	9.66E-13	5.33E-13	4.93E+01	4.39E-15
Zn-72	6.59E-12	5.48E-12	7.23E+00	7.73E-15
Zr-86	3.85E-12	1.56E-12	1.24E+01	5.61E-15
Zr-88	1.58E-12	8.95E-12	3.01E+01	1.70E-12
Zr-89	3.60E-12	1.92E-12	1.32E+01	2.95E-14
Zr-93	1.11E-12	7.29E-12	4.29E+01	1.71E-05
Zr-95	4.59E-12	1.65E-11	1.04E+01	4.84E-13
Zr-97	1.25E-11	4.81E-12	3.81E+00	2.00E-15

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INDUSTRIAL SOILS RADIONUCLIDE PRELIMINARY REMEDIATION GOALS

(Industrial Soils RAD PRGs)

Table 5. Industrial Soil Rad PRGs

Preliminary Remediation Goals for Radionuclides

Topic for Key OSWER Radiation Guidances and Reports

Equation Values for Outdoor Worker Soil

Parameter	Value	Parameter	Value
Target Risk (unitless)	1.0E-6	Exposure Duration (yr)	25
Exposure Frequency (day/yr)	225	Soil Intake Rate (mg/day)	100
Inhalation Rate (m^3/day)	20	Time of Exposure (yr)	25
Outdoor Exposure Time Fraction (unitless)	0.333	Indoor Exposure Time Fraction (unitless)	0.0
Indoor Dilution Factor (unitless)	0.4	Area Correction Factor (unitless)	0.9
Gamma Shielding Factor ~~(m^3/kg)~~ (unitless)	0.4	City (Climatic Zone)	Charleston(VI)
Surface Area (acres)	0.5	Q/C (g/m^2-s per kg/m^3)	74.89
Fraction of Vegetative Cover	.5	Mean Annual Windspeed (m/s)	3.89
Equivalent Threshold Value of Windspeed at 7m (m/s)	11.32	F(x) (unitless)	0.0391
Particulate Emission Factor (m^3/kg)	9.44E+09		

Radionuclide Preliminary Remediation Goals for Outdoor Worker Soil

Engineering Calculation K-CLC-G-00077, Rev 01
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Chemical	Industrial Exposure Soil Ingestion Slope Factor (Risk/pCi)*	Inhalation Slope Factor (Risk/pCi)	External Exposure Slope Factor (Risk/yr per pCi/g)	PRG (pCi/g)	PRG (mg/kg)
Ac-223			1.55E-08	5.78E+07	1.51E-07
Ac-224	2.77E-12	4.07E-10	6.06E-07	1.87E+04	3.88E-09
Ac-225	9.03E-11	2.86E-08	4.50E-08	2.44E+03	4.22E-08
Ac-226	2.84E-11	4.33E-09	4.46E-07	2.52E+03	5.28E-09
Ac-227	2.01E-10	1.49E-07	3.48E-10	1.26E+01	1.74E-07
Ac-227+D decaychain	3.45E-10	2.09E-07	1.47E-06	2.08E-01	2.88E-09
Ac-228	9.10E-13	4.92E-11	4.53E-06	1.18E+03	5.29E-10
Ag-102	5.74E-14	2.56E-14	1.60E-05	9.55E+03	6.70E-11
Ag-103	7.22E-14	6.07E-14	3.33E-06	9.01E+03	3.25E-10
Ag-104	1.10E-13	6.25E-14	1.25E-05	2.28E+03	8.74E-11
Ag-104m	8.29E-14	4.92E-14	5.50E-06	1.07E+04	1.99E-10
Ag-105	9.77E-13	2.83E-12	2.15E-06	1.55E+01	5.13E-10
Ag-106	4.44E-14	2.72E-14	3.08E-06	2.67E+04	3.61E-10
Ag-106m	2.82E-12	3.54E-12	1.31E-05	1.24E+01	8.50E-11
Ag-108			8.56E-08	9.72E+06	1.33E-08
Ag-108m decaychain	5.07E-12	2.67E-11	7.18E-06	3.23E-02	1.24E-09
Ag-109m			7.66E-09	3.90E+08	1.49E-07
Ag-110			1.69E-07	2.85E+07	6.84E-09
Ag-110m decaychain	5.96E-12	2.83E-11	1.30E-05	4.21E-01	8.89E-11
Ag-111	3.36E-12	6.66E-12	1.09E-07	1.68E+03	1.07E-08
Ag-112	9.10E-13	7.25E-13	3.23E-06	3.26E+03	3.64E-10
Ag-115	8.92E-14	6.81E-14	3.44E-06	2.87E+04	3.51E-10
Al-26	8.18E-12	6.92E-11	1.33E-05	1.63E-02	8.48E-07
Al-28			9.32E-06	9.44E+04	3.16E-11
Am-237	3.12E-14	5.77E-14	1.35E-06	2.00E+04	1.84E-09
Am-238	5.96E-14	9.51E-14	4.02E-06	5.00E+03	6.22E-10
Am-239	5.99E-13	8.40E-13	6.91E-07	4.00E+03	3.63E-09
Am-240	1.27E-12	1.41E-12	4.69E-06	1.38E+02	5.37E-10
Am-241 decaychain	9.10E-11	2.81E-08	2.76E-08	5.71E+00	1.66E-06
Am-242	7.51E-13	5.03E-11	3.48E-08	5.89E+04	7.28E-08

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Am-242m	7.33E-11	1.56E-08	1.05E-09	2.29E+01	2.36E-06
Am-242m+D	8.95E-11	2.81E-08	4.83E-08	3.87E+00	3.98E-07
Am-243	9.03E-11	2.70E-08	9.47E-08	2.05E+00	1.03E-05
Am-243+D decaychain	2.15E-12	2.70E-08	6.36E-07	3.41E-01	1.71E-06
Am-244	1.12E-12	3.09E-12	3.58E-06	9.09E+02	7.16E-10
Am-244m	3.81E-14	1.02E-13	5.09E-09	1.49E+07	5.03E-07
Am-245	1.10E-13	1.56E-13	1.04E-07	1.54E+05	2.47E-08
Am-246	8.47E-14	1.31E-13	2.93E-06	1.73E+04	8.82E-10
Am-246m	4.96E-14	3.96E-14	4.83E-06	1.63E+04	5.35E-10
Ar-37			0.00E+00		
Ar-39			5.94E-10	3.76E+02	1.11E-05
Ar-41			6.39E-06	2.81E+03	6.74E-11
As-69	7.70E-14	4.29E-14	4.43E-06	2.93E+04	1.64E-10
As-70	2.16E-13	1.37E-13	1.96E-05	1.91E+03	3.75E-11
As-71	1.09E-12	1.52E-12	2.37E-06	2.14E+02	3.15E-10
As-72	4.55E-12	4.29E-12	8.21E-06	1.54E+02	9.21E-11
As-73	6.85E-13	3.88E-12	5.78E-09	2.91E+03	1.31E-07
As-74	3.17E-12	8.44E-12	3.35E-06	2.30E+01	2.32E-10
As-76	4.14E-12	4.14E-12	2.01E-06	6.21E+02	3.97E-10
As-77	1.06E-12	1.76E-12	3.58E-08	2.36E+04	2.25E-08
As-78	3.59E-13	2.69E-13	6.11E-06	3.56E+03	1.34E-10
At-207	4.77E-13	7.77E-12	6.11E-06	2.99E+03	3.56E-10
At-211	2.23E-11	3.58E-10	7.94E-08	5.55E+04	2.70E-08
At-215			8.09E-10	1.46E+15	2.79E-06
At-216			3.08E-09	1.28E+14	7.37E-07
At-217			1.32E-09	2.77E+12	1.73E-06
At-218			3.57E-09	1.66E+10	6.41E-07
Au-193	3.26E-13	4.55E-13	4.30E-07	4.32E+03	4.71E-09
Au-194	8.70E-13	7.92E-13	4.93E-06	1.69E+02	4.13E-10
Au-195	6.48E-13	6.48E-12	1.38E-07	5.42E+01	1.48E-08
Au-195m			7.37E-07	5.26E+06	2.78E-09
Au-198	2.66E-12	4.00E-12	1.70E-06	2.98E+02	1.22E-09
Au-198m	3.20E-12	7.77E-12	1.89E-06	3.15E+02	1.10E-09
Au-199	1.16E-12	3.12E-12	2.79E-07	1.56E+03	7.49E-09
Au-200	9.92E-14	8.55E-14	1.30E-06	3.13E+04	1.62E-09

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Au-200m	2.50E-12	2.81E-12	9.04E-06	1.94E+02	2.32E-10
Au-201	3.19E-14	3.30E-14	2.29E-07	3.26E+05	9.22E-09
Ba-126	4.66E-13	3.49E-13	5.83E-07	3.50E+04	2.27E-09
Ba-128	6.92E-12	7.22E-12	2.10E-07	2.67E+03	6.38E-09
Ba-131	1.02E-12	2.91E-12	1.77E-06	6.55E+01	7.77E-10
Ba-131m	6.88E-15	1.69E-14	1.67E-07	8.09E+05	8.24E-09
Ba-133	4.37E-12	1.16E-11	1.44E-06	3.03E-01	1.21E-09
Ba-133m	1.42E-12	2.04E-12	1.96E-07	4.31E+03	7.12E-09
Ba-135m	1.14E-12	1.61E-12	1.70E-07	6.73E+03	8.33E-09
Ba-137m			2.69E-06	2.87E+05	5.35E-10
Ba-139	2.06E-13	1.79E-13	1.65E-07	1.44E+05	8.85E-09
Ba-140	6.77E-12	2.03E-11	7.61E-07	1.42E+02	1.93E-09
Ba-141	1.22E-13	9.69E-14	3.79E-06	2.84E+04	3.91E-10
Ba-142	5.88E-14	4.55E-14	4.85E-06	3.83E+04	3.08E-10
Be-10	2.96E-12	9.40E-11	7.43E-10	1.96E+02	8.79E-03
Be-7	5.03E-14	2.13E-13	2.13E-07	1.21E+02	3.45E-10
Bi-200	9.36E-14	7.55E-14	1.06E-05	5.11E+03	1.98E-10
Bi-201	2.26E-13	1.90E-13	6.05E-06	3.02E+03	3.49E-10
Bi-202	1.66E-13	1.12E-13	1.24E-05	1.59E+03	1.71E-10
Bi-203	1.01E-12	8.21E-13	1.16E-05	2.40E+02	1.84E-10
Bi-205	1.79E-12	3.24E-12	8.19E-06	1.09E+01	2.63E-10
Bi-206	4.00E-12	5.85E-12	1.52E-05	1.44E+01	1.42E-10
Bi-207 decaychain	2.77E-12	2.10E-11	7.08E-06	3.81E-02	8.39E-10
Bi-210	3.74E-12	3.17E-10	2.76E-09	8.50E+04	6.86E-07
Bi-210m	2.92E-11	1.17E-08	1.01E-06	2.14E-01	3.77E-04
Bi-211			1.88E-07	4.90E+06	1.18E-08
Bi-212	4.40E-13	7.77E-11	8.87E-07	3.67E+04	2.51E-09
Bi-213	3.17E-13	6.85E-11	5.65E-07	7.64E+04	3.96E-09
Bi-214	1.47E-13	2.90E-11	7.48E-06	1.32E+04	3.00E-10
Bk-245	1.45E-12	7.22E-12	7.09E-07	3.91E+02	3.63E-09
Bk-246	9.99E-13	9.25E-13	4.25E-06	1.76E+02	6.08E-10
Bk-247	1.12E-10	3.26E-08	3.09E-07	6.75E-01	6.44E-07
Bk-249	5.99E-13	5.14E-11	2.63E-12	5.66E+04	3.46E-05
Bk-250	2.77E-13	1.03E-12	4.23E-06	2.41E+03	6.21E-10
Br-74	1.22E-13	6.44E-14	2.32E-05	3.36E+03	3.35E-11

[redacted]	Br-74m	1.98E-13	1.15E-13	2.00E-05	2.38E+03	3.89E-11
	Br-75	1.22E-13	1.13E-13	5.21E-06	3.86E+03	1.51E-10
	Br-76	9.99E-13	1.10E-12	1.30E-05	1.56E+02	6.14E-11
	Br-77	2.20E-13	2.06E-13	1.34E-06	4.38E+02	6.04E-10
	Br-80	3.85E-14	1.80E-14	3.55E-07	3.19E+05	2.37E-09
	Br-80m	1.97E-13	2.43E-13	5.95E-09	1.24E+06	1.41E-07
	Br-82	1.24E-12	1.66E-12	1.24E-05	7.51E+01	6.95E-11
	Br-83	6.33E-14	1.21E-13	3.46E-08	3.97E+05	2.52E-08
	Br-84	1.19E-13	7.18E-14	9.35E-06	6.63E+03	9.44E-11
	C-11	3.32E-14	2.78E-14	4.45E-06	2.17E+04	2.60E-11
	C-14 decaychain	1.38E-12	7.07E-12	7.83E-12	1.23E+03	2.77E-04
	Ca-41	3.24E-13	2.09E-13	0.00E+00	5.49E+03	8.82E-02
	Ca-45	1.52E-12	9.40E-12	3.96E-11	3.74E+04	2.10E-06
	Ca-47	3.85E-12	7.88E-12	5.24E-06	5.77E+01	9.42E-11
	Ca-49			1.75E-05	1.29E+04	2.94E-11
	Cd-104	1.02E-13	7.66E-14	9.70E-07	3.52E+04	1.13E-09
	Cd-107	1.49E-13	3.10E-13	3.48E-08	1.45E+05	3.23E-08
	Cd-109 decaychain	3.36E-12	2.19E-11	8.73E-09	3.23E+02	1.25E-07
	Cd-113	2.18E-11	1.12E-10	7.36E-11	7.83E+01	2.30E+08
	Cd-113m	2.63E-11	1.30E-10	4.45E-10	1.05E+02	4.52E-07
	Cd-115	3.60E-12	5.14E-12	1.01E-06	6.08E+02	1.20E-09
	Cd-115m	7.70E-12	2.92E-11	1.13E-07	2.69E+02	1.06E-08
	Cd-117	6.22E-13	6.51E-13	5.23E-06	2.52E+03	2.35E-10
	Cd-117m	6.03E-13	6.55E-13	1.03E-05	9.49E+02	1.19E-10
	Ce-134	6.62E-12	6.96E-12	8.24E-09	5.04E+04	1.56E-07
	Ce-135	1.78E-12	1.75E-12	7.74E-06	2.41E+02	1.83E-10
	Ce-137	5.85E-14	4.11E-14	4.46E-08	8.18E+04	3.23E-08
	Ce-137m	1.42E-12	1.94E-12	1.38E-07	6.91E+03	1.04E-08
	Ce-139	6.07E-13	5.66E-12	4.54E-07	2.18E+01	3.22E-09
	Ce-141	1.89E-12	1.14E-11	2.27E-07	1.85E+02	6.52E-09
	Ce-143	2.93E-12	3.74E-12	1.09E-06	9.13E+02	1.38E-09
	Ce-144	1.42E-11	1.10E-10	5.02E-08	9.28E+01	2.91E-08
	Ce-144+D decaychain		1.10E-10	2.44E-07	1.98E+01	6.20E-09
	Cf-244	9.03E-14	2.96E-11	6.83E-11	1.28E+09	3.23E-05
	Cf-246	8.58E-12	1.47E-09	9.25E-11	8.08E+05	2.27E-06

[redacted]	Cf-248	2.42E-11	1.81E-08	4.73E-11	1.36E+03	8.65E-07
	Cf-249	1.14E-10	3.40E-08	1.37E-06	1.60E-01	3.92E-08
	Cf-250	7.10E-11	2.66E-08	4.48E-11	4.48E+01	4.11E-07
	Cf-251	1.17E-10	3.40E-08	3.76E-07	5.60E-01	3.54E-07
	Cf-252			8.66E-11	1.64E+04	3.06E-05
	Cf-253	1.96E-12	4.22E-09	4.86E-11	2.64E+05	9.13E-06
	Cf-254			1.46E-13	1.55E+08	1.83E-02
	Cl-36 decaychain	2.29E-12	2.50E-11	1.74E-09	1.07E+02	3.25E-03
	Cl-38	1.55E-13	9.40E-14	7.93E-06	6.68E+03	5.03E-11
	Cl-39	1.21E-13	9.36E-14	7.09E-06	5.00E+03	5.78E-11
	Cm-238	1.65E-13	1.35E-11	1.90E-07	7.21E+04	1.32E-08
	Cm-240	1.53E-11	9.51E-09	6.19E-11	2.62E+04	1.30E-06
	Cm-241	2.15E-12	1.01E-10	1.94E-06	2.15E+01	1.30E-09
	Cm-242	1.87E-11	1.51E-08	7.73E-11	3.55E+03	1.07E-06
	Cm-243 decaychain	7.84E-11	2.69E-08	4.19E-07	6.74E-01	1.31E-08
	Cm-244 decaychain	6.88E-11	2.53E-08	4.85E-11	3.98E+01	4.92E-07
	Cm-245	9.14E-11	2.77E-08	2.38E-07	8.70E-01	5.07E-06
	Cm-246	9.03E-11	2.77E-08	4.57E-11	1.96E+01	6.39E-05
	Cm-247	8.58E-11	2.50E-08	1.31E-06	1.64E-01	1.77E-03
	Cm-248 decaychain			3.42E-11	6.33E+03	1.49E+00
	Cm-249	4.92E-14	7.25E-14	8.51E-08	3.61E+05	3.07E-08
	Co-55	2.38E-12	2.07E-12	9.21E-06	2.04E+02	6.27E-11
	Co-56	5.29E-12	1.85E-11	1.80E-05	9.65E-01	3.27E-11
	Co-57 decaychain	4.85E-13	2.09E-12	3.55E-07	1.42E+01	1.69E-09
	Co-58	1.57E-12	5.99E-12	4.48E-06	4.32E+00	1.36E-10
	Co-58m	5.99E-14	6.88E-14	1.00E-12	4.33E+08	7.34E-05
	Co-60 decaychain	7.33E-12	3.58E-11	1.24E-05	5.96E-02	5.28E-11
	Co-60m	2.12E-15	3.96E-15	1.86E-08	1.01E+07	3.39E-08
	Co-61	1.32E-13	1.43E-13	2.48E-07	8.03E+04	2.58E-09
	Co-62m	6.55E-14	3.17E-14	1.35E-05	1.05E+04	4.82E-11
	Cr-48	4.07E-13	7.51E-13	1.62E-06	8.82E+02	3.11E-10
	Cr-49	9.10E-14	7.36E-14	4.43E-06	1.06E+04	1.16E-10
	Cr-51	8.88E-14	1.67E-13	1.27E-07	3.89E+02	4.22E-09
	Cs-125	4.77E-14	1.64E-14	2.92E-06	1.50E+04	4.50E-10
	Cs-126			4.74E-06	2.54E+05	2.79E-10

[redacted]	Cs-127	5.00E-14	2.47E-14	1.68E-06	3.13E+03	7.94E-10
	Cs-128			3.92E-06	1.29E+05	3.43E-10
	Cs-129	1.38E-13	7.44E-14	1.05E-06	9.75E+02	1.29E-09
	Cs-130	3.85E-14	1.24E-14	2.22E-06	2.97E+04	6.15E-10
	Cs-131	1.37E-13	7.51E-14	4.90E-09	2.87E+04	2.80E-07
	Cs-132	1.18E-12	5.92E-13	3.11E-06	6.79E+01	4.46E-10
	Cs-134 decaychain	4.48E-11	1.65E-11	7.10E-06	2.56E-01	1.98E-10
	Cs-134m	3.28E-14	1.99E-14	5.02E-08	2.26E+05	2.80E-08
	Cs-135 decaychain	4.70E-12	1.86E-12	2.36E-11	3.63E+02	3.16E-01
	Cs-135m	3.66E-14	1.32E-14	7.37E-06	5.05E+03	1.92E-10
	Cs-136	7.22E-12	3.49E-12	1.00E-05	1.05E+01	1.43E-10
	Cs-137	3.17E-11	1.19E-11	5.32E-10	6.49E+01	7.47E-07
	Cs-137+D decaychain	3.17E-11	1.19E-11	2.55E-06	1.12E-01	1.28E-09
	Cs-138	1.27E-13	4.00E-14	1.19E-05	5.15E+03	1.22E-10
	Cu-60	1.04E-13	5.77E-14	1.93E-05	4.40E+03	3.27E-11
	Cu-61	2.39E-13	2.41E-13	3.63E-06	2.65E+03	1.76E-10
	Cu-62			4.43E-06	4.57E+04	1.47E-10
	Cu-64	2.93E-13	4.33E-13	8.30E-07	3.12E+03	8.10E-10
	Cu-66			4.32E-07	8.95E+05	1.60E-09
	Cu-67	8.88E-13	2.35E-12	3.83E-07	1.39E+03	1.84E-09
	Dy-155	2.68E-13	2.45E-13	2.44E-06	1.35E+03	6.67E-10
	Dy-157	1.21E-13	8.33E-14	1.32E-06	3.07E+03	1.25E-09
	Dy-159	2.37E-13	1.28E-12	3.19E-08	2.98E+02	5.23E-08
	Dy-165	1.95E-13	2.10E-13	9.49E-08	1.49E+05	1.83E-08
	Dy-166	4.48E-12	8.36E-12	6.02E-08	6.63E+03	2.87E-08
	Er-161	1.65E-13	1.34E-13	4.09E-06	2.48E+03	4.13E-10
	Er-165	4.18E-14	3.13E-14	3.05E-08	1.04E+05	5.68E-08
	Er-169	1.02E-12	3.85E-12	9.10E-11	6.84E+05	8.25E-06
	Er-171	8.70E-13	9.40E-13	1.42E-06	3.08E+03	1.26E-09
	Er-172	2.55E-12	4.74E-12	2.20E-06	3.03E+02	8.21E-10
	Es-250	3.55E-14	5.07E-13	1.69E-06	9.26E+03	1.55E-09
	Es-251	4.33E-13	6.40E-12	2.55E-07	3.90E+03	1.03E-08
	Es-253	1.44E-11	8.84E-09	1.25E-09	2.22E+04	8.82E-07
	Es-254	2.82E-11	1.85E-08	8.55E-09	4.13E+02	2.22E-07
	Es-254m	1.11E-11	1.53E-09	2.10E-06	3.98E+02	1.27E-09

[redacted]

Eu-145	1.46E-12	1.81E-12	6.95E-06	3.32E+01	2.19E-10
Eu-146	2.45E-12	2.59E-12	1.16E-05	2.56E+01	1.32E-10
Eu-147	9.69E-13	3.85E-12	2.04E-06	2.80E+01	7.57E-10
Eu-148	2.38E-12	9.92E-12	9.84E-06	2.55E+00	1.58E-10
Eu-149	2.34E-13	1.07E-12	1.42E-07	1.04E+02	1.10E-08
Eu-150a	9.81E-13	1.03E-12	1.95E-07	1.34E+04	8.07E-09
Eu-150b	2.43E-12	1.12E-10	6.49E-06	4.25E-02	6.11E-10
Eu-152 decaychain	2.96E-12	9.10E-11	5.30E-06	7.31E-02	4.14E-10
Eu-152m	1.25E-12	1.12E-12	1.33E-06	2.65E+03	1.20E-09
Eu-154 decaychain	4.74E-12	1.15E-10	5.83E-06	8.50E-02	3.22E-10
Eu-155 decaychain	8.07E-13	1.48E-11	1.24E-07	6.29E+00	1.35E-08
Eu-156	5.44E-12	1.37E-11	6.62E-06	1.36E+01	2.47E-10
Eu-157	1.54E-12	1.57E-12	9.60E-07	2.25E+03	1.72E-09
Eu-158	1.39E-13	1.10E-13	5.06E-06	8.49E+03	3.28E-10
F-18	7.88E-14	1.21E-13	4.45E-06	4.03E+03	4.25E-11
Fe-52	3.29E-12	2.73E-12	3.07E-06	1.29E+03	1.78E-10
Fe-55 decaychain	5.18E-13	7.99E-13	0.00E+00	2.21E+04	9.17E-06
Fe-59	4.07E-12	1.33E-11	5.83E-06	5.28E+00	1.06E-10
Fe-60	1.28E-10	1.84E-10	6.38E-12	1.39E+01	2.33E-04
Fm-252	6.92E-12	1.03E-09	5.09E-11	1.62E+06	2.96E-06
Fm-253	2.13E-12	1.28E-09	2.24E-07	2.04E+03	1.18E-08
Fm-254	9.58E-13	1.98E-10	1.23E-10	4.23E+07	1.11E-05
Fm-255	6.73E-12	8.84E-10	3.85E-09	3.50E+05	5.73E-07
Fm-257	2.05E-11	2.04E-08	3.06E-07	4.39E+01	8.75E-09
Fr-219			1.44E-08	3.91E+11	1.60E-07
Fr-220			3.25E-08	1.33E+08	7.11E-08
Fr-221			1.11E-07	3.70E+06	2.09E-08
Fr-222	1.07E-12	2.42E-11	1.14E-08	1.19E+07	2.02E-07
Fr-223	4.85E-12	3.06E-12	1.40E-07	6.43E+05	1.67E-08
Ga-65	4.96E-14	2.84E-14	5.04E-06	2.57E+04	1.35E-10
Ga-66	2.81E-12	2.18E-12	1.26E-05	2.77E+02	5.50E-11
Ga-67	4.59E-13	9.55E-13	5.36E-07	7.83E+02	1.31E-09
Ga-68	1.66E-13	1.28E-13	4.17E-06	6.95E+03	1.71E-10
Ga-70	3.96E-14	2.92E-14	4.39E-08	2.12E+06	1.67E-08
Ga-72	2.54E-12	2.17E-12	1.37E-05	1.70E+02	5.52E-11

[redacted]	Ga-73	6.07E-13	6.14E-13	1.25E-06	5.35E+03	6.13E-10
	Gd-145	6.59E-14	3.63E-14	1.13E-05	7.62E+03	1.35E-10
	Gd-146	2.26E-12	2.27E-11	5.56E-07	5.10E+01	2.76E-09
	Gd-147	1.25E-12	1.34E-12	5.87E-06	1.47E+02	2.63E-10
	Gd-148	3.37E-11	1.26E-08	0.00E+00	5.77E+01	2.22E-06
	Gd-149	1.02E-12	2.76E-12	1.59E-06	9.16E+01	9.84E-10
	Gd-151	4.85E-13	2.92E-12	1.20E-07	9.50E+01	1.32E-08
	Gd-152	2.40E-11	9.10E-09	0.00E+00	7.39E+01	3.40E+06
	Gd-153 decaychain	6.66E-13	6.55E-12	1.62E-07	3.49E+01	9.91E-09
	Gd-159	1.31E-12	1.46E-12	1.74E-07	1.01E+04	9.59E-09
	Ge-66	2.58E-13	2.50E-13	2.86E-06	5.06E+03	2.42E-10
	Ge-67	8.62E-14	4.59E-14	6.24E-06	1.69E+04	1.13E-10
	Ge-68	3.48E-12	4.88E-11	4.69E-13	1.12E+04	1.68E-06
	Ge-69	5.99E-13	8.81E-13	4.02E-06	2.09E+02	1.80E-10
	Ge-71	3.19E-14	5.18E-14	4.74E-13	2.66E+07	1.71E-04
	Ge-75	6.92E-14	8.44E-14	1.38E-07	1.73E+05	5.71E-09
	Ge-77	7.92E-13	1.15E-12	4.82E-06	6.03E+02	1.68E-10
	Ge-78	2.43E-13	2.48E-13	1.10E-06	2.06E+04	7.45E-10
	H-3 decaychain	4.51E-14	1.99E-13		4.23E+00	4.41E-10
	Hf-170	1.05E-12	1.20E-12	2.04E-06	1.01E+03	8.75E-10
	Hf-172	2.35E-12	6.92E-11	1.62E-07	1.24E+01	1.11E-08
	Hf-173	5.00E-13	5.92E-13	1.34E-06	1.02E+03	1.36E-09
	Hf-175	9.21E-13	4.29E-12	1.35E-06	1.45E+01	1.36E-09
	Hf-177m	1.33E-13	1.81E-13	8.58E-06	4.47E+03	2.17E-10
	Hf-178m	8.40E-12	3.70E-10	9.57E-06	2.95E-02	4.56E-10
	Hf-179m	2.94E-12	1.38E-11	3.42E-06	1.59E+01	5.50E-10
	Hf-180m	3.56E-13	4.14E-13	3.93E-06	1.52E+03	4.81E-10
	Hf-181	2.75E-12	1.76E-11	2.24E-06	1.44E+01	8.49E-10
	Hf-182	3.74E-12	3.41E-10	9.10E-07	2.38E-01	1.09E-03
	Hf-182m	6.99E-14	1.04E-13	3.83E-06	8.37E+03	4.99E-10
	Hf-183	1.31E-13	1.65E-13	3.30E-06	9.34E+03	5.82E-10
	Hf-184	1.26E-12	1.38E-12	8.64E-07	9.23E+03	2.24E-09
	Hg-193	1.87E-13	2.53E-13	5.55E-07	1.69E+04	3.65E-09
	Hg-193m	9.10E-13	9.40E-13	4.54E-06	6.52E+02	4.46E-10
	Hg-194	2.00E-12	2.88E-11	5.04E-12	9.00E+02	1.27E-04

[redacted]

Hg-195	2.27E-13	2.84E-13	7.34E-07	4.52E+03	2.79E-09
Hg-195m	1.42E-12	2.33E-12	7.68E-07	1.03E+03	2.67E-09
Hg-197	5.99E-13	1.25E-12	1.14E-07	4.49E+03	1.81E-08
Hg-197m	1.24E-12	2.28E-12	2.50E-07	5.52E+03	8.27E-09
Hg-199m	4.44E-14	6.33E-14	5.77E-07	8.02E+04	3.62E-09
Hg-203	1.35E-12	8.95E-12	9.21E-07	3.19E+01	2.31E-09
Ho-155	6.25E-14	5.29E-14	1.52E-06	2.70E+04	1.07E-09
Ho-157	1.07E-14	7.36E-15	1.84E-06	8.50E+04	8.96E-10
Ho-159	1.28E-14	1.22E-14	1.16E-06	5.15E+04	1.44E-09
Ho-161	2.48E-14	1.98E-14	5.52E-08	2.38E+05	3.06E-08
Ho-162	4.66E-15	5.40E-15	6.02E-07	2.18E+05	2.83E-09
Ho-162m	4.55E-14	5.18E-14	2.46E-06	1.18E+04	6.92E-10
Ho-164	1.26E-14	1.65E-14	2.78E-08	2.45E+06	6.20E-08
Ho-164m	2.50E-14	3.48E-14	3.63E-08	1.45E+06	4.74E-08
Ho-166	3.74E-12	3.85E-12	1.18E-07	1.04E+04	1.47E-08
Ho-166m	4.29E-12	3.09E-10	7.69E-06	2.84E-02	1.58E-08
Ho-167	1.73E-13	2.25E-13	1.45E-06	7.31E+03	1.21E-09
I-120	5.66E-13	3.89E-13	1.33E-05	1.83E+03	9.48E-11
I-120m	3.53E-13	1.98E-13	2.55E-05	1.46E+03	4.94E-11
I-121	1.44E-13	9.81E-14	1.63E-06	9.51E+03	7.80E-10
I-122			4.17E-06	1.31E+05	3.07E-10
I-123	3.77E-13	3.03E-13	5.10E-07	4.88E+03	2.53E-09
I-124	2.18E-11	1.76E-11	5.10E-06	6.42E+01	2.55E-10
I-125	1.70E-11	1.06E-11	7.24E-09	2.45E+03	1.41E-07
I-126	3.24E-11	3.70E-11	1.96E-06	5.36E+01	6.74E-10
I-128	6.14E-14	3.04E-14	3.74E-07	2.11E+05	3.59E-09
I-129 decaychain	1.14E-10	6.07E-11	6.10E-09	1.08E+01	6.14E-02
I-130	3.41E-12	2.76E-12	9.67E-06	2.74E+02	1.41E-10
I-131	2.43E-11	1.95E-11	1.59E-06	1.07E+02	8.64E-10
I-132	5.07E-13	3.74E-13	1.06E-05	1.35E+03	1.31E-10
I-132m	3.40E-13	2.70E-13	1.40E-06	1.68E+04	9.90E-10
I-133	7.25E-12	6.25E-12	2.72E-06	5.81E+02	5.13E-10
I-134	1.76E-13	1.02E-13	1.24E-05	3.02E+03	1.14E-10
I-135	1.64E-12	1.34E-12	7.83E-06	6.35E+02	1.81E-10
In-109	1.32E-13	1.11E-13	2.90E-06	2.70E+03	3.95E-10

	In-110a	1.68E-13	1.17E-13	7.13E-06	4.00E+03	1.62E-10
	In-110b	4.51E-13	2.65E-13	1.41E-05	4.76E+02	8.19E-11
	In-111	6.25E-13	8.03E-13	1.42E-06	3.41E+02	8.21E-10
	In-112	1.33E-14	1.10E-14	1.15E-06	1.19E+05	1.02E-09
	In-113m	5.11E-14	5.18E-14	1.05E-06	1.89E+04	1.13E-09
	In-114			1.35E-08	1.22E+08	8.87E-08
	In-114m	1.07E-11	3.00E-11	3.57E-07	7.72E+01	3.34E-09
	In-115	3.19E-11	4.03E-10	2.70E-10	5.14E+01	8.45E+07
	In-115m	1.96E-13	2.15E-13	6.27E-07	1.17E+04	1.93E-09
	In-116m	1.07E-13	8.77E-14	1.23E-05	2.96E+03	9.91E-11
	In-117	4.74E-14	5.59E-14	2.90E-06	1.55E+04	4.24E-10
	In-117m	2.17E-13	2.33E-13	3.35E-07	5.03E+04	3.67E-09
	In-119			3.54E-06	2.32E+05	3.53E-10
	In-119m	5.85E-14	3.34E-14	5.63E-08	1.95E+06	2.22E-08
	Ir-182	6.92E-14	5.03E-14	5.85E-06	2.25E+04	3.27E-10
	Ir-184	3.38E-13	3.30E-13	8.66E-06	1.26E+03	2.23E-10
	Ir-185	6.03E-13	7.25E-13	2.69E-06	8.73E+02	7.22E-10
	Ir-186a	1.04E-12	1.06E-12	7.40E-06	2.81E+02	2.64E-10
	Ir-186b	1.12E-13	1.11E-13	4.22E-06	4.45E+03	4.63E-10
	Ir-187	2.71E-13	2.87E-13	1.42E-06	2.20E+03	1.38E-09
	Ir-188	1.30E-12	1.38E-12	7.68E-06	1.03E+02	2.57E-10
	Ir-189	6.44E-13	2.33E-12	1.69E-07	6.09E+02	1.17E-08
	Ir-190	2.72E-12	8.81E-12	5.99E-06	1.89E+01	3.33E-10
	Ir-190m	1.59E-14	3.89E-14	8.69E-13	9.76E+09	7.11E-04
	Ir-190n	2.33E-13	2.14E-13	6.48E-06	1.64E+03	3.08E-10
	Ir-191m			1.58E-07	1.52E+08	1.27E-08
	Ir-192	3.30E-12	2.41E-11	3.40E-06	5.44E+00	5.93E-10
	Ir-192m	6.77E-13	1.02E-10	5.39E-07	4.16E-01	5.39E-08
	Ir-194	3.52E-12	3.40E-12	4.09E-07	4.18E+03	4.98E-09
	Ir-194m	4.55E-12	4.59E-11	1.01E-05	7.93E-01	2.02E-10
	Ir-195	1.85E-13	2.39E-13	1.12E-07	1.17E+05	1.83E-08
	Ir-195m	4.63E-13	5.96E-13	1.58E-06	5.47E+03	1.30E-09
	K-38			1.61E-05	1.60E+04	2.48E-11
	K-40 decaychain	1.51E-11	1.03E-11	7.97E-07	2.71E-01	3.89E-02
	K-42	8.40E-13	4.33E-13	1.46E-06	1.81E+03	3.02E-10

[redacted]	K-43	5.48E-13	3.09E-13	4.23E-06	3.44E+02	1.07E-10
	K-44	1.13E-13	3.39E-14	1.19E-05	7.50E+03	3.88E-11
	K-45	7.29E-14	2.33E-14	9.53E-06	1.03E+04	4.96E-11
	Kr-74			4.90E-06	3.50E+04	1.59E-10
	Kr-76			1.73E-06	1.28E+03	4.61E-10
	Kr-77			4.22E-06	6.25E+03	1.92E-10
	Kr-79			1.08E-06	8.69E+02	7.68E-10
	Kr-81			2.18E-08	9.93E+00	4.73E-04
	Kr-81m			4.60E-07	1.98E+07	1.85E-09
	Kr-83m			1.34E-11	1.34E+09	6.51E-05
	Kr-85			1.05E-08	4.16E+01	1.06E-07
	Kr-85m			5.46E-07	1.34E+04	1.64E-09
	Kr-87			4.00E-06	6.46E+03	2.28E-10
	Kr-88			1.02E-05	1.13E+03	9.06E-11
	La-131	5.74E-14	5.48E-14	2.76E-06	1.21E+04	4.99E-10
	La-132	8.44E-13	6.25E-13	9.52E-06	7.19E+02	1.46E-10
	La-134			3.05E-06	9.69E+04	4.61E-10
	La-135	6.70E-14	5.03E-14	5.21E-08	3.23E+04	2.72E-08
	La-137	1.67E-13	1.39E-11	6.75E-09	3.20E+01	7.36E-04
	La-138	2.03E-12	3.05E-10	6.07E-06	3.57E-02	1.86E+00
	La-140	4.85E-12	4.77E-12	1.15E-05	7.09E+01	1.28E-10
	La-141	8.18E-13	7.44E-13	2.37E-07	3.53E+04	6.25E-09
	La-142	3.23E-13	2.42E-13	1.44E-05	1.48E+03	1.04E-10
	La-143	8.03E-14	5.66E-14	5.11E-07	2.72E+05	2.94E-09
	Lu-169	9.69E-13	1.33E-12	4.73E-06	2.04E+02	3.75E-10
	Lu-170	2.11E-12	2.25E-12	1.26E-05	5.43E+01	1.42E-10
	Lu-171	1.52E-12	3.50E-12	2.90E-06	5.74E+01	6.19E-10
	Lu-172	2.75E-12	6.03E-12	8.70E-06	2.35E+01	2.08E-10
	Lu-173	6.03E-13	8.70E-12	2.92E-07	9.37E+00	6.22E-09
	Lu-174	6.44E-13	1.42E-11	4.26E-07	2.67E+00	4.31E-09
	Lu-174m	1.39E-12	1.51E-11	9.88E-08	9.74E+01	1.85E-08
	Lu-176	4.11E-12	1.41E-10	1.83E-06	1.18E-01	2.10E+00
	Lu-176m	3.74E-13	4.55E-13	2.78E-08	3.21E+05	6.64E-08
	Lu-177	1.43E-12	4.66E-12	1.14E-07	1.79E+03	1.63E-08
	Lu-177m	4.14E-12	5.70E-11	3.63E-06	2.34E+00	5.12E-10

[redacted]	Lu-178	6.25E-14	5.29E-14	6.76E-07	1.03E+05	2.77E-09
	Lu-178m	5.37E-14	5.85E-14	4.26E-06	2.04E+04	4.39E-10
	Lu-179	4.81E-13	5.14E-13	1.19E-07	6.01E+04	1.58E-08
	Md-257	2.59E-13	7.70E-11	3.62E-07	1.75E+04	7.46E-09
	Md-258	1.95E-11	1.68E-08	1.31E-09	6.73E+03	7.33E-07
	Mg-28	5.22E-12	5.14E-12	6.56E-06	2.40E+02	4.48E-11
	Mn-51	1.37E-13	9.55E-14	4.37E-06	9.77E+03	1.23E-10
	Mn-52	3.60E-12	4.40E-12	1.67E-05	1.47E+01	3.27E-11
	Mn-52m	9.66E-14	5.07E-14	1.15E-05	8.13E+03	4.75E-11
	Mn-53	6.99E-14	2.17E-13	0.00E+00	2.54E+04	1.40E+01
	Mn-54 decaychain	1.48E-12	5.88E-12	3.89E-06	1.12E+00	1.46E-10
	Mn-56	5.11E-13	4.14E-13	8.44E-06	1.51E+03	6.97E-11
	Mo-101	5.59E-14	4.33E-14	6.62E-06	2.04E+04	1.60E-10
	Mo-90	5.03E-13	1.24E-12	3.41E-06	1.70E+03	2.77E-10
	Mo-93	3.38E-12	1.27E-12	2.17E-10	3.45E+02	3.15E-04
	Mo-93m	2.51E-13	4.33E-13	1.09E-05	4.40E+02	8.96E-11
	Mo-99	1.18E-12	4.29E-12	6.64E-07	7.50E+02	1.57E-09
	N-13			4.45E-06	4.44E+04	3.07E-11
	Na-22 decaychain	7.47E-12	3.89E-12	1.03E-05	1.40E-01	2.25E-11
	Na-24	9.29E-13	4.74E-13	2.20E-05	9.96E+01	1.15E-11
	Nb-88	8.92E-14	4.51E-14	1.89E-05	7.29E+03	4.89E-11
	Nb-89a	2.35E-13	1.74E-13	8.48E-06	3.52E+03	1.10E-10
	Nb-89b	5.22E-13	4.07E-13	6.64E-06	2.43E+03	1.41E-10
	Nb-90	2.75E-12	2.27E-12	2.13E-05	1.06E+02	4.44E-11
	Nb-93m	3.32E-13	1.90E-12	3.83E-11	4.86E+03	1.72E-05
	Nb-94 decaychain	3.89E-12	3.77E-11	7.29E-06	2.97E-02	1.59E-07
	Nb-95	1.23E-12	5.44E-12	3.53E-06	1.10E+01	2.83E-10
	Nb-95m	1.50E-12	3.27E-12	2.32E-07	1.63E+03	4.30E-09
	Nb-96	2.41E-12	2.28E-12	1.15E-05	1.22E+02	8.77E-11
	Nb-97	1.14E-13	1.07E-13	2.97E-06	9.21E+03	3.43E-10
	Nb-97m			3.34E-06	5.90E+05	3.05E-10
	Nb-98	1.81E-13	1.23E-13	1.16E-05	3.30E+03	8.87E-11
	Nd-136	1.64E-13	1.34E-13	1.01E-06	3.85E+04	1.41E-09
	Nd-138	1.49E-12	1.24E-12	6.73E-08	9.66E+04	2.15E-08
	Nd-139	3.11E-14	2.37E-14	1.72E-06	3.86E+04	8.49E-10

[redacted]	Nd-139m	5.37E-13	4.96E-13	7.13E-06	8.38E+02	2.05E-10
	Nd-141	1.61E-14	1.34E-14	2.28E-07	5.79E+04	6.50E-09
	Nd-141m			3.48E-06	5.45E+05	4.26E-10
	Nd-147	2.86E-12	9.36E-12	4.87E-07	2.55E+02	3.17E-09
	Nd-149	2.58E-13	3.19E-13	1.49E-06	1.27E+04	1.05E-09
	Nd-151	4.63E-14	3.92E-14	4.10E-06	3.88E+04	3.87E-10
	Ne-19			4.47E-06	1.54E+06	4.46E-11
	Ni-56	1.64E-12	2.88E-12	7.74E-06	2.90E+01	7.60E-11
	Ni-57	1.89E-12	1.78E-12	9.43E-06	9.65E+01	6.35E-11
	Ni-59 decaychain	1.44E-13	4.66E-13	0.00E+00	1.23E+04	1.53E-01
	Ni-63 decaychain	3.50E-13	1.64E-12	0.00E+00	5.55E+03	9.40E-05
	Ni-65	3.34E-13	3.03E-13	2.74E-06	4.76E+03	2.49E-10
	Ni-66	8.18E-12	8.99E-12	2.67E-11	5.88E+05	6.78E-07
	Np-232	1.57E-14	3.17E-14	5.25E-06	2.55E+04	4.64E-10
	Np-233	3.58E-15	2.49E-15	2.29E-07	2.38E+05	1.07E-08
	Np-234	1.72E-12	1.86E-12	7.06E-06	4.41E+01	3.48E-10
	Np-235	1.42E-13	1.15E-12	2.13E-09	1.61E+03	1.15E-06
	Np-236a	7.18E-12	9.77E-10	3.25E-07	6.64E-01	5.05E-05
	Np-236b	4.74E-13	8.07E-12	1.34E-07	1.09E+04	1.85E-08
	Np-237	4.70E-11	1.77E-08	5.36E-08	3.65E+00	5.18E-03
	Np-237+D decaychain	4.92E-11	1.77E-08	7.97E-07	2.70E-01	3.83E-04
	Np-238	2.33E-12	4.18E-12	2.62E-06	2.46E+02	9.54E-10
	Np-239	2.15E-12	4.00E-12	5.41E-07	1.07E+03	4.64E-09
	Np-240	1.37E-13	1.95E-13	5.80E-06	5.23E+03	4.35E-10
	Np-240m			1.51E-06	1.76E+05	1.67E-09
	O-15			4.46E-06	2.17E+05	3.53E-11
	Os-180	2.72E-14	2.62E-14	1.08E-07	8.30E+05	1.75E-08
	Os-181	1.83E-13	1.95E-13	5.41E-06	3.47E+03	3.51E-10
	Os-182	1.23E-12	1.45E-12	1.63E-06	9.16E+02	1.17E-09
	Os-185	1.04E-12	6.14E-12	3.11E-06	4.68E+00	6.25E-10
	Os-189m	4.29E-14	3.44E-14	7.20E-13	9.21E+08	3.34E-04
	Os-190m			6.76E-06	2.95E+04	2.95E-10
	Os-191	1.50E-12	7.10E-12	1.66E-07	5.35E+02	1.21E-08
	Os-191m	2.51E-13	6.36E-13	1.05E-08	2.40E+05	1.91E-07
	Os-193	2.16E-12	2.71E-12	2.69E-07	4.07E+03	7.53E-09

[redacted]

Os-194	6.55E-12	2.55E-10	6.57E-10	4.55E+02	1.48E-06
P-30			4.50E-06	1.75E+05	7.00E-11
P-32	5.37E-12	1.22E-11	9.41E-09	9.51E+03	3.34E-08
P-33	5.62E-13	5.11E-12	3.72E-11	5.10E+05	3.28E-06
Pa-227	6.48E-13	2.12E-10	4.37E-08	1.18E+06	5.45E-08
Pa-228	1.68E-12	2.33E-10	5.10E-06	2.93E+02	4.70E-10
Pa-230	1.80E-12	2.58E-09	2.86E-06	2.75E+01	8.45E-10
Pa-231 decaychain	1.54E-10	4.55E-08	1.39E-07	1.37E+00	2.91E-05
Pa-232	1.59E-12	6.81E-12	4.29E-06	2.44E+02	5.68E-10
Pa-233	2.34E-12	1.42E-11	7.43E-07	6.82E+01	3.29E-09
Pa-234	1.20E-12	1.46E-12	8.71E-06	5.63E+02	2.82E-10
Pa-234m			6.87E-08	2.45E+07	3.58E-08
Pb-195m	4.18E-14	4.37E-14	6.90E-06	1.81E+04	2.97E-10
Pb-198	1.62E-13	1.43E-13	1.62E-06	8.45E+03	1.28E-09
Pb-199	9.29E-14	7.44E-14	6.87E-06	3.19E+03	3.04E-10
Pb-200	8.70E-13	1.16E-12	5.97E-07	2.56E+03	3.52E-09
Pb-201	3.41E-13	3.50E-13	3.18E-06	1.10E+03	6.64E-10
Pb-202	1.74E-11	1.43E-11	3.09E-12	1.02E+02	1.73E-02
Pb-202m	2.65E-13	2.25E-13	9.32E-06	9.74E+02	2.28E-10
Pb-203	5.59E-13	7.55E-13	1.09E-06	5.79E+02	1.96E-09
Pb-205	4.92E-13	6.44E-13	3.50E-12	3.41E+03	2.80E+01
Pb-209	1.22E-13	1.90E-13	5.37E-10	1.83E+07	3.98E-06
Pb-210	5.99E-10	2.77E-09	1.41E-09	4.19E+00	5.49E-08
Pb-210+D decaychain	2.04E-09	1.39E-08	4.21E-09	1.23E+00	1.62E-08
Pb-211	2.63E-13	3.70E-11	2.29E-07	2.38E+05	9.68E-09
Pb-212	1.31E-11	5.77E-10	5.09E-07	6.07E+03	4.36E-09
Pb-214	2.21E-13	3.63E-11	9.82E-07	7.49E+04	2.29E-09
Pd-100	1.99E-12	3.10E-12	2.22E-07	1.70E+03	4.73E-09
Pd-101	2.03E-13	1.97E-13	1.38E-06	2.88E+03	7.69E-10
Pd-103	5.07E-13	1.77E-12	1.15E-09	6.65E+04	8.93E-07
Pd-107	1.01E-13	1.69E-12	0.00E+00	1.76E+04	3.43E+01
Pd-109	1.43E-12	1.85E-12	1.27E-08	1.90E+05	8.89E-08
Pm-141	4.96E-14	2.85E-14	3.33E-06	2.83E+04	4.45E-10
Pm-142			3.86E-06	7.57E+05	3.86E-10
Pm-143	4.59E-13	5.37E-12	1.33E-06	3.88E+00	1.13E-09

[redacted]

Pm-144	1.86E-12	2.76E-11	6.90E-06	5.47E-01	2.19E-10
Pm-145	2.54E-13	6.59E-12	1.61E-08	2.10E+01	1.51E-07
Pm-146	2.00E-12	5.40E-11	3.29E-06	2.15E-01	4.87E-10
Pm-147 decaychain	6.92E-13	1.61E-11	3.21E-11	1.23E+04	1.33E-05
Pm-148	7.07E-12	1.05E-11	2.80E-06	9.10E+01	5.55E-10
Pm-148m	3.85E-12	2.12E-11	8.98E-06	3.69E+00	1.73E-10
Pm-149	2.69E-12	3.66E-12	4.60E-08	1.34E+04	3.38E-08
Pm-150	5.25E-13	4.63E-13	6.87E-06	1.78E+03	2.29E-10
Pm-151	1.88E-12	2.36E-12	1.27E-06	9.11E+02	1.25E-09
Po-203	9.77E-14	7.73E-14	7.65E-06	7.02E+03	2.79E-10
Po-205	1.12E-13	1.72E-13	7.36E-06	2.48E+03	2.93E-10
Po-207	2.86E-13	1.99E-13	6.08E-06	9.26E+02	3.58E-10
Po-210	2.96E-10	1.08E-08	3.95E-11	2.75E+02	6.11E-08
Po-211			3.58E-08	6.40E+09	6.19E-08
Po-212			0.00E+00		
Po-213			0.00E+00		
Po-214			3.86E-10	1.87E+15	5.82E-06
Po-215			7.48E-10	8.88E+13	3.02E-06
Po-216			7.87E-11	1.00E+13	2.88E-05
Po-218			4.26E-11	1.52E+10	5.37E-05
Pr-136	4.66E-14	2.15E-14	9.74E-06	1.55E+04	1.47E-10
Pr-137	6.99E-14	5.55E-14	2.14E-06	1.20E+04	6.72E-10
Pr-138			3.57E-06	3.81E+05	4.06E-10
Pr-138m	2.41E-13	1.76E-13	1.13E-05	1.38E+03	1.28E-10
Pr-139	6.85E-14	6.96E-14	4.41E-07	1.65E+04	3.31E-09
Pr-142	3.50E-12	3.38E-12	3.14E-07	5.47E+03	4.74E-09
Pr-142m	4.48E-14	4.33E-14	0.00E+00	2.47E+10	2.73E-04
Pr-143	3.19E-12	9.73E-12	1.63E-09	4.99E+04	7.44E-07
Pr-144	6.33E-14	3.58E-14	1.94E-07	5.87E+05	7.80E-09
Pr-144m			8.73E-09	3.14E+07	1.73E-07
Pr-145	9.66E-13	9.25E-13	6.95E-08	7.89E+04	2.19E-08
Pr-147	4.40E-14	3.59E-14	3.78E-06	3.84E+04	4.08E-10
Pt-186	1.97E-13	8.25E-14	3.20E-06	5.13E+03	6.10E-10
Pt-188	1.74E-12	1.88E-12	6.02E-07	2.23E+02	3.28E-09
Pt-189	2.76E-13	1.32E-13	1.17E-06	2.58E+03	1.70E-09

[redacted]	Pt-191	7.88E-13	4.63E-13	9.78E-07	5.00E+02	2.05E-09
	Pt-193	8.51E-14	1.11E-13	2.78E-12	1.95E+04	5.27E-04
	Pt-193m	1.23E-12	7.73E-13	1.68E-08	1.87E+04	1.20E-07
	Pt-195m	1.69E-12	1.05E-12	1.26E-07	2.70E+03	1.62E-08
	Pt-197	1.07E-12	5.22E-13	5.63E-08	3.18E+04	3.67E-08
	Pt-197m	1.81E-13	8.66E-14	2.38E-07	8.77E+04	8.69E-09
	Pt-199	5.66E-14	2.48E-14	8.69E-07	7.37E+04	2.41E-09
	Pt-200	3.16E-12	1.48E-12	1.58E-07	1.66E+04	1.33E-08
	Pu-234	3.85E-13	6.85E-11	1.61E-07	2.32E+04	1.53E-08
	Pu-235	3.24E-15	2.39E-15	2.37E-07	3.29E+05	1.04E-08
	Pu-236	5.55E-11	2.28E-08	1.19E-10	1.91E+02	3.60E-07
	Pu-237	2.53E-13	1.27E-12	1.12E-07	2.70E+02	2.22E-08
	Pu-238 decaychain	1.17E-10	3.36E-08	7.22E-11	1.66E+01	9.72E-07
	Pu-239 decaychain	1.21E-10	3.33E-08	2.00E-10	1.45E+01	2.33E-04
	Pu-240 decaychain	1.21E-10	3.33E-08	6.98E-11	1.46E+01	6.42E-05
	Pu-241 decaychain	1.73E-12	3.34E-10	4.11E-12	1.73E+03	1.68E-05
	Pu-242 decaychain	1.15E-10	3.13E-08	6.25E-11	1.54E+01	3.91E-03
	Pu-243	2.06E-13	2.94E-13	5.50E-08	1.20E+05	4.64E-08
	Pu-244	1.15E-10	2.93E-08	3.01E-11	1.54E+01	8.69E-01
	Pu-244+D decaychain		2.93E-08	1.51E-06	1.43E-01	8.09E-03
	Pu-245	1.89E-12	2.07E-12	1.77E-06	1.77E+03	1.45E-09
	Pu-246	7.40E-12	1.73E-11	4.04E-07	3.10E+02	6.38E-09
	Ra-222			3.71E-08	8.39E+07	6.28E-08
	Ra-223	1.23E-10	2.50E-08	4.34E-07	2.67E+02	5.22E-09
	Ra-224	8.44E-11	9.99E-09	3.72E-08	7.88E+03	4.95E-08
	Ra-225	7.44E-11	2.10E-08	5.91E-09	6.17E+03	1.58E-07
	Ra-226	2.95E-10	1.15E-08	2.29E-08	3.70E+00	3.75E-06
	Ra-226+D decaychain	2.95E-10	1.16E-08	8.49E-06	2.55E-02	2.59E-08
	Ra-227	7.44E-14	3.13E-13	6.22E-07	7.51E+04	3.83E-09
	Ra-228	6.70E-10	5.18E-09	0.00E+00	8.41E+00	3.09E-08
	Ra-228+D decaychain	6.70E-10	5.23E-09	4.53E-06	1.49E-01	5.46E-10
	Rb-79	6.77E-14	2.37E-14	5.85E-06	1.47E+04	1.42E-10
	Rb-80			5.56E-06	6.26E+05	1.51E-10
	Rb-81	9.69E-14	4.63E-14	2.59E-06	2.77E+03	3.28E-10
	Rb-81m	1.57E-14	1.10E-14	9.08E-09	6.78E+06	9.37E-08

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Rb-82			4.85E-06	3.13E+05	1.78E-10
Rb-82m	2.75E-13	1.35E-13	1.35E-05	3.93E+02	6.38E-11
Rb-83	4.40E-12	2.32E-12	2.18E-06	7.28E+00	4.00E-10
Rb-84	6.55E-12	3.59E-12	4.22E-06	9.89E+00	2.09E-10
Rb-86	6.59E-12	4.00E-12	4.67E-07	1.57E+02	1.93E-09
Rb-87	3.43E-12	2.14E-12	9.11E-11	4.26E+02	4.87E+03
Rb-88	1.14E-13	3.17E-14	3.36E-06	3.30E+04	2.75E-10
Rb-89	6.40E-14	2.09E-14	1.05E-05	1.24E+04	8.90E-11
Re-177	3.28E-14	2.97E-14	2.62E-06	5.38E+04	7.10E-10
Re-178	3.37E-14	2.33E-14	5.65E-06	2.64E+04	3.31E-10
Re-180			5.29E-06	1.53E+05	3.57E-10
Re-181	7.96E-13	7.96E-13	3.18E-06	5.17E+02	5.98E-10
Re-182a	5.22E-13	5.51E-13	5.37E-06	4.82E+02	3.56E-10
Re-182b	2.86E-12	4.44E-12	8.22E-06	6.25E+01	2.33E-10
Re-184	1.94E-12	6.73E-12	3.93E-06	9.17E+00	4.92E-10
Re-184m	2.78E-12	2.26E-11	1.52E-06	5.46E+00	1.27E-09
Re-186	2.84E-12	4.26E-12	5.49E-08	6.56E+03	3.54E-08
Re-186m	4.03E-12	4.18E-11	1.75E-08	1.20E+01	1.25E-03
Re-187	9.47E-15	2.51E-14	0.00E+00	1.88E+05	4.91E+06
Re-188	2.52E-12	2.22E-12	2.38E-07	8.11E+03	8.29E-09
Re-188m	5.29E-14	5.07E-14	1.28E-07	8.28E+05	1.54E-08
Re-189	1.47E-12	1.73E-12	2.42E-07	5.58E+03	8.20E-09
Rh-100	1.42E-12	1.04E-12	1.38E-05	1.14E+02	7.61E-11
Rh-101	1.22E-12	1.81E-11	8.84E-07	1.33E+00	1.21E-09
Rh-101m	4.63E-13	7.14E-13	1.19E-06	2.65E+02	8.91E-10
Rh-102	5.22E-12	5.99E-11	9.73E-06	1.33E-01	1.10E-10
Rh-102m	2.85E-12	2.56E-11	2.11E-06	3.13E+00	5.08E-10
Rh-103m	5.66E-15	9.14E-15	9.31E-11	3.75E+08	1.15E-05
Rh-105	9.66E-13	1.59E-12	3.15E-07	2.95E+03	3.50E-09
Rh-106			9.66E-07	4.10E+06	1.15E-09
Rh-106m	3.09E-13	2.71E-13	1.37E-05	1.09E+03	8.13E-11
Rh-107	3.19E-14	2.88E-14	1.28E-06	7.10E+04	8.78E-10
Rh-99	1.10E-12	3.33E-12	2.50E-06	3.42E+01	4.16E-10
Rh-99m	1.32E-13	9.99E-14	3.02E-06	2.32E+03	3.44E-10
Rn-218			3.39E-09	9.97E+11	6.75E-07

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Rn-219			2.25E-07	1.33E+08	1.02E-08
Rn-220			1.70E-09	1.25E+09	1.36E-06
Rn-222			1.74E-09	2.06E+05	1.34E-06
Rn-222+D		7.57E-12		5.51E+10	3.58E-01
Ru-103	1.76E-12	8.92E-12	2.04E-06	1.71E+01	5.30E-10
Ru-105	6.07E-13	6.48E-13	3.51E-06	2.11E+03	3.14E-10
Ru-106	1.84E-11	1.02E-10	0.00E+00	1.66E+03	4.97E-07
Ru-106+D decaychain		1.02E-10	9.66E-07	3.85E+00	1.15E-09
Ru-94	1.61E-13	1.23E-13	2.31E-06	1.65E+04	4.27E-10
Ru-97	3.15E-13	3.36E-13	8.63E-07	5.47E+02	1.18E-09
S-35	3.27E-13	5.03E-12	8.77E-12	3.22E+05	7.56E-06
Sb-115	3.70E-14	2.33E-14	3.92E-06	1.58E+04	3.08E-10
Sb-116	3.89E-14	1.88E-14	1.05E-05	1.19E+04	1.16E-10
Sb-116m	1.18E-13	8.81E-14	1.47E-05	2.22E+03	8.29E-11
Sb-117	3.50E-14	4.07E-14	5.78E-07	2.03E+04	2.13E-09
Sb-118m	4.07E-13	2.64E-13	1.21E-05	5.43E+02	1.02E-10
Sb-119	2.01E-13	1.74E-13	2.58E-09	3.31E+05	4.80E-07
Sb-120a	1.94E-14	1.12E-14	1.94E-06	6.39E+04	6.50E-10
Sb-120b	2.45E-12	3.30E-12	1.15E-05	2.07E+01	1.10E-10
Sb-122	4.44E-12	5.48E-12	1.97E-06	2.57E+02	6.50E-10
Sb-124	6.03E-12	2.43E-11	8.89E-06	2.56E+00	1.46E-10
Sb-124m			1.56E-06	8.15E+05	8.35E-10
Sb-124n	1.20E-14	1.15E-14	7.76E-12	1.06E+10	1.41E-04
Sb-125	2.38E-12	1.66E-11	1.81E-06	7.49E-01	7.27E-10
Sb-125+D decaychain		1.93E-11	1.81E-06	7.50E-01	7.27E-10
Sb-126	5.40E-12	1.15E-11	1.28E-05	8.63E+00	1.03E-10
Sb-126m	5.11E-14	3.16E-14	6.94E-06	1.50E+04	1.91E-10
Sb-127	4.29E-12	7.51E-12	3.07E-06	1.16E+02	4.34E-10
Sb-128a	4.44E-14	2.12E-14	9.03E-06	2.10E+04	1.49E-10
Sb-128b	1.67E-12	1.44E-12	1.40E-05	2.60E+02	9.60E-11
Sb-129	9.81E-13	9.62E-13	6.85E-06	1.11E+03	1.98E-10
Sb-130	1.44E-13	9.73E-14	1.51E-05	3.26E+03	9.04E-11
Sb-131	1.59E-13	9.73E-14	9.08E-06	9.44E+03	1.52E-10
Sc-43	3.96E-13	3.81E-13	4.73E-06	1.79E+03	9.55E-11
Sc-44	7.51E-13	6.44E-13	9.95E-06	8.40E+02	4.64E-11

[redacted]	Sc-44m	6.03E-12	6.96E-12	1.15E-06	4.87E+02	4.02E-10
	Sc-46	3.07E-12	2.47E-11	9.63E-06	1.70E+00	5.02E-11
	Sc-47	1.44E-12	3.05E-12	3.62E-07	1.13E+03	1.36E-09
	Sc-48	3.59E-12	3.96E-12	1.62E-05	4.64E+01	3.11E-11
	Sc-49	1.22E-13	1.07E-13	1.90E-08	1.81E+06	2.71E-08
	Se-70	1.95E-13	7.36E-14	4.22E-06	1.14E+04	1.74E-10
	Se-73	4.48E-13	1.99E-13	4.52E-06	1.02E+03	1.70E-10
	Se-73m	5.07E-14	2.06E-14	1.06E-06	4.77E+04	7.23E-10
	Se-75	6.25E-12	3.77E-12	1.45E-06	7.86E+00	5.43E-10
	Se-77m			2.85E-07	2.37E+07	2.84E-09
	Se-79	5.29E-12	3.33E-12	1.10E-11	3.30E+02	4.75E-03
	Se-81	3.36E-14	1.27E-14	4.68E-08	2.28E+06	1.82E-08
	Se-81m	8.07E-14	3.54E-14	3.56E-08	9.66E+05	2.39E-08
	Se-83	7.33E-14	2.72E-14	1.15E-05	7.62E+03	7.58E-11
	Si-31	2.97E-13	3.05E-13	1.11E-08	1.13E+06	2.92E-08
	Si-32	1.50E-12	2.93E-10	2.18E-11	1.08E+03	4.35E-05
	Sm-141	5.37E-14	2.79E-14	6.39E-06	3.02E+04	2.32E-10
	Sm-141m	9.81E-14	6.29E-14	9.04E-06	9.65E+03	1.64E-10
	Sm-142	3.05E-13	2.13E-13	2.99E-07	9.09E+04	4.99E-09
	Sm-145	5.11E-13	4.51E-12	3.83E-08	1.05E+02	3.97E-08
	Sm-146	3.49E-11	7.88E-09	0.00E+00	5.09E+01	2.14E+00
	Sm-147 decaychain	3.17E-11	6.88E-09	0.00E+00	5.60E+01	2.44E+03
	Sm-151 decaychain	2.35E-13	4.88E-12	3.60E-13	8.21E+03	3.12E-04
	Sm-153	1.97E-12	2.95E-12	1.06E-07	6.62E+03	1.51E-08
	Sm-155	3.74E-14	3.15E-14	2.81E-07	3.17E+05	5.79E-09
	Sm-156	6.29E-13	9.69E-13	3.79E-07	9.22E+03	4.32E-09
	Sn-110	8.36E-13	6.70E-13	1.13E-06	7.27E+03	1.02E-09
	Sn-111	3.61E-14	2.83E-14	2.29E-06	2.44E+04	5.09E-10
	Sn-113	1.86E-12	1.00E-11	2.02E-08	5.83E+02	5.81E-08
	Sn-117m	1.83E-12	8.84E-12	4.69E-07	2.15E+02	2.62E-09
	Sn-119m	9.14E-13	7.81E-12	1.20E-09	3.56E+03	9.53E-07
	Sn-121	6.11E-13	1.02E-12	1.30E-10	5.93E+06	6.22E-06
	Sn-121m	9.99E-13	1.54E-11	8.85E-10	2.51E+02	4.67E-06
	Sn-123	5.70E-12	3.03E-11	3.88E-08	2.69E+02	3.27E-08
	Sn-123m	5.33E-14	5.62E-14	4.62E-07	1.06E+05	2.80E-09

[redacted]	Sn-125	8.25E-12	1.41E-11	1.53E-06	9.28E+01	8.58E-10
	Sn-126	1.17E-11	9.95E-11	9.96E-08	2.14E+00	7.56E-05
	Sn-127	4.11E-13	4.40E-13	9.25E-06	1.69E+03	1.44E-10
	Sn-128	2.57E-13	2.29E-13	2.62E-06	1.27E+04	5.13E-10
	Sr-80	6.11E-13	4.51E-13	5.08E-11	1.57E+08	6.71E-06
	Sr-81	1.17E-13	8.07E-14	5.97E-06	1.30E+04	1.43E-10
	Sr-82	1.57E-11	3.69E-11	5.00E-11	2.79E+04	4.39E-07
	Sr-83	1.14E-12	1.26E-12	3.60E-06	2.82E+02	2.42E-10
	Sr-85	1.42E-12	2.56E-12	2.20E-06	9.60E+00	4.06E-10
	Sr-85m	1.14E-14	8.32E-15	8.21E-07	3.46E+04	1.09E-09
	Sr-87m	6.03E-14	5.62E-14	1.33E-06	8.79E+03	6.87E-10
	Sr-89	6.48E-12	2.34E-11	7.19E-09	3.40E+03	1.17E-07
	Sr-90	5.18E-11	1.05E-10	4.82E-10	4.23E+01	3.10E-07
	Sr-90+D decaychain	5.92E-11	1.13E-10	1.96E-08	1.07E+01	7.86E-08
	Sr-91	1.57E-12	1.70E-12	3.30E-06	1.05E+03	2.90E-10
	Sr-92	1.07E-12	1.03E-12	6.69E-06	1.81E+03	1.44E-10
	Ta-172	7.96E-14	7.22E-14	7.04E-06	7.61E+03	2.57E-10
	Ta-173	4.22E-13	4.44E-13	2.38E-06	3.78E+03	7.63E-10
	Ta-174	9.47E-14	1.11E-13	2.55E-06	1.07E+04	7.17E-10
	Ta-175	4.37E-13	4.37E-13	4.16E-06	7.52E+02	4.42E-10
	Ta-176	6.55E-13	5.96E-13	1.06E-05	3.84E+02	1.74E-10
	Ta-177	2.58E-13	4.44E-13	1.20E-07	4.84E+03	1.55E-08
	Ta-178a			3.29E-07	6.44E+05	5.68E-09
	Ta-178b	1.38E-13	1.79E-13	3.78E-06	3.95E+03	4.95E-10
	Ta-179	1.54E-13	2.05E-12	3.62E-08	5.68E+01	5.19E-08
	Ta-180	1.99E-12	7.25E-11	2.03E-06	1.07E-01	5.37E+02
	Ta-180m	1.31E-13	1.86E-13	6.13E-08	6.62E+04	3.08E-08
	Ta-182	3.59E-12	3.74E-11	6.04E-06	1.97E+00	3.16E-10
	Ta-182m	1.54E-14	3.41E-14	7.38E-07	1.69E+05	2.59E-09
	Ta-183	3.44E-12	8.81E-12	9.40E-07	2.85E+02	2.04E-09
	Ta-184	1.58E-12	1.73E-12	7.02E-06	5.38E+02	2.75E-10
	Ta-185	9.88E-14	1.18E-13	6.24E-07	6.45E+04	3.11E-09
	Ta-186	4.44E-14	2.69E-14	6.69E-06	2.81E+04	2.92E-10
	Tb-147	2.88E-13	2.26E-13	7.30E-06	2.73E+03	2.11E-10
	Tb-149	5.25E-13	1.65E-11	7.60E-06	1.04E+03	2.06E-10

[redacted]	Tb-150	5.25E-13	3.88E-13	7.79E-06	1.29E+03	2.02E-10
	Tb-151	7.25E-13	7.73E-13	3.65E-06	5.11E+02	4.34E-10
	Tb-153	5.77E-13	8.18E-13	7.24E-07	8.08E+02	2.22E-09
	Tb-154	1.34E-12	1.14E-12	1.18E-05	1.30E+02	1.37E-10
	Tb-155	4.81E-13	8.99E-13	3.26E-07	7.89E+02	4.99E-09
	Tb-156	2.46E-12	4.22E-12	8.37E-06	3.06E+01	1.96E-10
	Tb-156m	3.92E-13	8.47E-13	2.16E-08	6.22E+04	7.57E-08
	Tb-156n	1.82E-13	3.77E-13	4.06E-09	1.61E+06	4.01E-07
	Tb-157	7.99E-14	1.46E-12	1.63E-09	1.40E+02	9.22E-06
	Tb-158	2.38E-12	8.29E-11	3.57E-06	6.42E-02	4.26E-09
	Tb-160	3.85E-12	2.45E-11	5.23E-06	3.62E+00	3.21E-10
	Tb-161	1.95E-12	5.03E-12	3.44E-08	5.72E+03	4.88E-08
	Tc-101	2.42E-14	1.85E-14	1.37E-06	1.01E+05	7.74E-10
	Tc-104	1.07E-13	5.33E-14	9.75E-06	1.11E+04	1.12E-10
	Tc-93	1.04E-13	6.36E-14	7.31E-06	1.63E+03	1.34E-10
	Tc-93m	4.51E-14	3.17E-14	3.62E-06	1.25E+04	2.70E-10
	Tc-94	3.92E-13	2.80E-13	1.24E-05	5.43E+02	7.96E-11
	Tc-94m	1.55E-13	1.03E-13	8.70E-06	4.36E+03	1.13E-10
	Tc-95	3.50E-13	2.63E-13	3.63E-06	4.53E+02	2.75E-10
	Tc-95m	1.10E-12	3.40E-12	2.93E-06	7.66E+00	3.41E-10
	Tc-96	2.15E-12	2.00E-12	1.16E-05	2.76E+01	8.69E-11
	Tc-96m	2.27E-14	2.05E-14	2.13E-07	1.80E+05	4.73E-09
	Tc-97	1.34E-13	8.51E-13	2.94E-10	6.98E+02	4.93E-01
	Tc-97m	1.14E-12	1.12E-11	1.04E-09	1.33E+04	8.64E-07
	Tc-98	3.92E-12	3.01E-11	6.45E-06	3.36E-02	3.87E-05
	Tc-99 decaychain	1.32E-12	1.41E-11	8.14E-11	8.94E+02	5.28E-02
	Tc-99m	4.37E-14	5.70E-14	3.93E-07	1.39E+04	2.65E-09
	Te-116	3.48E-13	3.20E-13	1.34E-07	9.85E+04	9.09E-09
	Te-121	9.07E-13	1.30E-12	2.46E-06	3.27E+01	5.17E-10
	Te-121m	4.51E-12	1.44E-11	7.83E-07	1.13E+01	1.62E-09
	Te-123	4.07E-12	2.50E-12	2.73E-09	6.71E+01	2.31E+05
	Te-123m	2.46E-12	1.36E-11	4.48E-07	2.55E+01	2.88E-09
	Te-125m	1.70E-12	1.17E-11	6.95E-09	3.30E+03	1.83E-07
	Te-127	4.22E-13	6.11E-13	2.10E-08	1.67E+05	6.34E-08
	Te-127m	4.77E-12	2.58E-11	2.73E-09	3.79E+03	4.03E-07

[redacted]

Te-129	9.88E-14	9.95E-14	2.45E-07	1.16E+05	5.53E-09
Te-129m	7.18E-12	2.49E-11	1.38E-07	2.93E+02	9.76E-09
Te-131	1.31E-13	6.40E-14	1.79E-06	4.41E+04	7.69E-10
Te-131m	4.00E-12	4.22E-12	6.61E-06	1.66E+02	2.08E-10
Te-132	8.25E-12	9.32E-12	7.83E-07	5.36E+02	1.77E-09
Te-133	1.11E-13	4.92E-14	4.29E-06	3.68E+04	3.26E-10
Te-133m	4.74E-13	2.64E-13	1.09E-05	3.26E+03	1.28E-10
Te-134	1.89E-13	1.60E-13	3.78E-06	1.25E+04	3.72E-10
Th-226	4.77E-13	1.56E-10	2.36E-08	2.70E+06	1.00E-07
Th-227	2.03E-11	3.51E-08	3.78E-07	1.92E+02	6.27E-09
Th-228	6.40E-11	1.32E-07	5.59E-09	1.46E+02	1.77E-07
Th-228+D decaychain	1.62E-10	1.43E-07	7.76E-06	2.52E-01	3.08E-10
Th-229	1.97E-10	1.75E-07	2.25E-07	8.70E-01	4.09E-06
Th-229+D decaychain	3.63E-10	2.25E-07	1.17E-06	1.78E-01	8.40E-07
Th-230 decaychain	7.73E-11	2.85E-08	8.19E-10	2.11E+01	1.05E-03
Th-231	9.14E-13	1.52E-12	2.45E-08	5.24E+04	9.86E-08
Th-232 decaychain	8.47E-11	4.33E-08	3.42E-10	2.02E+01	1.85E+02
Th-234	9.51E-12	3.07E-11	1.63E-08	3.25E+03	1.41E-07
Ti-44	1.34E-11	3.41E-10	2.39E-07	1.07E+00	6.26E-09
Ti-45	3.12E-13	3.09E-13	3.79E-06	2.81E+03	1.25E-10
Tl-194	1.48E-14	5.11E-15	3.25E-06	1.84E+04	6.27E-10
Tl-194m	6.36E-14	2.50E-14	1.01E-05	5.95E+03	2.02E-10
Tl-195	5.00E-14	2.08E-14	6.02E-06	4.71E+03	3.40E-10
Tl-197	4.51E-14	2.39E-14	1.65E-06	7.01E+03	1.25E-09
Tl-198	1.61E-13	7.92E-14	9.67E-06	6.41E+02	2.15E-10
Tl-198m	1.01E-13	4.92E-14	5.04E-06	3.49E+03	4.13E-10
Tl-199	5.33E-14	2.89E-14	8.56E-07	5.17E+03	2.44E-09
Tl-200	4.55E-13	2.52E-13	5.93E-06	2.12E+02	3.54E-10
Tl-201	2.23E-13	1.49E-13	1.88E-07	2.40E+03	1.12E-08
Tl-202	1.05E-12	6.14E-13	1.83E-06	6.13E+01	1.16E-09
Tl-204 decaychain	3.16E-12	2.45E-12	2.76E-09	3.19E+02	6.88E-07
Tl-206			6.05E-09	7.76E+07	3.58E-07
Tl-207			1.52E-08	2.72E+07	1.43E-07
Tl-208			1.76E-05	3.65E+04	1.24E-10
Tl-209			9.83E-06	9.12E+04	2.23E-10

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Tm-162	4.29E-14	2.72E-14	8.69E-06	1.05E+04	1.96E-10
Tm-166	5.85E-13	5.14E-13	8.98E-06	4.75E+02	1.94E-10
Tm-167	1.44E-12	4.37E-12	3.97E-07	3.73E+02	4.42E-09
Tm-170	3.61E-12	2.43E-11	1.01E-08	1.01E+03	1.69E-07
Tm-171	2.85E-13	3.33E-12	6.97E-10	2.67E+03	2.45E-06
Tm-172	4.44E-12	5.62E-12	2.35E-06	2.20E+02	7.69E-10
Tm-173	7.44E-13	7.73E-13	1.62E-06	2.46E+03	1.12E-09
Tm-175	3.85E-14	3.26E-14	4.78E-06	2.71E+04	3.85E-10
U-230	1.04E-10	4.55E-08	3.07E-09	4.17E+03	1.53E-07
U-231	7.40E-13	1.80E-12	1.60E-07	2.04E+03	1.52E-08
U-232 decaychain	2.45E-10	1.95E-08	5.98E-10	8.00E+00	3.74E-07
U-233 decaychain	5.22E-11	1.16E-08	9.82E-10	2.95E+01	3.06E-03
U-234 decaychain	5.11E-11	1.14E-08	2.52E-10	3.34E+01	5.36E-03
U-235	4.92E-11	1.01E-08	5.18E-07	4.13E-01	1.91E-01
U-235+D decaychain	5.03E-11	1.01E-08	5.43E-07	3.94E-01	1.83E-01
U-236 decaychain	4.85E-11	1.05E-08	1.25E-10	3.58E+01	5.54E-01
U-237	2.05E-12	6.44E-12	3.76E-07	5.39E+02	6.62E-09
U-238	4.66E-11	9.32E-09	4.99E-11	3.78E+01	1.12E+02
U-238+D decaychain	5.62E-11	9.35E-09	1.14E-07	1.79E+00	5.34E+00
U-239	4.40E-14	5.70E-14	1.21E-07	6.93E+05	2.07E-08
U-240	2.96E-12	2.96E-12	7.33E-10	2.13E+06	2.31E-06
V-47	8.88E-14	5.96E-14	4.36E-06	1.39E+04	1.13E-10
V-48	4.11E-12	9.29E-12	1.40E-05	6.04E+00	3.60E-11
V-49	5.00E-14	1.47E-13	0.00E+00	6.81E+05	8.45E-05
W-176	2.13E-13	1.24E-13	3.20E-07	4.46E+04	5.78E-09
W-177	1.13E-13	5.99E-14	3.63E-06	4.02E+03	5.12E-10
W-178	5.37E-13	3.85E-13	1.59E-08	3.95E+03	1.17E-07
W-179	5.00E-15	1.83E-15	6.01E-08	8.75E+05	3.13E-08
W-181	1.83E-13	1.35E-13	4.86E-08	2.33E+02	3.91E-08
W-185	1.21E-12	9.36E-13	2.92E-10	4.15E+04	4.42E-06
W-187	1.59E-12	1.11E-12	2.04E-06	6.74E+02	9.63E-10
W-188	5.77E-12	4.63E-12	7.02E-09	2.55E+03	2.56E-07
Xe-120			1.70E-06	2.90E+04	7.41E-10
Xe-121			8.73E-06	5.63E+03	1.46E-10
Xe-122			1.83E-07	8.93E+03	7.00E-09

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Xe-123			2.72E-06	5.81E+03	4.75E-10
Xe-125			9.38E-07	2.06E+03	1.40E-09
Xe-127			9.52E-07	3.95E+01	1.40E-09
Xe-129m			4.25E-08	4.03E+03	3.19E-08
Xe-131m			1.41E-08	8.16E+03	9.76E-08
Xe-133			6.62E-08	3.94E+03	2.11E-08
Xe-133m			9.25E-08	6.76E+03	1.51E-08
Xe-135			9.70E-07	3.73E+03	1.46E-09
Xe-135m			1.86E-06	6.93E+04	7.62E-10
Xe-138			5.62E-06	2.47E+04	2.58E-10
Y-86	2.03E-12	1.58E-12	1.73E-05	1.29E+02	5.22E-11
Y-86m	1.18E-13	9.29E-14	8.35E-07	4.92E+04	1.08E-09
Y-87	1.21E-12	1.49E-12	1.94E-06	2.11E+02	4.71E-10
Y-88	2.40E-12	1.70E-11	1.37E-05	9.34E-01	6.75E-11
Y-90	7.29E-12	8.40E-12	1.91E-08	2.57E+04	4.73E-08
Y-90m	4.40E-13	4.81E-13	2.58E-06	3.99E+03	3.66E-10
Y-91	6.48E-12	3.36E-11	2.51E-08	9.04E+02	3.69E-08
Y-91m	2.15E-14	3.01E-14	2.34E-06	1.70E+04	4.08E-10
Y-92	1.10E-12	9.32E-13	1.26E-06	7.37E+03	7.67E-10
Y-93	2.96E-12	2.64E-12	4.60E-07	7.07E+03	2.12E-09
Y-94	1.06E-13	5.51E-14	5.45E-06	1.89E+04	1.81E-10
Y-95	5.85E-14	2.92E-14	4.80E-06	3.84E+04	2.08E-10
Yb-162	3.62E-14	3.00E-14	3.26E-07	3.20E+05	5.22E-09
Yb-166	2.08E-12	2.89E-12	9.46E-08	6.11E+03	1.84E-08
Yb-167	1.04E-14	1.71E-14	6.21E-07	1.81E+05	2.82E-09
Yb-169	1.73E-12	1.08E-11	7.75E-07	5.52E+01	2.29E-09
Yb-175	1.17E-12	2.95E-12	1.54E-07	2.12E+03	1.19E-08
Yb-177	1.69E-13	2.29E-13	8.35E-07	2.07E+04	2.23E-09
Yb-178	1.92E-13	2.38E-13	1.44E-07	1.85E+05	1.30E-08
Zn-62	2.25E-12	2.65E-12	1.87E-06	1.90E+03	3.48E-10
Zn-63	1.13E-13	7.55E-14	4.87E-06	1.06E+04	1.36E-10
Zn-65 decaychain	8.95E-12	5.81E-12	2.81E-06	2.00E+00	2.43E-10
Zn-69	4.51E-14	6.11E-14	1.67E-09	2.06E+07	4.33E-07
Zn-69m	8.33E-13	1.28E-12	1.77E-06	1.35E+03	4.09E-10
Zn-71m	4.92E-13	5.33E-13	6.84E-06	1.23E+03	1.09E-10

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Zn-72	3.34E-12	5.48E-12	4.68E-07	1.51E+03	1.61E-09
Zr-86	1.86E-12	1.56E-12	1.04E-06	1.91E+03	8.68E-10
Zr-88	9.36E-13	8.95E-12	1.65E-06	9.95E+00	5.60E-10
Zr-89	1.72E-12	1.92E-12	5.38E-06	7.79E+01	1.74E-10
Zr-93	9.81E-13	7.29E-12	0.00E+00	1.81E+03	7.22E-01
Zr-95	2.16E-12	1.65E-11	3.40E-06	6.29E+00	2.93E-10
Zr-97	5.25E-12	4.81E-12	8.62E-07	2.25E+03	1.18E-09

* Soil Ingestion Slope Factor is calculated for ages 18thru 65 and is only available for certain radionuclides.

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RESIDENTIAL SOILS RADIONUCLIDE PRELIMINARY REMEDIATION GOALS

(Residential Soils RAD PRGs)

Table 6, Residential Soil Rad PRGs

Preliminary Remediation Goals for Radionuclides

Topic for Key OSWER Radiation Guidances and Reports

Equation Values for Residential Soil

Parameter	Value	Parameter	Value
Target Risk (unitless)	1.0E-6	Exposure Duration (yr)	30
Adult Exposure Duration (yr)	24	Child Exposure Duration (yr)	6
Exposure Frequency (day/yr)	350	Adult Intake Rate (mg/day)	100
Child Intake Rate (mg/day)	200	Age-adjusted Ingestion Factor (mg-yr/kg-day)	120
Adult Inhalation Rate (m^3/day)	20	Child Inhalation Rate (m^3/day)	10
Age-adjusted Inhalation Factor (mg-yr/kg-day)	18	Time of Exposure (yr)	30
Outdoor Exposure Time Fraction (unitless)	0.073	Indoor Exposure Time Fraction (unitless)	0.683
Indoor Dilution Factor (unitless)	0.4	Area Correction Factor (unitless)	0.9
Gamma Shielding Factor (~~m^3/kg~~ unitless)	0.4	Age-adjusted Fruit Consumption Rate (kg/yr)	17.48
Age-Adjusted Vegetable Consumption Rate (kg/yr)	9.08	Contaminated Plant Fraction (unitless)	0
Child Vegetable Consumption Rate (kg/yr)	3.8	Adult Vegetable Consumption Rate (kg/yr)	10.4
Child Fruit Consumption Rate (kg/yr)	5.4	Adult Fruit Consumption Rate (kg/yr)	20.5
Particulate Emission Factor (m^3/kg)	9.44E+09	City (Climatic Zone)	Charleston(VI)
Surface Area (acres)	0.5	Q/C (g/m^2-s per kg/m^3)	74.89
Fraction of Vegetative Cover	.5	Mean Annual Windspeed (m/s)	2.89

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Fraction of Vegetative Cover	.5	Mean Annual Windspeed (m/s)	3.69
Equivalent Threshold Value of Windspeed at 7m (m/s)	11.32	F(x) (unitless)	0.0391

Radionuclide Preliminary Remediation Goals for Residential Soil

Chemical	Residential Exposure Soil Ingestion Slope Factor (Risk/pCi)*	Inhalation Slope Factor (Risk/pCi)	External Exposure Slope Factor (Risk/yr per pCi/g)	Food Ingestion Slope Factor (Risk/pCi)	Soil-to-Plant Transfer Factor (pCi plant/pCi soil)	PRG (pCi/g)	PRG (mg/kg)
Ac-223			1.55E-08		0.0025	3.58E+07	9.34E-08
Ac-224	1.53E-11	4.07E-10	6.06E-07	8.03E-12	0.0025	1.15E+04	2.39E-09
Ac-225	5.18E-10	2.86E-08	4.50E-08	2.71E-10	0.0025	7.18E+02	1.24E-08
Ac-226	2.00E-10	4.33E-09	4.46E-07	1.01E-10	0.0025	1.48E+03	3.10E-09
Ac-227	3.81E-10	1.49E-07	3.48E-10	2.45E-10	0.0025	3.20E+00	4.44E-08
Ac-227+D decaychain	1.16E-09	2.09E-07	1.47E-06	6.53E-10	0.0025	1.06E-01	1.47E-09
Ac-228	5.55E-12	4.92E-11	4.53E-06	2.89E-12	0.0025	7.32E+02	3.27E-10
Ag-102	1.56E-13	2.56E-14	1.60E-05	9.95E-14	0.15	5.91E+03	4.14E-11
Ag-103	2.96E-13	6.07E-14	3.33E-06	1.69E-13	0.15	5.57E+03	2.01E-10
Ag-104	3.77E-13	6.25E-14	1.25E-05	2.29E-13	0.15	1.41E+03	5.40E-11
Ag-104m	2.81E-13	4.92E-14	5.50E-06	1.68E-13	0.15	6.62E+03	1.23E-10
Ag-105	4.40E-12	2.83E-12	2.15E-06	2.49E-12	0.15	9.60E+00	3.17E-10
Ag-106	1.34E-13	2.72E-14	3.08E-06	8.21E-14	0.15	1.65E+04	2.24E-10
Ag-106m	1.14E-11	3.54E-12	1.31E-05	6.73E-12	0.15	7.68E+00	5.25E-11
Ag-108			8.56E-08		0.15	6.01E+06	8.19E-09
Ag-108m decaychain	1.92E-11	2.67E-11	7.18E-06	1.12E-11	0.15	1.68E-02	6.47E-10
Ag-109m			7.66E-09		0.15	2.41E+08	9.24E-08
Ag-110			1.69E-07		0.15	1.76E+07	4.23E-09
Ag-110m decaychain	2.37E-11	2.83E-11	1.30E-05	1.37E-11	0.15	2.60E-01	5.49E-11
Ag-111	2.37E-11	6.66E-12	1.09E-07	1.21E-11	0.15	1.01E+03	6.42E-09
Ag-112	5.59E-12	7.25E-13	3.23E-06	2.90E-12	0.15	2.02E+03	2.25E-10

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Ag-115	3.46E-13	6.81E-14	3.44E-06	1.98E-13	0.15	1.77E+04	2.17E-10
Al-26	4.70E-11	6.92E-11	1.33E-05	2.49E-11	0.004	8.38E-03	4.37E-07
Al-28			9.32E-06		0.004	5.84E+04	1.95E-11
Am-237	1.24E-13	5.77E-14	1.35E-06	7.18E-14	0.001	1.24E+04	1.14E-09
Am-238	2.28E-13	9.51E-14	4.02E-06	1.35E-13	0.001	3.09E+03	3.84E-10
Am-239	3.89E-12	8.40E-13	6.91E-07	2.01E-12	0.001	2.47E+03	2.24E-09
Am-240	6.81E-12	1.41E-12	4.69E-06	3.70E-12	0.001	8.53E+01	3.32E-10
Am-241 decaychain	2.17E-10	2.81E-08	2.76E-08	1.34E-10	0.001	1.97E+00	5.73E-07
Am-242	5.14E-12	5.03E-11	3.48E-08	2.62E-12	0.001	3.57E+04	4.42E-08
Am-242m	1.29E-10	1.56E-08	1.05E-09	8.77E-11	0.001	6.22E+00	6.40E-07
Am-242m+D	2.21E-10	2.81E-08	4.83E-08	1.36E-10	0.001	1.50E+00	1.55E-07
Am-243	2.17E-10	2.70E-08	9.47E-08	1.34E-10	0.001	8.92E-01	4.48E-06
Am-243+D decaychain	2.32E-10	2.70E-08	6.36E-07	1.42E-10	0.001	1.67E-01	8.39E-07
Am-244	7.03E-12	3.09E-12	3.58E-06	3.66E-12	0.001	5.62E+02	4.43E-10
Am-244m	1.18E-13	1.02E-13	5.09E-09	7.10E-14	0.001	9.18E+06	3.10E-07
Am-245	6.11E-13	1.56E-13	1.04E-07	3.22E-13	0.001	9.52E+04	1.53E-08
Am-246	2.93E-13	1.31E-13	2.93E-06	1.73E-13	0.001	1.07E+04	5.45E-10
Am-246m	1.48E-13	3.96E-14	4.83E-06	9.10E-14	0.001	1.01E+04	3.31E-10
Ar-37			0.00E+00		0		
Ar-39			5.94E-10		0	1.95E+02	5.73E-06
Ar-41			6.39E-06		0	1.74E+03	4.17E-11
As-69	2.39E-13	4.29E-14	4.43E-06	1.46E-13	0.08	1.81E+04	1.01E-10
As-70	7.40E-13	1.37E-13	1.96E-05	4.48E-13	0.08	1.18E+03	2.32E-11
As-71	6.07E-12	1.52E-12	2.37E-06	3.29E-12	0.08	1.32E+02	1.94E-10
As-72	2.79E-11	4.29E-12	8.21E-06	1.48E-11	0.08	9.51E+01	5.69E-11
As-73	4.40E-12	3.88E-12	5.78E-09	2.28E-12	0.08	1.65E+03	7.41E-08
As-74	1.82E-11	8.44E-12	3.35E-06	9.69E-12	0.08	1.42E+01	1.43E-10
As-76	2.70E-11	4.14E-12	2.01E-06	1.42E-11	0.08	3.84E+02	2.45E-10
As-77	7.03E-12	1.76E-12	3.58E-08	3.67E-12	0.08	1.42E+04	1.36E-08
As-78	1.61E-12	2.69E-13	6.11E-06	9.03E-13	0.08	2.20E+03	8.29E-11
At-207	1.66E-12	7.77E-12	6.11E-06	9.51E-13		1.85E+03	2.20E-10
At-211	8.21E-11	3.58E-10	7.94E-08	4.63E-11		3.10E+04	1.51E-08
At-215			8.09E-10			9.04E+14	1.73E-06
At-216			3.08E-09			7.92E+13	4.55E-07
At-217			1.32E-09			1.72E+12	1.07E-06

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At-218			3.57E-09			1.02E+10	3.97E-07
Au-193	2.05E-12	4.55E-13	4.30E-07	1.07E-12	0.1	2.67E+03	2.91E-09
Au-194	4.22E-12	7.92E-13	4.93E-06	2.36E-12	0.1	1.04E+02	2.56E-10
Au-195	4.22E-12	6.48E-12	1.38E-07	2.19E-12	0.1	3.34E+01	9.14E-09
Au-195m			7.37E-07		0.1	3.25E+06	1.72E-09
Au-198	1.78E-11	4.00E-12	1.70E-06	9.18E-12	0.1	1.84E+02	7.55E-10
Au-198m	2.09E-11	7.77E-12	1.89E-06	1.08E-11	0.1	1.94E+02	6.79E-10
Au-199	7.92E-12	3.12E-12	2.79E-07	4.07E-12	0.1	9.63E+02	4.61E-09
Au-200	3.85E-13	8.55E-14	1.30E-06	2.20E-13	0.1	1.94E+04	9.99E-10
Au-200m	1.48E-11	2.81E-12	9.04E-06	7.88E-12	0.1	1.20E+02	1.44E-10
Au-201	1.01E-13	3.30E-14	2.29E-07	6.03E-14	0.1	2.02E+05	5.70E-09
Ba-126	2.24E-12	3.49E-13	5.83E-07	1.22E-12	0.005	2.17E+04	1.40E-09
Ba-128	4.33E-11	7.22E-12	2.10E-07	2.23E-11	0.005	1.61E+03	3.85E-09
Ba-131	5.25E-12	2.91E-12	1.77E-06	2.87E-12	0.005	4.05E+01	4.80E-10
Ba-131m	2.11E-14	1.69E-14	1.67E-07	1.29E-14	0.005	5.00E+05	5.09E-09
Ba-133	1.39E-11	1.16E-11	1.44E-06	9.44E-12	0.005	1.75E-01	6.99E-10
Ba-133m	9.07E-12	2.04E-12	1.96E-07	4.66E-12	0.005	2.65E+03	4.38E-09
Ba-135m	7.29E-12	1.61E-12	1.70E-07	3.74E-12	0.005	4.14E+03	5.13E-09
Ba-137m			2.69E-06		0.005	1.78E+05	3.31E-10
Ba-139	9.73E-13	1.79E-13	1.65E-07	5.33E-13	0.005	8.93E+04	5.47E-09
Ba-140	4.18E-11	2.03E-11	7.61E-07	2.17E-11	0.005	8.69E+01	1.19E-09
Ba-141	5.59E-13	9.69E-14	3.79E-06	3.07E-13	0.005	1.76E+04	2.42E-10
Ba-142	2.27E-13	4.55E-14	4.85E-06	1.31E-13	0.005	2.37E+04	1.90E-10
Be-10	2.02E-11	9.40E-11	7.43E-10	1.02E-11	0.004	3.11E+01	1.40E-03
Be-7	2.02E-13	2.13E-13	2.13E-07	1.20E-13	0.004	7.46E+01	2.13E-10
Bi-200	3.65E-13	7.55E-14	1.06E-05	2.13E-13	0.1	3.16E+03	1.23E-10
Bi-201	1.09E-12	1.90E-13	6.05E-06	6.03E-13	0.1	1.87E+03	2.16E-10
Bi-202	6.18E-13	1.12E-13	1.24E-05	3.69E-13	0.1	9.81E+02	1.06E-10
Bi-203	4.85E-12	8.21E-13	1.16E-05	2.73E-12	0.1	1.48E+02	1.14E-10
Bi-205	8.18E-12	3.24E-12	8.19E-06	4.66E-12	0.1	6.76E+00	1.63E-10
Bi-206	1.98E-11	5.85E-12	1.52E-05	1.10E-11	0.1	8.92E+00	8.80E-11
Bi-207 decaychain	1.49E-11	2.10E-11	7.08E-06	8.14E-12	0.1	2.05E-02	4.50E-10
Bi-210	2.55E-11	3.17E-10	2.76E-09	1.30E-11	0.1	2.66E+04	2.15E-07
Bi-210m	1.45E-10	1.17E-08	1.01E-06	7.77E-11	0.1	1.08E-01	1.91E-04
Bi-211			1.88E-07		0.1	3.03E+06	7.29E-09

[redacted]	Bi-212	1.78E-12	7.77E-11	8.87E-07	9.99E-13	0.1	2.27E+04	1.55E-09
	Bi-213	1.28E-12	6.85E-11	5.65E-07	7.18E-13	0.1	4.72E+04	2.45E-09
	Bi-214	4.33E-13	2.90E-11	7.48E-06	2.65E-13	0.1	8.19E+03	1.86E-10
	Bk-245	9.73E-12	7.22E-12	7.09E-07	5.00E-12		2.41E+02	2.24E-09
	Bk-246	5.25E-12	9.25E-13	4.25E-06	2.88E-12		1.09E+02	3.76E-10
	Bk-247	2.49E-10	3.26E-08	3.09E-07	1.60E-10		3.27E-01	3.12E-07
	Bk-249	2.95E-12	5.14E-11	2.63E-12	1.57E-12		6.34E+03	3.87E-06
	Bk-250	1.54E-12	1.03E-12	4.23E-06	8.18E-13		1.49E+03	3.84E-10
	Br-74	3.19E-13	6.44E-14	2.32E-05	2.05E-13	0.76	2.08E+03	2.07E-11
	Br-74m	5.29E-13	1.15E-13	2.00E-05	3.36E-13	0.76	1.47E+03	2.40E-11
	Br-75	3.42E-13	1.13E-13	5.21E-06	2.13E-13	0.76	2.39E+03	9.35E-11
	Br-76	3.34E-12	1.10E-12	1.30E-05	1.97E-12	0.76	9.65E+01	3.80E-11
	Br-77	6.51E-13	2.06E-13	1.34E-06	4.03E-13	0.76	2.71E+02	3.73E-10
	Br-80	1.03E-13	1.80E-14	3.55E-07	6.48E-14	0.76	1.97E+05	1.46E-09
	Br-80m	6.70E-13	2.43E-13	5.95E-09	3.89E-13	0.76	7.61E+05	8.60E-08
	Br-82	3.70E-12	1.66E-12	1.24E-05	2.30E-12	0.76	4.64E+01	4.29E-11
	Br-83	1.94E-13	1.21E-13	3.46E-08	1.16E-13	0.76	2.46E+05	1.56E-08
	Br-84	3.21E-13	7.18E-14	9.35E-06	2.02E-13	0.76	4.10E+03	5.83E-11
	C-11	8.70E-14	2.78E-14	4.45E-06	5.59E-14	5.5	1.34E+04	1.61E-11
	C-14 decaychain	2.79E-12	7.07E-12	7.83E-12	2.00E-12	5.5	2.79E+02	6.28E-05
	Ca-41	5.74E-13	2.09E-13	0.00E+00	4.37E-13	0.5	1.38E+03	2.22E-02
	Ca-45	6.07E-12	9.40E-12	3.96E-11	3.37E-12	0.5	5.82E+03	3.27E-07
	Ca-47	2.02E-11	7.88E-12	5.24E-06	1.08E-11	0.5	3.56E+01	5.82E-11
	Ca-49			1.75E-05		0.5	7.99E+03	1.82E-11
	Cd-104	4.14E-13	7.66E-14	9.70E-07	2.41E-13	0.3	2.18E+04	6.96E-10
	Cd-107	9.99E-13	3.10E-13	3.48E-08	5.11E-13	0.3	8.96E+04	1.99E-08
	Cd-109 decaychain	1.14E-11	2.19E-11	8.73E-09	6.70E-12	0.3	1.77E+02	6.85E-08
	Cd-113	3.85E-11	1.12E-10	7.36E-11	2.90E-11	0.3	2.05E+01	6.02E+07
	Cd-113m	5.11E-11	1.30E-10	4.45E-10	3.64E-11	0.3	2.85E+01	1.23E-07
	Cd-115	2.47E-11	5.14E-12	1.01E-06	1.27E-11	0.3	3.75E+02	7.37E-10
	Cd-115m	4.74E-11	2.92E-11	1.13E-07	2.46E-11	0.3	1.59E+02	6.24E-09
	Cd-117	3.81E-12	6.51E-13	5.23E-06	1.99E-12	0.3	1.56E+03	1.45E-10
	Cd-117m	3.26E-12	6.55E-13	1.03E-05	1.76E-12	0.3	5.87E+02	7.38E-11
	Ce-134	4.59E-11	6.96E-12	8.24E-09	2.33E-11	0.002	1.92E+04	5.92E-08
	Ce-135	1.02E-11	1.75E-12	7.74E-06	5.48E-12	0.002	1.49E+02	1.13E-10

[redacted]

Ce-137	3.64E-13	4.11E-14	4.46E-08	1.91E-13	0.002	5.06E+04	1.99E-08
Ce-137m	9.99E-12	1.94E-12	1.38E-07	5.07E-12	0.002	4.24E+03	6.38E-09
Ce-139	3.70E-12	5.66E-12	4.54E-07	1.95E-12	0.002	1.35E+01	1.99E-09
Ce-141	1.34E-11	1.14E-11	2.27E-07	6.77E-12	0.002	1.14E+02	4.00E-09
Ce-143	2.04E-11	3.74E-12	1.09E-06	1.04E-11	0.002	5.63E+02	8.50E-10
Ce-144	1.02E-10	1.10E-10	5.02E-08	5.18E-11	0.002	4.62E+01	1.45E-08
Ce-144+D decaychain	1.02E-10	1.10E-10	2.44E-07	5.19E-11	0.002	1.15E+01	3.62E-09
Cf-244	2.93E-13	2.96E-11	6.83E-11	1.74E-13	0.001	5.74E+08	1.45E-05
Cf-246	6.11E-11	1.47E-09	9.25E-11	3.09E-11	0.001	6.55E+04	1.84E-07
Cf-248	1.18E-10	1.81E-08	4.73E-11	6.22E-11	0.001	1.52E+02	9.67E-08
Cf-249	2.54E-10	3.40E-08	1.37E-06	1.63E-10	0.001	8.17E-02	2.00E-08
Cf-250	1.85E-10	2.66E-08	4.48E-11	1.12E-10	0.001	8.54E+00	7.83E-08
Cf-251	2.67E-10	3.40E-08	3.76E-07	1.70E-10	0.001	2.73E-01	1.72E-07
Cf-252			8.66E-11		0.001	1.01E+04	1.89E-05
Cf-253	1.20E-11	4.22E-09	4.86E-11	6.11E-12	0.001	2.74E+04	9.45E-07
Cf-254			1.46E-13		0.001	9.58E+07	1.13E-02
Cl-36 decaychain	7.66E-12	2.50E-11	1.74E-09	4.44E-12	20	3.96E+01	1.20E-03
Cl-38	4.22E-13	9.40E-14	7.93E-06	2.64E-13	20	4.13E+03	3.11E-11
Cl-39	3.31E-13	9.36E-14	7.09E-06	2.08E-13	20	3.09E+03	3.57E-11
Cm-238	8.70E-13	1.35E-11	1.90E-07	4.70E-13	0.001	4.45E+04	8.13E-09
Cm-240	9.88E-11	9.51E-09	6.19E-11	5.07E-11	0.001	2.25E+03	1.12E-07
Cm-241	1.35E-11	1.01E-10	1.94E-06	7.03E-12	0.001	1.33E+01	8.06E-10
Cm-242	1.05E-10	1.51E-08	7.73E-11	5.48E-11	0.001	3.50E+02	1.06E-07
Cm-243 decaychain	2.05E-10	2.69E-08	4.19E-07	1.23E-10	0.001	3.51E-01	6.81E-09
Cm-244 decaychain	1.81E-10	2.53E-08	4.85E-11	1.08E-10	0.001	7.36E+00	9.10E-08
Cm-245	2.18E-10	2.77E-08	2.38E-07	1.35E-10	0.001	4.16E-01	2.42E-06
Cm-246	2.12E-10	2.77E-08	4.57E-11	1.31E-10	0.001	3.74E+00	1.22E-05
Cm-247	2.11E-10	2.50E-08	1.31E-06	1.30E-10	0.001	8.33E-02	8.98E-04
Cm-248 decaychain			3.42E-11		0.001	3.26E+03	7.68E-01
Cm-249	2.18E-13	7.25E-14	8.51E-08	1.20E-13	0.001	2.23E+05	1.90E-08
Co-55	1.23E-11	2.07E-12	9.21E-06	6.70E-12	0.08	1.26E+02	3.88E-11
Co-56	2.56E-11	1.85E-11	1.80E-05	1.43E-11	0.08	5.97E-01	2.02E-11
Co-57 decaychain	2.78E-12	2.09E-12	3.55E-07	1.49E-12	0.08	8.79E+00	1.04E-09
Co-58	7.44E-12	5.99E-12	4.48E-06	4.18E-12	0.08	2.67E+00	8.41E-11
Co-58m	3.47E-13	6.88E-14	1.00E-12	1.83E-13	0.08	4.46E+07	7.57E-06

[redacted]	Co-60 decaychain	4.03E-11	3.58E-11	1.24E-05	2.23E-11	0.08	3.62E-02	3.20E-11
	Co-60m	5.88E-15	3.96E-15	1.86E-08	3.66E-15	0.08	6.24E+06	2.09E-08
	Co-61	6.40E-13	1.43E-13	2.48E-07	3.49E-13	0.08	4.96E+04	1.60E-09
	Co-62m	1.79E-13	3.17E-14	1.35E-05	1.13E-13	0.08	6.50E+03	2.98E-11
	Cr-48	1.84E-12	7.51E-13	1.62E-06	1.05E-12	0	5.45E+02	1.92E-10
	Cr-49	3.20E-13	7.36E-14	4.43E-06	1.89E-13	0	6.54E+03	7.18E-11
	Cr-51	4.96E-13	1.67E-13	1.27E-07	2.66E-13	0	2.41E+02	2.61E-09
	Cs-125	1.29E-13	1.64E-14	2.92E-06	8.18E-14	0.04	9.28E+03	2.78E-10
	Cs-126			4.74E-06		0.04	1.57E+05	1.73E-10
	Cs-127	1.38E-13	2.47E-14	1.68E-06	8.73E-14	0.04	1.94E+03	4.91E-10
	Cs-128			3.92E-06		0.04	7.97E+04	2.12E-10
	Cs-129	4.00E-13	7.44E-14	1.05E-06	2.48E-13	0.04	6.03E+02	7.98E-10
	Cs-130	1.02E-13	1.24E-14	2.22E-06	6.48E-14	0.04	1.84E+04	3.80E-10
	Cs-131	4.11E-13	7.51E-14	4.90E-09	2.49E-13	0.04	1.76E+04	1.72E-07
	Cs-132	2.89E-12	5.92E-13	3.11E-06	1.91E-12	0.04	4.20E+01	2.76E-10
	Cs-134 decaychain	5.81E-11	1.65E-11	7.10E-06	5.14E-11	0.04	1.58E-01	1.22E-10
	Cs-134m	8.84E-14	1.99E-14	5.02E-08	5.55E-14	0.04	1.40E+05	1.73E-08
	Cs-135 decaychain	7.18E-12	1.86E-12	2.36E-11	5.88E-12	0.04	1.08E+02	9.39E-02
	Cs-135m	9.10E-14	1.32E-14	7.37E-06	6.07E-14	0.04	3.12E+03	1.19E-10
	Cs-136	1.65E-11	3.49E-12	1.00E-05	1.12E-11	0.04	6.46E+00	8.83E-11
	Cs-137	4.33E-11	1.19E-11	5.32E-10	3.74E-11	0.04	2.34E+01	2.69E-07
	Cs-137+D decaychain	4.33E-11	1.19E-11	2.55E-06	3.74E-11	0.04	6.05E-02	6.96E-10
	Cs-138	3.40E-13	4.00E-14	1.19E-05	2.16E-13	0.04	3.18E+03	7.53E-11
	Cu-60	3.00E-13	5.77E-14	1.93E-05	1.89E-13	0.13	2.72E+03	2.02E-11
	Cu-61	1.20E-12	2.41E-13	3.63E-06	6.70E-13	0.13	1.64E+03	1.09E-10
	Cu-62			4.43E-06		0.13	2.83E+04	9.09E-11
	Cu-64	1.72E-12	4.33E-13	8.30E-07	9.32E-13	0.13	1.93E+03	5.01E-10
	Cu-66			4.32E-07		0.13	5.53E+05	9.92E-10
	Cu-67	5.29E-12	2.35E-12	3.83E-07	2.83E-12	0.13	8.55E+02	1.13E-09
	Dy-155	1.35E-12	2.45E-13	2.44E-06	7.47E-13		8.33E+02	4.13E-10
	Dy-157	5.62E-13	8.33E-14	1.32E-06	3.20E-13		1.90E+03	7.72E-10
	Dy-159	1.47E-12	1.28E-12	3.19E-08	7.70E-13		1.83E+02	3.22E-08
	Dy-165	1.15E-12	2.10E-13	9.49E-08	6.03E-13		9.17E+04	1.13E-08
	Dy-166	3.22E-11	8.36E-12	6.02E-08	1.63E-11		3.85E+03	1.67E-08
	Er-161	8.10E-13	1.34E-13	4.09E-06	4.51E-13		1.53E+03	2.56E-10

[redacted]	Er-165	2.42E-13	3.13E-14	3.05E-08	1.30E-13		6.40E+04	3.51E-08
	Er-169	7.36E-12	3.85E-12	9.10E-11	3.70E-12		8.09E+04	9.75E-07
	Er-171	5.74E-12	9.40E-13	1.42E-06	2.96E-12		1.90E+03	7.82E-10
	Er-172	1.70E-11	4.74E-12	2.20E-06	8.77E-12		1.87E+02	5.07E-10
	Es-250	1.44E-13	5.07E-13	1.69E-06	8.36E-14		5.73E+03	9.61E-10
	Es-251	2.89E-12	6.40E-12	2.55E-07	1.49E-12		2.41E+03	6.38E-09
	Es-253	1.01E-10	8.84E-09	1.25E-09	5.11E-11		2.67E+03	1.06E-07
	Es-254	1.50E-10	1.85E-08	8.55E-09	7.81E-11		1.03E+02	5.56E-08
	Es-254m	7.88E-11	1.53E-09	2.10E-06	4.00E-11		2.45E+02	7.81E-10
	Eu-145	6.77E-12	1.81E-12	6.95E-06	3.85E-12	0.0025	2.05E+01	1.35E-10
	Eu-146	1.12E-11	2.59E-12	1.16E-05	6.40E-12	0.0025	1.58E+01	8.17E-11
	Eu-147	5.37E-12	3.85E-12	2.04E-06	2.90E-12	0.0025	1.73E+01	4.68E-10
	Eu-148	1.04E-11	9.92E-12	9.84E-06	6.03E-12	0.0025	1.58E+00	9.77E-11
	Eu-149	1.40E-12	1.07E-12	1.42E-07	7.40E-13	0.0025	6.40E+01	6.81E-09
	Eu-150a	6.88E-12	1.03E-12	1.95E-07	3.50E-12	0.0025	8.23E+03	4.97E-09
	Eu-150b	1.08E-11	1.12E-10	6.49E-06	6.07E-12	0.0025	2.29E-02	3.29E-10
	Eu-152 decaychain	1.62E-11	9.10E-11	5.30E-06	8.70E-12	0.0025	4.16E-02	2.36E-10
	Eu-152m	8.51E-12	1.12E-12	1.33E-06	4.37E-12	0.0025	1.64E+03	7.42E-10
	Eu-154 decaychain	2.85E-11	1.15E-10	5.83E-06	1.49E-11	0.0025	4.99E-02	1.89E-10
	Eu-155 decaychain	5.40E-12	1.48E-11	1.24E-07	2.77E-12	0.0025	3.81E+00	8.19E-09
	Eu-156	3.56E-11	1.37E-11	6.62E-06	1.84E-11	0.0025	8.41E+00	1.53E-10
	Eu-157	1.06E-11	1.57E-12	9.60E-07	5.40E-12	0.0025	1.39E+03	1.06E-09
	Eu-158	5.22E-13	1.10E-13	5.06E-06	3.01E-13	0.0025	5.25E+03	2.03E-10
	F-18	2.00E-13	1.21E-13	4.45E-06	1.30E-13	0.02	2.49E+03	2.63E-11
	Fe-52	1.94E-11	2.73E-12	3.07E-06	1.03E-11	0.001	7.99E+02	1.10E-10
	Fe-55 decaychain	2.09E-12	7.99E-13	0.00E+00	1.16E-12	0.001	2.93E+03	1.22E-06
	Fe-59	2.07E-11	1.33E-11	5.83E-06	1.11E-11	0.001	3.26E+00	6.57E-11
	Fe-60	3.53E-10	1.84E-10	6.38E-12	2.39E-10	0.001	2.25E+00	3.78E-05
	Fm-252	4.92E-11	1.03E-09	5.09E-11	2.48E-11		1.28E+05	2.35E-07
	Fm-253	1.48E-11	1.28E-09	2.24E-07	7.51E-12		1.25E+03	7.27E-09
	Fm-254	6.07E-12	1.98E-10	1.23E-10	3.13E-12		6.42E+06	1.69E-06
	Fm-255	4.77E-11	8.84E-10	3.85E-09	2.42E-11		9.58E+04	1.57E-07
	Fm-257	1.23E-10	2.04E-08	3.06E-07	6.29E-11		2.59E+01	5.16E-09
	Fr-219			1.44E-08			2.42E+11	9.88E-08
	Fr-220			3.25E-08			8.21E+07	4.40E-08

[redacted]

Fr-221			1.11E-07			2.29E+06	1.29E-08
Fr-222	3.43E-12	2.42E-11	1.14E-08	2.02E-12		7.13E+06	1.21E-07
Fr-223	1.78E-11	3.06E-12	1.40E-07	1.00E-11		3.92E+05	1.02E-08
Ga-65	1.39E-13	2.84E-14	5.04E-06	8.73E-14		1.59E+04	8.38E-11
Ga-66	1.80E-11	2.18E-12	1.26E-05	9.32E-12		1.72E+02	3.40E-11
Ga-67	2.89E-12	9.55E-13	5.36E-07	1.51E-12		4.84E+02	8.11E-10
Ga-68	7.18E-13	1.28E-13	4.17E-06	4.03E-13		4.30E+03	1.06E-10
Ga-70	1.19E-13	2.92E-14	4.39E-08	7.22E-14		1.31E+06	1.04E-08
Ga-72	1.53E-11	2.17E-12	1.37E-05	8.07E-12		1.05E+02	3.41E-11
Ga-73	3.92E-12	6.14E-13	1.25E-06	2.03E-12		3.31E+03	3.79E-10
Gd-145	1.99E-13	3.63E-14	1.13E-05	1.23E-13	0.0025	4.71E+03	8.33E-11
Gd-146	1.39E-11	2.27E-11	5.56E-07	7.29E-12	0.0025	3.14E+01	1.70E-09
Gd-147	6.33E-12	1.34E-12	5.87E-06	3.50E-12	0.0025	9.08E+01	1.63E-10
Gd-148	9.07E-11	1.26E-08	0.00E+00	5.51E-11	0.0025	9.76E+00	3.76E-07
Gd-149	6.03E-12	2.76E-12	1.59E-06	3.22E-12	0.0025	5.66E+01	6.08E-10
Gd-151	3.20E-12	2.92E-12	1.20E-07	1.65E-12	0.0025	5.86E+01	8.14E-09
Gd-152	6.29E-11	9.10E-09	0.00E+00	3.85E-11	0.0025	1.26E+01	5.79E+05
Gd-153 decaychain	4.26E-12	6.55E-12	1.62E-07	2.22E-12	0.0025	2.15E+01	6.11E-09
Gd-159	9.21E-12	1.46E-12	1.74E-07	4.66E-12	0.0025	6.23E+03	5.89E-09
Ge-66	7.99E-13	2.50E-13	2.86E-06	4.88E-13	0.4	3.13E+03	1.50E-10
Ge-67	2.28E-13	4.59E-14	6.24E-06	1.45E-13	0.4	1.04E+04	6.97E-11
Ge-68	1.85E-11	4.88E-11	4.69E-13	9.88E-12	0.4	1.13E+03	1.70E-07
Ge-69	2.35E-12	8.81E-13	4.02E-06	1.35E-12	0.4	1.29E+02	1.11E-10
Ge-71	1.73E-13	5.18E-14	4.74E-13	9.18E-14	0.4	2.89E+06	1.86E-05
Ge-75	1.85E-13	8.44E-14	1.38E-07	1.17E-13	0.4	1.07E+05	3.53E-09
Ge-77	2.81E-12	1.15E-12	4.82E-06	1.65E-12	0.4	3.73E+02	1.04E-10
Ge-78	6.22E-13	2.48E-13	1.10E-06	4.03E-13	0.4	1.27E+04	4.60E-10
H-3 decaychain	2.20E-13	1.99E-13		1.44E-13	4.8	2.69E+00	2.80E-10
Hf-170	5.81E-12	1.20E-12	2.04E-06	3.14E-12		6.22E+02	5.41E-10
Hf-172	1.37E-11	6.92E-11	1.62E-07	7.14E-12		7.57E+00	6.81E-09
Hf-173	2.85E-12	5.92E-13	1.34E-06	1.52E-12		6.32E+02	8.38E-10
Hf-175	5.29E-12	4.29E-12	1.35E-06	2.83E-12		8.95E+00	8.41E-10
Hf-177m	4.74E-13	1.81E-13	8.58E-06	2.81E-13		2.76E+03	1.34E-10
Hf-178m	3.89E-11	3.70E-10	9.57E-06	2.13E-11		1.60E-02	2.47E-10
Hf-179m	1.81E-11	1.38E-11	3.42E-06	9.51E-12		9.86E+00	3.40E-10

[redacted]	Hf-180m	1.89E-12	4.14E-13	3.93E-06	1.03E-12		9.40E+02	2.97E-10
	Hf-181	1.79E-11	1.76E-11	2.24E-06	9.25E-12		8.90E+00	5.24E-10
	Hf-182	1.27E-11	3.41E-10	9.10E-07	7.25E-12		1.22E-01	5.61E-04
	Hf-182m	2.70E-13	1.04E-13	3.83E-06	1.57E-13		5.18E+03	3.09E-10
	Hf-183	6.25E-13	1.65E-13	3.30E-06	3.42E-13		5.77E+03	3.60E-10
	Hf-184	8.18E-12	1.38E-12	8.64E-07	4.26E-12		5.70E+03	1.38E-09
	Hg-193	1.14E-12	2.53E-13	5.55E-07	5.99E-13	0.38	1.05E+04	2.26E-09
	Hg-193m	5.37E-12	9.40E-13	4.54E-06	2.84E-12	0.38	4.03E+02	2.76E-10
	Hg-194	1.55E-10	2.88E-11	5.04E-12	1.06E-10	0.38	5.33E+00	7.52E-07
	Hg-195	1.41E-12	2.84E-13	7.34E-07	7.36E-13	0.38	2.80E+03	1.72E-09
	Hg-195m	9.55E-12	2.33E-12	7.68E-07	4.92E-12	0.38	6.35E+02	1.65E-09
	Hg-197	4.07E-12	1.25E-12	1.14E-07	2.09E-12	0.38	2.77E+03	1.12E-08
	Hg-197m	8.62E-12	2.28E-12	2.50E-07	4.40E-12	0.38	3.40E+03	5.09E-09
	Hg-199m	1.63E-13	6.33E-14	5.77E-07	9.44E-14	0.38	4.96E+04	2.24E-09
	Hg-203	1.27E-11	8.95E-12	9.21E-07	7.62E-12	0.38	1.97E+01	1.43E-09
	Ho-155	2.63E-13	5.29E-14	1.52E-06	1.49E-13	0.0026	1.67E+04	6.62E-10
	Ho-157	3.49E-14	7.36E-15	1.84E-06	2.13E-14	0.0026	5.26E+04	5.54E-10
	Ho-159	3.96E-14	1.22E-14	1.16E-06	2.46E-14	0.0026	3.18E+04	8.90E-10
	Ho-161	1.33E-13	1.98E-14	5.52E-08	7.14E-14	0.0026	1.47E+05	1.89E-08
	Ho-162	1.29E-14	5.40E-15	6.02E-07	8.18E-15	0.0026	1.35E+05	1.75E-09
	Ho-162m	1.81E-13	5.18E-14	2.46E-06	1.05E-13	0.0026	7.29E+03	4.28E-10
	Ho-164	4.11E-14	1.65E-14	2.78E-08	2.45E-14	0.0026	1.51E+06	3.83E-08
	Ho-164m	1.05E-13	3.48E-14	3.63E-08	5.88E-14	0.0026	8.95E+05	2.93E-08
	Ho-166	2.67E-11	3.85E-12	1.18E-07	1.35E-11	0.0026	6.23E+03	8.85E-09
	Ho-166m	2.10E-11	3.09E-10	7.69E-06	1.14E-11	0.0026	1.46E-02	8.16E-09
	Ho-167	9.95E-13	2.25E-13	1.45E-06	5.25E-13	0.0026	4.52E+03	7.48E-10
	I-120	2.33E-12	3.89E-13	1.33E-05	2.46E-12	0.02	1.13E+03	5.86E-11
	I-120m	1.20E-12	1.98E-13	2.55E-05	1.30E-12	0.02	9.02E+02	3.06E-11
	I-121	5.59E-13	9.81E-14	1.63E-06	6.03E-13	0.02	5.88E+03	4.82E-10
	I-122			4.17E-06		0.02	8.08E+04	1.90E-10
	I-123	1.96E-12	3.03E-13	5.10E-07	2.05E-12	0.02	3.02E+03	1.57E-09
	I-124	1.16E-10	1.76E-11	5.10E-06	1.22E-10	0.02	3.96E+01	1.57E-10
	I-125	5.55E-11	1.06E-11	7.24E-09	6.29E-11	0.02	9.36E+02	5.40E-08
	I-126	2.31E-10	3.70E-11	1.96E-06	2.48E-10	0.02	3.27E+01	4.11E-10
	I-128	1.89E-13	3.04E-14	3.74E-07	2.06E-13	0.02	1.30E+05	2.22E-09

[redacted]	I-129 decaychain	2.71E-10	6.07E-11	6.10E-09	3.22E-10	0.02	2.52E+00	1.43E-02
	I-130	1.80E-11	2.76E-12	9.67E-06	1.88E-11	0.02	1.69E+02	8.73E-11
	I-131	1.26E-10	1.95E-11	1.59E-06	1.34E-10	0.02	6.55E+01	5.29E-10
	I-132	2.22E-12	3.74E-13	1.06E-05	2.34E-12	0.02	8.33E+02	8.09E-11
	I-132m	1.70E-12	2.70E-13	1.40E-06	1.78E-12	0.02	1.04E+04	6.12E-10
	I-133	4.26E-11	6.25E-12	2.72E-06	4.40E-11	0.02	3.58E+02	3.17E-10
	I-134	5.96E-13	1.02E-13	1.24E-05	6.44E-13	0.02	1.87E+03	7.02E-11
	I-135	8.62E-12	1.34E-12	7.83E-06	8.99E-12	0.02	3.93E+02	1.12E-10
	In-109	6.25E-13	1.11E-13	2.90E-06	3.50E-13	0.003	1.67E+03	2.44E-10
	In-110a	7.03E-13	1.17E-13	7.13E-06	4.00E-13	0.003	2.47E+03	1.00E-10
	In-110b	1.77E-12	2.65E-13	1.41E-05	1.05E-12	0.003	2.94E+02	5.07E-11
	In-111	3.40E-12	8.03E-13	1.42E-06	1.85E-12	0.003	2.11E+02	5.07E-10
	In-112	3.70E-14	1.10E-14	1.15E-06	2.32E-14	0.003	7.36E+04	6.33E-10
	In-113m	2.47E-13	5.18E-14	1.05E-06	1.35E-13	0.003	1.17E+04	6.99E-10
	In-114			1.35E-08		0.003	7.54E+07	5.48E-08
	In-114m	7.03E-11	3.00E-11	3.57E-07	3.60E-11	0.003	4.66E+01	2.02E-09
	In-115	5.85E-11	4.03E-10	2.70E-10	4.33E-11	0.003	1.30E+01	2.14E+07
	In-115m	1.24E-12	2.15E-13	6.27E-07	6.40E-13	0.003	7.22E+03	1.19E-09
	In-116m	3.77E-13	8.77E-14	1.23E-05	2.26E-13	0.003	1.83E+03	6.12E-11
	In-117	1.67E-13	5.59E-14	2.90E-06	9.84E-14	0.003	9.60E+03	2.62E-10
	In-117m	1.22E-12	2.33E-13	3.35E-07	6.44E-13	0.003	3.11E+04	2.27E-09
	In-119			3.54E-06		0.003	1.43E+05	2.18E-10
	In-119m	1.70E-13	3.34E-14	5.63E-08	1.04E-13	0.003	1.20E+06	1.37E-08
	Ir-182	2.33E-13	5.03E-14	5.85E-06	1.39E-13	0.03	1.39E+04	2.02E-10
	Ir-184	1.67E-12	3.30E-13	8.66E-06	9.21E-13	0.03	7.77E+02	1.38E-10
	Ir-185	3.61E-12	7.25E-13	2.69E-06	1.91E-12	0.03	5.39E+02	4.47E-10
	Ir-186a	5.44E-12	1.06E-12	7.40E-06	2.98E-12	0.03	1.74E+02	1.63E-10
	Ir-186b	5.07E-13	1.11E-13	4.22E-06	2.84E-13	0.03	2.75E+03	2.86E-10
	Ir-187	1.57E-12	2.87E-13	1.42E-06	8.33E-13	0.03	1.36E+03	8.55E-10
	Ir-188	6.40E-12	1.38E-12	7.68E-06	3.58E-12	0.03	6.37E+01	1.59E-10
	Ir-189	4.29E-12	2.33E-12	1.69E-07	2.21E-12	0.03	3.75E+02	7.24E-09
	Ir-190	1.50E-11	8.81E-12	5.99E-06	8.10E-12	0.03	1.17E+01	2.06E-10
	Ir-190m	8.44E-14	3.89E-14	8.69E-13	4.55E-14	0.03	1.33E+09	9.69E-05
	Ir-190n	1.07E-12	2.14E-13	6.48E-06	6.03E-13	0.03	1.01E+03	1.90E-10
	Ir-191m			1.58E-07		0.03	9.37E+07	7.85E-09

[redacted]	Ir-192	2.04E-11	2.41E-11	3.40E-06	1.07E-11	0.03	3.36E+00	3.66E-10
	Ir-192m	2.16E-12	1.02E-10	5.39E-07	1.32E-12	0.03	2.16E-01	2.80E-08
	Ir-194	2.49E-11	3.40E-12	4.09E-07	1.26E-11	0.03	2.57E+03	3.05E-09
	Ir-194m	2.29E-11	4.59E-11	1.01E-05	1.26E-11	0.03	4.90E-01	1.25E-10
	Ir-195	1.10E-12	2.39E-13	1.12E-07	5.77E-13	0.03	7.25E+04	1.13E-08
	Ir-195m	2.89E-12	5.96E-13	1.58E-06	1.50E-12	0.03	3.38E+03	8.01E-10
	K-38			1.61E-05		0.3	9.91E+03	1.53E-11
	K-40 decaychain	6.18E-11	1.03E-11	7.97E-07	3.43E-11	0.3	1.38E-01	1.99E-02
	K-42	3.06E-12	4.33E-13	1.46E-06	1.74E-12	0.3	1.12E+03	1.87E-10
	K-43	1.81E-12	3.09E-13	4.23E-06	1.07E-12	0.3	2.13E+02	6.60E-11
	K-44	3.00E-13	3.39E-14	1.19E-05	1.91E-13	0.3	4.64E+03	2.40E-11
	K-45	1.93E-13	2.33E-14	9.53E-06	1.22E-13	0.3	6.40E+03	3.07E-11
	Kr-74			4.90E-06		0	2.16E+04	9.81E-11
	Kr-76			1.73E-06		0	7.94E+02	2.85E-10
	Kr-77			4.22E-06		0	3.87E+03	1.19E-10
	Kr-79			1.08E-06		0	5.38E+02	4.75E-10
	Kr-81			2.18E-08		0	5.12E+00	2.44E-04
	Kr-81m			4.60E-07		0	1.22E+07	1.14E-09
	Kr-83m			1.34E-11		0	8.29E+08	4.02E-05
	Kr-85			1.05E-08		0	2.41E+01	6.14E-08
	Kr-85m			5.46E-07		0	8.31E+03	1.01E-09
	Kr-87			4.00E-06		0	3.99E+03	1.41E-10
	Kr-88			1.02E-05		0	7.01E+02	5.60E-11
	La-131	2.28E-13	5.48E-14	2.76E-06	1.31E-13	0.0025	7.49E+03	3.08E-10
	La-132	4.85E-12	6.25E-13	9.52E-06	2.58E-12	0.0025	4.45E+02	9.00E-11
	La-134			3.05E-06		0.0025	5.99E+04	2.85E-10
	La-135	3.96E-13	5.03E-14	5.21E-08	2.11E-13	0.0025	2.00E+04	1.68E-08
	La-137	9.44E-13	1.39E-11	6.75E-09	5.00E-13	0.0025	1.62E+01	3.73E-04
	La-138	8.81E-12	3.05E-10	6.07E-06	4.96E-12	0.0025	1.84E-02	9.59E-01
	La-140	3.05E-11	4.77E-12	1.15E-05	1.59E-11	0.0025	4.38E+01	7.90E-11
	La-141	5.37E-12	7.44E-13	2.37E-07	2.74E-12	0.0025	2.17E+04	3.85E-09
	La-142	1.48E-12	2.42E-13	1.44E-05	8.21E-13	0.0025	9.15E+02	6.40E-11
	La-143	3.14E-13	5.66E-14	5.11E-07	1.78E-13	0.0025	1.68E+05	1.82E-09
	Lu-169	5.03E-12	1.33E-12	4.73E-06	2.77E-12		1.26E+02	2.32E-10
	Lu-170	1.06E-11	2.25E-12	1.26E-05	5.88E-12		3.36E+01	8.76E-11

[redacted]	Lu-171	8.84E-12	3.50E-12	2.90E-06	4.70E-12		3.55E+01	3.83E-10
	Lu-172	1.47E-11	6.03E-12	8.70E-06	8.03E-12		1.45E+01	1.28E-10
	Lu-173	3.74E-12	8.70E-12	2.92E-07	1.96E-12		5.79E+00	3.84E-09
	Lu-174	4.11E-12	1.42E-11	4.26E-07	2.12E-12		1.65E+00	2.65E-09
	Lu-174m	9.73E-12	1.51E-11	9.88E-08	4.96E-12		5.95E+01	1.13E-08
	Lu-176	2.60E-11	1.41E-10	1.83E-06	1.35E-11		6.08E-02	1.08E+00
	Lu-176m	2.43E-12	4.55E-13	2.78E-08	1.25E-12		1.96E+05	4.06E-08
	Lu-177	1.02E-11	4.66E-12	1.14E-07	5.18E-12		1.09E+03	9.96E-09
	Lu-177m	2.60E-11	5.70E-11	3.63E-06	1.36E-11		1.45E+00	3.16E-10
	Lu-178	2.02E-13	5.29E-14	6.76E-07	1.20E-13		6.35E+04	1.71E-09
	Lu-178m	1.59E-13	5.85E-14	4.26E-06	9.84E-14		1.26E+04	2.71E-10
	Lu-179	3.21E-12	5.14E-13	1.19E-07	1.64E-12		3.71E+04	9.73E-09
	Md-257	1.67E-12	7.70E-11	3.62E-07	8.58E-13		1.08E+04	4.61E-09
	Md-258	1.23E-10	1.68E-08	1.31E-09	6.25E-11		8.27E+02	9.00E-08
	Mg-28	3.06E-11	5.14E-12	6.56E-06	1.65E-11		1.48E+02	2.77E-11
	Mn-51	5.11E-13	9.55E-14	4.37E-06	2.95E-13	0.3	6.04E+03	7.58E-11
	Mn-52	1.58E-11	4.40E-12	1.67E-05	9.07E-12	0.3	9.07E+00	2.02E-11
	Mn-52m	2.82E-13	5.07E-14	1.15E-05	1.75E-13	0.3	5.02E+03	2.94E-11
	Mn-53	4.37E-13	2.17E-13	0.00E+00	2.25E-13	0.3	1.82E+03	9.97E-01
	Mn-54 decaychain	5.14E-12	5.88E-12	3.89E-06	3.11E-12	0.3	6.95E-01	9.01E-11
	Mn-56	2.78E-12	4.14E-13	8.44E-06	1.48E-12	0.3	9.33E+02	4.31E-11
	Mo-101	1.48E-13	4.33E-14	6.62E-06	9.44E-14	0.13	1.26E+04	9.91E-11
	Mo-90	1.39E-12	1.24E-12	3.41E-06	8.73E-13	0.13	1.05E+03	1.71E-10
	Mo-93	5.29E-12	1.27E-12	2.17E-10	4.18E-12	0.13	1.16E+02	1.06E-04
	Mo-93m	6.62E-13	4.33E-13	1.09E-05	4.26E-13	0.13	2.72E+02	5.54E-11
	Mo-99	3.50E-12	4.29E-12	6.64E-07	2.11E-12	0.13	4.63E+02	9.68E-10
	N-13			4.45E-06		7.5	2.75E+04	1.90E-11
	Na-22 decaychain	1.97E-11	3.89E-12	1.03E-05	1.26E-11	0.05	8.66E-02	1.39E-11
	Na-24	2.64E-12	4.74E-13	2.20E-05	1.65E-12	0.05	6.16E+01	7.08E-12
	Nb-88	2.45E-13	4.51E-14	1.89E-05	1.55E-13	0.01	4.51E+03	3.02E-11
	Nb-89a	1.01E-12	1.74E-13	8.48E-06	5.66E-13	0.01	2.18E+03	6.82E-11
	Nb-89b	2.82E-12	4.07E-13	6.64E-06	1.51E-12	0.01	1.50E+03	8.70E-11
	Nb-90	1.52E-11	2.27E-12	2.13E-05	8.21E-12	0.01	6.53E+01	2.74E-11
	Nb-93m	2.31E-12	1.90E-12	3.83E-11	1.17E-12	0.01	6.00E+02	2.12E-06
	Nb-94 decaychain	2.05E-11	3.77E-11	7.29E-06	1.11E-11	0.01	1.53E-02	8.18E-08

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[redacted]	Nb-95	6.36E-12	5.44E-12	3.53E-06	3.50E-12	0.01	6.81E+00	1.75E-10
	Nb-95m	1.05E-11	3.27E-12	2.32E-07	5.37E-12	0.01	1.00E+03	2.64E-09
	Nb-96	1.35E-11	2.28E-12	1.15E-05	7.25E-12	0.01	7.55E+01	5.42E-11
	Nb-97	5.00E-13	1.07E-13	2.97E-06	2.79E-13	0.01	5.69E+03	2.12E-10
	Nb-97m			3.34E-06		0.01	3.65E+05	1.89E-10
	Nb-98	6.73E-13	1.23E-13	1.16E-05	3.92E-13	0.01	2.04E+03	5.49E-11
	Nd-136	6.70E-13	1.34E-13	1.01E-06	3.81E-13	0.0024	2.38E+04	8.74E-10
	Nd-138	9.69E-12	1.24E-12	6.73E-08	5.00E-12	0.0024	5.87E+04	1.31E-08
	Nd-139	1.21E-13	2.37E-14	1.72E-06	6.96E-14	0.0024	2.39E+04	5.25E-10
	Nd-139m	2.86E-12	4.96E-13	7.13E-06	1.56E-12	0.0024	5.18E+02	1.27E-10
	Nd-141	8.07E-14	1.34E-14	2.28E-07	4.40E-14	0.0024	3.58E+04	4.02E-09
	Nd-141m			3.48E-06		0.0024	3.37E+05	2.63E-10
	Nd-147	2.01E-11	9.36E-12	4.87E-07	1.02E-11	0.0024	1.57E+02	1.95E-09
	Nd-149	1.51E-12	3.19E-13	1.49E-06	7.92E-13	0.0024	7.88E+03	6.49E-10
	Nd-151	1.83E-13	3.92E-14	4.10E-06	1.04E-13	0.0024	2.40E+04	2.39E-10
	Ne-19			4.47E-06			9.51E+05	2.76E-11
	Ni-56	6.70E-12	2.88E-12	7.74E-06	3.96E-12	0.05	1.79E+01	4.70E-11
	Ni-57	1.02E-11	1.78E-12	9.43E-06	5.55E-12	0.05	5.97E+01	3.93E-11
	Ni-59 decaychain	7.33E-13	4.66E-13	0.00E+00	3.89E-13	0.05	1.08E+03	1.34E-02
	Ni-63 decaychain	1.79E-12	1.64E-12	0.00E+00	9.51E-13	0.05	4.93E+02	8.35E-06
	Ni-65	1.92E-12	3.03E-13	2.74E-06	1.01E-12	0.05	2.94E+03	1.54E-10
	Ni-66	5.77E-11	8.99E-12	2.67E-11	2.94E-11	0.05	4.57E+04	5.27E-08
	Np-232	4.14E-14	3.17E-14	5.25E-06	2.70E-14	0.02	1.58E+04	2.87E-10
	Np-233	1.14E-14	2.49E-15	2.29E-07	6.99E-15	0.02	1.47E+05	6.61E-09
	Np-234	8.77E-12	1.86E-12	7.06E-06	4.85E-12	0.02	2.72E+01	2.15E-10
	Np-235	9.99E-13	1.15E-12	2.13E-09	5.07E-13	0.02	9.42E+02	6.72E-07
	Np-236a	2.56E-11	9.77E-10	3.25E-07	1.44E-11	0.02	3.40E-01	2.58E-05
	Np-236b	3.19E-12	8.07E-12	1.34E-07	1.63E-12	0.02	6.72E+03	1.14E-08
	Np-237	1.46E-10	1.77E-08	5.36E-08	8.29E-11	0.02	1.50E+00	2.14E-03
	Np-237+D decaychain	1.62E-10	1.77E-08	7.97E-07	9.10E-11	0.02	1.36E-01	1.93E-04
	Np-238	1.52E-11	4.18E-12	2.62E-06	7.88E-12	0.02	1.52E+02	5.89E-10
	Np-239	1.47E-11	4.00E-12	5.41E-07	7.51E-12	0.02	6.61E+02	2.86E-09
	Np-240	5.55E-13	1.95E-13	5.80E-06	3.16E-13	0.02	3.23E+03	2.69E-10
	Np-240m			1.51E-06		0.02	1.09E+05	1.03E-09
	O-15			4.46E-06			1.34E+05	2.18E-11

[redacted]	Os-180	7.92E-14	2.62E-14	1.08E-07	5.00E-14		5.13E+05	1.08E-08
	Os-181	9.21E-13	1.95E-13	5.41E-06	5.07E-13		2.15E+03	2.17E-10
	Os-182	6.92E-12	1.45E-12	1.63E-06	3.74E-12		5.66E+02	7.25E-10
	Os-185	4.77E-12	6.14E-12	3.11E-06	2.70E-12		2.90E+00	3.86E-10
	Os-189m	2.94E-13	3.44E-14	7.20E-13	1.50E-13		8.05E+07	2.92E-05
	Os-190m			6.76E-06			1.82E+04	1.83E-10
	Os-191	1.05E-11	7.10E-12	1.66E-07	5.33E-12		3.28E+02	7.41E-09
	Os-191m	1.76E-12	6.36E-13	1.05E-08	8.95E-13		1.45E+05	1.15E-07
	Os-193	1.53E-11	2.71E-12	2.69E-07	7.77E-12		2.50E+03	4.62E-09
	Os-194	4.37E-11	2.55E-10	6.57E-10	2.23E-11		5.87E+01	1.91E-07
	P-30			4.50E-06		1	1.08E+05	4.33E-11
	P-32	2.21E-11	1.22E-11	9.41E-09	1.23E-11	1	4.73E+03	1.66E-08
	P-33	2.47E-12	5.11E-12	3.72E-11	1.36E-12	1	8.67E+04	5.58E-07
	Pa-227	2.38E-12	2.12E-10	4.37E-08	1.37E-12	0.01	7.23E+05	3.35E-08
	Pa-228	9.84E-12	2.33E-10	5.10E-06	5.18E-12	0.01	1.81E+02	2.90E-10
	Pa-230	1.02E-11	2.58E-09	2.86E-06	5.40E-12	0.01	1.70E+01	5.22E-10
	Pa-231 decaychain	3.74E-10	4.55E-08	1.39E-07	2.26E-10	0.01	5.82E-01	1.24E-05
	Pa-232	9.55E-12	6.81E-12	4.29E-06	5.03E-12	0.01	1.51E+02	3.51E-10
	Pa-233	1.59E-11	1.42E-11	7.43E-07	8.14E-12	0.01	4.21E+01	2.03E-09
	Pa-234	7.03E-12	1.46E-12	8.71E-06	3.70E-12	0.01	3.48E+02	1.74E-10
	Pa-234m			6.87E-08		0.01	1.52E+07	2.21E-08
	Pb-195m	1.20E-13	4.37E-14	6.90E-06	7.55E-14	0.01	1.12E+04	1.84E-10
	Pb-198	6.18E-13	1.43E-13	1.62E-06	3.63E-13	0.01	5.23E+03	7.94E-10
	Pb-199	3.28E-13	7.44E-14	6.87E-06	1.97E-13	0.01	1.97E+03	1.88E-10
	Pb-200	4.03E-12	1.16E-12	5.97E-07	2.24E-12	0.01	1.58E+03	2.17E-09
	Pb-201	1.47E-12	3.50E-13	3.18E-06	8.36E-13	0.01	6.80E+02	4.10E-10
	Pb-202	3.74E-11	1.43E-11	3.09E-12	2.93E-11	0.01	2.12E+01	3.60E-03
	Pb-202m	9.84E-13	2.25E-13	9.32E-06	5.85E-13	0.01	6.02E+02	1.41E-10
	Pb-203	2.65E-12	7.55E-13	1.09E-06	1.46E-12	0.01	3.58E+02	1.21E-09
	Pb-205	1.26E-12	6.44E-13	3.50E-12	8.25E-13	0.01	6.18E+02	5.07E+00
	Pb-209	6.55E-13	1.90E-13	5.37E-10	3.49E-13	0.01	9.94E+06	2.16E-06
	Pb-210	1.84E-09	2.77E-09	1.41E-09	1.18E-09	0.01	6.60E-01	8.65E-09
	Pb-210+D decaychain	2.66E-09	1.39E-08	4.21E-09	3.44E-09	0.01	4.54E-01	5.95E-09
	Pb-211	1.04E-12	3.70E-11	2.29E-07	5.81E-13	0.01	1.47E+05	5.98E-09
	Pb-212	6.70E-11	5.77E-10	5.09E-07	3.54E-11	0.01	3.70E+03	2.66E-09

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[redacted]

Pb-214	8.51E-13	3.63E-11	9.82E-07	4.85E-13	0.01	4.63E+04	1.42E-09
Pd-100	1.05E-11	3.10E-12	2.22E-07	5.77E-12	0.1	1.04E+03	2.91E-09
Pd-101	1.12E-12	1.97E-13	1.38E-06	6.07E-13	0.1	1.78E+03	4.75E-10
Pd-103	3.61E-12	1.77E-12	1.15E-09	1.84E-12	0.1	3.00E+04	4.04E-07
Pd-107	7.25E-13	1.69E-12	0.00E+00	3.67E-13	0.1	1.09E+03	2.13E+00
Pd-109	1.01E-11	1.85E-12	1.27E-08	5.14E-12	0.1	1.07E+05	5.01E-08
Pm-141	1.52E-13	2.85E-14	3.33E-06	9.25E-14	0.0025	1.75E+04	2.75E-10
Pm-142			3.86E-06		0.0025	4.68E+05	2.39E-10
Pm-143	2.20E-12	5.37E-12	1.33E-06	1.24E-12	0.0025	2.40E+00	6.98E-10
Pm-144	8.10E-12	2.76E-11	6.90E-06	4.66E-12	0.0025	3.38E-01	1.36E-10
Pm-145	1.54E-12	6.59E-12	1.61E-08	8.07E-13	0.0025	1.16E+01	8.35E-08
Pm-146	1.12E-11	5.40E-11	3.29E-06	5.99E-12	0.0025	1.30E-01	2.95E-10
Pm-147 decaychain	4.88E-12	1.61E-11	3.21E-11	2.48E-12	0.0025	1.23E+03	1.33E-06
Pm-148	4.96E-11	1.05E-11	2.80E-06	2.52E-11	0.0025	5.62E+01	3.42E-10
Pm-148m	2.13E-11	2.12E-11	8.98E-06	1.15E-11	0.0025	2.28E+00	1.07E-10
Pm-149	1.93E-11	3.66E-12	4.60E-08	9.77E-12	0.0025	7.86E+03	1.99E-08
Pm-150	2.94E-12	4.63E-13	6.87E-06	1.56E-12	0.0025	1.10E+03	1.42E-10
Pm-151	1.28E-11	2.36E-12	1.27E-06	6.59E-12	0.0025	5.63E+02	7.71E-10
Po-203	3.92E-13	7.73E-14	7.65E-06	1.88E-13	0.001	4.34E+03	1.72E-10
Po-205	4.26E-13	1.72E-13	7.36E-06	2.41E-13	0.001	1.53E+03	1.81E-10
Po-207	1.28E-12	1.99E-13	6.08E-06	5.55E-13	0.001	5.73E+02	2.21E-10
Po-210	7.96E-10	1.08E-08	3.95E-11	2.25E-09	0.001	5.48E+01	1.22E-08
Po-211			3.58E-08		0.001	3.96E+09	3.83E-08
Po-212			0.00E+00		0.001		
Po-213			0.00E+00		0.001		
Po-214			3.86E-10		0.001	1.16E+15	3.60E-06
Po-215			7.48E-10		0.001	5.49E+13	1.87E-06
Po-216			7.87E-11		0.001	6.20E+12	1.78E-05
Po-218			4.26E-11		0.001	9.38E+09	3.32E-05
Pr-136	1.27E-13	2.15E-14	9.74E-06	8.07E-14	0.0025	9.55E+03	9.07E-11
Pr-137	3.22E-13	5.55E-14	2.14E-06	1.78E-13	0.0025	7.44E+03	4.16E-10
Pr-138			3.57E-06		0.0025	2.36E+05	2.51E-10
Pr-138m	1.03E-12	1.76E-13	1.13E-05	5.92E-13	0.0025	8.56E+02	7.93E-11
Pr-139	4.03E-13	6.96E-14	4.41E-07	2.12E-13	0.0025	1.02E+04	2.05E-09
Pr-142	2.49E-11	3.38E-12	3.14E-07	1.26E-11	0.0025	3.35E+03	2.90E-09

[redacted]	Pr-142m	3.20E-13	4.33E-14	0.00E+00	1.62E-13	0.0025	1.86E+09	2.05E-05
	Pr-143	2.29E-11	9.73E-12	1.63E-09	1.16E-11	0.0025	1.28E+04	1.92E-07
	Pr-144	1.82E-13	3.58E-14	1.94E-07	1.12E-13	0.0025	3.63E+05	4.82E-09
	Pr-144m			8.73E-09		0.0025	1.94E+07	1.07E-07
	Pr-145	6.59E-12	9.25E-13	6.95E-08	3.36E-12	0.0025	4.82E+04	1.34E-08
	Pr-147	1.32E-13	3.59E-14	3.78E-06	8.10E-14	0.0025	2.37E+04	2.53E-10
	Pt-186	1.03E-12	8.25E-14	3.20E-06	5.62E-13		3.17E+03	3.77E-10
	Pt-188	1.03E-11	1.88E-12	6.02E-07	5.44E-12		1.38E+02	2.02E-09
	Pt-189	1.61E-12	1.32E-13	1.17E-06	8.55E-13		1.59E+03	1.05E-09
	Pt-191	4.85E-12	4.63E-13	9.78E-07	2.55E-12		3.09E+02	1.27E-09
	Pt-193	6.14E-13	1.11E-13	2.78E-12	3.09E-13		1.53E+03	4.14E-05
	Pt-193m	8.81E-12	7.73E-13	1.68E-08	4.44E-12		1.08E+04	6.95E-08
	Pt-195m	1.19E-11	1.05E-12	1.26E-07	6.03E-12		1.65E+03	9.92E-09
	Pt-197	7.59E-12	5.22E-13	5.63E-08	3.85E-12		1.94E+04	2.23E-08
	Pt-197m	1.12E-12	8.66E-14	2.38E-07	5.81E-13		5.42E+04	5.37E-09
	Pt-199	2.18E-13	2.48E-14	8.69E-07	1.25E-13		4.55E+04	1.49E-09
	Pt-200	2.23E-11	1.48E-12	1.58E-07	1.13E-11		1.01E+04	8.06E-09
	Pu-234	2.39E-12	6.85E-11	1.61E-07	1.25E-12	0.001	1.43E+04	9.42E-09
	Pu-235	9.73E-15	2.39E-15	2.37E-07	6.03E-15	0.001	2.03E+05	6.44E-09
	Pu-236	1.74E-10	2.28E-08	1.19E-10	9.92E-11	0.001	3.31E+01	6.24E-08
	Pu-237	1.62E-12	1.27E-12	1.12E-07	8.40E-13	0.001	1.67E+02	1.37E-08
	Pu-238 decaychain	2.72E-10	3.36E-08	7.22E-11	1.69E-10	0.001	3.27E+00	1.91E-07
	Pu-239 decaychain	2.76E-10	3.33E-08	2.00E-10	1.74E-10	0.001	2.86E+00	4.61E-05
	Pu-240 decaychain	2.77E-10	3.33E-08	6.98E-11	1.74E-10	0.001	2.86E+00	1.26E-05
	Pu-241 decaychain	3.29E-12	3.34E-10	4.11E-12	2.28E-12	0.001	4.52E+02	4.39E-06
	Pu-242 decaychain	2.63E-10	3.13E-08	6.25E-11	1.65E-10	0.001	3.01E+00	7.67E-04
	Pu-243	1.34E-12	2.94E-13	5.50E-08	6.92E-13	0.001	7.42E+04	2.86E-08
	Pu-244	2.94E-10	2.93E-08	3.01E-11	1.80E-10	0.001	2.70E+00	1.52E-01
	Pu-244+D decaychain	3.14E-10	2.93E-08	1.51E-06	1.90E-10	0.001	7.18E-02	4.05E-03
	Pu-245	1.28E-11	2.07E-12	1.77E-06	6.55E-12	0.001	1.09E+03	8.98E-10
	Pu-246	4.92E-11	1.73E-11	4.04E-07	2.53E-11	0.001	1.89E+02	3.89E-09
	Ra-222			3.71E-08		0.04	5.19E+07	3.89E-08
	Ra-223	6.44E-10	2.50E-08	4.34E-07	3.39E-10	0.04	1.42E+02	2.76E-09
	Ra-224	4.51E-10	9.99E-09	3.72E-08	2.38E-10	0.04	2.30E+03	1.45E-08
	Ra-225	2.72E-10	2.10E-08	5.91E-09	1.54E-10	0.04	1.30E+03	3.31E-08

[redacted]	Ra-226	7.29E-10	1.15E-08	2.29E-08	5.14E-10	0.04	8.96E-01	9.07E-07
	Ra-226+D decaychain	7.30E-10	1.16E-08	8.49E-06	5.15E-10	0.04	1.31E-02	1.32E-08
	Ra-227	2.48E-13	3.13E-13	6.22E-07	1.46E-13	0.04	4.64E+04	2.37E-09
	Ra-228	2.28E-09	5.18E-09	0.00E+00	1.43E-09	0.04	1.29E+00	4.75E-09
	Ra-228+D decaychain	2.29E-09	5.23E-09	4.53E-06	1.43E-09	0.04	8.54E-02	3.14E-10
	Rb-79	1.79E-13	2.37E-14	5.85E-06	1.14E-13	0.13	9.10E+03	8.77E-11
	Rb-80			5.56E-06		0.13	3.87E+05	9.34E-11
	Rb-81	2.83E-13	4.63E-14	2.59E-06	1.74E-13	0.13	1.71E+03	2.03E-10
	Rb-81m	4.55E-14	1.10E-14	9.08E-09	2.80E-14	0.13	4.19E+06	5.79E-08
	Rb-82			4.85E-06		0.13	1.93E+05	1.10E-10
	Rb-82m	7.25E-13	1.35E-13	1.35E-05	4.70E-13	0.13	2.43E+02	3.94E-11
	Rb-83	1.18E-11	2.32E-12	2.18E-06	7.51E-12	0.13	4.50E+00	2.47E-10
	Rb-84	1.91E-11	3.59E-12	4.22E-06	1.17E-11	0.13	6.11E+00	1.29E-10
	Rb-86	2.37E-11	4.00E-12	4.67E-07	1.34E-11	0.13	9.63E+01	1.19E-09
	Rb-87	1.25E-11	2.14E-12	9.11E-11	7.07E-12	0.13	6.04E+01	6.91E+02
	Rb-88	3.06E-13	3.17E-14	3.36E-06	1.92E-13	0.13	2.04E+04	1.70E-10
	Rb-89	1.70E-13	2.09E-14	1.05E-05	1.08E-13	0.13	7.64E+03	5.50E-11
	Re-177	1.05E-13	2.97E-14	2.62E-06	6.33E-14		3.32E+04	4.39E-10
	Re-178	9.32E-14	2.33E-14	5.65E-06	5.85E-14		1.63E+04	2.05E-10
	Re-180			5.29E-06			9.48E+04	2.21E-10
	Re-181	3.64E-12	7.96E-13	3.18E-06	2.00E-12		3.19E+02	3.70E-10
	Re-182a	2.16E-12	5.51E-13	5.37E-06	1.22E-12		2.98E+02	2.20E-10
	Re-182b	1.26E-11	4.44E-12	8.22E-06	6.99E-12		3.86E+01	1.44E-10
	Re-184	7.66E-12	6.73E-12	3.93E-06	4.40E-12		5.67E+00	3.04E-10
	Re-184m	1.27E-11	2.26E-11	1.52E-06	6.96E-12		3.37E+00	7.85E-10
	Re-186	1.53E-11	4.26E-12	5.49E-08	8.03E-12		3.93E+03	2.12E-08
	Re-186m	1.95E-11	4.18E-11	1.75E-08	1.05E-11		5.51E+00	5.74E-04
	Re-187	4.81E-14	2.51E-14	0.00E+00	2.56E-14		1.65E+04	4.32E+05
	Re-188	1.35E-11	2.22E-12	2.38E-07	7.07E-12		4.98E+03	5.09E-09
	Re-188m	2.69E-13	5.07E-14	1.28E-07	1.42E-13		5.12E+05	9.54E-09
	Re-189	7.84E-12	1.73E-12	2.42E-07	4.11E-12		3.44E+03	5.05E-09
	Rh-100	6.62E-12	1.04E-12	1.38E-05	3.74E-12	0.13	7.08E+01	4.71E-11
	Rh-101	5.37E-12	1.81E-11	8.84E-07	3.01E-12	0.13	8.20E-01	7.43E-10
	Rh-101m	2.46E-12	7.14E-13	1.19E-06	1.34E-12	0.13	1.64E+02	5.51E-10
	Rh-102	1.71E-11	5.99E-11	9.73E-06	1.04E-11	0.13	8.22E-02	6.81E-11

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[redacted]	Rh-102m	1.66E-11	2.56E-11	2.11E-06	8.73E-12	0.13	1.94E+00	3.14E-10
	Rh-103m	2.40E-14	9.14E-15	9.31E-11	1.34E-14	0.13	2.25E+08	6.93E-06
	Rh-105	6.73E-12	1.59E-12	3.15E-07	3.43E-12	0.13	1.82E+03	2.16E-09
	Rh-106			9.66E-07		0.13	2.53E+06	7.13E-10
	Rh-106m	1.37E-12	2.71E-13	1.37E-05	7.73E-13	0.13	6.74E+02	5.02E-11
	Rh-107	9.51E-14	2.88E-14	1.28E-06	5.81E-14	0.13	4.39E+04	5.43E-10
	Rh-99	5.77E-12	3.33E-12	2.50E-06	3.15E-12	0.13	2.12E+01	2.57E-10
	Rh-99m	6.03E-13	9.99E-14	3.02E-06	3.42E-13	0.13	1.43E+03	2.13E-10
	Rn-218			3.39E-09		0	6.16E+11	4.18E-07
	Rn-219			2.25E-07		0	8.21E+07	6.32E-09
	Rn-220			1.70E-09		0	7.74E+08	8.40E-07
	Rn-222			1.74E-09		0	1.27E+05	8.29E-07
	Rn-222+D		7.57E-12			0	3.79E+10	2.46E-01
	Ru-103	1.05E-11	8.92E-12	2.04E-06	5.55E-12	0.03	1.06E+01	3.28E-10
	Ru-105	3.77E-12	6.48E-13	3.51E-06	1.96E-12	0.03	1.30E+03	1.94E-10
	Ru-106	1.19E-10	1.02E-10	0.00E+00	6.11E-11	0.03	1.38E+02	4.12E-08
	Ru-106+D decaychain	1.19E-10	1.02E-10	9.66E-07	6.11E-11	0.03	2.34E+00	7.01E-10
	Ru-94	8.03E-13	1.23E-13	2.31E-06	4.37E-13	0.03	1.02E+04	2.64E-10
	Ru-97	1.65E-12	3.36E-13	8.63E-07	9.07E-13	0.03	3.38E+02	7.30E-10
	S-35	1.24E-12	5.03E-12	8.77E-12	3.70E-12	0.6	5.29E+04	1.24E-06
	Sb-115	1.16E-13	2.33E-14	3.92E-06	7.10E-14	0.01	9.78E+03	1.91E-10
	Sb-116	1.07E-13	1.88E-14	1.05E-05	6.81E-14	0.01	7.35E+03	7.17E-11
	Sb-116m	4.00E-13	8.81E-14	1.47E-05	2.45E-13	0.01	1.38E+03	5.12E-11
	Sb-117	1.70E-13	4.07E-14	5.78E-07	9.44E-14	0.01	1.26E+04	1.31E-09
	Sb-118m	1.67E-12	2.64E-13	1.21E-05	9.81E-13	0.01	3.36E+02	6.33E-11
	Sb-119	1.35E-12	1.74E-13	2.58E-09	6.96E-13	0.01	1.93E+05	2.79E-07
	Sb-120a	5.44E-14	1.12E-14	1.94E-06	3.42E-14	0.01	3.95E+04	4.02E-10
	Sb-120b	1.08E-11	3.30E-12	1.15E-05	6.22E-12	0.01	1.28E+01	6.78E-11
	Sb-122	3.03E-11	5.48E-12	1.97E-06	1.55E-11	0.01	1.59E+02	4.01E-10
	Sb-124	3.50E-11	2.43E-11	8.89E-06	1.85E-11	0.01	1.58E+00	9.05E-11
	Sb-124m			1.56E-06		0.01	5.04E+05	5.16E-10
	Sb-124n	3.81E-14	1.15E-14	7.76E-12	2.32E-14	0.01	4.60E+09	6.14E-05
	Sb-125	1.12E-11	1.66E-11	1.81E-06	6.14E-12	0.01	4.62E-01	4.48E-10
	Sb-125+D decaychain	1.32E-11	1.93E-11	1.81E-06	7.21E-12	0.01	4.62E-01	4.48E-10
	Sb-126	2.93E-11	1.15E-11	1.28E-05	1.59E-11	0.01	5.33E+00	6.39E-11

[redacted]

Sb-126m	1.48E-13	3.16E-14	6.94E-06	9.21E-14	0.01	9.25E+03	1.18E-10
Sb-127	2.85E-11	7.51E-12	3.07E-06	1.47E-11	0.01	7.15E+01	2.68E-10
Sb-128a	1.19E-13	2.12E-14	9.03E-06	7.55E-14	0.01	1.30E+04	9.21E-11
Sb-128b	9.21E-12	1.44E-12	1.40E-05	4.96E-12	0.01	1.61E+02	5.94E-11
Sb-129	6.11E-12	9.62E-13	6.85E-06	3.19E-12	0.01	6.87E+02	1.22E-10
Sb-130	4.77E-13	9.73E-14	1.51E-05	2.88E-13	0.01	2.02E+03	5.59E-11
Sb-131	6.48E-13	9.73E-14	9.08E-06	3.59E-13	0.01	5.84E+03	9.37E-11
Sc-43	2.21E-12	3.81E-13	4.73E-06	1.18E-12	0.002	1.10E+03	5.90E-11
Sc-44	4.22E-12	6.44E-13	9.95E-06	2.25E-12	0.002	5.20E+02	2.87E-11
Sc-44m	3.89E-11	6.96E-12	1.15E-06	2.01E-11	0.002	3.00E+02	2.47E-10
Sc-46	1.62E-11	2.47E-11	9.63E-06	8.88E-12	0.002	1.05E+00	3.10E-11
Sc-47	1.00E-11	3.05E-12	3.62E-07	5.11E-12	0.002	6.95E+02	8.40E-10
Sc-48	1.93E-11	3.96E-12	1.62E-05	1.05E-11	0.002	2.87E+01	1.92E-11
Sc-49	5.25E-13	1.07E-13	1.90E-08	2.92E-13	0.002	1.11E+06	1.67E-08
Se-70	6.92E-13	7.36E-14	4.22E-06	4.11E-13	0.1	7.05E+03	1.08E-10
Se-73	1.99E-12	1.99E-13	4.52E-06	1.13E-12	0.1	6.29E+02	1.05E-10
Se-73m	2.02E-13	2.06E-14	1.06E-06	1.17E-13	0.1	2.95E+04	4.47E-10
Se-75	1.67E-11	3.77E-12	1.45E-06	1.08E-11	0.1	4.86E+00	3.35E-10
Se-77m			2.85E-07		0.1	1.47E+07	1.75E-09
Se-79	1.60E-11	3.33E-12	1.10E-11	9.69E-12	0.1	4.94E+01	7.10E-04
Se-81	9.58E-14	1.27E-14	4.68E-08	5.92E-14	0.1	1.41E+06	1.12E-08
Se-81m	3.24E-13	3.54E-14	3.56E-08	1.85E-13	0.1	5.97E+05	1.48E-08
Se-83	2.33E-13	2.72E-14	1.15E-05	1.43E-13	0.1	4.71E+03	4.69E-11
Si-31	1.81E-12	3.05E-13	1.11E-08	9.40E-13		6.84E+05	1.77E-08
Si-32	9.81E-12	2.93E-10	2.18E-11	5.00E-12		8.15E+01	3.29E-06
Sm-141	1.59E-13	2.79E-14	6.39E-06	9.81E-14	0.0025	1.87E+04	1.43E-10
Sm-141m	3.26E-13	6.29E-14	9.04E-06	1.95E-13	0.0025	5.97E+03	1.01E-10
Sm-142	1.40E-12	2.13E-13	2.99E-07	7.70E-13	0.0025	5.62E+04	3.08E-09
Sm-145	3.27E-12	4.51E-12	3.83E-08	1.70E-12	0.0025	6.42E+01	2.43E-08
Sm-146	8.36E-11	7.88E-09	0.00E+00	5.25E-11	0.0025	9.49E+00	4.00E-01
Sm-147 decaychain	7.59E-11	6.88E-09	0.00E+00	4.77E-11	0.0025	1.05E+01	4.56E+02
Sm-151 decaychain	1.59E-12	4.88E-12	3.60E-13	8.07E-13	0.0025	5.58E+02	2.12E-05
Sm-153	1.40E-11	2.95E-12	1.06E-07	7.10E-12	0.0025	4.03E+03	9.20E-09
Sm-155	1.13E-13	3.15E-14	2.81E-07	6.88E-14	0.0025	1.96E+05	3.58E-09
Sm-156	4.26E-12	9.69E-13	3.79E-07	2.18E-12	0.0025	5.69E+03	2.67E-09

[redacted]	Sn-110	5.18E-12	6.70E-13	1.13E-06	2.71E-12	0.0025	4.49E+03	6.32E-10
	Sn-111	1.32E-13	2.83E-14	2.29E-06	7.70E-14	0.0025	1.51E+04	3.15E-10
	Sn-113	1.22E-11	1.00E-11	2.02E-08	6.33E-12	0.0025	3.36E+02	3.35E-08
	Sn-117m	1.25E-11	8.84E-12	4.69E-07	6.40E-12	0.0025	1.32E+02	1.61E-09
	Sn-119m	6.36E-12	7.81E-12	1.20E-09	3.24E-12	0.0025	1.38E+03	3.69E-07
	Sn-121	4.33E-12	1.02E-12	1.30E-10	2.20E-12	0.0025	1.01E+06	1.06E-06
	Sn-121m	6.66E-12	1.54E-11	8.85E-10	3.41E-12	0.0025	7.36E+01	1.37E-06
	Sn-123	4.03E-11	3.03E-11	3.88E-08	2.05E-11	0.0025	1.48E+02	1.80E-08
	Sn-123m	1.94E-13	5.62E-14	4.62E-07	1.12E-13	0.0025	6.58E+04	1.73E-09
	Sn-125	5.81E-11	1.41E-11	1.53E-06	2.95E-11	0.0025	5.71E+01	5.28E-10
	Sn-126	7.07E-11	9.95E-11	9.96E-08	3.69E-11	0.0025	1.02E+00	3.59E-05
	Sn-127	2.22E-12	4.40E-13	9.25E-06	1.19E-12	0.0025	1.05E+03	8.92E-11
	Sn-128	1.09E-12	2.29E-13	2.62E-06	6.14E-13	0.0025	7.87E+03	3.17E-10
	Sr-80	2.83E-12	4.51E-13	5.08E-11	1.55E-12	0.3	2.72E+07	1.16E-06
	Sr-81	4.03E-13	8.07E-14	5.97E-06	2.39E-13	0.3	8.01E+03	8.81E-11
	Sr-82	8.47E-11	3.69E-11	5.00E-11	4.48E-11	0.3	2.83E+03	4.45E-08
	Sr-83	5.85E-12	1.26E-12	3.60E-06	3.17E-12	0.3	1.74E+02	1.50E-10
	Sr-85	5.03E-12	2.56E-12	2.20E-06	3.11E-12	0.3	5.94E+00	2.51E-10
	Sr-85m	3.74E-14	8.32E-15	8.21E-07	2.31E-14	0.3	2.14E+04	6.72E-10
	Sr-87m	2.69E-13	5.62E-14	1.33E-06	1.51E-13	0.3	5.44E+03	4.25E-10
	Sr-89	3.47E-11	2.34E-11	7.19E-09	1.84E-11	0.3	1.39E+03	4.79E-08
	Sr-90	9.18E-11	1.05E-10	4.82E-10	6.88E-11	0.3	1.17E+01	8.55E-08
	Sr-90+D decaychain	1.44E-10	1.13E-10	1.96E-08	9.53E-11	0.3	3.92E+00	2.87E-08
	Sr-91	8.81E-12	1.70E-12	3.30E-06	4.66E-12	0.3	6.48E+02	1.79E-10
	Sr-92	6.18E-12	1.03E-12	6.69E-06	3.26E-12	0.3	1.12E+03	8.93E-11
	Ta-172	2.64E-13	7.22E-14	7.04E-06	1.59E-13	0.02	4.71E+03	1.59E-10
	Ta-173	2.49E-12	4.44E-13	2.38E-06	1.31E-12	0.02	2.34E+03	4.72E-10
	Ta-174	4.11E-13	1.11E-13	2.55E-06	2.30E-13	0.02	6.64E+03	4.43E-10
	Ta-175	2.25E-12	4.37E-13	4.16E-06	1.24E-12	0.02	4.65E+02	2.73E-10
	Ta-176	3.18E-12	5.96E-13	1.06E-05	1.78E-12	0.02	2.37E+02	1.08E-10
	Ta-177	1.65E-12	4.44E-13	1.20E-07	8.58E-13	0.02	2.99E+03	9.56E-09
	Ta-178a			3.29E-07		0.02	3.98E+05	3.51E-09
	Ta-178b	6.29E-13	1.79E-13	3.78E-06	3.53E-13	0.02	2.44E+03	3.06E-10
	Ta-179	9.51E-13	2.05E-12	3.62E-08	5.00E-13	0.02	3.50E+01	3.20E-08
	Ta-180	1.23E-11	7.25E-11	2.03E-06	6.44E-12	0.02	5.49E-02	2.77E+02

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[redacted]

Ta-180m	8.58E-13	1.86E-13	6.13E-08	4.40E-13	0.02	4.08E+04	1.90E-08
Ta-182	2.19E-11	3.74E-11	6.04E-06	1.15E-11	0.02	1.22E+00	1.96E-10
Ta-182m	4.44E-14	3.41E-14	7.38E-07	2.76E-14	0.02	1.05E+05	1.60E-09
Ta-183	2.38E-11	8.81E-12	9.40E-07	1.22E-11	0.02	1.76E+02	1.26E-09
Ta-184	9.81E-12	1.73E-12	7.02E-06	5.11E-12	0.02	3.33E+02	1.70E-10
Ta-185	3.92E-13	1.18E-13	6.24E-07	2.22E-13	0.02	3.99E+04	1.93E-09
Ta-186	1.19E-13	2.69E-14	6.69E-06	7.55E-14	0.02	1.74E+04	1.81E-10
Tb-147	1.37E-12	2.26E-13	7.30E-06	7.59E-13	0.0026	1.69E+03	1.31E-10
Tb-149	2.90E-12	1.65E-11	7.60E-06	1.56E-12	0.0026	6.44E+02	1.27E-10
Tb-150	2.92E-12	3.88E-13	7.79E-06	1.56E-12	0.0026	7.98E+02	1.25E-10
Tb-151	3.92E-12	7.73E-13	3.65E-06	2.13E-12	0.0026	3.16E+02	2.69E-10
Tb-153	3.54E-12	8.18E-13	7.24E-07	1.86E-12	0.0026	4.99E+02	1.37E-09
Tb-154	6.51E-12	1.14E-12	1.18E-05	3.64E-12	0.0026	8.05E+01	8.48E-11
Tb-155	2.97E-12	8.99E-13	3.26E-07	1.56E-12	0.0026	4.88E+02	3.08E-09
Tb-156	1.30E-11	4.22E-12	8.37E-06	7.10E-12	0.0026	1.89E+01	1.21E-10
Tb-156m	2.29E-12	8.47E-13	2.16E-08	1.22E-12	0.0026	3.80E+04	4.62E-08
Tb-156n	1.11E-12	3.77E-13	4.06E-09	5.85E-13	0.0026	9.64E+05	2.40E-07
Tb-157	5.29E-13	1.46E-12	1.63E-09	2.70E-13	0.0026	7.01E+01	4.62E-06
Tb-158	1.32E-11	8.29E-11	3.57E-06	6.99E-12	0.0026	3.34E-02	2.22E-09
Tb-160	2.42E-11	2.45E-11	5.23E-06	1.27E-11	0.0026	2.24E+00	1.99E-10
Tb-161	1.38E-11	5.03E-12	3.44E-08	7.03E-12	0.0026	3.37E+03	2.88E-08
Tc-101	6.81E-14	1.85E-14	1.37E-06	4.22E-14	5	6.27E+04	4.79E-10
Tc-104	3.09E-13	5.33E-14	9.75E-06	1.90E-13	5	6.87E+03	6.93E-11
Tc-93	3.55E-13	6.36E-14	7.31E-06	2.20E-13	5	1.01E+03	8.26E-11
Tc-93m	1.55E-13	3.17E-14	3.62E-06	9.44E-14	5	7.74E+03	1.67E-10
Tc-94	1.48E-12	2.80E-13	1.24E-05	8.88E-13	5	3.36E+02	4.92E-11
Tc-94m	5.74E-13	1.03E-13	8.70E-06	3.32E-13	5	2.69E+03	7.02E-11
Tc-95	1.35E-12	2.63E-13	3.63E-06	8.03E-13	5	2.80E+02	1.70E-10
Tc-95m	4.29E-12	3.40E-12	2.93E-06	2.51E-12	5	4.74E+00	2.11E-10
Tc-96	7.81E-12	2.00E-12	1.16E-05	4.74E-12	5	1.71E+01	5.37E-11
Tc-96m	8.36E-14	2.05E-14	2.13E-07	5.00E-14	5	1.11E+05	2.93E-09
Tc-97	7.40E-13	8.51E-13	2.94E-10	3.89E-13	5	2.80E+02	1.98E-01
Tc-97m	6.62E-12	1.12E-11	1.04E-09	3.44E-12	5	4.94E+03	3.20E-07
Tc-98	1.83E-11	3.01E-11	6.45E-06	1.01E-11	5	1.73E-02	1.99E-05
Tc-99 decaychain	7.66E-12	1.41E-11	8.14E-11	4.00E-12	5	9.63E+01	5.69E-03

[redacted]	Tc-99m	2.03E-13	5.70E-14	3.93E-07	1.14E-13	5	8.59E+03	1.64E-09
	Te-116	1.75E-12	3.20E-13	1.34E-07	9.62E-13	0.6	6.08E+04	5.61E-09
	Te-121	3.40E-12	1.30E-12	2.46E-06	2.01E-12	0.6	2.02E+01	3.19E-10
	Te-121m	1.42E-11	1.44E-11	7.83E-07	8.51E-12	0.6	7.00E+00	1.00E-09
	Te-123	6.77E-12	2.50E-12	2.73E-09	5.11E-12	0.6	3.03E+01	1.04E+05
	Te-123m	1.02E-11	1.36E-11	4.48E-07	5.66E-12	0.6	1.57E+01	1.78E-09
	Te-125m	8.92E-12	1.17E-11	6.95E-09	4.70E-12	0.6	1.78E+03	9.90E-08
	Te-127	2.87E-12	6.11E-13	2.10E-08	1.48E-12	0.6	1.02E+05	3.85E-08
	Te-127m	2.25E-11	2.58E-11	2.73E-09	1.20E-11	0.6	1.32E+03	1.40E-07
	Te-129	4.40E-13	9.95E-14	2.45E-07	2.44E-13	0.6	7.15E+04	3.42E-09
	Te-129m	4.26E-11	2.49E-11	1.38E-07	2.20E-11	0.6	1.75E+02	5.82E-09
	Te-131	5.62E-13	6.40E-14	1.79E-06	3.05E-13	0.6	2.72E+04	4.75E-10
	Te-131m	2.28E-11	4.22E-12	6.61E-06	1.19E-11	0.6	1.02E+02	1.29E-10
	Te-132	4.77E-11	9.32E-12	7.83E-07	2.44E-11	0.6	3.29E+02	1.09E-09
	Te-133	5.29E-13	4.92E-14	4.29E-06	2.73E-13	0.6	2.27E+04	2.01E-10
	Te-133m	2.42E-12	2.64E-13	1.09E-05	1.24E-12	0.6	2.02E+03	7.92E-11
	Te-134	7.51E-13	1.60E-13	3.78E-06	4.18E-13	0.6	7.72E+03	2.30E-10
	Th-226	1.58E-12	1.56E-10	2.36E-08	9.32E-13	0.001	1.66E+06	6.16E-08
	Th-227	1.37E-10	3.51E-08	3.78E-07	6.92E-11	0.001	1.14E+02	3.71E-09
	Th-228	2.89E-10	1.32E-07	5.59E-09	1.48E-10	0.001	2.62E+01	3.20E-08
	Th-228+D decaychain	8.09E-10	1.43E-07	7.76E-06	4.22E-10	0.001	1.54E-01	1.88E-10
	Th-229	4.96E-10	1.75E-07	2.25E-07	2.90E-10	0.001	3.79E-01	1.78E-06
	Th-229+D decaychain	1.29E-09	2.25E-07	1.17E-06	7.16E-10	0.001	8.27E-02	3.89E-07
	Th-230 decaychain	2.02E-10	2.85E-08	8.19E-10	1.19E-10	0.001	3.82E+00	1.89E-04
	Th-231	6.36E-12	1.52E-12	2.45E-08	3.24E-12	0.001	3.14E+04	5.91E-08
	Th-232 decaychain	2.31E-10	4.33E-08	3.42E-10	1.33E-10	0.001	3.40E+00	3.11E+01
	Th-234	6.70E-11	3.07E-11	1.63E-08	3.40E-11	0.001	1.37E+03	5.91E-08
	Ti-44	6.73E-11	3.41E-10	2.39E-07	3.64E-11		5.55E-01	3.23E-09
	Ti-45	1.75E-12	3.09E-13	3.79E-06	9.32E-13		1.74E+03	7.71E-11
	Tl-194	3.68E-14	5.11E-15	3.25E-06	2.45E-14	0.2	1.14E+04	3.88E-10
	Tl-194m	1.63E-13	2.50E-14	1.01E-05	1.06E-13	0.2	3.68E+03	1.25E-10
	Tl-195	1.36E-13	2.08E-14	6.02E-06	8.70E-14	0.2	2.91E+03	2.10E-10
	Tl-197	1.41E-13	2.39E-14	1.65E-06	8.55E-14	0.2	4.34E+03	7.75E-10
	Tl-198	4.26E-13	7.92E-14	9.67E-06	2.75E-13	0.2	3.96E+02	1.33E-10
	Tl-198m	2.76E-13	4.92E-14	5.04E-06	1.75E-13	0.2	2.16E+03	2.55E-10

[redacted]	Tl-199	1.64E-13	2.89E-14	8.56E-07	9.99E-14	0.2	3.20E+03	1.51E-09
	Tl-200	1.31E-12	2.52E-13	5.93E-06	8.21E-13	0.2	1.31E+02	2.19E-10
	Tl-201	8.81E-13	1.49E-13	1.88E-07	5.00E-13	0.2	1.48E+03	6.94E-09
	Tl-202	3.28E-12	6.14E-13	1.83E-06	2.01E-12	0.2	3.79E+01	7.17E-10
	Tl-204 decaychain	1.54E-11	2.45E-12	2.76E-09	8.25E-12	0.2	1.25E+02	2.70E-07
	Tl-206			6.05E-09		0.2	4.80E+07	2.21E-07
	Tl-207			1.52E-08		0.2	1.68E+07	8.84E-08
	Tl-208			1.76E-05		0.2	2.26E+04	7.68E-11
	Tl-209			9.83E-06		0.2	5.64E+04	1.38E-10
	Tm-162	1.24E-13	2.72E-14	8.69E-06	7.77E-14		6.46E+03	1.21E-10
	Tm-166	2.86E-12	5.14E-13	8.98E-06	1.59E-12		2.94E+02	1.20E-10
	Tm-167	9.88E-12	4.37E-12	3.97E-07	5.07E-12		2.30E+02	2.72E-09
	Tm-170	2.59E-11	2.43E-11	1.01E-08	1.31E-11		4.78E+02	8.03E-08
	Tm-171	2.02E-12	3.33E-12	6.97E-10	1.02E-12		1.23E+03	1.13E-06
	Tm-172	3.09E-11	5.62E-12	2.35E-06	1.57E-11		1.36E+02	4.74E-10
	Tm-173	4.88E-12	7.73E-13	1.62E-06	2.52E-12		1.52E+03	6.93E-10
	Tm-175	1.19E-13	3.26E-14	4.78E-06	7.25E-14		1.68E+04	2.38E-10
	U-230	5.66E-10	4.55E-08	3.07E-09	2.98E-10	0.0025	4.92E+02	1.81E-08
	U-231	5.00E-12	1.80E-12	1.60E-07	2.56E-12	0.0025	1.25E+03	9.34E-09
	U-232 decaychain	5.74E-10	1.95E-08	5.98E-10	3.85E-10	0.0025	1.58E+00	7.39E-08
	U-233 decaychain	1.60E-10	1.16E-08	9.82E-10	9.69E-11	0.0025	4.75E+00	4.93E-04
	U-234 decaychain	1.58E-10	1.14E-08	2.52E-10	9.55E-11	0.0025	4.97E+00	7.97E-04
	U-235	1.57E-10	1.01E-08	5.18E-07	9.44E-11	0.0025	2.07E-01	9.57E-02
	U-235+D decaychain	1.63E-10	1.01E-08	5.43E-07	9.76E-11	0.0025	1.97E-01	9.13E-02
	U-236 decaychain	1.49E-10	1.05E-08	1.25E-10	9.03E-11	0.0025	5.29E+00	8.18E-02
	U-237	1.39E-11	6.44E-12	3.76E-07	7.14E-12	0.0025	3.32E+02	4.07E-09
	U-238	1.43E-10	9.32E-09	4.99E-11	8.66E-11	0.0025	5.53E+00	1.65E+01
	U-238+D decaychain	2.10E-10	9.35E-09	1.14E-07	1.21E-10	0.0025	7.77E-01	2.32E+00
	U-239	1.90E-13	5.70E-14	1.21E-07	1.06E-13	0.0025	4.29E+05	1.28E-08
	U-240	2.02E-11	2.96E-12	7.33E-10	1.03E-11	0.0025	4.03E+05	4.36E-07
	V-47	2.92E-13	5.96E-14	4.36E-06	1.74E-13		8.58E+03	7.00E-11
	V-48	2.13E-11	9.29E-12	1.40E-05	1.17E-11		3.73E+00	2.23E-11
	V-49	3.53E-13	1.47E-13	0.00E+00	1.79E-13		5.17E+04	6.41E-06
	W-176	1.05E-12	1.24E-13	3.20E-07	5.88E-13	0.018	2.76E+04	3.57E-09
	W-177	5.00E-13	5.99E-14	3.63E-06	2.84E-13	0.018	2.49E+03	3.17E-10

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[redacted]

W-178	3.33E-12	3.85E-13	1.59E-08	1.75E-12	0.018	2.38E+03	7.06E-08
W-179	1.68E-14	1.83E-15	6.01E-08	1.01E-14	0.018	5.41E+05	1.93E-08
W-181	1.07E-12	1.35E-13	4.86E-08	5.70E-13	0.018	1.44E+02	2.41E-08
W-185	8.36E-12	9.36E-13	2.92E-10	4.29E-12	0.018	7.68E+03	8.19E-07
W-187	1.03E-11	1.11E-12	2.04E-06	5.37E-12	0.018	4.16E+02	5.95E-10
W-188	4.00E-11	4.63E-12	7.02E-09	2.05E-11	0.018	9.65E+02	9.66E-08
Xe-120			1.70E-06		0	1.79E+04	4.58E-10
Xe-121			8.73E-06		0	3.48E+03	9.00E-11
Xe-122			1.83E-07		0	5.52E+03	4.33E-09
Xe-123			2.72E-06		0	3.59E+03	2.94E-10
Xe-125			9.38E-07		0	1.27E+03	8.65E-10
Xe-127			9.52E-07		0	2.44E+01	8.66E-10
Xe-129m			4.25E-08		0	2.49E+03	1.97E-08
Xe-131m			1.41E-08		0	5.05E+03	6.03E-08
Xe-133			6.62E-08		0	2.44E+03	1.30E-08
Xe-133m			9.25E-08		0	4.18E+03	9.34E-09
Xe-135			9.70E-07		0	2.30E+03	9.04E-10
Xe-135m			1.86E-06		0	4.28E+04	4.71E-10
Xe-138			5.62E-06		0	1.53E+04	1.59E-10
Y-86	1.05E-11	1.58E-12	1.73E-05	5.81E-12	0.0025	7.99E+01	3.23E-11
Y-86m	6.11E-13	9.29E-14	8.35E-07	3.35E-13	0.0025	3.04E+04	6.69E-10
Y-87	6.92E-12	1.49E-12	1.94E-06	3.70E-12	0.0025	1.30E+02	2.91E-10
Y-88	9.92E-12	1.70E-11	1.37E-05	5.85E-12	0.0025	5.77E-01	4.17E-11
Y-90	5.25E-11	8.40E-12	1.91E-08	2.65E-11	0.0025	1.20E+04	2.21E-08
Y-90m	2.95E-12	4.81E-13	2.58E-06	1.51E-12	0.0025	2.47E+03	2.27E-10
Y-91	4.66E-11	3.36E-11	2.51E-08	2.35E-11	0.0025	4.57E+02	1.87E-08
Y-91m	8.51E-14	3.01E-14	2.34E-06	4.96E-14	0.0025	1.05E+04	2.53E-10
Y-92	7.03E-12	9.32E-13	1.26E-06	3.61E-12	0.0025	4.55E+03	4.74E-10
Y-93	2.08E-11	2.64E-12	4.60E-07	1.05E-11	0.0025	4.35E+03	1.30E-09
Y-94	3.08E-13	5.51E-14	5.45E-06	1.90E-13	0.0025	1.17E+04	1.12E-10
Y-95	1.59E-13	2.92E-14	4.80E-06	9.99E-14	0.0025	2.37E+04	1.29E-10
Yb-162	1.21E-13	3.00E-14	3.26E-07	7.29E-14		1.98E+05	3.23E-09
Yb-166	1.17E-11	2.89E-12	9.46E-08	6.29E-12		3.72E+03	1.12E-08
Yb-167	3.70E-14	1.71E-14	6.21E-07	2.18E-14		1.12E+05	1.75E-09
Yb-169	1.12E-11	1.08E-11	7.75E-07	5.85E-12		3.41E+01	1.41E-09

[redacted]

Yb-175	8.29E-12	2.95E-12	1.54E-07	4.22E-12		1.30E+03	7.32E-09
Yb-177	9.51E-13	2.29E-13	8.35E-07	5.03E-13		1.28E+04	1.38E-09
Yb-178	1.06E-12	2.38E-13	1.44E-07	5.59E-13		1.14E+05	8.02E-09
Zn-62	1.34E-11	2.65E-12	1.87E-06	7.25E-12	0.4	1.17E+03	2.15E-10
Zn-63	3.77E-13	7.55E-14	4.87E-06	2.26E-13	0.4	6.57E+03	8.40E-11
Zn-65 decaychain	2.45E-11	5.81E-12	2.81E-06	1.54E-11	0.4	1.23E+00	1.50E-10
Zn-69	1.79E-13	6.11E-14	1.67E-09	1.03E-13	0.4	1.26E+07	2.64E-07
Zn-69m	5.07E-12	1.28E-12	1.77E-06	2.73E-12	0.4	8.32E+02	2.53E-10
Zn-71m	2.50E-12	5.33E-13	6.84E-06	1.39E-12	0.4	7.58E+02	6.74E-11
Zn-72	1.71E-11	5.48E-12	4.68E-07	9.44E-12	0.4	9.29E+02	9.94E-10
Zr-86	1.02E-11	1.56E-12	1.04E-06	5.55E-12	0.001	1.18E+03	5.36E-10
Zr-88	3.74E-12	8.95E-12	1.65E-06	2.18E-12	0.001	6.15E+00	3.46E-10
Zr-89	9.58E-12	1.92E-12	5.38E-06	5.18E-12	0.001	4.82E+01	1.07E-10
Zr-93	2.12E-12	7.29E-12	0.00E+00	1.44E-12	0.001	3.74E+02	1.49E-01
Zr-95	1.23E-11	1.65E-11	3.40E-06	6.59E-12	0.001	3.89E+00	1.81E-10
Zr-97	3.57E-11	4.81E-12	8.62E-07	1.83E-11	0.001	1.39E+03	7.27E-10

* Soil Ingestion Slope Factor is calculated for a lifetime of 70 years.
For table of soil to plant transfer factors click here

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Table 7.
Calculation Check

Lutonen-Dahl Equation

Kr-217AD

$SF_s = 3.13 \times 10^{-10}$

$SF_i = 2.09 \times 10^{-7}$

$SF_E = 1.17 \times 10^{-6}$

Half life = 21.8 hr

$\lambda = \frac{\ln 2}{1?} = 3.18 \times 10^{-2}$

$ING = 3.45 \times 10^{-10} \times 100 \cdot 0.001 \cdot 225 = 7.762 \times 10^{-9}$

$INH = 2.09 \times 10^{-7} \cdot 20 \cdot \frac{1000}{9.91 \times 10^{?}} \cdot 225 \cdot (0.?) = 3.2?? \times 10^{-11}$

$EXT_E = 1.17 \times 10^{-6} \cdot \frac{225}{?} \cdot 0.? \cdot 0.? = 2.6? \times 10^{-7}$

$HRG = \frac{1.0 \times 10^{?} \cdot 25 \cdot 3.1? \times 10^{?}}{25 \cdot (1 - e^{-(3.18 \times 10^{-2} \times 25?)})} \cdot (7.762 \times 10^{?} + 3.288 \times 10^{-11} + 2.69 \times 10^{-7})$

$HRG = \frac{7.95 \times 10^{-7}}{1.37 \times 10^{1} \cdot (2.69 \times 10^{-7})} = \frac{7.9? \times 10^{-7}}{3.687 \times 10^{-6}}$

= 0.216 pCi/g (0.???)

Intruder - Worker Equation

$$PRG(pCi/g) = (TR \cdot t \cdot x) \cdot 1/[ED \cdot (1-\exp(-\lambda \cdot t) \cdot (ING_s + INH_s + EXT_s)]$$

$$ING_s = SF_s \cdot IR_s \cdot 0.001 g/mg \cdot EF$$

$$INH_s = SF_i \cdot IR_i \cdot (1000 g/kg / PEF) \cdot EF \cdot [ET_o + (ET_i \cdot DF_i)]$$

$$EXT_s = SF_e \cdot (EF/365 \text{ days per year}) \cdot ACF \cdot [ET_o + (ET_i \cdot GSF_i)]$$

$$C(pCi/g) = \frac{TR \cdot t \cdot \lambda}{ED \cdot EF \cdot (1-e^{-\lambda t}) \cdot \left[\begin{array}{l} (SF_s \cdot IR_s \cdot 1\times10^{-3} g/mg) + (SF_i \cdot IR_i \cdot 10^3 g/kg / PEF \cdot [ET_o + (ET_i \cdot DF_i)] \\ + (SF_e \cdot \frac{1}{365 d/y} \cdot ACF \cdot [ET_o + (ET_i \cdot GSF)] \end{array} \right]}$$

Am-241

$$C(pCi/g) = \frac{1\times10^{-6} \cdot 25 \cdot 1.6\times10^{-3}}{25\times225 \cdot (1-e^{-(1.6\times10^{-3}\times25)}) \cdot \left[\begin{array}{l} (9.1\times10^{-11} \cdot 100 \cdot 10^{-3}) + (2.81\times10^{-8} \cdot \frac{20\cdot10^3}{9.44\times10^8}) \cdot [0.33 + (0 \cdot 0.4)] \\ + (2.76\times10^{-8} \cdot \frac{1}{365} \cdot 9 \cdot [0.33 + (0 \cdot 0.4)] \end{array} \right]}$$

$$= \frac{4.0\times10^{-2}}{2.21\times10^2 \cdot [(9.1\times10^{-12}) + (1.965\times10^{-14}) + (2.246\times10^{-11})]}$$

$$= \frac{4.0\times10^{-8}}{5.21\times10^2 \cdot [(9.1\times10^{-12}) + (2\times10^{-14}) + (2.2\times10^{-11})]} = \frac{4.0\times10^{-8}}{5.21\times10^2 \cdot 3.1\times10^{-11}}$$

$$= 5.7 \text{ pCi/g}$$

Assumptions

$TR = 1.0\times10^{-6}$
$EF = 225 d/y$
$IR = 20$
$DF_i = 0.4$
$GSF = 0.4$
$PEF = 9.63\times10^9 (9.44\times10^8)$
$ED = 25 YRS$
$IR_s = 100$
$ET_o = 0.33$
$ACF = 0.9$
$SF_s = 9.10\times10^{-11}$
$SF_i = 2.81\times10^{-8}$
$SF_e = 2.76\times10^{-8}$
Half-life $= 433 YRS$
$\lambda = \frac{\ln 2}{433} = 1.6\times10^{-3}$

[illegible]

Am-241 (continued)

$PRG = (1 \cdot t \cdot \lambda) \cdot 1/ED \cdot (1 - e^{(-\lambda t)}) \cdot (ING_s + INH_s + EXT_s)$

$ING_s = SF_i \cdot IR_s \cdot 0.001 g/mg \cdot EF$

$INH_s = SF_i \cdot IR_i \cdot \left(\frac{1000 g/kg}{PEF}\right) \cdot EF \cdot [ET_o + (ET_i \cdot DF_i)]$

$EXT_s = SF_e \cdot (1 / 365 d/y) \cdot ACF \cdot [ET_o + (ET_i \cdot GSF_i)]$

$ING_s = 1.1 \times 10^{-11} \cdot [illegible] = 2.047 \times 10^{-9}$

$INH_s = 2.81 \times 10^{-?} \cdot 20 \cdot \frac{1000}{9.44 \times 10^{9}} \cdot 225 \cdot (0.33) = 4.42 \times 10^{-12}$

$EXT_s = 2.78 \times 10^{-2} \cdot \left(\frac{225}{365}\right) \cdot 0.9 \cdot (0.33) = 5.09 \times 10^{-9}$

$$PRG = \frac{1.0 \times 10^{-6} \cdot [illegible] \cdot 1.6 \times 10^{-3}}{25 \cdot (1 - e^{-(1.6 \times 10^{-3} \times 25)}) \cdot (2.047 \times 10^{-9} + 4.42 \times 10^{-12} + 5.09 \times 10^{-9})}$$

$$PRG = \frac{4.0 \times 10^{-8}}{0.98 \cdot (7.137 \times 10^{-9})} = 5.[illegible] \ pCi/g \ ([illegible])$$

Guildmann Worker Equation

Cs-137+D

$$PRG = (TR \cdot t \cdot \lambda) \cdot 1 / [ED \cdot (1 - exp(-\lambda t)) \cdot (ING_s + INH_s + EXT_s)]$$

$ING_s = 3.17 \times 10^{-11} \times 100 \cdot 0.001 \cdot 225 = 7.13 \times 10^{-10}$

Cs-137+D

$INH_s = 1.19 \times 10^{-11} \cdot 20 \cdot \frac{1000}{9.44 \times 10^{9}} \cdot 225 \cdot (0.33) = 1.87 \times 10^{-15}$

Assumptions:

$EXT_s = 2.55 \times 10^{-6} \cdot \left(\frac{225}{365}\right) \cdot 0.9 \cdot (0.33) = 4.67 \times 10^{-7}$

- $TR = 1.0 \times 10^{-6}$
- $EF = 225$ d/yr
- $IR = 20$
- $DF_L = 0.4$
- $GSF = 0.4$
- $PEF = 9.44 \times 10^{9}$
- $ED = 25$ YRS
- $ET_o = 0.33$
- $ACF = 0.9$
- $SF_s = 3.17 \times 10^{-11}$
- $SF_i = 1.19 \times 10^{-11}$
- $SF_e = 2.55 \times 10^{-6}$

Half life = 30.1 YRS

$\lambda = \frac{\ln 2}{30.1} = 2.30 \times 10^{-2}$

$$PRG = \frac{1.0 \times 10^{-6} \cdot 25 \cdot 2.30 \times 10^{-2}}{25 \cdot (1 - e^{-(2.30 \times 10^{-2} \times 25)}) \cdot (7.13 \times 10^{-10} + 1.87 \times 10^{-15} + 4.67 \times 10^{-7})}$$

$$PRG = \frac{5.75 \times 10^{-7}}{1.093 \times 10^{1} \cdot (4.67 \times 10^{-7})}$$

PRG = .113 pCi/g (0.113)

[illegible]

[illegible] ([illegible] external radiation [illegible]).

[illegible] Co-60

[illegible] = 5.26 yr

[illegible] = [illegible] / 5.26 = [illegible] $\times 10^{-1}$

t = 30 yr

[illegible] = [illegible] $\times 10^{-6}$

[illegible]

[illegible] = [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] = 1.[illegible] $\times 10^{-?}$

[illegible] = 160 [illegible]

[illegible] = [illegible]

[illegible] = 0.[illegible]

[illegible] = [illegible]

[illegible] = 0.0[illegible]

[illegible] = 0.[illegible]

[illegible]

[illegible] = 9.44 $\times 10^{-?}$

[illegible] = 0.4

[illegible] (Co-60)
([illegible])

[illegible] $(P_i/g) = ([illegible] \cdot \lambda) \cdot 1 / [illegible] \cdot (1-\exp(-\lambda \cdot t)) \cdot ([illegible] + [illegible] + EXT_c)$

[illegible] $= 1.1 [illegible] \times 10^{-9}$

[illegible] $\times 10^{-11} \cdot 12 \cdot \frac{1000}{[illegible]} \cdot [illegible] \cdot [0.0731 + (0.683 \cdot 0.4)] = [illegible] \times 10^{-15}$

$EXT_c = 1.51 \times 10^{-[illegible]} \cdot [illegible] \cdot 0.9 \cdot [0.0731 + (0.683 \cdot 0.4)] = 3.[illegible] \times 10^{-6}$

$PRG = \frac{[illegible] \cdot 30 \cdot 1.[illegible]}{30 \cdot (1-e^{[illegible]}) \cdot (1.61 \times 10^{[illegible]} + [illegible])}$

$PRG = \frac{3.96 \times 10^{-6}}{1.43 \cdot 3.[illegible] \times 10^{-6}} = \frac{3.96 \times 10^{-6}}{1.0[illegible]} = 3.64 \times 10^{-2}$

$PRG = 3.0[illegible] \times 10^{-[illegible]}$ [illegible] $(3.[illegible] \times 10^{-2})$

% Diff $= \left(\frac{[illegible] - 3.[illegible]}{3.[illegible]} \right) \times 100$