Document ID: EDF-CRPD-001
Revision ID: 1

Engineering Design File

Relative Inventories of Reactor-Produced Species in INTEC Waste Types

Prepared for:
U.S. Department of Energy
Idaho Operations Office
Idaho Falls, Idaho

INEEL
Idaho National Engineering and Environmental Laboratory

Form 412.14
07/24/2001
Rev. 03

ENGINEERING DESIGN FILE

1. Title: **Relative Inventories of Reactor-Produced Species in INTEC Waste Types**

2. Project File No.: **NA**

3. Index Codes: **NA**
   Building/Type **NA** SSC ID **NA** Site Area **INTEC**

4. Summary: **Radionuclide and element inventories for aluminum, coprocessing, sodium-bearing, electrolytic, and zirconium wastes have been previously calculated for INTEC wastes. Calculations to update the previous calculations and to expand the previous decay times were made under Contract 9912, issued to DR Wenzel Consulting. This EDF calculated radionuclide and element inventories decayed to the years 1999, 2002, 2003, 2010, 2012, 2016, 2022, 2032, 2042, 2116, 2400, 3016, 3110, and 12000. Radionuclide and element inventories were calculated using the ORIGEN2 computer code. Fortran programs were modified and written by D.R. Wenzel as necessary to convert and calculate data. A copy of all computer files generated of calculations has been included on a CD inserted on the back cover of the EDF.**

5. Review (R) and Approval (A) and Acceptance (Ac) Signatures:
   (See instructions for definitions of terms and significance of signatures.)

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7. Does document contain sensitive unclassified information? ☐ Yes ☒ No
   If Yes, what category:

8. Can document be externally distributed? ☒ Yes ☐ No

9. Uniform File Code: **61.53.103** Disposition Authority: **ENVI-k-2-b**
   Record Retention Period: **Cutoff at Project Completion. Destroy 25 years after project completion.**

10. For QA Records Classification Only: ☒ Lifetime ☐ Nonpermanent ☐ Permanent
    Item and activity to which the QA Record apply:

11. NRC related? ☐ Yes ☒ No

12. Registered Professional Engineer's Stamp (if required)

    NA

ASSUMPTIONS

This EDF relies on radionuclide inventory calculations previously made for INTEC aluminum waste (Wenzel 1997a), coprocessing waste (Wenzel 1998), electrolytic waste (Wenzel 1999), sodium-bearing waste (SBW) (Wenzel 1997b), and zirconium waste (Wenzel 1997c). Most of the assumptions in the previous EDFs have not been repeated in this EDF. It is assumed that readers of this EDF have access to the previous EDFs. Many of the assumptions in this EDF and the previous EDFs are documented in Fortran programs. It is assumed that those desiring to know and understand the details of the calculations have a working knowledge of Fortran programming.

This EDF calculates radionuclide concentrations for five types of INTEC wastes. Assumptions about the different waste calculations are therefore included in the Calculations sections for the different waste types.

Revision 0 of this EDF included the calculation of the mass of all of the elements from cladding and structural materials. Since the mass of the stable isotopes of the major elements of Al, Cr, Fe, Ni, Zr and Sn have been measured by analytical analysis, a decision was made to revise the EDF to include only the mass of the radioactive isotopes of these elements in the element summation tables. Revision 1 of this EDF incorporates this change. After issuing Revision 0 of this EDF, minor errors were discovered in the amount of Ni-63 and Np isotopes reported in SBW. Revision 1 of this EDF corrects these identified errors.

CALCULATIONS

This EDF updates the previous radionuclide inventory calculations to decay the inventories for each of the waste types to the years 1999, 2002, 2003, 2010, 2012, 2016, 2022, 2032, 2042, 2116, 2400, 3016, 3110, and 12000. All calculations are calculated for January 1, except for the year 1999, which is calculated for July 1.

ORIGEN2 is known to calculate radionuclide inventories to activities of less than one atom. In previous calculations, all calculated activities of less than one atom in the small volume used for calculation purposes were deleted. At the request of the EDF sponsor, however, activities of less than one atom are not deleted in the current calculations. This allows determination of activities present in the large volumes of wastes processed at INTEC. ORIGEN2 does, however, eventually round results that are less than one atom to zero. In order to make the final tables more readable, ORIGEN2 activities calculated to be zero were converted to a blank field. In some cases, when it was obvious that ORIGEN2 was calculating activities of less than one atom with considerable round-off error, the fields were also converted to a blank field. This is the case for Ru-106, Rh-106, Ag-108, Ag-108m, Ag-109, Cd-109, Sn-119m, Gd-153, Np-235, and Cf-252.

1. Aluminum Waste

Calculations for aluminum waste began with the revision of ORIGEN2 run (Croff 1980) ALDECAY.INP (Wenzel 1997a, Attachment H, page 1). Due to the number of decay times requested, the updated ORIGEN2 calculations were broken into two separate runs. The first run is called AL_RUN1 and calculates the nuclides decayed between the years 1999 and 2022. The input file (AL_RUN1.INP) is presented in Appendix A-1, pages 1–3. The associated BAT file is also presented in Appendix A-1, page 3. The summarized ORIGEN2 output for the activity of the radionuclides is called AL_RUN1.CI and is presented in Appendix A-1, pages 4-6. Note that file AL_RUN1.CI presents the total Ci for Calcine Bin Set 1. Fortran program ROUND, presented on pages 1–2 of Attachment I of Wenzel 1997a, was converted from Fortran 77 to Fortran 90 and modified to better format the output. Program ROUNDAL1 also converts the calculated activities from total Ci in Calcine Bin Set 1 to Ci/g. This was done using a measured average packed density of 1.09 g/m^3 (Staples 1979). The revised program is called ROUNDAL1, and a source list is presented in Appendix A-2, pages 1–3. Program ROUNDAL1 uses file MASTER to identify the radionuclides, their half-lives, and their order to be included in the output file. A copy of file MASTER is presented in Appendix A-2, pages 4–6. The output from program ROUNDAL1 is called ROUNDAL1.OUT and is presented in Appendix A-2, pages 7–9.

The original EDF (Wenzel 1997a) calculations did not carry all of the stable nuclides that are actually present in the waste. ORIGEN2 run AL_RUN1 was changed to output the mass of all of the stable nuclides that ORIGEN2 is capable of calculating. This was done by modifying the OPTL line in AL_RUN1.INP (see Appendix A-1, page 1). The output of run AL_RUN1 for the mass of each of the nuclides is called AL_RUN1.G and is presented in Appendix A-3. A Fortran 90 program called ELEAL1 was written to sum the mass of each isotope of the different elements, normalize the mass to grams of element per gram of calcine, and to round the output to two places of accuracy. The source list of ELEAL1 is presented in Appendix A-4, pages 1–3. Program ELEAL1 uses a file called SYMBOL that identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELEAL1 is called AL_RUN1.ELE and is presented in Appendix A-4, pages 6–7.

As noted above, the number of decay times requested required breaking the calculations into two separate runs. The second ORIGEN2 run is called AL_RUN2. It calculates the nuclides decayed between the years 2032 and 12000. The input file (AL_RUN2.INP) is presented in Appendix A-5, pages 1–3. The associated BAT file is also presented in Appendix A-5, page 3. The summarized ORIGEN2 output for the activity of the radionuclides is called AL_RUN2.CI and is presented in Appendix A-5, pages 4–6. Fortran program ROUNDAL2 was used to format the data in output file AL_RUN2.CI and to round the results to two places of accuracy. A copy of the source list of Fortran program ROUNDAL2 is presented in Appendix A-6, pages 1–3. The output from program ROUNDAL2 is called ROUNDAL2.OUT and is presented in Appendix A-6, pages 4–6.

The output of run AL_RUN2 for the mass of the nuclides is called AL_RUN2.G and is presented in Appendix A-7. A Fortran 90 program called ELEAL2 was written to sum the mass of each isotope of the different elements, normalize the mass to grams of element per gram of calcine, and to round the output to two places of accuracy. Program ELEAL2 uses the file called SYMBOL, which identifies the elements to be summed. The source list of ELEAL2 is presented in Appendix A-8, pages 1–3. A copy of the file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELEAL2 is called AL_RUN2.ELE and is presented in Appendix A-8, pages 4–5.

Tables 1 and 2 present the calculated radionuclide activities for the requested decay times. As in the original calculations, the results are expressed in Ci/g of calcine and are an average of the calcine stored in Bin Set 1. Tables 3 and 4 present the calculated mass of each element as a function of decay time for those elements present in the waste.

Table 1. Calculated radionuclide activities for Al calcine in Ci/g for years 1999 through 2022.

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	5.7E-06	5.0E-06	4.7E-06	3.2E-06	2.8E-06	2.3E-06	1.6E-06
Be-10	1.600E+06	yr	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
C-14	5.729E+03	yr	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11
Se-79	6.496E+04	yr	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08
Rb-87	4.696E+10	yr	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12
Sr-90	2.912E+01	yr	4.8E-03	4.5E-03	4.4E-03	3.7E-03	3.5E-03	3.2E-03	2.8E-03
Y-90	6.400E+01	h	4.8E-03	4.5E-03	4.4E-03	3.7E-03	3.5E-03	3.2E-03	2.8E-03
Zr-93	1.530E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Nb-93m	1.360E+01	yr	2.3E-07	2.3E-07	2.3E-07	2.4E-07	2.4E-07	2.5E-07	2.5E-07
Nb-94	2.030E+04	yr	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12
Tc-98	4.199E+06	yr	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14
Tc-99	2.130E+05	yr	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Rh-102	1.059E+03	d	6.6E-13	3.7E-13	2.9E-13	5.4E-14	3.3E-14	1.3E-14	3.1E-15
Ru-106	3.682E+02	d	2.2E-14	3.9E-15	1.9E-15	1.6E-17	4.0E-18	2.6E-19	4.1E-21
Rh-106	2.990E+01	s	2.2E-14	3.9E-15	1.9E-15	1.6E-17	4.0E-18	2.6E-19	4.1E-21
Pd-107	6.496E+06	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Ag-108	2.370E+00	m	1.4E-15	1.4E-15	1.4E-15	1.3E-15	1.3E-15	1.3E-15	1.2E-15
Ag-108m	1.270E+02	yr	1.6E-14	1.6E-14	1.6E-14	1.5E-14	1.5E-14	1.4E-14	1.4E-14
Ag-109m	3.960E+01	s	1.2E-22	3.2E-23	1.8E-23	4.0E-25	1.4E-25	1.5E-26	5.8E-28
Cd-109	4.640E+02	d	1.2E-22	3.2E-23	1.8E-23	4.0E-25	1.4E-25	1.5E-26	5.4E-28
Ag-110	2.460E+01	s	4.8E-25	3.8E-26	1.4E-26	1.2E-29	1.5E-30	6.7E-31	1.1E-30
Ag-110m	2.499E+02	d	3.6E-23	2.9E-24	1.0E-24	8.7E-28	5.0E-29	5.0E-29	8.6E-29
Cd-113m	1.459E+01	yr	2.3E-07	2.1E-07	2.0E-07	1.4E-07	1.3E-07	1.1E-07	8.0E-08
In-115	4.997E+14	yr	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18
Sn-119m	2.450E+02	d	2.0E-23	1.5E-24	5.5E-25	3.9E-28	1.4E-28	9.8E-29	
Sn-121m	4.997E+01	yr	6.5E-09	6.3E-09	6.2E-09	5.6E-09	5.5E-09	5.2E-09	4.8E-09
Te-123	1.000E+13	yr	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21
Sb-125	2.770E+00	yr	3.3E-08	1.7E-08	1.4E-08	2.4E-09	1.4E-09	5.3E-10	1.2E-10
Te-125m	5.800E+01	d	8.0E-09	4.3E-09	3.3E-09	5.8E-10	3.5E-10	1.3E-10	2.9E-11
Sn-126	1.000E+05	yr	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08
Sb-126	1.240E+01	d	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Sb-126m	1.900E+01	m	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08
I-129	1.570E+07	yr	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09
Cs-134	2.062E+00	yr	4.7E-09	2.0E-09	1.4E-09	1.4E-10	7.0E-11	1.8E-11	2.4E-12
Cs-135	2.300E+06	yr	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08
Cs-137	3.000E+01	yr	5.1E-03	4.8E-03	4.7E-03	4.0E-03	3.8E-03	3.5E-03	3.0E-03
Ba-137m	2.552E+00	m	4.8E-03	4.6E-03	4.5E-03	3.8E-03	3.6E-03	3.3E-03	2.9E-03
La-138	1.350E+11	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Ce-142	1.049E+11	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Ce-144	2.843E+02	d	1.1E-16	1.2E-17	4.8E-18	9.5E-21	1.6E-21	4.5E-23	2.2E-25
Pr-144	1.728E+01	m	1.1E-16	1.2E-17	4.8E-18	9.5E-21	1.6E-21	4.5E-23	2.2E-25
Pr-144m	7.200E+00	m	1.3E-18	1.4E-19	5.8E-20	1.1E-22	1.9E-23	5.4E-25	2.6E-27
Nd-144	2.099E+15	yr	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16
Pm-146	5.500E+00	yr	5.1E-10	3.7E-10	3.3E-10	1.3E-10	1.0E-10	6.3E-11	3.0E-11
Sm-146	7.000E+07	yr	3.1E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15
Pm-147	2.623E+00	yr	1.0E-06	5.2E-07	4.0E-07	6.2E-08	3.7E-08	1.3E-08	2.6E-09
Sm-147	1.070E+11	yr	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12
Sm-148	8.001E+15	yr	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18
Sm-149	9.994E+15	yr	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19
Eu-150	3.600E+01	yr	2.2E-13	2.1E-13	2.1E-13	1.8E-13	1.8E-13	1.6E-13	1.4E-13
Sm-151	8.999E+01	yr	8.0E-05	7.9E-05	7.8E-05	7.4E-05	7.3E-05	7.1E-05	6.8E-05
Eu-152	1.360E+01	yr	7.0E-08	6.2E-08	5.8E-08	4.1E-08	3.7E-08	3.0E-08	2.2E-08
Gd-152	1.080E+14	yr	4.0E-20	4.0E-20	4.0E-20	4.1E-20	4.1E-20	4.1E-20	4.1E-20
Gd-153	2.420E+02	d	4.0E-25	2.9E-26	1.0E-26	6.8E-30	6.8E-30	6.8E-30	6.8E-30
Eu-154	8.600E+00	yr	6.2E-06	5.0E-06	4.6E-06	2.6E-06	2.2E-06	1.6E-06	1.0E-06
Eu-155	4.959E+00	yr	9.8E-07	6.9E-07	6.0E-07	2.2E-07	1.7E-07	9.7E-08	4.2E-08
Ho-166m	1.200E+03	yr	8.9E-13	8.9E-13	8.9E-13	8.9E-13	8.9E-13	8.9E-13	8.8E-13
Tm-171	1.920E+00	yr	2.8E-21	1.1E-21	7.9E-22	6.3E-23	3.1E-23	7.3E-24	8.3E-25
Tl-207	4.770E+00	m	1.8E-11	1.9E-11	1.9E-11	2.2E-11	2.2E-11	2.4E-11	2.5E-11
Tl-208	3.070E+00	m	9.0E-13	5.3E-13	4.5E-13	2.7E-13	2.6E-13	2.5E-13	2.3E-13
Tl-209	2.200E+00	m	4.6E-16	4.6E-16	4.6E-16	4.7E-16	4.7E-16	4.8E-16	4.9E-16
Pb-209	3.300E+00	h	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Pb-210	2.230E+01	yr	2.0E-12	2.3E-12	2.4E-12	3.4E-12	3.7E-12	4.3E-12	5.3E-12
Pb-211	3.610E+01	m	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Pb-212	1.064E+01	h	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Pb-214	2.680E+01	m	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Bi-210m	3.000E+06	yr	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29
Bi-210	5.012E+00	d	2.0E-12	2.3E-12	2.4E-12	3.4E-12	3.7E-12	4.3E-12	5.3E-12

Table 1. Calculated radionuclide activities for Al calcine in Ci/g for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Bi-211	2.130E+00	m	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Bi-212	6.055E+01	m	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Bi-213	4.565E+01	m	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Bi-214	1.990E+01	m	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Po-210	1.384E+02	d	2.0E-12	2.2E-12	2.4E-12	3.4E-12	3.6E-12	4.3E-12	5.3E-12
Po-211	5.600E-01	s	5.1E-14	5.4E-14	5.5E-14	6.1E-14	6.3E-14	6.6E-14	7.0E-14
Po-212	3.000E-07	s	1.6E-12	9.4E-13	8.0E-13	4.9E-13	4.7E-13	4.4E-13	4.1E-13
Po-213	4.200E-06	s	2.1E-14	2.1E-14	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14
Po-214	1.643E-04	s	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Po-215	1.780E-03	s	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Po-216	1.500E-01	s	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Po-218	3.050E+00	m	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
At-217	3.230E-02	s	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Rn-219	3.960E+00	s	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Rn-220	5.560E+01	s	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Rn-222	3.824E+00	d	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Fr-221	4.800E+00	m	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Fr-223	2.180E+01	m	2.5E-13	2.6E-13	2.7E-13	3.0E-13	3.1E-13	3.3E-13	3.4E-13
Ra-223	1.143E+01	d	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Ra-224	3.660E+00	d	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Ra-225	1.480E+01	d	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Ra-226	1.600E+03	yr	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Ra-228	6.700E+00	yr	8.3E-17	8.4E-17	8.5E-17	8.7E-17	8.8E-17	8.9E-17	8.9E-17
Ac-225	1.000E+01	d	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Ac-227	2.177E+01	yr	1.8E-11	1.9E-11	1.9E-11	2.2E-11	2.2E-11	2.4E-11	2.5E-11
Ac-228	6.131E+00	h	8.3E-17	8.4E-17	8.5E-17	8.7E-17	8.8E-17	8.9E-17	8.9E-17
Th-227	1.872E+01	d	1.8E-11	1.9E-11	1.9E-11	2.2E-11	2.2E-11	2.3E-11	2.5E-11
Th-228	1.913E+00	yr	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Th-229	7.339E+03	yr	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Th-230	7.700E+04	yr	4.9E-10	4.9E-10	4.9E-10	4.9E-10	4.9E-10	4.9E-10	4.9E-10
Th-231	2.552E+01	h	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
Th-232	1.405E+10	yr	9.0E-17	9.0E-17	9.0E-17	9.0E-17	9.0E-17	9.0E-17	9.0E-17
Th-234	2.410E+01	d	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-231	3.277E+04	yr	3.1E-11	3.1E-11	3.1E-11	3.2E-11	3.2E-11	3.2E-11	3.2E-11
Pa-233	2.700E+01	d	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09
Pa-234m	1.170E+00	m	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-234	6.700E+00	h	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15
U-232	7.200E+01	yr	7.8E-13	7.6E-13	7.5E-13	7.1E-13	6.9E-13	6.7E-13	6.3E-13
U-233	1.585E+05	yr	3.3E-13	3.9E-13	4.2E-13	5.7E-13	6.2E-13	7.0E-13	8.4E-13
U-234	2.445E+05	yr	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08
U-235	7.038E+08	yr	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
U-236	2.341E+07	yr	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10
U-237	6.750E+00	d	4.6E-11	4.1E-11	3.9E-11	2.8E-11	2.5E-11	2.1E-11	1.6E-11
U-238	4.468E+09	yr	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
U-240	1.410E+01	h	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Np-236	1.150E+05	yr	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14
Np-237	2.140E+06	yr	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09
Np-238	2.117E+00	d	9.8E-14	9.6E-14	9.6E-14	9.3E-14	9.2E-14	9.1E-14	8.8E-14
Np-239	2.355E+00	d	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
Np-240m	7.400E+00	m	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Pu-236	2.851E+00	yr	1.2E-14	8.7E-15	7.9E-15	5.4E-15	5.2E-15	5.0E-15	4.9E-15
Pu-238	8.774E+01	yr	2.1E-06	2.1E-06	2.1E-06	2.0E-06	1.9E-06	1.9E-06	1.8E-06
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07
Pu-240	6.537E+03	yr	9.6E-08	9.6E-08	9.6E-08	9.6E-08	9.6E-08	9.6E-08	9.6E-08
Pu-241	1.440E+01	yr	1.9E-06	1.7E-06	1.6E-06	1.1E-06	1.0E-06	8.4E-07	6.3E-07
Pu-242	3.869E+05	yr	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12
Pu-243	4.956E+00	h	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Pu-244	8.261E+07	yr	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Am-241	4.322E+02	yr	5.2E-07	5.3E-07	5.3E-07	5.4E-07	5.4E-07	5.4E-07	5.5E-07
Am-242m	1.520E+02	yr	2.0E-11	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.8E-11	1.8E-11
Am-242	1.602E+01	h	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.8E-11	1.8E-11
Am-243	7.380E+03	yr	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
Cm-242	1.632E+02	d	1.6E-11	1.6E-11	1.6E-11	1.5E-11	1.5E-11	1.5E-11	1.4E-11
Cm-243	2.850E+01	yr	1.4E-12	1.4E-12	1.3E-12	1.1E-12	1.1E-12	9.7E-13	8.4E-13
Cm-244	1.811E+01	yr	5.6E-11	5.1E-11	4.9E-11	3.8E-11	3.5E-11	3.0E-11	2.4E-11
Cm-245	8.499E+03	yr	5.1E-15	5.1E-15	5.1E-15	5.1E-15	5.1E-15	5.1E-15	5.1E-15
Cm-246	4.731E+03	yr	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16

Table 1. Calculated radionuclide activities for Al calcine in Ci/g for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Cm-247	1.560E+07	yr	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Cm-248	3.391E+05	yr	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23
Cf-249	3.505E+02	yr	2.7E-23	2.7E-23	2.7E-23	2.6E-23	2.6E-23	2.6E-23	2.6E-23
Cf-250	1.308E+01	yr	5.3E-24	4.7E-24	4.4E-24	3.1E-24	2.7E-24	2.2E-24	1.6E-24
Cf-251	8.980E+02	yr	7.1E-26	7.0E-26	7.0E-26	7.0E-26	7.0E-26	7.0E-26	6.9E-26
Cf-252	2.638E+00	yr	4.2E-27	2.2E-27	1.7E-27	2.8E-28	1.3E-28	6.7E-29	4.5E-29

Table 2. Calculated radionuclide activities for Al calcine in Ci/g for years 2032 through 12000.

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	9.2E-07	5.2E-07	8.2E-09	9.8E-16	9.5E-31	9.5E-31	
Be-10	1.600E+06	yr	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
C-14	5.729E+03	yr	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.3E-11	1.3E-11	4.4E-12
Se-79	6.496E+04	yr	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	4.8E-08
Rb-87	4.696E+10	yr	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12
Sr-90	2.912E+01	yr	2.2E-03	1.7E-03	3.0E-04	3.5E-07	1.5E-13	2.0E-14	
Y-90	6.400E+01	h	2.2E-03	1.7E-03	3.0E-04	3.5E-07	1.5E-13	2.0E-14	
Zr-93	1.530E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Nb-93m	1.360E+01	yr	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07
Nb-94	2.030E+04	yr	2.9E-12	2.9E-12	2.8E-12	2.8E-12	2.8E-12	2.8E-12	2.0E-12
Tc-98	4.199E+06	yr	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14
Tc-99	2.130E+05	yr	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Rh-102	1.059E+03	d	2.8E-16	2.6E-17	5.4E-25				
Ru-106	3.682E+02	d	4.2E-24	4.3E-27					
Rh-106	2.990E+01	s	4.2E-24	4.4E-27					
Pd-107	6.496E+06	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Ag-108	2.370E+00	m	1.2E-15	1.1E-15	7.5E-16	1.6E-16	5.5E-18	3.5E-18	2.8E-39
Ag-108m	1.270E+02	yr	1.3E-14	1.3E-14	8.4E-15	1.8E-15	6.2E-17	3.9E-17	3.1E-38
Ag-109m	3.960E+01	s	2.5E-30	2.5E-30					
Cd-109	4.640E+02	d	2.5E-30	2.5E-30					
Ag-110	2.460E+01	s	2.4E-39						
Ag-110m	2.499E+02	d	1.8E-37	7.2E-42					
Cd-113m	1.459E+01	yr	5.0E-08	3.1E-08	9.2E-10	1.3E-15	2.5E-28		
In-115	4.997E+14	yr	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18
Sn-119m	2.450E+02	d	5.3E-38	1.7E-42					
Sn-121m	4.997E+01	yr	4.1E-09	3.6E-09	1.3E-09	2.5E-11	4.9E-15	1.5E-15	
Te-123	1.000E+13	yr	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21
Sb-125	2.770E+00	yr	9.6E-12	7.8E-13	7.1E-21				
Te-125m	5.800E+01	d	2.3E-12	1.9E-13	1.7E-21				
Sn-126	1.000E+05	yr	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.4E-08
Sb-126	1.240E+01	d	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.2E-09
Sb-126m	1.900E+01	m	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.4E-08
I-129	1.570E+07	yr	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09
Cs-134	2.062E+00	yr	8.5E-14	2.9E-15	4.6E-26				
Cs-135	2.300E+06	yr	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08
Cs-137	3.000E+01	yr	2.4E-03	1.9E-03	3.5E-04	4.9E-07	3.2E-13	4.6E-14	
Ba-137m	2.552E+00	m	2.3E-03	1.8E-03	3.3E-04	4.6E-07	3.0E-13	4.4E-14	
La-138	1.350E+11	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Ce-142	1.049E+11	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Ce-144	2.843E+02	d	2.9E-29	4.0E-33					
Pr-144	1.728E+01	m	2.9E-29	4.0E-33					
Pr-144m	7.200E+00	m	3.5E-31	4.8E-35					
Nd-144	2.099E+15	yr	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16
Pm-146	5.500E+00	yr	8.4E-12	2.4E-12	2.1E-16	6.1E-32			
Sm-146	7.000E+07	yr	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15
Pm-147	2.623E+00	yr	1.9E-10	1.3E-11	4.3E-20				
Sm-147	1.070E+11	yr	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12
Sm-148	8.001E+15	yr	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18

Table 2. Calculated radionuclide activities for Al calcine in Ci/g for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Sm-149	9.994E+15	yr	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19
Eu-150	3.600E+01	yr	1.2E-13	9.9E-14	2.4E-14	1.0E-16	7.1E-22	1.4E-22	
Sm-151	8.999E+01	yr	6.3E-05	5.8E-05	3.3E-05	3.7E-06	3.2E-08	1.7E-08	
Eu-152	1.360E+01	yr	1.3E-08	8.0E-09	1.8E-10	9.5E-17	2.2E-30	2.2E-30	
Gd-152	1.080E+14	yr	4.2E-20	4.2E-20	4.2E-20	4.2E-20	4.2E-20	4.2E-20	4.2E-20
Gd-153	2.420E+02	d	6.9E-40	2.0E-44					
Eu-154	8.600E+00	yr	4.5E-07	2.0E-07	5.2E-10	5.9E-20	1.6E-41	1.6E-41	
Eu-155	4.959E+00	yr	1.0E-08	2.6E-09	8.2E-14	4.7E-31			
Ho-166m	1.200E+03	yr	8.8E-13	8.7E-13	8.4E-13	7.1E-13	5.0E-13	4.7E-13	2.8E-15
Tm-171	1.920E+00	yr	2.3E-26	6.6E-28	1.6E-39				
Tl-207	4.770E+00	m	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Tl-208	3.070E+00	m	2.1E-13	1.9E-13	9.5E-14	7.8E-15	1.8E-15	1.8E-15	1.7E-15
Tl-209	2.200E+00	m	5.0E-16	5.3E-16	8.4E-16	4.3E-15	2.4E-14	2.8E-14	1.7E-12
Pb-209	3.300E+00	h	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Pb-210	2.230E+01	yr	7.0E-12	8.8E-12	2.3E-11	8.7E-11	2.0E-10	2.1E-10	1.5E-09
Pb-211	3.610E+01	m	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Pb-212	1.064E+01	h	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Pb-214	2.680E+01	m	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Bi-210m	3.000E+06	yr	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29
Bi-210	5.012E+00	d	7.0E-12	8.8E-12	2.3E-11	8.7E-11	2.0E-10	2.1E-10	1.5E-09
Bi-211	2.130E+00	m	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Bi-212	6.055E+01	m	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Bi-213	4.565E+01	m	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Bi-214	1.990E+01	m	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Po-210	1.384E+02	d	7.0E-12	8.8E-12	2.3E-11	8.7E-11	2.0E-10	2.1E-10	1.5E-09
Po-211	5.600E-01	s	7.5E-14	7.9E-14	8.8E-14	9.0E-14	9.2E-14	9.3E-14	1.3E-13
Po-212	3.000E-07	s	3.8E-13	3.4E-13	1.7E-13	1.4E-14	3.2E-15	3.2E-15	3.1E-15
Po-213	4.200E-06	s	2.3E-14	2.4E-14	3.8E-14	1.9E-13	1.1E-12	1.2E-12	7.6E-11
Po-214	1.643E-04	s	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Po-215	1.780E-03	s	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Po-216	1.500E-01	s	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Po-218	3.050E+00	m	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
At-217	3.230E-02	s	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Rn-219	3.960E+00	s	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Rn-220	5.560E+01	s	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Rn-222	3.824E+00	d	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Fr-221	4.800E+00	m	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Fr-223	2.180E+01	m	3.7E-13	3.9E-13	4.3E-13	4.4E-13	4.6E-13	4.6E-13	6.2E-13
Ra-223	1.143E+01	d	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Ra-224	3.660E+00	d	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Ra-225	1.480E+01	d	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Ra-226	1.600E+03	yr	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Ra-228	6.700E+00	yr	9.0E-17	9.0E-17	9.1E-17	9.5E-17	1.0E-16	1.0E-16	2.1E-16
Ac-225	1.000E+01	d	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Ac-227	2.177E+01	yr	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Ac-228	6.131E+00	h	9.0E-17	9.0E-17	9.1E-17	9.5E-17	1.0E-16	1.0E-16	2.1E-16
Th-227	1.872E+01	d	2.6E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Th-228	1.913E+00	yr	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Th-229	7.339E+03	yr	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Th-230	7.700E+04	yr	5.0E-10	5.0E-10	5.1E-10	5.4E-10	6.3E-10	6.4E-10	1.8E-09
Th-231	2.552E+01	h	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
Th-232	1.405E+10	yr	9.0E-17	9.0E-17	9.1E-17	9.5E-17	1.0E-16	1.0E-16	2.1E-16
Th-234	2.410E+01	d	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-231	3.277E+04	yr	3.2E-11	3.2E-11	3.2E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Pa-233	2.700E+01	d	5.0E-09	5.0E-09	5.0E-09	5.1E-09	5.1E-09	5.1E-09	5.1E-09
Pa-234m	1.170E+00	m	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-234	6.700E+00	h	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15
U-232	7.200E+01	yr	5.7E-13	5.2E-13	2.6E-13	2.1E-14	4.9E-15	4.8E-15	4.6E-15
U-233	1.585E+05	yr	1.0E-12	1.3E-12	2.9E-12	9.2E-12	2.3E-11	2.5E-11	2.2E-10
U-234	2.445E+05	yr	1.5E-08	1.5E-08	1.5E-08	1.6E-08	1.6E-08	1.6E-08	1.5E-08
U-235	7.038E+08	yr	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
U-236	2.341E+07	yr	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.6E-10
U-237	6.750E+00	d	9.6E-12	5.9E-12	1.7E-13	3.2E-19	1.2E-19	1.2E-19	5.6E-20
U-238	4.468E+09	yr	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
U-240	1.410E+01	h	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Np-236	1.150E+05	yr	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.1E-14
Np-237	2.140E+06	yr	5.0E-09	5.0E-09	5.0E-09	5.1E-09	5.1E-09	5.1E-09	5.1E-09

Table 2. Calculated radionuclide activities for Al calcine in Ci/g for tears 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Np-238	2.117E+00	d	8.4E-14	8.0E-14	5.7E-14	1.6E-14	9.5E-16	6.5E-16	1.5E-33
Np-239	2.355E+00	d	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.7E-11	1.7E-11	7.5E-12
Np-240m	7.400E+00	m	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Pu-236	2.851E+00	yr	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.6E-15
Pu-238	8.774E+01	yr	1.7E-06	1.5E-06	8.5E-07	9.1E-08	7.0E-10	3.6E-10	6.0E-31
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07	1.8E-07
Pu-240	6.537E+03	yr	9.6E-08	9.5E-08	9.5E-08	9.2E-08	8.6E-08	8.5E-08	3.3E-08
Pu-241	1.440E+01	yr	3.9E-07	2.4E-07	6.8E-09	1.3E-14	4.7E-15	4.7E-15	2.3E-15
Pu-242	3.869E+05	yr	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.1E-12
Pu-243	4.956E+00	h	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Pu-244	8.261E+07	yr	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Am-241	4.322E+02	yr	5.4E-07	5.4E-07	4.9E-07	3.1E-07	1.2E-07	1.0E-07	6.6E-14
Am-242m	1.520E+02	yr	1.7E-11	1.6E-11	1.1E-11	3.1E-12	1.9E-13	1.3E-13	3.1E-31
Am-242	1.602E+01	h	1.7E-11	1.6E-11	1.1E-11	3.1E-12	1.9E-13	1.3E-13	3.0E-31
Am-243	7.380E+03	yr	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.7E-11	1.7E-11	7.5E-12
Cm-242	1.632E+02	d	1.4E-11	1.3E-11	9.4E-12	2.6E-12	1.6E-13	1.1E-13	2.5E-31
Cm-243	2.850E+01	yr	6.6E-13	5.2E-13	8.5E-14	8.5E-17	2.7E-23	3.5E-24	
Cm-244	1.811E+01	yr	1.6E-11	1.1E-11	6.5E-13	1.2E-17	7.1E-28	3.4E-29	
Cm-245	8.499E+03	yr	5.1E-15	5.1E-15	5.1E-15	5.0E-15	4.7E-15	4.7E-15	2.3E-15
Cm-246	4.731E+03	yr	1.2E-16	1.2E-16	1.2E-16	1.1E-16	1.0E-16	1.0E-16	2.7E-17
Cm-247	1.560E+07	yr	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Cm-248	3.391E+05	yr	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23
Cf-249	3.505E+02	yr	2.5E-23	2.5E-23	2.1E-23	1.2E-23	3.6E-24	3.1E-24	6.9E-32
Cf-250	1.308E+01	yr	9.5E-25	5.6E-25	1.1E-26	3.2E-33			
Cf-251	8.980E+02	yr	6.9E-26	6.8E-26	6.4E-26	5.2E-26	3.2E-26	3.0E-26	3.2E-29
Cf-252	2.638E+00	yr	8.2E-31	8.2E-31	3.0E-39				

Table 3. Calculated element mass for Al calcine in g element/g calcine for years 1999 through 2022.

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	5.9E-10	5.1E-10	4.9E-10	3.3E-10	2.9E-10	2.3E-10	1.7E-10
He	4.0E-09	4.0E-09	4.0E-09	4.2E-09	4.2E-09	4.3E-09	4.5E-09
Li	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11
Be	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
C	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
Zn	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15
Ga	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14
Ge	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08
As	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08
Se	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06
Br	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06
Kr	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05
Rb	6.0E-05	6.0E-05	6.0E-05	6.0E-05	6.0E-05	6.1E-05	6.1E-05
Sr	9.4E-05	9.2E-05	9.1E-05	8.6E-05	8.5E-05	8.3E-05	7.9E-05
Y	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05
Zr	5.8E-04	5.9E-04	5.9E-04	5.9E-04	5.9E-04	5.9E-04	6.0E-04
Nb	2.1E-09	2.2E-09	2.2E-09	2.6E-09	2.7E-09	2.9E-09	3.2E-09
Mo	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04
Tc	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Ru	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04
Rh	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05
Pd	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05
Ag	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07
Cd	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06
In	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
Sn	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06
Sb	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07
Te	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05

Table 3. Calculated element mass for Al calcine in g element/g calcine for years 1999 through 2022 (continued).

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
I	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Xe	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04
Cs	2.6E-04	2.6E-04	2.6E-04	2.5E-04	2.5E-04	2.4E-04	2.4E-04
Ba	2.7E-04	2.7E-04	2.7E-04	2.8E-04	2.8E-04	2.9E-04	2.9E-04
La	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04
Ce	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04
Pr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Nd	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04
Pm	1.1E-09	5.6E-10	4.3E-10	6.8E-11	4.0E-11	1.4E-11	2.9E-12
Sm	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Eu	7.5E-06	7.5E-06	7.5E-06	7.7E-06	7.7E-06	7.8E-06	7.9E-06
Gd	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06
Tb	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08
Dy	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09
Ho	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10
Er	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10
Tm	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Yb	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16
Tl	9.8E-20	1.0E-19	1.0E-19	1.2E-19	1.2E-19	1.2E-19	1.3E-19
Pb	2.9E-12	3.0E-12	3.0E-12	3.1E-12	3.1E-12	3.1E-12	3.2E-12
Bi	2.5E-16	2.8E-16	2.9E-16	3.5E-16	3.7E-16	4.1E-16	4.8E-16
Po	4.5E-16	5.0E-16	5.2E-16	7.6E-16	8.0E-16	9.6E-16	1.2E-15
At	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.4E-26	1.4E-26	1.4E-26
Rn	3.8E-17	4.1E-17	4.3E-17	5.2E-17	5.5E-17	6.0E-17	6.9E-17
Fr	6.6E-21	6.9E-21	7.1E-21	7.9E-21	8.1E-21	8.5E-21	9.0E-21
Ra	5.9E-12	6.4E-12	6.6E-12	8.1E-12	8.6E-12	9.4E-12	1.1E-11
Ac	2.5E-13	2.6E-13	2.7E-13	3.0E-13	3.1E-13	3.3E-13	3.4E-13
Th	2.5E-08	2.5E-08	2.5E-08	2.5E-08	2.5E-08	2.5E-08	2.5E-08
Pa	6.7E-10	6.7E-10	6.7E-10	6.7E-10	6.7E-10	6.7E-10	6.7E-10
U	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05
Np	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Pu	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06
Am	1.5E-07	1.5E-07	1.5E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Cm	7.6E-13	6.9E-13	6.7E-13	5.2E-13	4.9E-13	4.2E-13	3.4E-13
Cf	6.7E-24	6.6E-24	6.6E-24	6.5E-24	6.5E-24	6.4E-24	6.4E-24
Total	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**

Table 4. Calculated element mass for Al calcine in g element/g calcine for years 2032 through 12000.

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	9.5E-11	5.4E-11	8.5E-13	1.0E-19	9.8E-35	9.8E-35	0.0E+00
He	4.7E-09	4.9E-09	6.0E-09	8.4E-09	1.1E-08	1.1E-08	3.2E-08
Li	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11
Be	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
C	3.3E-12	3.3E-12	3.3E-12	3.1E-12	2.9E-12	2.9E-12	9.9E-13
Zn	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15
Ga	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14
Ge	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08
As	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08
Se	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	7.9E-06
Br	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.2E-06	3.2E-06	3.2E-06
Kr	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05
Rb	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05

Table 4. Calculated element mass for Al calcine in g element/g calcine for years 2032 through 12000 (continued).

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Sr	7.5E-05	7.2E-05	6.1E-05	5.9E-05	5.9E-05	5.9E-05	5.9E-05
Y	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05
Zr	6.0E-04	6.1E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04
Nb	3.7E-09	4.2E-09	7.8E-09	2.2E-08	5.2E-08	5.7E-08	5.0E-07
Mo	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04
Tc	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.0E-04
Ru	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04
Rh	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05
Pd	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05
Ag	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07
Cd	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06
In	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
Sn	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.3E-06
Sb	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07
Te	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05
I	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Xe	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04
Cs	2.3E-04	2.2E-04	2.1E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04
Ba	3.0E-04	3.1E-04	3.2E-04	3.3E-04	3.3E-04	3.3E-04	3.3E-04
La	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04
Ce	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04
Pr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Nd	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04
Pm	2.2E-13	2.0E-14	4.8E-19	1.4E-34	0.0E+00	0.0E+00	0.0E+00
Sm	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Eu	8.1E-06	8.3E-06	9.2E-06	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Gd	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06
Tb	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08
Dy	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09
Ho	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10
Er	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10
Tm	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Yb	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16
Tl	1.4E-19	1.5E-19	1.6E-19	1.7E-19	1.7E-19	1.7E-19	2.4E-19
Pb	3.4E-12	3.5E-12	5.1E-12	1.6E-11	6.1E-11	6.9E-11	3.4E-09
Bi	5.8E-16	6.9E-16	1.7E-15	1.4E-14	1.6E-13	2.0E-13	1.1E-10
Po	1.6E-15	2.0E-15	5.2E-15	1.9E-14	4.6E-14	4.8E-14	3.3E-13
At	1.4E-26	1.5E-26	2.4E-26	1.2E-25	6.8E-25	7.9E-25	4.8E-23
Rn	8.2E-17	9.6E-17	2.0E-16	5.7E-16	1.3E-15	1.4E-15	9.6E-15
Fr	9.7E-21	1.0E-20	1.1E-20	1.3E-20	1.8E-20	1.9E-20	4.6E-19
Ra	1.3E-11	1.5E-11	3.0E-11	8.8E-11	2.1E-10	2.2E-10	1.5E-09
Ac	3.7E-13	3.9E-13	4.3E-13	4.4E-13	4.6E-13	4.6E-13	6.3E-13
Th	2.5E-08	2.5E-08	2.6E-08	2.8E-08	3.2E-08	3.3E-08	9.0E-08
Pa	6.7E-10	6.7E-10	6.7E-10	6.8E-10	7.0E-10	7.0E-10	9.6E-10
U	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.2E-05
Np	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06
Pu	4.4E-06	4.4E-06	4.3E-06	4.2E-06	4.1E-06	4.1E-06	3.1E-06
Am	1.6E-07	1.6E-07	1.4E-07	9.0E-08	3.4E-08	2.9E-08	3.7E-11
Cm	2.5E-13	1.8E-13	4.3E-14	3.0E-14	2.8E-14	2.8E-14	1.3E-14
Cf	6.2E-24	6.1E-24	5.3E-24	3.0E-24	9.0E-25	7.7E-25	2.0E-29
Total	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**

2. Coprocessing Waste

The calculations for coprocessing waste calculated in Wenzel 1998 did not include structural materials and activation products other than Fe-55, Ni-59, Ni-63, and Co-60. At the request of the EDF sponsor, structural materials and their activation products are included in the current calculations. As noted in Wenzel 1998, coprocessing waste is a mixture of aluminum waste and zirconium waste. However, the decay times are different from those used in the separate calculations for aluminum and zirconium wastes. Only the structural materials for zirconium waste contains additional structural materials in coprocessing waste. Structural materials used in the calculations are the same as those presented by M. D. Staiger for zirconium waste. A copy of the list of structural materials used is presented on page 1 of Appendix E-1. The input to the ORIGEN2 code requires that all elements be inputted by their individual stable nuclides. The calculations of the mass of the individual nuclides is presented on pages 2–3 of Appendix E-1.

The ORIGEN2 calculations for coprocessing waste began with ORIGEN2 run AL_3_4 from Wenzel 1998. The run was renamed CO_AL for convenience. The input file (CO_AL.INP) is presented in Appendix B-1, page 1. The associated BAT file is also presented in Appendix B-1, page 2. The summarized ORIGEN2 output for the activity of the radionuclides is called CO_AL.CI and is presented on pages 3–5 of Attachment B-1. The summarized output for the mass of the different nuclides is called CO_AL.G and is presented on pages 6-10 of Appendix B-1.

The next step in the calculations was the revision of ORIGEN2 run ZR_5_6, which was used in previous calculations described in Wenzel 1998. The revised ORIGEN2 run was renamed CO_ZR to prevent confusion with the original run. The input file (CO_ZR.INP) for the revised run includes the structural materials and is presented in Appendix B-2, pages 1–2. The associated BAT file is also presented in Appendix B-2, page 2. The summarized ORIGEN2 output for the activity of the radionuclides is called CO_ZR.CI and is presented on pages 3–6 of Attachment B-2. The summarized output for the mass of the different nuclides is called CO_ZR.G and is presented on pages 7–14 of Appendix B-2.

Fortran program ADJ185 from Attachment B-1 of Wenzel 1998 calculates the blending of aluminum and zirconium wastes to make coprocessing waste. Program ADJ185 was converted from Fortran 77 to Fortran 90 and modified to calculate not only the radionuclide activity but also the mass of the individual nuclides. The program was renamed ADJ185G. A copy of the source list for program ADJ185G is presented on pages 1–4 of Appendix B-3. A comment has been added to the source list for program ADJ185G that explains the blending of the processing streams from which coprocessing waste was produced. Program ADJ185G uses a file called MASTER_A to identify the nuclides desired in the output. A copy of the nuclide list in file MASTER_A is presented in Appendix B-3, page 5. The output of program ADJ185G for the mass of each of the nuclides is called ADJ185G.OUT and is presented on pages 6–14 of Appendix B-3.

The previous EDF (Wenzel 1998, Attachment E) contained a Fortran 77 program named MOD185 that was used to change the activities (in d/s/mL) in file ADJ185G.OUT to the analytically measured results for those radionuclides that were measured. Program MOD185 was revised to output the results to grams of nuclide per 0.0115 gram of Cs-137. A mass of 0.0115 of Cs-137 is equal to a normalized activity of 1 Ci/L. By changing the output to a mass basis rather than an activity basis, the mass of each stable nuclide is calculated. The revised Fortran 90 program is called CEXTRACT. Program CEXTRACT also converts the output format to one that can be easily converted to the input format for the ORIGEN2 code. Program CEXTRACT also changes the calculated activities to those measured by analytical analyses. Each revised nuclide mass is equivalent to the activities analytically measured in coprocessing waste (Wenzel 1998, Attachment D). The source list for program CEXTRACT is presented on pages 1–3 of Appendix B-4. Program CEXTRACT used a file called MASTER_E, which is presented

on pages 4–11 of Appendix B-4. The output from CEXTRACT (CEXTRACT.OUT) is presented on pages 12–19 of Appendix B-4.

The next step in the calculations was to modify ORIGEN2 run 185DECAY from Attachment F of Wenzel 1998. As before, the updated ORIGEN2 calculations were broken into two separate runs. The first run is called CO_RUN1 and calculates the nuclides decayed between the years 1999 and 2022. The input file (CO_RUN1.INP) is presented in Appendix B-5, pages 1–4. The associated BAT file is also presented in Appendix B-5, page 5. The summarized ORIGEN2 output for the activity of the radionuclides is called CO_RUN1.CI and is presented in Appendix B-5, pages 6–8.

Fortran program ROUND, which was used in the original calculations (see Attachment G of Wenzel 1998), was revised to format the output of CO_RUN1.CI. The revised program is called ROUNDCO1 and a copy of the source listing is presented in Appendix B-6, pages 1–3. Program ROUNDCO1 uses file MASTER to identify the radionuclides, their half-lives, and their order to be included in the output file. A copy of file MASTER is presented in Appendix A-2, pages 4–7. The output from program ROUNDCO1 is called ROUNDCO1.OUT and is presented in Appendix B-6, pages 4–6.

The output of ORIGEN2 run CO_RUN1 was also requested for the mass of the nuclides present. The output for the mass of the nuclides is called CO_RUN1.G and is presented in Appendix B-7. A Fortran 90 program called ELECO1 was written to sum the mass of each isotope of the different elements, normalize the mass to g/L, and to round the output to two places of accuracy. A copy of the source list for program ELECO1 is presented on pages 1–3 of Appendix B-8. Program ELECO1 uses the file called SYMBOL, which identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELECO1 is called CO_RUN1.ELE and is presented in Appendix B-8, pages 4-5.

The second ORIGEN2 run, called CO_RUN2, calculates the nuclides decayed between the years 2032 and 12000. The input file (CO_RUN2.INP) is presented in Appendix B-9, pages 1–4. The associated BAT file is also presented in Appendix B-9, page 5. The summarized ORIGEN2 output for the activity of the radionuclides is called CO_RUN2.CI and is presented in Appendix B-9, pages 6–8. Fortran program ROUNDCO2 was used to format the data in output file CO_RUN2.CI and to round the results to two places of accuracy. The source list for Fortran program ROUNDCO2 is presented in Appendix B-10, pages 1–3. The output from program ROUNDCO2 is called ROUNDCO2.OUT and is presented in Appendix B-10, pages 4–6.

The output of ORIGEN2 run CO_RUN2 for the mass of the nuclides is called CO_RUN2.G and is presented in Appendix B-11. A Fortran 90 program called ELECO2 was written to sum the mass of each isotope of the different elements, normalize the mass to g/L, and to round the output to two places of accuracy. Program ELECO2 uses the file called SYMBOL, which identifies the elements to be summed. A copy of the source list for program ELECO2 is presented in Appendix B-12, pages 1–3. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELECO2 is called CO_RUN2.ELE and is presented in Appendix B-12, pages 4-5.

Tables 5 and 6 present the calculated radionuclide activities for the requested decay times. As in the original calculations, the results are expressed in Ci/. Tables 7 and 8 present the calculated mass of the elements as a function of decay time for elements present in the waste that come from fission and structural materials.

Table 5. Calculated radionuclide activities for coprocessing waste in Ci/L for years 1999 through 2022.

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.233E+01	yr	7.0E-04	6.1E-04	5.8E-04	3.9E-04	3.5E-04	2.8E-04	2.0E-04
Be-10	1.510E+06	yr	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11
C-14	5.730E+03	yr	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06
Ca 45	1.626E+02	d	7.6E-31	7.6E-31	7.6E-31	1.4E-35	1.4E-35	1.4E-35	1.1E-39
V 50	1.400E+17	yr	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20
Mn 54	3.123E+02	d	2.9E-15	3.8E-16	1.7E-16	6.1E-19	1.1E-19		
Fe-55	2.730E+00	yr	7.9E-06	4.1E-06	3.1E-06	4.8E-07	2.8E-07	9.7E-08	2.0E-08
Ni-59	7.600E+04	yr	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06
Co-60	5.271E+00	yr	3.6E-05	2.6E-05	2.3E-05	9.0E-06	6.9E-06	4.1E-06	1.8E-06
Ni-63	1.001E+02	yr	6.6E-04	6.5E-04	6.4E-04	6.1E-04	6.0E-04	5.8E-04	5.6E-04
Zn 65	2.443E+02	d	2.9E-25	2.9E-25	2.9E-25	2.0E-28	2.0E-28	2.0E-28	2.0E-28
Se-79	1.130E+06	yr	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
Rb-87	4.750E+10	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Sr-90	2.878E+01	yr	4.8E-01	4.5E-01	4.4E-01	3.7E-01	3.6E-01	3.2E-01	2.8E-01
Y-90	6.410E+01	h	4.8E-01	4.5E-01	4.4E-01	3.7E-01	3.6E-01	3.2E-01	2.8E-01
Zr-93	1.530E+06	yr	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05
Nb-93m	1.613E+01	yr	2.2E-05	2.2E-05	2.2E-05	2.3E-05	2.4E-05	2.4E-05	2.4E-05
Nb-94	2.030E+04	yr	4.9E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06
Tc-98	4.200E+06	yr	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11
Tc-99	2.111E+05	yr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Rh-102	2.070E+02	d	1.5E-09	8.5E-10	6.7E-10	1.3E-10	7.8E-11	3.0E-11	7.1E-12
Ru-106	3.736E+02	d	3.5E-10	6.2E-11	3.1E-11	2.5E-13	6.4E-14	4.1E-15	6.7E-17
Rh-106	2.980E+01	s	3.5E-10	6.2E-11	3.1E-11	2.5E-13	6.4E-14	4.1E-15	6.7E-17
Pd-107	6.500E+06	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Ag-108	2.370E+00	m	4.3E-13	4.2E-13	4.2E-13	4.1E-13	4.0E-13	3.9E-13	3.8E-13
Ag-108m	4.180E+02	yr	4.8E-12	4.8E-12	4.7E-12	4.6E-12	4.5E-12	4.4E-12	4.3E-12
Ag-109m	3.960E+01	s	5.0E-18	1.3E-18	7.4E-19	1.6E-20	4.7E-21	4.7E-21	4.7E-21
Cd-109	4.626E+02	d	5.0E-18	1.3E-18	7.4E-19	4.7E-21	4.7E-21	4.7E-21	4.7E-21
Ag-110	2.460E+01	s	8.5E-20	6.8E-21	2.4E-21	1.8E-24	1.8E-24	1.8E-24	1.8E-24
Ag-110m	2.498E+02	d	6.4E-18	4.9E-19	1.6E-19	1.3E-22	1.3E-22	1.3E-22	1.3E-22
Cd-113m	1.410E+01	yr	3.0E-05	2.7E-05	2.6E-05	1.8E-05	1.7E-05	1.4E-05	1.0E-05
In-115	4.410E+14	yr	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17
Sn-119m	2.931E+02	d	3.7E-16	2.8E-17	1.0E-17	7.2E-21	7.2E-21	7.2E-21	7.2E-21
Sn-121m	5.500E+01	yr	3.8E-05	3.7E-05	3.7E-05	3.3E-05	3.2E-05	3.0E-05	2.8E-05
Te-123	1.000E+13	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Sb-125	2.758E+00	yr	2.6E-05	1.4E-05	1.1E-05	1.9E-06	1.2E-06	4.3E-07	9.5E-08
Te-125m	5.740E+01	d	6.5E-06	3.5E-06	2.7E-06	4.7E-07	2.8E-07	1.0E-07	2.3E-08
Sn-126	1.000E+05	yr	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06
Sb-126	1.246E+01	d	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07
Sb-126m	1.915E+01	m	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06
I-129	1.570E+07	yr	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07
Cs-134	2.065E+00	yr	1.4E-05	6.2E-06	4.4E-06	4.2E-07	2.2E-07	5.6E-08	7.5E-09
Cs-135	2.300E+06	yr	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Cs-137	3.007E+01	yr	5.2E-01	4.9E-01	4.8E-01	4.1E-01	3.9E-01	3.5E-01	3.1E-01
Ba-137m	2.552E+00	m	4.9E-01	4.6E-01	4.5E-01	3.8E-01	3.7E-01	3.3E-01	2.9E-01
La-138	1.050E+11	yr	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15
Ce-142	5.000E+16	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Ce-144	2.849E+02	d	9.8E-12	1.1E-12	4.4E-13	8.5E-16	1.4E-16	4.1E-18	4.0E-20
Pr-144	1.728E+01	m	9.9E-12	1.1E-12	4.4E-13	8.6E-16	1.4E-16	4.1E-18	4.0E-20
Pr-144m	7.200E+00	m	1.2E-13	1.3E-14	5.2E-15	1.0E-17	1.7E-18	4.9E-20	4.9E-22
Nd-144	2.290E+15	yr	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14
Pm-146	5.530E+00	yr	2.5E-07	1.9E-07	1.6E-07	6.8E-08	5.3E-08	3.2E-08	1.5E-08
Sm-146	1.030E+08	yr	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12
Pm-147	2.623E+00	yr	3.0E-04	1.5E-04	1.2E-04	1.9E-05	1.1E-05	3.8E-06	7.8E-07
Sm-147	1.060E+11	yr	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11
Sm-148	7.000E+15	yr	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16
Sm-149	2.000E+15	yr	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17
Eu-150	3.690E+01	yr	1.1E-10	1.0E-10	1.0E-10	8.7E-11	8.4E-11	7.8E-11	6.9E-11
Sm-151	9.000E+01	yr	2.8E-03	2.7E-03	2.7E-03	2.6E-03	2.5E-03	2.5E-03	2.3E-03
Eu-152	1.354E+01	yr	2.6E-05	2.3E-05	2.2E-05	1.5E-05	1.4E-05	1.1E-05	8.2E-06
Gd-152	1.080E+14	yr	2.0E-17	2.0E-17	2.0E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17
Gd-153	2.416E+02	d	1.0E-19						
Eu-154	8.593E+00	yr	1.5E-03	1.2E-03	1.2E-03	6.6E-04	5.6E-04	4.0E-04	2.5E-04
Eu-155	4.761E+00	yr	2.7E-04	1.9E-04	1.6E-04	6.2E-05	4.7E-05	2.7E-05	1.2E-05
Ho-166m	1.200E+03	yr	5.7E-10	5.7E-10	5.7E-10	5.7E-10	5.7E-10	5.6E-10	5.6E-10
Tm-171	1.920E+00	yr	2.4E-16	9.8E-17	6.8E-17	5.4E-18	2.6E-18	6.3E-19	6.6E-20
Lu176	3.780E+10	yr	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15

Table 5. Calculated radionuclide activities for coprocessing waste in Ci/L for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Lu177	6.734E+00	d	2.8E-31	2.7E-31	2.7E-31	3.0E-36			
Lu177m	1.604E+02	d	1.2E-30	1.2E-30	1.2E-30	1.3E-35	1.3E-35	1.3E-35	1.2E-39
Hf182	9.000E+06	yr	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Ta182	1.144E+02	d	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Re187	4.350E+10	yr	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21
Tl-207	4.770E+00	m	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Tl-208	3.053E+00	m	2.7E-08	2.7E-08	2.6E-08	2.5E-08	2.4E-08	2.3E-08	2.2E-08
Tl-209	2.200E+00	m	1.2E-14	1.2E-14	1.2E-14	1.2E-14	1.2E-14	1.3E-14	1.3E-14
Pb-209	3.253E+00	h	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Pb-210	2.230E+01	yr	3.5E-12	4.2E-12	4.5E-12	7.0E-12	7.8E-12	9.6E-12	1.3E-11
Pb-211	3.610E+01	m	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Pb-212	1.064E+01	h	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Pb-214	2.680E+01	m	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Bi-210m	3.040E+06	yr	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24
Bi-210	5.013E+00	d	3.5E-12	4.2E-12	4.5E-12	7.0E-12	7.8E-12	9.7E-12	1.3E-11
Bi-211	2.140E+00	m	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Bi-212	6.055E+01	m	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Bi-213	4.559E+01	m	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Bi-214	1.990E+01	m	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Po-210	1.384E+02	d	3.5E-12	4.0E-12	4.3E-12	7.0E-12	7.5E-12	9.7E-12	1.3E-11
Po-211	5.160E-01	s	2.9E-13	3.0E-13	3.0E-13	3.4E-13	3.5E-13	3.6E-13	3.9E-13
Po-212	2.990E-07	s	4.8E-08	4.7E-08	4.7E-08	4.4E-08	4.3E-08	4.1E-08	3.9E-08
Po-213	4.200E-06	s	5.6E-13	5.6E-13	5.6E-13	5.6E-13	5.7E-13	5.7E-13	5.7E-13
Po-214	1.643E-04	s	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Po-215	1.781E-03	s	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Po-216	1.450E-01	s	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Po-218	3.100E+00	m	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
At-217	3.230E-02	s	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Rn-219	3.960E+00	s	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Rn-220	5.560E+01	s	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Rn-222	3.823E+00	d	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Fr-221	4.900E+00	m	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Fr-223	2.180E+00	m	1.4E-12	1.5E-12	1.5E-12	1.7E-12	1.7E-12	1.8E-12	1.9E-12
Ra-223	1.144E+01	d	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Ra-224	3.660E+00	d	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Ra-225	1.490E+01	d	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Ra-226	1.600E+03	yr	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Ra-228	5.750E+00	yr	1.8E-15	1.8E-15	1.8E-15	1.9E-15	1.9E-15	1.9E-15	1.9E-15
Ac-225	1.000E+01	d	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Ac-227	2.177E+01	yr	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Ac-228	6.150E+00	h	1.8E-15	1.8E-15	1.8E-15	1.9E-15	1.9E-15	1.9E-15	1.9E-15
Th-227	1.872E+01	d	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Th-228	1.912E+00	yr	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.4E-08	6.1E-08
Th-229	7.340E+03	yr	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Th-230	7.538E+04	yr	1.5E-09	1.6E-09	1.6E-09	1.9E-09	2.0E-09	2.2E-09	2.4E-09
Th-231	2.552E+01	h	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08
Th-232	1.405E+10	yr	1.9E-15	1.9E-15	1.9E-15	1.9E-15	1.9E-15	2.0E-15	2.0E-15
Th-234	2.410E+01	d	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-231	3.276E+04	yr	1.6E-10	1.7E-10	1.7E-10	1.7E-10	1.7E-10	1.7E-10	1.8E-10
Pa-233	2.697E+01	d	9.9E-09	1.0E-08	1.0E-08	1.1E-08	1.1E-08	1.1E-08	1.2E-08
Pa-234m	1.170E+00	m	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-234	6.700E+00	h	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
U-232	6.890E+01	yr	7.3E-08	7.2E-08	7.1E-08	6.6E-08	6.5E-08	6.3E-08	5.9E-08
U-233	1.592E+05	yr	8.3E-12	8.4E-12	8.5E-12	8.8E-12	8.9E-12	9.1E-12	9.4E-12
U-234	2.455E+05	yr	4.5E-06	4.5E-06	4.5E-06	4.6E-06	4.6E-06	4.7E-06	4.7E-06
U-235	7.038E+08	yr	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08
U-236	2.342E+07	yr	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08
U-237	6.750E+00	d	3.8E-08	3.4E-08	3.2E-08	2.3E-08	2.1E-08	1.7E-08	1.3E-08
U-238	4.470E+09	yr	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
U-240	1.410E+01	h	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Np-236	1.540E+05	yr	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.3E-14
Np-237	2.144E+06	yr	9.9E-09	1.0E-08	1.0E-08	1.1E-08	1.1E-08	1.1E-08	1.2E-08
Np-238	2.117E+00	d	1.3E-09	1.3E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.1E-09
Np-239	2.356E+00	d	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06
Np-240m	7.220E+00	m	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Pu-236	2.858E+00	yr	2.3E-09	1.2E-09	9.8E-10	1.8E-10	1.1E-10	4.1E-11	9.6E-12
Pu-238	8.770E+01	yr	5.0E-03	4.9E-03	4.8E-03	4.6E-03	4.5E-03	4.4E-03	4.2E-03

Table 5. Calculated radionuclide activities for coprocessing waste in Ci/L for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pu-239	2.411E+04	yr	8.6E-05	8.6E-05	8.6E-05	8.6E-05	8.6E-05	8.6E-05	8.6E-05
Pu-240	6.563E+03	yr	7.7E-05	7.7E-05	7.7E-05	7.7E-05	7.7E-05	7.7E-05	7.7E-05
Pu-241	1.435E+01	yr	1.6E-03	1.4E-03	1.3E-03	9.4E-04	8.5E-04	7.0E-04	5.3E-04
Pu-242	3.733E+05	yr	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Pu-243	4.956E+00	h	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Pu-244	8.080E+07	yr	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Am-241	4.322E+02	yr	2.3E-04	2.4E-04	2.4E-04	2.5E-04	2.5E-04	2.6E-04	2.6E-04
Am-242m	1.410E+02	yr	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07
Am-242	1.602E+01	h	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07
Am-243	7.370E+03	yr	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06
Cm-242	1.628E+02	d	2.1E-07	2.1E-07	2.1E-07	2.0E-07	2.0E-07	1.9E-07	1.9E-07
Cm-243	2.910E+01	yr	4.5E-08	4.3E-08	4.2E-08	3.5E-08	3.4E-08	3.0E-08	2.6E-08
Cm-244	1.810E+01	yr	2.3E-06	2.1E-06	2.0E-06	1.5E-06	1.4E-06	1.2E-06	9.7E-07
Cm-245	8.500E+03	yr	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Cm-246	4.730E+03	yr	2.8E-11	2.8E-11	2.8E-11	2.8E-11	2.8E-11	2.8E-11	2.8E-11
Cm-247	1.560E+07	yr	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Cm-248	3.400E+05	yr	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17
Cf-249	3.510E+02	yr	2.6E-16	2.6E-16	2.6E-16	2.6E-16	2.6E-16	2.5E-16	2.5E-16
Cf-250	1.308E+01	yr	1.8E-16	1.6E-16	1.5E-16	1.0E-16	9.2E-17	7.4E-17	5.4E-17
Cf-251	8.980E+02	yr	4.4E-18	4.4E-18	4.4E-18	4.4E-18	4.4E-18	4.4E-18	4.4E-18
Cf-252	2.645E+00	yr	6.8E-20	3.8E-20	3.8E-20	1.1E-20	1.1E-20	1.1E-20	7.4E-21

Table 6. Calculated radionuclide activities for coprocessing waste in Ci/L for years 2032 through 12000.

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.233E+01	yr	1.1E-04	6.5E-05	1.0E-06	1.2E-13	1.2E-28	1.2E-28	
Be-10	1.510E+06	yr	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.3E-11
C-14	5.730E+03	yr	9.6E-06	9.6E-06	9.6E-06	9.2E-06	8.6E-06	8.5E-06	2.9E-06
V 50	1.400E+17	yr	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20
Mn 54	3.123E+02	d	1.1E-26	3.2E-30					
Fe 55	2.730E+00	yr	1.4E-09	9.5E-11	2.6E-19				
Ni-59	7.600E+04	yr	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.2E-06
Co-60	5.271E+00	yr	5.0E-07	1.3E-07	7.9E-12	4.7E-28			
Ni-63	1.001E+02	yr	5.2E-04	4.8E-04	2.8E-04	3.2E-05	3.1E-07	1.5E-07	
Se-79	1.130E+06	yr	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.6E-06	4.6E-06	4.2E-06
Rb-87	4.750E+10	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Sr-90	2.878E+01	yr	2.2E-01	1.7E-01	3.0E-02	3.5E-05	1.5E-11	1.6E-12	
Y-90	6.410E+01	h	2.2E-01	1.7E-01	3.0E-02	3.5E-05	1.5E-11	1.6E-12	
Zr-93	1.530E+06	yr	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05
Nb-93m	1.613E+01	yr	2.5E-05	2.5E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Nb-94	2.030E+04	yr	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.7E-06	4.7E-06	3.4E-06
Tc-98	4.200E+06	yr	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11
Tc-99	2.111E+05	yr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Rh-102	2.070E+02	d	6.5E-13	5.9E-14	1.2E-21				
Pd-107	6.500E+06	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Ag-108	2.370E+00	m	3.6E-13	3.4E-13	2.3E-13	4.8E-14	1.7E-15	1.0E-15	
Ag-108m	4.180E+02	yr	4.0E-12	3.8E-12	2.6E-12	5.4E-13	1.9E-14	1.1E-14	9.5E-36
Cd-113m	1.410E+01	yr	6.5E-06	4.0E-06	1.2E-07	1.7E-13	3.2E-26	3.2E-26	
In-115	4.410E+14	yr	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17
Sn-121m	5.500E+01	yr	2.4E-05	2.1E-05	7.6E-06	1.5E-07	2.9E-11	7.8E-12	
Te-123	1.000E+13	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Sb-125	2.758E+00	yr	7.8E-09	6.4E-10	5.8E-18				
Te-125m	5.740E+01	d	1.9E-09	1.6E-10	1.4E-18				
Sn-126	1.000E+05	yr	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.1E-06	4.1E-06	3.9E-06
Sb-126	1.246E+01	d	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.4E-07
Sb-126m	1.915E+01	m	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.1E-06	4.1E-06	3.9E-06
I-129	1.570E+07	yr	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07
Cs-134	2.065E+00	yr	2.6E-10	9.0E-12	1.4E-22				
Cs-135	2.300E+06	yr	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Cs-137	3.007E+01	yr	2.4E-01	1.9E-01	3.5E-02	5.0E-05	3.3E-11	3.7E-12	
Ba-137m	2.552E+00	m	2.3E-01	1.8E-01	3.3E-02	4.7E-05	3.1E-11	3.5E-12	
La-138	1.050E+11	yr	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15

Table 6. Calculated radionuclide activities for coprocessing waste in Ci/L for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Ce-142	5.000E+16	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Nd-144	2.290E+15	yr	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14
Pm-146	5.530E+00	yr	4.2E-09	1.2E-09	1.1E-13	3.0E-29			
Sm-146	1.030E+08	yr	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12
Pm-147	2.623E+00	yr	5.6E-08	4.0E-09	1.3E-17				
Sm-147	1.060E+11	yr	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11
Sm-148	7.000E+15	yr	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16
Sm-149	2.000E+15	yr	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17
Eu-150	3.690E+01	yr	5.7E-11	4.7E-11	1.1E-11	4.8E-14	3.4E-19	5.4E-20	
Sm-151	9.000E+01	yr	2.2E-03	2.0E-03	1.1E-03	1.3E-04	1.1E-06	5.4E-07	
Eu-152	1.354E+01	yr	5.0E-06	3.0E-06	6.8E-08	3.5E-14	8.2E-28	8.2E-28	
Gd-152	1.080E+14	yr	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17
Eu-154	8.593E+00	yr	1.1E-04	5.0E-05	1.3E-07	1.5E-17	4.0E-39		
Eu-155	4.761E+00	yr	2.9E-06	7.0E-07	2.3E-11	1.3E-28			
Ho-166m	1.200E+03	yr	5.6E-10	5.6E-10	5.3E-10	4.5E-10	3.2E-10	3.0E-10	1.8E-12
Tm-171	1.920E+00	yr	1.9E-21	1.9E-21	4.8E-33				
Lu176	3.780E+10	yr	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15
Hf182	9.000E+06	yr	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Ta182	1.144E+02	d	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Re187	4.350E+10	yr	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21
Tl-207	4.770E+00	m	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Tl-208	3.053E+00	m	2.0E-08	1.8E-08	8.8E-09	5.7E-10	1.5E-12	6.2E-13	1.7E-14
Tl-209	2.200E+00	m	1.3E-14	1.3E-14	1.5E-14	3.3E-14	1.7E-13	2.0E-13	2.1E-11
Pb-209	3.253E+00	h	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Pb-210	2.230E+01	yr	1.9E-11	2.7E-11	1.4E-10	1.9E-09	1.1E-08	1.2E-08	4.1E-07
Pb-211	3.610E+01	m	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Pb-212	1.064E+01	h	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Pb-214	2.680E+01	m	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Bi-210m	3.040E+06	yr	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24
Bi-210	5.013E+00	d	1.9E-11	2.7E-11	1.4E-10	1.9E-09	1.1E-08	1.2E-08	4.1E-07
Bi-211	2.140E+00	m	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Bi-212	6.055E+01	m	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Bi-213	4.559E+01	m	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Bi-214	1.990E+01	m	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Po-210	1.384E+02	d	1.9E-11	2.7E-11	1.4E-10	1.9E-09	1.1E-08	1.2E-08	4.1E-07
Po-211	5.160E-01	s	4.2E-13	4.5E-13	5.9E-13	1.1E-12	2.1E-12	2.2E-12	1.5E-11
Po-212	2.990E-07	s	3.5E-08	3.2E-08	1.6E-08	1.0E-09	2.7E-12	1.1E-12	3.1E-14
Po-213	4.200E-06	s	5.8E-13	5.9E-13	6.7E-13	1.5E-12	7.6E-12	9.3E-12	9.4E-10
Po-214	1.643E-04	s	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Po-215	1.781E-03	s	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Po-216	1.450E-01	s	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Po-218	3.100E+00	m	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
At-217	3.230E-02	s	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Rn-219	3.960E+00	s	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Rn-220	5.560E+01	s	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Rn-222	3.823E+00	d	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Fr-221	4.900E+00	m	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Fr-223	2.180E+00	m	2.1E-12	2.2E-12	2.9E-12	5.4E-12	1.0E-11	1.1E-11	7.3E-11
Ra-223	1.144E+01	d	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Ra-224	3.660E+00	d	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Ra-225	1.490E+01	d	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Ra-226	1.600E+03	yr	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Ra-228	5.750E+00	yr	2.0E-15	2.0E-15	2.3E-15	3.3E-15	5.5E-15	5.8E-15	4.1E-14
Ac-225	1.000E+01	d	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Ac-227	2.177E+01	yr	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Ac-228	6.150E+00	h	2.0E-15	2.0E-15	2.3E-15	3.3E-15	5.5E-15	5.8E-15	4.1E-14
Th-227	1.872E+01	d	1.5E-10	1.6E-10	2.1E-10	3.8E-10	7.2E-10	7.6E-10	5.2E-09
Th-228	1.912E+00	yr	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Th-229	7.340E+03	yr	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Th-230	7.538E+04	yr	2.9E-09	3.3E-09	6.8E-09	2.2E-08	5.6E-08	6.1E-08	5.3E-07
Th-231	2.552E+01	h	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.8E-08
Th-232	1.405E+10	yr	2.0E-15	2.0E-15	2.3E-15	3.3E-15	5.5E-15	5.8E-15	4.1E-14
Th-234	2.410E+01	d	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-231	3.276E+04	yr	1.8E-10	1.9E-10	2.3E-10	3.9E-10	7.3E-10	7.8E-10	5.3E-09
Pa-233	2.697E+01	d	1.3E-08	1.3E-08	1.9E-08	3.7E-08	5.6E-08	5.8E-08	6.7E-08
Pa-234m	1.170E+00	m	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-234	6.700E+00	h	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12

Table 6. Calculated radionuclide activities for coprocessing waste in Ci/L for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
U-232	6.890E+01	yr	5.4E-08	4.9E-08	2.4E-08	1.6E-09	4.1E-12	1.7E-12	7.0E-15
U-233	1.592E+05	yr	9.9E-12	1.0E-11	1.6E-11	5.2E-11	1.8E-10	2.0E-10	2.8E-09
U-234	2.455E+05	yr	4.9E-06	5.0E-06	5.5E-06	6.2E-06	6.2E-06	6.2E-06	6.1E-06
U-235	7.038E+08	yr	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.8E-08
U-236	2.342E+07	yr	7.1E-08	7.1E-08	7.1E-08	7.2E-08	7.3E-08	7.3E-08	8.5E-08
U-237	6.750E+00	d	8.0E-09	4.9E-09	1.4E-10	8.4E-15	7.9E-15	7.8E-15	3.8E-15
U-238	4.470E+09	yr	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
U-240	1.410E+01	h	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Np-236	1.540E+05	yr	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.2E-14	8.2E-14	7.8E-14
Np-237	2.144E+06	yr	1.3E-08	1.3E-08	1.9E-08	3.7E-08	5.6E-08	5.8E-08	6.7E-08
Np-238	2.117E+00	d	1.1E-09	1.0E-09	7.5E-10	2.0E-10	1.2E-11	8.0E-12	2.0E-29
Np-239	2.356E+00	d	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06	7.7E-07
Np-240m	7.220E+00	m	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Pu-236	2.858E+00	yr	8.5E-13	8.2E-14	7.4E-15	7.4E-15	7.4E-15	7.4E-15	7.0E-15
Pu-238	8.770E+01	yr	3.8E-03	3.6E-03	2.0E-03	2.1E-04	1.6E-06	7.7E-07	7.8E-27
Pu-239	2.411E+04	yr	8.6E-05	8.6E-05	8.5E-05	8.5E-05	8.3E-05	8.3E-05	6.5E-05
Pu-240	6.563E+03	yr	7.7E-05	7.7E-05	7.6E-05	7.4E-05	6.9E-05	6.8E-05	2.7E-05
Pu-241	1.435E+01	yr	3.3E-04	2.0E-04	5.7E-06	3.4E-10	3.2E-10	3.2E-10	1.5E-10
Pu-242	3.733E+05	yr	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Pu-243	4.956E+00	h	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Pu-244	8.080E+07	yr	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Am-241	4.322E+02	yr	2.6E-04	2.6E-04	2.4E-04	1.5E-04	5.6E-05	4.8E-05	1.9E-10
Am-242m	1.410E+02	yr	2.2E-07	2.1E-07	1.5E-07	4.1E-08	2.5E-09	1.6E-09	4.0E-27
Am-242	1.602E+01	h	2.2E-07	2.1E-07	1.5E-07	4.1E-08	2.4E-09	1.6E-09	4.0E-27
Am-243	7.370E+03	yr	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06	7.7E-07
Cm-242	1.628E+02	d	1.8E-07	1.7E-07	1.2E-07	3.4E-08	2.0E-09	1.3E-09	3.3E-27
Cm-243	2.910E+01	yr	2.1E-08	1.6E-08	2.7E-09	2.7E-12	8.3E-19	8.4E-20	
Cm-244	1.810E+01	yr	6.6E-07	4.5E-07	2.7E-08	5.1E-13	2.9E-23	2.9E-23	
Cm-245	8.500E+03	yr	3.5E-10	3.5E-10	3.4E-10	3.4E-10	3.2E-10	3.2E-10	1.5E-10
Cm-246	4.730E+03	yr	2.7E-11	2.7E-11	2.7E-11	2.6E-11	2.4E-11	2.3E-11	6.4E-12
Cm-247	1.560E+07	yr	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Cm-248	3.400E+05	yr	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17
Cf-249	3.510E+02	yr	2.5E-16	2.4E-16	2.1E-16	1.2E-16	3.5E-17	2.9E-17	6.7E-25
Cf-250	1.308E+01	yr	3.2E-17	1.9E-17	3.7E-19	2.7E-25	1.6E-25	1.6E-25	1.6E-25
Cf-251	8.980E+02	yr	4.3E-18	4.3E-18	4.1E-18	3.3E-18	2.0E-18	1.9E-18	2.0E-21
Cf-252	2.645E+00	yr	1.3E-23	1.3E-23	4.8E-32				

Table 7. Calculated element mass for coprocessing waste in g element/L waste for years 1999 through 2022.

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	7.3E-08	6.3E-08	6.0E-08	4.0E-08	3.6E-08	2.9E-08	2.1E-08
He	2.7E-06	2.8E-06	2.9E-06	3.1E-06	3.2E-06	3.4E-06	3.6E-06
Li	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09
Be	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09
B	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07
C	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04
N	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04
O	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02
F	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Ne	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
Na	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22
Mg	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09
Si	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
P	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19
S	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25
Cl	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19

Table 7. Calculated element mass for coprocessing waste in g element/L waste for years 1999 through 2022 (continued).

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Ar	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16
K	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17
Ca	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10
Sc	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Ti	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
V	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05
Mn	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
Fe	3.2E-09	1.6E-09	1.2E-09	1.9E-10	1.1E-10	3.9E-11	7.9E-12
Co	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06
Ni	8.5E-05	8.5E-05	8.5E-05	8.4E-05	8.4E-05	8.4E-05	8.4E-05
Cu	3.7E-06	3.9E-06	4.0E-06	4.5E-06	4.7E-06	5.0E-06	5.4E-06
Zn	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08
Ga	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
Ge	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06
As	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Se	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04
Br	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04
Kr	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03
Rb	5.3E-03	5.3E-03	5.3E-03	5.3E-03	5.3E-03	5.3E-03	5.3E-03
Sr	8.7E-03	8.5E-03	8.4E-03	7.9E-03	7.8E-03	7.6E-03	7.3E-03
Y	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
Zr	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Nb	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
Mo	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02
Tc	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03
Ru	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Rh	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03
Pd	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Ag	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05
Cd	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04
In	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05
Sn	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Sb	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04
Te	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
I	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
Xe	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02
Cs	2.5E-02	2.5E-02	2.5E-02	2.4E-02	2.4E-02	2.4E-02	2.3E-02
Ba	2.4E-02	2.4E-02	2.5E-02	2.5E-02	2.6E-02	2.6E-02	2.6E-02
La	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02
Ce	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02
Pr	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02
Nd	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02
Pm	3.2E-07	1.7E-07	1.3E-07	2.0E-08	1.2E-08	4.2E-09	8.8E-10
Sm	9.2E-03	9.2E-03	9.2E-03	9.2E-03	9.2E-03	9.2E-03	9.2E-03
Eu	8.9E-04	8.9E-04	8.9E-04	8.9E-04	8.9E-04	9.0E-04	9.0E-04
Gd	4.3E-04	4.3E-04	4.3E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04
Tb	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Dy	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06
Ho	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08
Er	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08
Tm	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Yb	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Lu	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
Hf	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03
Ta	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04
W	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Re	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Os	8.1E-10	8.1E-10	8.1E-10	8.1E-10	8.1E-10	8.1E-10	8.1E-10

Table 7. Calculated element mass for coprocessing waste in g element/L waste for years 1999 through 2022 (continued).

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Tl	9.3E-17	9.1E-17	9.0E-17	8.4E-17	8.3E-17	7.9E-17	7.5E-17
Pb	1.1E-09	1.2E-09	1.2E-09	1.4E-09	1.4E-09	1.6E-09	1.7E-09
Bi	1.3E-14	1.4E-14	1.4E-14	1.5E-14	1.6E-14	1.6E-14	1.8E-14
Po	7.9E-16	9.0E-16	9.6E-16	1.6E-15	1.7E-15	2.1E-15	2.8E-15
At	3.5E-25	3.5E-25	3.5E-25	3.6E-25	3.6E-25	3.6E-25	3.6E-25
Rn	1.6E-16	1.7E-16	1.7E-16	2.0E-16	2.1E-16	2.3E-16	2.7E-16
Fr	4.0E-20	4.1E-20	4.2E-20	4.6E-20	4.7E-20	4.9E-20	5.2E-20
Ra	1.3E-11	1.4E-11	1.5E-11	2.1E-11	2.2E-11	2.6E-11	3.2E-11
Ac	1.4E-12	1.5E-12	1.5E-12	1.7E-12	1.7E-12	1.8E-12	1.9E-12
Th	9.2E-08	9.7E-08	9.9E-08	1.1E-07	1.2E-07	1.3E-07	1.4E-07
Pa	3.5E-09	3.5E-09	3.5E-09	3.6E-09	3.6E-09	3.7E-09	3.8E-09
U	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02
Np	1.4E-05	1.4E-05	1.4E-05	1.5E-05	1.5E-05	1.6E-05	1.7E-05
Pu	2.1E-03	2.1E-03	2.1E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Am	7.8E-05	8.0E-05	8.0E-05	8.3E-05	8.4E-05	8.4E-05	8.5E-05
Cm	3.1E-08	2.9E-08	2.8E-08	2.2E-08	2.0E-08	1.8E-08	1.5E-08
Bk	2.1E-28	2.1E-28	2.1E-28	2.1E-28	2.1E-28	2.1E-28	2.1E-28
Cf	6.8E-17	6.8E-17	6.8E-17	6.6E-17	6.6E-17	6.5E-17	6.4E-17
Total	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**

Table 8. Calculated element mass for coprocessing waste in g element/L waste for years 2032 through 12000.

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	1.2E-08	6.7E-09	1.1E-10	1.3E-17	1.2E-32	1.2E-32	0.0E+00
He	3.9E-06	4.2E-06	6.0E-06	8.6E-06	1.0E-05	1.0E-05	1.9E-05
Li	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09
Be	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09
B	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07
C	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04
N	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04
O	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02
F	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Ne	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
Na	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22
Mg	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09
Si	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
P	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19
S	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25
Cl	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19
Ar	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16
K	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17
Ca	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10
Sc	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Ti	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
V	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05
Mn	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
Fe	5.5E-13	3.8E-14	1.0E-22	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	1.3E-06	1.3E-06	1.3E-06	1.5E-06	1.9E-06	2.0E-06	7.4E-06
Ni	8.3E-05	8.2E-05	7.9E-05	7.5E-05	7.4E-05	7.4E-05	6.8E-05
Cu	6.1E-06	6.7E-06	1.0E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05
Zn	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08

Table 8. Calculated element mass for coprocessing waste in g element/L waste for years 2032 through 12000 (continued).

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Ga	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
Ge	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06
As	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Se	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.0E-04
Br	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.8E-04
Kr	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03
Rb	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03
Sr	6.8E-03	6.5E-03	5.4E-03	5.2E-03	5.2E-03	5.2E-03	5.2E-03
Y	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
Zr	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Nb	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
Mo	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02
Tc	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.7E-03
Ru	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Rh	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03
Pd	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Ag	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.6E-05
Cd	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04
In	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05
Sn	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.4E-04
Sb	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04
Te	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
I	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
Xe	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02
Cs	2.2E-02	2.2E-02	2.0E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Ba	2.7E-02	2.8E-02	3.0E-02	3.0E-02	3.0E-02	3.0E-02	3.0E-02
La	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02
Ce	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02
Pr	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02
Nd	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02
Pm	7.0E-11	7.0E-12	2.4E-16	6.8E-32	0.0E+00	0.0E+00	0.0E+00
Sm	9.2E-03	9.2E-03	9.2E-03	9.1E-03	9.1E-03	9.1E-03	9.1E-03
Eu	9.1E-04	9.1E-04	9.4E-04	9.8E-04	9.9E-04	9.9E-04	9.9E-04
Gd	4.4E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04
Tb	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Dy	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06
Ho	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.8E-08
Er	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.6E-08	1.6E-08
Tm	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Yb	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Lu	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
Hf	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03
Ta	8.2E-05	8.2E-05	8.2E-05	8.2E-05	8.2E-05	8.2E-05	8.2E-05
W	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Re	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Os	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Tl	6.8E-17	6.2E-17	3.1E-17	4.0E-18	3.8E-18	4.0E-18	2.8E-17
Pb	1.9E-09	2.2E-09	3.2E-09	4.3E-09	6.0E-09	6.5E-09	7.2E-07
Bi	2.0E-14	2.2E-14	4.0E-14	1.7E-13	1.3E-12	1.6E-12	1.3E-09
Po	4.3E-15	6.1E-15	3.1E-14	4.1E-13	2.4E-12	2.7E-12	9.2E-11
At	3.7E-25	3.7E-25	4.3E-25	9.4E-25	4.9E-24	5.9E-24	5.9E-22
Rn	3.4E-16	4.2E-16	1.4E-15	1.2E-14	7.0E-14	8.2E-14	2.7E-12
Fr	5.7E-20	6.0E-20	7.9E-20	1.5E-19	3.1E-19	3.3E-19	7.3E-18
Ra	4.3E-11	5.7E-11	2.2E-10	1.9E-09	1.1E-08	1.3E-08	4.2E-07
Ac	2.1E-12	2.2E-12	2.9E-12	5.4E-12	1.0E-11	1.1E-11	7.4E-11
Th	1.6E-07	1.8E-07	3.6E-07	1.1E-06	2.8E-06	3.1E-06	2.7E-05
Pa	3.9E-09	4.0E-09	4.9E-09	8.2E-09	1.6E-08	1.7E-08	1.1E-07
U	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.9E-02
Np	1.8E-05	1.9E-05	2.8E-05	5.3E-05	8.0E-05	8.2E-05	9.6E-05

Table 8. Calculated element mass for coprocessing waste in g element/L waste for years 2032 through 12000.

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pu	2.0E-03	2.0E-03	1.9E-03	1.7E-03	1.7E-03	1.7E-03	1.2E-03
Am	8.6E-05	8.6E-05	7.9E-05	5.4E-05	2.5E-05	2.3E-05	3.9E-06
Cm	1.1E-08	8.1E-09	2.5E-09	2.1E-09	1.9E-09	1.9E-09	9.2E-10
Bk	4.2E-32	4.2E-32	4.2E-32	4.2E-32	4.2E-32	4.2E-32	4.2E-32
Cf	6.3E-17	6.2E-17	5.3E-17	3.1E-17	9.8E-18	8.3E-18	1.2E-21
Total	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**

3. Electrolytic Waste

Calculations for electrolytic waste began with the revision of ORIGEN2 run ELECTDCY (Wenzel 1999a, Attachment F, page 1). As in the aluminum calculations, the updated ORIGEN2 calculations were broken into two separate runs. The first run is called SS_RUN1 and calculates the nuclides decayed between the years 1999 and 2022. The input file (SS_RUN1.INP) is presented in Appendix C-1, pages 1–4. The associated BAT file is also presented in Appendix C-1, page 4. The summarized ORIGEN2 output for the activity of the radionuclides is called SS_RUN1.CI and is presented in Appendix C-1, pages 5–7. Fortran program ROUND, presented on pages 1–2 of Attachment G of Wenzel 1999a, was converted from Fortran 77 to Fortran 90 and modified to better format the output. The revised program is called ROUNDSS1, and the source list is presented in Appendix C-2, pages 1–3. Program ROUNDSS1 uses file MASTER to identify the radionuclides, their half-lives, and their order to be included in the output file. A copy of file MASTER is presented in Appendix A-2, pages 4–7. The output from program ROUNDSS1 is called ROUNDSS1.OUT and is presented in Appendix C-2, pages 4–6.

The output of ORIGEN2 run SS_RUN1 was also requested for the mass of the nuclides present. The output for the mass of the nuclides is called SS_RUN1.G and is presented in Appendix C-3. A Fortran 90 program called ELESS1 was written to sum the mass of each isotope of the different elements, normalize the mass to grams of element per liter of waste, and to round the output to two places of accuracy. The source list for program ELESS1 is presented in Appendix C-4, pages 1–3. It uses the file called SYMBOL, which identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELESS1 is called SS_RUN1.ELE and is presented in Appendix C-4, pages 4-5.

The second ORIGEN2 run, called SS_RUN2, calculates the nuclides decayed between the years 2032 and 12000. The input file (SS_RUN2.INP) is presented in Appendix C-5, pages 1–4. The associated BAT file is also presented in Appendix C-5, page 4. The summarized ORIGEN2 output for the activity of the radionuclides is called SS_RUN2.CI and is presented in Appendix C-5, pages 5–7. Fortran program ROUNDSS2 was used to format the data in output file SS_RUN2.CI and to round the results to two places of accuracy. The source list for program ROUNDSS2 is presented in Appendix C-6, pages 1–3. The output from program ROUNDSS2 is called ROUNDSS2.OUT and is presented in Appendix C-6, pages 4–6.

The output of SS_RUN2 for the mass of the nuclides is called SS_RUN2.G and is presented in Appendix C-7. A Fortran 90 program called ELESS2 was written to sum the mass of each isotope of the different elements, normalize the mass to g/L of liquid electrolytic waste, and to round the output to two places of accuracy. The source list for program ELESS2 is presented in Appendix C-8, pages 1–3. ELESS2 uses the file called SYMBOL, which identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELESS2 is called SS_RUN2.ELE and is presented in Appendix C-8, pages 4-5.

Tables 9 and 10 present the calculated radionuclide activities for the requested decay times. As in the original calculations, the results are expressed in Ci/L and are based on the first electrolytic dissolution campaign. Tables 11 and 12 present the calculated mass of each element as a function of decay time for elements present in the waste that come from fission only.

Table 9. Calculated radionuclide activities for electrolytic waste in Ci/L for years 1999 through 2022.

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	6.7E-04	5.8E-04	5.5E-04	3.7E-04	3.3E-04	2.7E-04	1.9E-04
Be-10	1.600E+06	yr	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
C-14	5.729E+03	yr	5.3E-10	5.3E-10	5.3E-10	5.3E-10	5.3E-10	5.3E-10	5.3E-10
Ca-45	1.630E+02	d	4.6E-33	4.6E-33	4.6E-33	8.6E-38	8.6E-38	8.6E-38	
V-50	4.000E+16	yr	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18
Mn-54	3.125E+02	d	4.2E-11	5.5E-12	2.5E-12	8.5E-15	1.7E-15	6.5E-17	4.9E-19
Fe-55	2.600E+00	yr	3.3E-05	1.7E-05	1.3E-05	2.0E-06	1.2E-06	4.0E-07	8.2E-08
Ni-59	8.000E+04	yr	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Co-60	5.270E+00	yr	1.4E-04	1.0E-04	9.1E-05	3.6E-05	2.8E-05	1.7E-05	7.5E-06
Ni-63	9.200E+01	yr	1.4E-03	1.3E-03	1.3E-03	1.3E-03	1.2E-03	1.2E-03	1.2E-03
Se-79	6.496E+04	yr	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05
Rb-87	4.696E+10	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Sr-90	2.912E+01	yr	2.0E-01	1.9E-01	1.9E-01	1.6E-01	1.5E-01	1.4E-01	1.2E-01
Y-90	6.400E+01	h	2.0E-01	1.9E-01	1.9E-01	1.6E-01	1.5E-01	1.4E-01	1.2E-01
Zr-93	1.530E+06	yr	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06
Nb-93m	1.360E+01	yr	7.3E-06	7.5E-06	7.5E-06	8.0E-06	8.1E-06	8.3E-06	8.5E-06
Nb-94	2.030E+04	yr	7.8E-11	7.8E-11	7.8E-11	7.8E-11	7.8E-11	7.8E-11	7.8E-11
Tc-98	4.199E+06	yr	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12
Tc-99	2.130E+05	yr	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05
Rh-102	1.059E+03	d	1.8E-10	9.9E-11	7.8E-11	1.5E-11	9.0E-12	3.5E-12	8.3E-13
Ru-106	3.682E+02	d	2.2E-09	3.9E-10	2.0E-10	1.6E-12	4.0E-13	2.6E-14	4.2E-16
Rh-106	2.990E+01	s	2.2E-09	3.9E-10	2.0E-10	1.6E-12	4.0E-13	2.6E-14	4.2E-16
Pd-107	6.496E+06	yr	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Ag-108	2.370E+00	m	2.2E-13	2.1E-13	2.1E-13	2.0E-13	2.0E-13	2.0E-13	1.9E-13
Ag-108m	1.270E+02	yr	2.4E-12	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.2E-12	2.2E-12
Ag-109m	3.960E+01	s	2.6E-17	6.7E-18	3.9E-18	1.0E-19	5.1E-20	2.1E-20	1.3E-20
Cd-109	4.640E+02	d	2.6E-17	6.7E-18	3.8E-18	1.0E-19	5.1E-20	2.1E-20	1.3E-20
Ag-110	2.460E+01	s	5.8E-19	4.6E-20	1.7E-20	1.4E-23	1.4E-23	1.4E-23	1.4E-23
Ag-110m	2.499E+02	d	4.3E-17	3.5E-18	1.3E-18	1.1E-21	1.1E-21	1.1E-21	1.1E-21
Cd-113m	1.459E+01	yr	6.1E-05	5.4E-05	5.2E-05	3.7E-05	3.4E-05	2.8E-05	2.1E-05
In-115	4.997E+14	yr	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16
Sn-119m	2.450E+02	d	3.4E-16	2.6E-17	9.0E-18	6.5E-21	6.5E-21	6.5E-21	6.5E-21
Sn-121m	4.997E+01	yr	1.5E-06	1.4E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.1E-06
Te-123	1.000E+13	yr	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20
Sb-125	2.770E+00	yr	1.5E-05	8.0E-06	6.3E-06	1.1E-06	6.6E-07	2.4E-07	5.4E-08
Te-125m	5.800E+01	d	3.7E-06	2.0E-06	1.5E-06	2.7E-07	1.6E-07	5.9E-08	1.3E-08
Sn-126	1.000E+05	yr	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
Sb-126	1.240E+01	d	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07
Sb-126m	1.900E+01	m	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
I-129	1.570E+07	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Cs-134	2.062E+00	yr	6.1E-07	2.6E-07	1.9E-07	1.8E-08	9.1E-09	2.4E-09	3.2E-10
Cs-135	2.300E+06	yr	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06
Cs-137	3.000E+01	yr	2.3E-01	2.2E-01	2.1E-01	1.8E-01	1.7E-01	1.6E-01	1.4E-01
Ba-137m	2.552E+00	m	2.2E-01	2.0E-01	2.0E-01	1.7E-01	1.6E-01	1.5E-01	1.3E-01
La-138	1.350E+11	yr	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16
Ce-142	1.049E+11	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Ce-144	2.843E+02	d	1.7E-10	1.9E-11	7.6E-12	1.5E-14	2.5E-15	7.1E-17	3.7E-19
Pr-144	1.728E+01	m	1.7E-10	1.9E-11	7.6E-12	1.5E-14	2.5E-15	7.1E-17	3.7E-19
Pr-144m	7.200E+00	m	2.1E-12	2.2E-13	9.2E-14	1.8E-16	3.0E-17	8.6E-19	4.5E-21
Nd-144	2.099E+15	yr	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15
Pm-146	5.500E+00	yr	1.4E-07	1.0E-07	9.2E-08	3.8E-08	2.9E-08	1.8E-08	8.3E-09
Sm-146	7.000E+07	yr	3.6E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
Pm-147	2.623E+00	yr	6.6E-04	3.4E-04	2.6E-04	4.1E-05	2.4E-05	8.4E-06	1.7E-06
Sm-147	1.070E+11	yr	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Sm-148	8.001E+15	yr	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18
Sm-149	9.994E+15	yr	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17
Eu-150	3.600E+01	yr	1.3E-10	1.2E-10	1.2E-10	1.0E-10	1.0E-10	9.3E-11	8.3E-11
Sm-151	8.999E+01	yr	9.0E-03	8.8E-03	8.7E-03	8.3E-03	8.1E-03	7.9E-03	7.5E-03
Eu-152	1.360E+01	yr	5.6E-07	4.9E-07	4.7E-07	3.3E-07	3.0E-07	2.4E-07	1.8E-07
Gd-152	1.080E+14	yr	2.0E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.2E-19	2.2E-19
Gd-153	2.420E+02	d	1.3E-20	1.3E-20	1.3E-20	8.9E-24	8.9E-24	8.9E-24	8.9E-24
Eu-154	8.600E+00	yr	4.1E-05	3.3E-05	3.1E-05	1.8E-05	1.5E-05	1.1E-05	6.7E-06
Eu-155	4.959E+00	yr	2.6E-04	1.8E-04	1.6E-04	5.9E-05	4.5E-05	2.6E-05	1.1E-05
Ho-166m	1.200E+03	yr	1.2E-10	1.2E-10	1.2E-10	1.1E-10	1.1E-10	1.1E-10	1.1E-10
Tm-171	1.920E+00	yr	1.9E-21	1.9E-21	1.9E-21	1.9E-21	1.9E-21	1.9E-21	1.9E-21
Tl-207	4.770E+00	m	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.4E-09	1.5E-09	1.6E-09
Tl-208	3.070E+00	m	8.6E-10	8.6E-10	8.5E-10	8.0E-10	7.9E-10	7.6E-10	7.1E-10
Tl-209	2.200E+00	m	5.2E-14	5.2E-14	5.2E-14	5.3E-14	5.3E-14	5.3E-14	5.4E-14

Table 9. Calculated radionuclide activities for electrolytic waste in Ci/L for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pb-209	3.300E+00	h	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Pb-210	2.230E+01	yr	1.1E-10	1.2E-10	1.3E-10	1.8E-10	1.9E-10	2.2E-10	2.7E-10
Pb-211	3.610E+01	m	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Pb-212	1.064E+01	h	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Pb-214	2.680E+01	m	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Bi-210m	3.000E+06	yr	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26
Bi-210	5.012E+00	d	1.1E-10	1.2E-10	1.3E-10	1.8E-10	1.9E-10	2.2E-10	2.7E-10
Bi-211	2.130E+00	m	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Bi-212	6.055E+01	m	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Bi-213	4.565E+01	m	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Bi-214	1.990E+01	m	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Po-210	1.384E+02	d	1.1E-10	1.2E-10	1.2E-10	1.8E-10	1.9E-10	2.2E-10	2.7E-10
Po-211	5.600E-01	s	3.3E-12	3.5E-12	3.6E-12	4.0E-12	4.1E-12	4.2E-12	4.5E-12
Po-212	3.000E-07	s	1.5E-09	1.5E-09	1.5E-09	1.4E-09	1.4E-09	1.3E-09	1.3E-09
Po-213	4.200E-06	s	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.5E-12
Po-214	1.643E-04	s	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Po-215	1.780E-03	s	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Po-216	1.500E-01	s	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Po-218	3.050E+00	m	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
At-217	3.230E-02	s	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Rn-219	3.960E+00	s	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Rn-220	5.560E+01	s	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Rn-222	3.824E+00	d	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Fr-221	4.800E+00	m	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Fr-223	2.180E+01	m	1.6E-11	1.7E-11	1.8E-11	2.0E-11	2.0E-11	2.1E-11	2.2E-11
Ra-223	1.143E+01	d	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Ra-224	3.660E+00	d	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Ra-225	1.480E+01	d	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Ra-226	1.600E+03	yr	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Ra-228	6.700E+00	yr	7.9E-16	8.0E-16	8.0E-16	8.2E-16	8.2E-16	8.2E-16	8.3E-16
Ac-225	1.000E+01	d	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Ac-227	2.177E+01	yr	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.4E-09	1.5E-09	1.6E-09
Ac-228	6.131E+00	h	7.9E-16	8.0E-16	8.0E-16	8.2E-16	8.2E-16	8.2E-16	8.3E-16
Th-230	7.700E+04	yr	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08
Th-231	2.552E+01	h	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09
Th-232	1.405E+10	yr	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.3E-16
Th-234	2.410E+01	d	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-231	3.277E+04	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Pa-233	2.700E+01	d	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Pa-234m	1.170E+00	m	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-234	6.700E+00	h	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13
U-232	7.200E+01	yr	2.4E-09	2.3E-09	2.3E-09	2.2E-09	2.1E-09	2.0E-09	1.9E-09
U-233	1.585E+05	yr	3.1E-11	3.4E-11	3.5E-11	4.3E-11	4.6E-11	5.1E-11	5.8E-11
U-234	2.445E+05	yr	2.4E-09	2.6E-09	2.6E-09	3.2E-09	3.3E-09	3.6E-09	4.0E-09
U-235	7.038E+08	yr	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09
U-236	2.341E+07	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.3E-10
U-237	6.750E+00	d	4.1E-11	3.6E-11	3.5E-11	2.5E-11	2.3E-11	1.9E-11	1.4E-11
U-238	4.468E+09	yr	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
U-240	1.410E+01	h	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Np-236	1.150E+05	yr	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12
Np-237	2.140E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Np-238	2.117E+00	d	1.9E-14	1.9E-14	1.8E-14	1.8E-14	1.8E-14	1.7E-14	1.7E-14
Np-239	2.355E+00	d	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14
Np-240m	7.400E+00	m	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Pu-236	2.851E+00	yr	1.2E-10	6.5E-11	5.1E-11	9.6E-12	6.0E-12	2.5E-12	8.1E-13
Pu-238	8.774E+01	yr	2.8E-05	2.8E-05	2.7E-05	2.6E-05	2.6E-05	2.5E-05	2.4E-05
Pu-239	2.406E+04	yr	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03
Pu-240	6.537E+03	yr	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Pu-241	1.440E+01	yr	1.7E-06	1.5E-06	1.4E-06	1.0E-06	9.2E-07	7.6E-07	5.7E-07
Pu-242	3.869E+05	yr	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13
Pu-244	8.261E+07	yr	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24
Am-241	4.322E+02	yr	1.8E-07	1.9E-07	1.9E-07	2.0E-07	2.1E-07	2.1E-07	2.1E-07
Am-242m	1.520E+02	yr	3.8E-12	3.7E-12	3.7E-12	3.6E-12	3.5E-12	3.5E-12	3.4E-12
Am-242	1.602E+01	h	3.7E-12	3.7E-12	3.7E-12	3.6E-12	3.5E-12	3.5E-12	3.4E-12
Am-243	7.380E+03	yr	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14
Cm-242	1.632E+02	d	3.1E-12	3.1E-12	3.0E-12	2.9E-12	2.9E-12	2.9E-12	2.8E-12
Cm-243	2.850E+01	yr	1.4E-14	1.3E-14	1.2E-14	1.0E-14	1.0E-14	9.1E-15	7.8E-15

Table 9. Calculated radionuclide activities for electrolytic waste in Ci/L for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Cm-244	1.811E+01	yr	2.0E-15	1.8E-15	1.7E-15	1.3E-15	1.2E-15	1.0E-15	8.3E-16
Th-227	1.872E+01	d	1.2E-09	1.2E-09	1.3E-09	1.4E-09	1.4E-09	1.5E-09	1.6E-09
Th-228	1.913E+00	yr	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Th-229	7.339E+03	yr	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Cm-245	8.499E+03	yr	1.4E-20	1.4E-20	1.4E-20	1.4E-20	1.4E-20	1.4E-20	1.4E-20

Table 10. Calculated radionuclide activities for electrolytic waste in Ci/L for years 2032 through 12000.

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	1.1E-04	6.2E-05	9.7E-07	1.2E-13	1.1E-28	1.1E-28	
Be-10	1.600E+06	yr	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
C-14	5.729E+03	yr	5.3E-10	5.3E-10	5.2E-10	5.0E-10	4.7E-10	4.6E-10	1.6E-10
V-50	4.000E+16	yr	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18
Mn-54	3.125E+02	d	1.5E-22	4.7E-26					
Fe-55	2.600E+00	yr	5.7E-09	4.0E-10	1.1E-18				
Ni-59	8.000E+04	yr	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
Co-60	5.270E+00	yr	2.0E-06	5.4E-07	3.2E-11	1.9E-27			
Ni-63	9.200E+01	yr	1.1E-03	9.9E-04	5.7E-04	6.7E-05	6.4E-07	3.2E-07	
Se-79	6.496E+04	yr	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	3.8E-05
Rb-87	4.696E+10	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Sr-90	2.912E+01	yr	9.4E-02	7.4E-02	1.3E-02	1.5E-05	6.3E-12	6.7E-13	
Y-90	6.400E+01	h	9.4E-02	7.4E-02	1.3E-02	1.5E-05	6.3E-12	6.7E-13	
Zr-93	1.530E+06	yr	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06
Nb-93m	1.360E+01	yr	8.7E-06	8.8E-06	9.0E-06	9.0E-06	9.0E-06	9.0E-06	9.0E-06
Nb-94	2.030E+04	yr	7.8E-11	7.8E-11	7.8E-11	7.7E-11	7.6E-11	7.5E-11	5.6E-11
Tc-98	4.199E+06	yr	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12
Tc-99	2.130E+05	yr	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	5.9E-05
Rh-102	1.059E+03	d	7.6E-14	6.9E-15	1.4E-22				
Ru-106	3.682E+02	d	4.3E-19	2.2E-20					
Rh-106	2.990E+01	s	4.3E-19	2.2E-20					
Pd-107	6.496E+06	yr	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Ag-108	2.370E+00	m	1.8E-13	1.7E-13	1.1E-13	2.4E-14	8.5E-16	5.1E-16	
Ag-108m	1.270E+02	yr	2.0E-12	1.9E-12	1.3E-12	2.7E-13	9.5E-15	5.7E-15	4.8E-36
Ag-109m	3.960E+01	s	5.2E-25	5.2E-25					
Cd-109	4.640E+02	d	5.2E-25	5.2E-25					
Cd-113m	1.459E+01	yr	1.3E-05	8.1E-06	2.4E-07	3.3E-13	6.5E-26	6.5E-26	
In-115	4.997E+14	yr	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16
Sn-121m	4.997E+01	yr	9.4E-07	8.2E-07	2.9E-07	5.7E-09	1.1E-12	3.0E-13	
Te-123	1.000E+13	yr	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20
Sb-125	2.770E+00	yr	4.4E-09	3.6E-10	3.3E-18				
Te-125m	5.800E+01	d	1.1E-09	8.8E-11	8.0E-19				
Sn-126	1.000E+05	yr	5.4E-06	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.0E-06
Sb-126	1.240E+01	d	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.0E-07
Sb-126m	1.900E+01	m	5.4E-06	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.0E-06
I-129	1.570E+07	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Cs-134	2.062E+00	yr	1.1E-11	3.8E-13	6.0E-24				
Cs-135	2.300E+06	yr	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06
Cs-137	3.000E+01	yr	1.1E-01	8.5E-02	1.5E-02	2.2E-05	1.4E-11	1.6E-12	
Ba-137m	2.552E+00	m	1.0E-01	8.1E-02	1.5E-02	2.1E-05	1.4E-11	1.6E-12	
La-138	1.350E+11	yr	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16
Ce-142	1.049E+11	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Pr-144m	7.200E+00	m							
Nd-144	2.099E+15	yr	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15
Pm-146	5.500E+00	yr	2.4E-09	6.7E-10	6.0E-14	1.7E-29			
Sm-146	7.000E+07	yr	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
Pm-147	2.623E+00	yr	1.2E-07	8.7E-09	2.8E-17				
Sm-147	1.070E+11	yr	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Sm-148	8.001E+15	yr	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18
Sm-149	9.994E+15	yr	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17
Eu-150	3.600E+01	yr	6.9E-11	5.7E-11	1.4E-11	5.7E-14	4.1E-19	6.7E-20	
Sm-151	8.999E+01	yr	7.0E-03	6.5E-03	3.7E-03	4.1E-04	3.6E-06	1.7E-06	
Eu-152	1.360E+01	yr	1.1E-07	6.4E-08	1.5E-09	7.7E-16	1.8E-29	1.8E-29	

Table 10. Calculated radionuclide activities for electrolytic waste in Ci/L for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Gd-152	1.080E+14	yr	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Eu-154	8.600E+00	yr	3.0E-06	1.3E-06	3.4E-09	3.9E-19	1.2E-40		
Eu-155	4.959E+00	yr	2.7E-06	6.8E-07	2.2E-11	1.3E-28			
Ho-166m	1.200E+03	yr	1.1E-10	1.1E-10	1.1E-10	9.1E-11	6.4E-11	6.1E-11	3.6E-13
Tm-171	1.920E+00	yr	1.5E-26	1.5E-26	3.8E-38				
Tl-207	4.770E+00	m	1.7E-09	1.8E-09	1.9E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Tl-208	3.070E+00	m	6.5E-10	5.9E-10	2.9E-10	1.9E-11	1.6E-13	1.3E-13	1.1E-13
Tl-209	2.200E+00	m	5.5E-14	5.7E-14	7.5E-14	2.6E-13	1.3E-12	1.5E-12	8.8E-11
Pb-209	3.300E+00	h	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Pb-210	2.230E+01	yr	3.5E-10	4.4E-10	1.1E-09	4.0E-09	8.7E-09	9.1E-09	2.3E-08
Pb-211	3.610E+01	m	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Pb-212	1.064E+01	h	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Pb-214	2.680E+01	m	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Bi-210m	3.000E+06	yr	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26
Bi-210	5.012E+00	d	3.5E-10	4.4E-10	1.1E-09	4.0E-09	8.7E-09	9.1E-09	2.3E-08
Bi-211	2.130E+00	m	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Bi-212	6.055E+01	m	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Bi-213	4.565E+01	m	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Bi-214	1.990E+01	m	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Po-210	1.384E+02	d	3.5E-10	4.4E-10	1.1E-09	4.0E-09	8.7E-09	9.1E-09	2.3E-08
Po-211	5.600E-01	s	4.7E-12	5.0E-12	5.5E-12	5.6E-12	5.8E-12	5.8E-12	1.1E-11
Po-212	3.000E-07	s	1.2E-09	1.0E-09	5.1E-10	3.4E-11	2.9E-13	2.3E-13	1.9E-13
Po-213	4.200E-06	s	2.5E-12	2.6E-12	3.4E-12	1.2E-11	5.9E-11	6.9E-11	4.0E-09
Po-214	1.643E-04	s	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Po-215	1.780E-03	s	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Po-216	1.500E-01	s	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Po-218	3.050E+00	m	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
At-217	3.230E-02	s	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Rn-219	3.960E+00	s	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Rn-220	5.560E+01	s	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Rn-222	3.824E+00	d	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Fr-221	4.800E+00	m	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Fr-223	2.180E+01	m	2.3E-11	2.4E-11	2.7E-11	2.8E-11	2.8E-11	2.8E-11	5.4E-11
Ra-223	1.143E+01	d	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Ra-224	3.660E+00	d	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Ra-225	1.480E+01	d	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Ra-226	1.600E+03	yr	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Ra-228	6.700E+00	yr	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.4E-16	8.5E-16	1.4E-15
Ac-225	1.000E+01	d	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Ac-227	2.177E+01	yr	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Ac-228	6.131E+00	h	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.4E-16	8.5E-16	1.4E-15
Th-227	1.872E+01	d	1.7E-09	1.7E-09	1.9E-09	2.0E-09	2.0E-09	2.0E-09	3.8E-09
Th-228	1.913E+00	yr	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Th-229	7.339E+03	yr	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Th-230	7.700E+04	yr	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.3E-08
Th-231	2.552E+01	h	5.6E-09	5.6E-09	5.7E-09	6.1E-09	6.9E-09	7.0E-09	1.8E-08
Th-232	1.405E+10	yr	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.4E-16	8.5E-16	1.4E-15
Th-234	2.410E+01	d	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-231	3.277E+04	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Pa-233	2.700E+01	d	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Pa-234m	1.170E+00	m	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-234	6.700E+00	h	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13
U-232	7.200E+01	yr	1.8E-09	1.6E-09	7.8E-10	5.1E-11	4.4E-13	3.6E-13	2.9E-13
U-233	1.585E+05	yr	6.9E-11	8.1E-11	1.7E-10	5.0E-10	1.2E-09	1.3E-09	1.1E-08
U-234	2.445E+05	yr	4.7E-09	5.3E-09	8.5E-09	1.2E-08	1.2E-08	1.2E-08	1.2E-08
U-235	7.038E+08	yr	5.6E-09	5.6E-09	5.7E-09	6.1E-09	6.9E-09	7.0E-09	1.8E-08
U-236	2.341E+07	yr	1.3E-10	1.3E-10	1.6E-10	2.4E-10	4.2E-10	4.5E-10	2.1E-09
U-237	6.750E+00	d	8.6E-12	5.3E-12	1.5E-13	1.7E-19	3.1E-25	3.1E-25	1.5E-25
U-238	4.468E+09	yr	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
U-240	1.410E+01	h	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Np-236	1.150E+05	yr	3.5E-12	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12
Np-237	2.140E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Np-238	2.117E+00	d	1.6E-14	1.5E-14	1.1E-14	3.0E-15	1.8E-16	1.2E-16	2.9E-34
Np-239	2.355E+00	d	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.0E-14	9.9E-15	4.3E-15
Np-240m	7.400E+00	m	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Pu-236	2.851E+00	yr	3.5E-13	3.1E-13	3.1E-13	3.1E-13	3.1E-13	3.1E-13	2.9E-13
Pu-238	8.774E+01	yr	2.2E-05	2.0E-05	1.1E-05	1.2E-06	9.2E-09	4.4E-09	1.2E-31

Table 10. Calculated radionuclide activities for electrolytic waste in Ci/L for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pu-239	2.406E+04	yr	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.1E-03
Pu-240	6.537E+03	yr	1.1E-05	1.1E-05	1.0E-05	1.0E-05	9.5E-06	9.4E-06	3.7E-06
Pu-241	1.440E+01	yr	3.5E-07	2.2E-07	6.2E-09	7.1E-15	1.3E-20	1.3E-20	6.1E-21
Pu-242	3.869E+05	yr	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.5E-13
Pu-244	8.261E+07	yr	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24
Am-241	4.322E+02	yr	2.2E-07	2.2E-07	2.0E-07	1.3E-07	4.7E-08	4.1E-08	2.6E-14
Am-242m	1.520E+02	yr	3.2E-12	3.1E-12	2.2E-12	6.0E-13	3.6E-14	2.4E-14	5.9E-32
Am-242	1.602E+01	h	3.2E-12	3.1E-12	2.2E-12	6.0E-13	3.6E-14	2.4E-14	5.9E-32
Am-243	7.380E+03	yr	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.0E-14	9.9E-15	4.3E-15
Cm-242	1.632E+02	d	2.7E-12	2.5E-12	1.8E-12	5.0E-13	3.0E-14	2.0E-14	4.9E-32
Cm-243	2.850E+01	yr	6.1E-15	4.8E-15	8.0E-16	7.9E-19	2.5E-25	2.5E-25	
Cm-244	1.811E+01	yr	5.6E-16	3.8E-16	2.3E-17	4.3E-22	2.5E-32	2.5E-32	
Cm-245	8.499E+03	yr	1.4E-20	1.4E-20	1.4E-20	1.3E-20	1.3E-20	1.2E-20	6.0E-21
Cm-246	4.731E+03	yr	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24	

Table 11. Calculated element mass for electrolytic waste in g element/L waste for years 1999 through 2022.

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	6.9E-08	6.0E-08	5.7E-08	3.8E-08	3.4E-08	2.7E-08	2.0E-08
He	3.8E-07	4.1E-07	4.2E-07	5.0E-07	5.2E-07	5.6E-07	6.3E-07
Li	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Be	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10
B	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
C	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02
N	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15
O	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24
Ne	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
Na	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13
Mg	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Si	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01
P	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02
S	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02
Cl	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09
Ar	1.3E-17	1.3E-17	1.3E-17	1.4E-17	1.5E-17	1.5E-17	1.6E-17
K	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20
Ca	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Sc	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18
Ti	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05
V	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05
Mn	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Fe	1.3E-08	6.8E-09	5.2E-09	8.0E-10	4.7E-10	1.6E-10	3.3E-11
Co	2.3E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05
Ni	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04
Cu	6.8E-06	7.2E-06	7.4E-06	8.5E-06	8.8E-06	9.4E-06	1.0E-05
Zn	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12
Ga	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11
Ge	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06
As	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06
Se	9.0E-04	9.0E-04	9.0E-04	9.0E-04	9.0E-04	9.0E-04	9.0E-04
Br	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04
Kr	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Rb	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03
Sr	3.6E-03	3.5E-03	3.4E-03	3.2E-03	3.2E-03	3.1E-03	2.9E-03
Y	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03
Zr	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03
Nb	6.6E-08	7.1E-08	7.4E-08	8.8E-08	9.3E-08	1.0E-07	1.1E-07
Mo	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01

Table 11. Calculated element mass for electrolytic waste in g element/L waste for years 1999 through 2022 (continued).

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Tc	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03
Ru	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02
Rh	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Pd	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Ag	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04
Cd	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04
In	6.3E-05	6.3E-05	6.3E-05	6.3E-05	6.3E-05	6.4E-05	6.4E-05
Sn	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04
Sb	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04
Te	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03
I	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Xe	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Cs	1.4E-02	1.4E-02	1.4E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02
Ba	8.6E-03	8.8E-03	8.8E-03	9.2E-03	9.3E-03	9.4E-03	9.7E-03
La	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03
Ce	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Pr	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03
Nd	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02
Pm	7.1E-07	3.7E-07	2.8E-07	4.4E-08	2.6E-08	9.1E-09	1.9E-09
Sm	3.2E-03	3.2E-03	3.2E-03	3.1E-03	3.1E-03	3.1E-03	3.1E-03
Eu	2.9E-04	3.0E-04	3.0E-04	3.2E-04	3.2E-04	3.3E-04	3.5E-04
Gd	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Tb	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06
Dy	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06
Ho	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08
Er	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08
Tm	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14
Yb	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17
Tl	9.2E-18	9.5E-18	9.6E-18	1.0E-17	1.0E-17	1.0E-17	1.1E-17
Pb	2.2E-10	2.2E-10	2.2E-10	2.3E-10	2.4E-10	2.4E-10	2.5E-10
Bi	3.0E-14	3.2E-14	3.3E-14	4.1E-14	4.3E-14	4.7E-14	5.4E-14
Po	2.3E-14	2.6E-14	2.7E-14	3.9E-14	4.1E-14	4.9E-14	6.0E-14
At	1.5E-24	1.5E-24	1.5E-24	1.5E-24	1.5E-24	1.5E-24	1.6E-24
Rn	2.0E-15	2.1E-15	2.2E-15	2.7E-15	2.8E-15	3.1E-15	3.5E-15
Fr	4.4E-19	4.6E-19	4.7E-19	5.2E-19	5.3E-19	5.5E-19	5.8E-19
Ra	3.1E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.8E-10	5.4E-10
Ac	1.7E-11	1.7E-11	1.8E-11	2.0E-11	2.0E-11	2.1E-11	2.2E-11
Th	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
Pa	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.2E-08
U	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
Np	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04
Pu	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.3E-02
Am	5.4E-08	5.5E-08	5.6E-08	5.9E-08	6.0E-08	6.1E-08	6.2E-08
Cm	1.2E-15	1.2E-15	1.2E-15	1.1E-15	1.1E-15	1.1E-15	1.0E-15
Total	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**

Table 12. Calculated element mass for electrolytic waste in g element/L waste for years 2032 through 12000.

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	1.1E-08	6.4E-09	1.0E-10	1.2E-17	1.2E-32	1.2E-32	0.0E+00
He	7.5E-07	8.6E-07	1.7E-06	4.8E-06	1.2E-05	1.3E-05	9.7E-05
Li	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Be	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10
B	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
C	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02
N	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15
O	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24
Ne	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
Na	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13
Mg	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Si	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01
P	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02
S	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02
Cl	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09
Ar	1.8E-17	2.0E-17	3.2E-17	7.9E-17	1.8E-16	2.0E-16	1.6E-15
K	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20
Ca	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Sc	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18
Ti	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05
V	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05
Mn	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Fe	2.3E-12	1.6E-13	4.3E-22	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	2.2E-05	2.2E-05	2.3E-05	2.3E-05	2.4E-05	2.4E-05	3.5E-05
Ni	1.7E-04	1.6E-04	1.6E-04	1.5E-04	1.5E-04	1.5E-04	1.4E-04
Cu	1.2E-05	1.3E-05	2.0E-05	2.8E-05	2.9E-05	2.9E-05	2.9E-05
Zn	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12
Ga	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11
Ge	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06
As	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06
Se	9.0E-04	9.0E-04	9.0E-04	8.9E-04	8.9E-04	8.9E-04	8.4E-04
Br	1.2E-04	1.2E-04	1.2E-04	1.3E-04	1.3E-04	1.3E-04	1.9E-04
Kr	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Rb	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03
Sr	2.8E-03	2.6E-03	2.2E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03
Y	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03
Zr	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03
Nb	1.4E-07	1.6E-07	3.1E-07	9.1E-07	2.2E-06	2.4E-06	1.9E-05
Mo	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01
Tc	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.5E-03
Ru	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02
Rh	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Pd	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Ag	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04
Cd	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04
In	6.4E-05	6.4E-05	6.4E-05	6.4E-05	6.4E-05	6.4E-05	6.4E-05
Sn	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.8E-04
Sb	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04
Te	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03
I	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Xe	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Cs	1.2E-02	1.2E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Ba	1.0E-02	1.0E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
La	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03
Ce	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Pr	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03
Nd	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02
Pm	1.4E-10	1.1E-11	1.3E-16	3.8E-32	0.0E+00	0.0E+00	0.0E+00
Sm	3.1E-03	3.1E-03	3.0E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03

Table 12. Calculated element mass for electrolytic waste in g element/L waste for years 2032 through 12000 (continued).

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Eu	3.7E-04	3.9E-04	4.9E-04	6.2E-04	6.3E-04	6.3E-04	6.3E-04
Gd	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Tb	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06
Dy	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06
Ho	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08
Er	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08
Tm	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14
Yb	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17
Tl	1.1E-17	1.1E-17	1.1E-17	1.1E-17	1.1E-17	1.1E-17	2.1E-17
Pb	2.8E-10	2.9E-10	4.2E-10	1.0E-09	3.1E-09	3.5E-09	8.4E-08
Bi	6.4E-14	7.6E-14	1.7E-13	1.0E-12	9.3E-12	1.2E-11	5.9E-09
Po	7.9E-14	9.8E-14	2.6E-13	9.0E-13	1.9E-12	2.0E-12	5.1E-12
At	1.6E-24	1.6E-24	2.2E-24	7.6E-24	3.7E-23	4.4E-23	2.5E-21
Rn	4.1E-15	4.8E-15	9.5E-15	2.6E-14	5.6E-14	6.0E-14	1.5E-13
Fr	6.2E-19	6.4E-19	7.2E-19	7.8E-19	1.1E-18	1.1E-18	2.4E-17
Ra	6.4E-10	7.4E-10	1.5E-09	4.1E-09	8.8E-09	9.4E-09	2.3E-08
Ac	2.3E-11	2.4E-11	2.7E-11	2.8E-11	2.8E-11	2.8E-11	5.4E-11
Th	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
Pa	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.4E-08	4.4E-08	8.3E-08
U	2.8E-03	2.8E-03	2.9E-03	3.0E-03	3.4E-03	3.5E-03	8.5E-03
Np	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04
Pu	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.2E-02	2.2E-02	1.7E-02
Am	6.3E-08	6.4E-08	5.8E-08	3.7E-08	1.4E-08	1.2E-08	2.9E-14
Cm	9.3E-16	8.7E-16	5.7E-16	1.5E-16	9.1E-18	6.0E-18	3.5E-20
Total	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**

4. Sodium-Bearing Waste

The calculations for sodium-bearing waste (SBW) (Wenzel 1997b), like those for coprocessing waste, did not include structural materials and activation products other than Fe-55 and Ni-63. The first thing done was to add the structural materials and activation products to the calculations. The calculations began by modifying the Fortran program REDUCDE97 (Wenzel 1997b, Attachment B, page 1). It was converted to Fortran 90 and revised to calculate all of the nuclides, including structural materials. The revised program was renamed REDUCESB. A copy of the source list for program REDUCESB is presented in Appendix D-1.

As noted in Wenzel (1997b), SBW is a mixture of aluminum, zirconium, and electrolytic wastes. Program REDUCESB, like the older program REDUCE97, reads data from a number of ORIGEN2 runs. A copy of the input and output for each of the modified ORIGEN2 runs is presented in Appendix D-2. The OPT lines were changed to request output in grams. Structural materials were also added to the runs for zirconium waste, as described in Section 5 of this EDF.

Program REDUCESB uses the file called MASTER_A to identify the nuclides desired in the output. A copy of the list of nuclides in file MASTER_A is presented in Appendix B-3, page 5. The output from REDUCESB is called REDUCESB.OUT and is presented in Appendix D-3. Unlike the old program, REDUCE97, the output from REDUCESB is in g/L rather than mCi/L.

A new Fortran 90 program called EXTRACTS was written to convert the output from program REDUCESB to a format that can be easily converted to the input format for the ORIGEN2 code. Program EXTRACTS also combines the nuclide mass when there are multiple entries in REDUCESB.OUT for the same nuclide. Finally, program EXTRACTS changes the calculated mass of those nuclides measured by analytical methods (Wenzel 1997b, Attachment G). The source list for program EXTRACTS is presented on pages 1–3 of Appendix D-4. Program EXTRACTS used a file called MASTER_E. A copy of file MASTER_E is presented on pages 4–11 of Appendix B-4. The output from EXTRACTS (EXTRACTS.OUT) is presented on pages 4–11 of Appendix D-4.

The next step in the calculations was to modify ORIGEN2 run SBWDECAY (Wenzel 1997b, Attachment G, page 1). As before, the updated ORIGEN2 calculations were broken into two separate runs. The first run is called SBW_RUN1 and calculates the nuclides decayed between the years 1999 and 2022. The input file (SBW_RUN1.INP) is presented in Appendix D-5, pages 1–3. The associated BAT file is also presented in Appendix D-5, page 4. The summarized ORIGEN2 output for the activity of the radionuclides is called SBW_RUN1.CI and is presented in Appendix D-5, pages 4–7. Fortran program ROUNDSB1 was used to format the data in output file SBW_RUN1.CI and to round the results to two places of accuracy. The source list for ROUNDSB1 is presented in Appendix D-6, pages 1–3. Program ROUNDSB1 uses file MASTER to identify the radionuclides, their half-lives, and their order to be included in the output file. A copy of file MASTER is presented in Appendix A-2, pages 4–7. The output from program ROUNDSB1 is called ROUNDSB1.OUT and is presented in Appendix D-6, pages 4–6.

A change was made to ORIGEN2 runs SBW_RUN1 and SBW_RUN2 to revise the amount of I-129 present, based on calculations made subsequent to Wenzel 1997b. The analytical results originally reported for I-129 were less-than values rather than actual measured values. Subsequent calculations (Wenzel 1999b) revised the activity of I-129 from 1.0E-5 Ci/L to 6.6E-8 Ci/L.

The output of ORIGEN2 run SBW_RUN1 was also requested for the mass of the nuclides present. The output for the mass of the nuclides is called SBW_RUN1.G and is presented in Appendix D-7. A Fortran 90 program called ELESBW1 was written to sum the mass of each isotope of the different elements, normalize the mass to g/L of liquid waste, and to round the output to two places of accuracy.

The source list for ELESBW1 is presented in Appendix D-8, pages 1–3. ELESBW1 uses the file called SYMBOL, which identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELESBW1 is called SBW_RUN1.ELE and is presented in Appendix D-8, pages 4–5.

The second ORIGEN2 run, called SBW_RUN2, calculates the nuclides decayed between the years 2032 and 12000. The input file (SBW_RUN2.INP) is presented in Appendix D-9, pages 1–3. The associated BAT file is also presented in Appendix D-9, page 4. The summarized ORIGEN2 output for the activity of the radionuclides is called SBW_RUN2.CI and is presented in Appendix D-9, pages 5–7. Fortran program ROUNDSB2 was used to format the data in output file SBW_RUN2.CI and to round the results to two places of accuracy. The source list for ROUNDSB2 is presented in Appendix D-10, pages 1–3. The output from program ROUNDSB2 is called ROUNDSB2.OUT and is presented in Appendix D-10, pages 4–6.

The output of ORIGEN2 run SBW_RUN2 for the mass of the nuclides is called SBW_RUN2.G and is presented in Appendix D-11. A Fortran 90 program called ELESBW2 was written to sum the mass of each isotope of the different elements, normalize the mass to g/L of liquid electrolytic waste, and to round the output to two places of accuracy. The source list for ELESBW2 is presented in Appendix D-12, pages 1–3. ELESBW2 uses the file called SYMBOL, which identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELESBW2 is called SBW_RUN2.ELE and is presented in Appendix D-12, pages 4-5.

Tables 13 and 14 present the calculated radionuclide activities for the requested decay times. As in the original calculations, the results are expressed in Ci/. Tables 15 and 16 present the calculated mass of each element as a function of decay time for elements present in the waste that come from fission only.

Table 13. Calculated radionuclide activities for sodium-bearing waste in Ci/L for years 1999 through 2022.

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	1.7E-05	1.4E-05	1.4E-05	9.2E-06	8.2E-06	6.6E-06	4.7E-06
Be-10	1.600E+06	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
C-14	5.729E+03	yr	1.5E-10	1.5E-10	1.5E-10	1.5E-10	1.5E-10	1.5E-10	1.5E-10
Ca-45	1.630E+02	d	2.6E-21	4.5E-24	4.5E-24	8.5E-29	8.5E-29	8.5E-29	7.6E-33
V-50	4.000E+16	yr	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21
Mn-54	3.125E+02	d	5.0E-11	6.7E-12	3.0E-12	1.0E-14	2.0E-15	7.9E-17	6.1E-19
Fe-55	2.600E+00	yr	5.5E-06	2.8E-06	2.2E-06	3.3E-07	2.0E-07	6.7E-08	1.4E-08
Ni-59	8.000E+04	yr	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07
Co-60	5.270E+00	yr	7.1E-05	5.1E-05	4.5E-05	1.8E-05	1.4E-05	8.1E-06	3.7E-06
Ni-63	9.200E+01	yr	4.0E-05	3.9E-05	3.9E-05	3.7E-05	3.7E-05	3.5E-05	3.4E-05
Se-79	6.496E+04	yr	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07
Rb-87	4.696E+10	yr	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11
Sr-90	2.912E+01	yr	6.9E-02	6.5E-02	6.4E-02	5.4E-02	5.1E-02	4.7E-02	4.0E-02
Y-90	6.400E+01	h	6.9E-02	6.5E-02	6.4E-02	5.4E-02	5.1E-02	4.7E-02	4.0E-02
Zr-93	1.530E+06	yr	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06
Nb-93m	1.360E+01	yr	2.0E-06	2.1E-06	2.1E-06	2.3E-06	2.3E-06	2.3E-06	2.4E-06
Nb-94	2.030E+04	yr	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06
Tc-98	4.199E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Tc-99	2.130E+05	yr	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
Ru-102	1.059E+03	d	2.5E-09	1.4E-09	1.1E-09	2.0E-10	1.2E-10	4.8E-11	1.1E-11
Ru-106	3.682E+02	d	1.3E-05	2.3E-06	1.2E-06	9.3E-09	2.4E-09	1.5E-10	2.4E-12
Rh-106	2.990E+01	s	1.3E-05	2.3E-06	1.2E-06	9.3E-09	2.4E-09	1.5E-10	2.4E-12
Pd-107	6.496E+06	yr	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Ag-108	2.370E+00	m	4.8E-14	4.7E-14	4.7E-14	4.5E-14	4.5E-14	4.4E-14	4.2E-14
Ag-108m	1.270E+02	yr	5.4E-13	5.3E-13	5.3E-13	5.1E-13	5.0E-13	4.9E-13	4.8E-13
Ag-109m	3.960E+01	s	1.1E-15	2.7E-16	1.6E-16	3.5E-18	1.2E-18	1.3E-19	5.0E-21
Cd-109	4.640E+02	d	1.1E-15	2.7E-16	1.6E-16	3.5E-18	1.2E-18	1.3E-19	4.9E-21
Ag-110	2.460E+01	s	1.4E-14	1.1E-15	4.0E-16	3.4E-19	4.4E-20	7.7E-22	2.1E-24
Ag-110m	2.499E+02	d	1.1E-12	8.4E-14	3.0E-14	2.5E-17	3.3E-18	5.8E-20	1.6E-22

Table 13. Calculated radionuclide activities for sodium-bearing waste in Ci/L for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Cd-113m	1.459E+01	yr	4.9E-06	4.3E-06	4.1E-06	2.9E-06	2.7E-06	2.2E-06	1.7E-06
In-115	4.997E+14	yr	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16
Sn-119m	2.450E+02	d	2.3E-13	1.7E-14	6.2E-15	4.5E-18	5.7E-19	9.1E-21	
Sn-121m	4.997E+01	yr	8.7E-08	8.4E-08	8.3E-08	7.5E-08	7.3E-08	6.9E-08	6.4E-08
Te-123	1.000E+13	yr	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19
Sb-125	2.770E+00	yr	3.8E-05	2.1E-05	1.6E-05	2.8E-06	1.7E-06	6.2E-07	1.4E-07
Te-125m	5.800E+01	d	9.3E-06	5.0E-06	3.9E-06	6.8E-07	4.1E-07	1.5E-07	3.4E-08
Sn-126	1.000E+05	yr	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07
Sb-126	1.240E+01	d	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08
Sb-126m	1.900E+01	m	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07
I-129	1.570E+07	yr	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08
Cs-134	2.062E+00	yr	8.4E-05	3.6E-05	2.6E-05	2.5E-06	1.3E-06	3.3E-07	4.3E-08
Cs-135	2.300E+06	yr	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Cs-137	3.000E+01	yr	6.8E-02	6.4E-02	6.2E-02	5.3E-02	5.1E-02	4.6E-02	4.0E-02
Ba-137m	2.552E+00	m	6.4E-02	6.0E-02	5.9E-02	5.0E-02	4.8E-02	4.4E-02	3.8E-02
La-138	1.350E+11	yr	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16
Ce-142	1.049E+11	yr	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11
Ce-144	2.843E+02	d	1.8E-05	1.9E-06	7.8E-07	1.5E-09	2.6E-10	7.3E-12	3.5E-14
Pr-144	1.728E+01	m	1.8E-05	1.9E-06	7.8E-07	1.5E-09	2.6E-10	7.3E-12	3.5E-14
Pr-144m	7.200E+00	m	2.1E-07	2.3E-08	9.3E-09	1.8E-11	3.1E-12	8.7E-14	4.2E-16
Nd-144	2.099E+15	yr	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15
Pm-146	5.500E+00	yr	9.8E-08	7.1E-08	6.3E-08	2.6E-08	2.0E-08	1.2E-08	5.7E-09
Sm-146	7.000E+07	yr	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13
Pm-147	2.623E+00	yr	5.3E-04	2.7E-04	2.1E-04	3.3E-05	2.0E-05	6.8E-06	1.4E-06
Sm-147	1.070E+11	yr	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12
Sm-148	8.001E+15	yr	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17
Sm-149	9.994E+15	yr	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18
Eu-150	3.600E+01	yr	1.9E-11	1.8E-11	1.8E-11	1.6E-11	1.5E-11	1.4E-11	1.2E-11
Sm-151	8.999E+01	yr	4.3E-04	4.2E-04	4.2E-04	3.9E-04	3.9E-04	3.8E-04	3.6E-04
Eu-152	1.360E+01	yr	3.7E-06	3.3E-06	3.1E-06	2.2E-06	2.0E-06	1.6E-06	1.2E-06
Gd-152	1.080E+14	yr	1.7E-18	1.8E-18	1.8E-18	1.8E-18	1.8E-18	1.8E-18	1.8E-18
Gd-153	2.420E+02	d	3.6E-14	2.6E-15	9.2E-16	6.1E-19	7.5E-20	1.1E-21	
Eu-154	8.600E+00	yr	2.6E-04	2.2E-04	2.0E-04	1.1E-04	9.6E-05	7.0E-05	4.3E-05
Eu-155	4.959E+00	yr	3.3E-04	2.3E-04	2.0E-04	7.6E-05	5.8E-05	3.3E-05	1.4E-05
Ho-166m	1.200E+03	yr	5.7E-11	5.7E-11	5.7E-11	5.7E-11	5.7E-11	5.7E-11	5.6E-11
Tm-171	1.920E+00	yr	2.2E-15	8.9E-16	6.2E-16	5.0E-17	2.4E-17	5.7E-18	6.5E-19
Lu-176	3.000E+10	yr	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16
Lu-177	6.709E+00	d	3.9E-21	6.5E-23	1.0E-23				
Hf-182	9.000E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Ta-182	1.150E+02	d	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Re-187	5.000E+10	yr	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21
Tl-207	4.770E+00	m	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Tl-208	3.070E+00	m	2.8E-09	1.7E-09	1.4E-09	9.2E-10	8.9E-10	8.5E-10	8.0E-10
Tl-209	2.200E+00	m	4.6E-15	4.9E-15	5.1E-15	7.3E-15	8.2E-15	1.0E-14	1.5E-14
Pb-209	3.300E+00	h	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Pb-210	2.230E+01	yr	2.7E-12	3.2E-12	3.4E-12	5.0E-12	5.6E-12	6.7E-12	8.5E-12
Pb-211	3.610E+01	m	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Pb-212	1.064E+01	h	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Pb-214	2.680E+01	m	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Bi-210m	3.000E+06	yr	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25
Bi-210	5.012E+00	d	2.7E-12	3.2E-12	3.4E-12	5.0E-12	5.6E-12	6.7E-12	8.6E-12
Bi-211	2.130E+00	m	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Bi-212	6.055E+01	m	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Bi-213	4.565E+01	m	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Bi-214	1.990E+01	m	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Po-210	1.384E+02	d	2.6E-12	3.1E-12	3.3E-12	5.0E-12	5.4E-12	6.7E-12	8.6E-12
Po-211	5.600E-01	s	1.1E-13	1.3E-13	1.3E-13	1.7E-13	1.8E-13	2.0E-13	2.2E-13
Po-212	3.000E-07	s	5.1E-09	3.0E-09	2.5E-09	1.6E-09	1.6E-09	1.5E-09	1.4E-09
Po-213	4.200E-06	s	2.1E-13	2.2E-13	2.3E-13	3.3E-13	3.7E-13	4.7E-13	6.7E-13
Po-214	1.643E-04	s	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Po-215	1.780E-03	s	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Po-216	1.500E-01	s	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Po-218	3.050E+00	m	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
At-217	3.230E-02	s	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Rn-219	3.960E+00	s	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Rn-220	5.560E+01	s	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09

Table 13. Calculated radionuclide activities for sodium-bearing waste in Ci/L for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Rn-222	3.824E+00	d	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Fr-221	4.800E+00	m	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Fr-223	2.180E+01	m	5.6E-13	6.3E-13	6.6E-13	8.4E-13	8.8E-13	9.7E-13	1.1E-12
Ra-223	1.143E+01	d	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Ra-224	3.660E+00	d	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Ra-225	1.480E+01	d	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Ra-226	1.600E+03	yr	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Ra-228	6.700E+00	yr	5.7E-16	6.4E-16	6.6E-16	7.8E-16	8.0E-16	8.3E-16	8.7E-16
Ac-225	1.000E+01	d	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Ac-227	2.177E+01	yr	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Ac-228	6.131E+00	h	5.7E-16	6.4E-16	6.6E-16	7.8E-16	8.0E-16	8.3E-16	8.7E-16
Th-227	1.872E+01	d	4.0E-11	4.5E-11	4.7E-11	6.0E-11	6.3E-11	6.9E-11	7.8E-11
Th-228	1.913E+00	yr	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Th-229	7.339E+03	yr	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Th-230	7.700E+04	yr	9.9E-10	1.0E-09	1.0E-09	1.1E-09	1.1E-09	1.1E-09	1.2E-09
Th-231	2.552E+01	h	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Th-232	1.405E+10	yr	8.7E-16	8.7E-16	8.8E-16	8.9E-16	8.9E-16	9.0E-16	9.1E-16
Th-234	2.410E+01	d	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-231	3.277E+04	yr	1.1E-10	1.1E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.2E-10
Pa-233	2.700E+01	d	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Pa-234m	1.170E+00	m	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-234	6.700E+00	h	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11
U-232	7.200E+01	yr	2.4E-09	2.4E-09	2.5E-09	2.4E-09	2.4E-09	2.3E-09	2.2E-09
U-233	1.585E+05	yr	4.0E-11	8.1E-11	9.9E-11	2.1E-10	2.4E-10	3.1E-10	4.0E-10
U-234	2.445E+05	yr	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06
U-235	7.038E+08	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
U-236	2.341E+07	yr	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.1E-08
U-237	6.750E+00	d	9.4E-09	8.4E-09	8.0E-09	5.7E-09	5.2E-09	4.3E-09	3.2E-09
U-238	4.468E+09	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
U-240	1.410E+01	h	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Np-236	1.150E+05	yr	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12
Np-237	2.140E+06	yr	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Np-238	2.117E+00	d	9.6E-11	9.4E-11	9.4E-11	9.1E-11	9.0E-11	8.9E-11	8.6E-11
Np-239	2.355E+00	d	2.7E-08	2.7E-08	2.7E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Np-240m	7.400E+00	m	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Pu-236	2.851E+00	yr	7.9E-09	4.3E-09	3.4E-09	6.2E-10	3.8E-10	1.4E-10	3.4E-11
Pu-238	8.774E+01	yr	4.8E-04	4.7E-04	4.7E-04	4.4E-04	4.4E-04	4.2E-04	4.0E-04
Pu-239	2.406E+04	yr	6.7E-05	6.7E-05	6.7E-05	6.7E-05	6.7E-05	6.7E-05	6.7E-05
Pu-240	6.537E+03	yr	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
Pu-241	1.440E+01	yr	3.8E-04	3.4E-04	3.2E-04	2.3E-04	2.1E-04	1.7E-04	1.3E-04
Pu-242	3.869E+05	yr	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09
Pu-243	4.956E+00	h	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Pu-244	8.261E+07	yr	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Am-241	4.322E+02	yr	6.0E-05	6.1E-05	6.2E-05	6.4E-05	6.5E-05	6.6E-05	6.6E-05
Am-242m	1.520E+02	yr	1.9E-08	1.9E-08	1.9E-08	1.8E-08	1.8E-08	1.8E-08	1.7E-08
Am-242	1.602E+01	h	1.9E-08	1.9E-08	1.9E-08	1.8E-08	1.8E-08	1.8E-08	1.7E-08
Am-243	7.380E+03	yr	2.7E-08	2.7E-08	2.7E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Cm-242	1.632E+02	d	1.6E-08	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.5E-08	1.4E-08
Cm-243	2.850E+01	yr	3.8E-08	3.6E-08	3.5E-08	3.0E-08	2.8E-08	2.6E-08	2.2E-08
Cm-244	1.811E+01	yr	2.5E-06	2.3E-06	2.2E-06	1.7E-06	1.5E-06	1.3E-06	1.1E-06
Cm-245	8.499E+03	yr	3.7E-10	3.7E-10	3.7E-10	3.7E-10	3.7E-10	3.7E-10	3.7E-10
Cm-246	4.731E+03	yr	2.4E-11	2.4E-11	2.4E-11	2.4E-11	2.4E-11	2.4E-11	2.4E-11
Cm-247	1.560E+07	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Cm-248	3.391E+05	yr	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17
Cf-249	3.505E+02	yr	2.2E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17
Cf-250	1.308E+01	yr	2.1E-17	1.8E-17	1.7E-17	1.2E-17	1.1E-17	8.8E-18	6.4E-18
Cf-251	8.980E+02	yr	3.4E-19	3.4E-19	3.4E-19	3.3E-19	3.3E-19	3.3E-19	3.3E-19
Cf-252	2.638E+00	yr	1.2E-19	6.0E-20	4.6E-20	7.3E-21	4.3E-21	1.5E-21	3.2E-22

Table 14. Calculated radionuclide activities for sodium-bearing waste in Ci/L for years 2032 through 12000.

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	2.7E-06	1.5E-06	2.4E-08	2.9E-15	2.8E-30	2.8E-30	
Be-10	1.600E+06	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
C-14	5.729E+03	yr	1.5E-10	1.5E-10	1.5E-10	1.4E-10	1.3E-10	1.3E-10	4.4E-11
V-50	4.000E+16	yr	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21
Mn-54	3.125E+02	d	1.9E-22	5.6E-26					
Fe-55	2.600E+00	yr	9.4E-10	6.6E-11	1.8E-19				
Ni-59	8.000E+04	yr	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.5E-07
Co-60	5.270E+00	yr	9.9E-07	2.7E-07	1.6E-11	9.4E-28			
Ni-63	9.200E+01	yr	3.1E-05	2.9E-05	1.7E-05	2.0E-06	1.9E-08	9.3E-09	
Se-79	6.496E+04	yr	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.3E-07	5.3E-07	4.9E-07
Rb-87	4.696E+10	yr	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11
Sr-90	2.912E+01	yr	3.2E-02	2.5E-02	4.3E-03	5.0E-06	2.1E-12	2.3E-13	
Y-90	6.400E+01	h	3.2E-02	2.5E-02	4.3E-03	5.0E-06	2.1E-12	2.3E-13	
Zr-93	1.530E+06	yr	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06
Nb-93m	1.360E+01	yr	2.5E-06	2.5E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06
Nb-94	2.030E+04	yr	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.0E-06
Tc-98	4.199E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Tc-99	2.130E+05	yr	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
Rh-102	1.059E+03	d	1.0E-12	9.5E-14	2.0E-21				
Pd-107	6.496E+06	yr	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Ag-108	2.370E+00	m	4.0E-14	3.8E-14	2.5E-14	5.4E-15	1.9E-16	1.1E-16	1.1E-37
Ag-108m	1.270E+02	yr	4.5E-13	4.3E-13	2.8E-13	6.0E-14	2.1E-15	1.3E-15	1.1E-36
Ag-109m	3.960E+01	s	2.1E-23	9.3E-24					
Cd-109	4.640E+02	d	2.1E-23	9.3E-24	2.7E-41				
Ag-110	2.460E+01	s	7.0E-29	2.8E-33					
Ag-110m	2.499E+02	d	5.3E-27	2.1E-31					
Cd-113m	1.459E+01	yr	1.0E-06	6.4E-07	1.9E-08	2.6E-14	5.1E-27	5.1E-27	
In-115	4.997E+14	yr	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16
Sn-121m	4.997E+01	yr	5.5E-08	4.8E-08	1.7E-08	3.4E-10	6.5E-14	1.8E-14	
Te-123	1.000E+13	yr	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19
Sb-125	2.770E+00	yr	1.1E-08	9.2E-10	8.4E-18				
Te-125m	5.800E+01	d	2.7E-09	2.2E-10	2.0E-18				
Sn-126	1.000E+05	yr	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.0E-07	5.0E-07	4.7E-07
Sb-126	1.240E+01	d	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	6.6E-08
Sb-126m	1.900E+01	m	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.0E-07	5.0E-07	4.7E-07
I-129	1.570E+07	yr	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08
Cs-134	2.062E+00	yr	1.5E-09	5.2E-11	8.2E-22				
Cs-135	2.300E+06	yr	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Cs-137	3.000E+01	yr	3.2E-02	2.5E-02	4.6E-03	6.4E-06	4.2E-12	4.8E-13	
Ba-137m	2.552E+00	m	3.0E-02	2.4E-02	4.3E-03	6.1E-06	4.0E-12	4.6E-13	
La-138	1.350E+11	yr	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16
Ce-142	1.049E+11	yr	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11
Ce-144	2.843E+02	d	4.7E-18	6.4E-22					
Pr-144	1.728E+01	m	4.7E-18	6.4E-22					
Pr-144m	7.200E+00	m	5.6E-20	7.6E-24					
Nd-144	2.099E+15	yr	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15
Pm-146	5.500E+00	yr	1.6E-09	4.6E-10	4.1E-14	1.2E-29			
Sm-146	7.000E+07	yr	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13
Pm-147	2.623E+00	yr	9.9E-08	7.1E-09	2.3E-17				
Sm-147	1.070E+11	yr	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12
Sm-148	8.001E+15	yr	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17
Sm-149	9.994E+15	yr	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18
Eu-150	3.600E+01	yr	1.0E-11	8.4E-12	2.0E-12	8.5E-15	6.0E-20	9.8E-21	
Sm-151	8.999E+01	yr	3.3E-04	3.1E-04	1.7E-04	2.0E-05	1.7E-07	8.2E-08	
Eu-152	1.360E+01	yr	7.1E-07	4.3E-07	9.8E-09	5.1E-15	1.2E-28	1.2E-28	
Gd-152	1.080E+14	yr	1.8E-18	1.9E-18	1.9E-18	1.9E-18	1.9E-18	1.9E-18	1.9E-18
Eu-154	8.600E+00	yr	1.9E-05	8.6E-06	2.2E-08	2.5E-18	6.9E-40	3.5E-43	
Eu-155	4.959E+00	yr	3.5E-06	8.7E-07	2.8E-11	1.6E-28			
Ho-166m	1.200E+03	yr	5.6E-11	5.6E-11	5.3E-11	4.5E-11	3.2E-11	3.0E-11	1.8E-13
Tm-171	1.920E+00	yr	1.8E-20	4.7E-22	1.2E-33				
Lu-176	3.000E+10	yr	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16
Hf-182	9.000E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Ta-182	1.150E+02	d	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Re-187	5.000E+10	yr	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21
Tl-207	4.770E+00	m	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Tl-208	3.070E+00	m	7.3E-10	6.6E-10	3.2E-10	2.1E-11	6.9E-14	3.6E-14	2.0E-14
Tl-209	2.200E+00	m	2.4E-14	3.7E-14	2.3E-13	2.6E-12	1.6E-11	1.9E-11	1.2E-09

Table 14. Calculated radionuclide activities for sodium-bearing waste in Ci/L for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.300E+00	h	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Pb-210	2.230E+01	yr	1.2E-11	1.6E-11	6.0E-11	4.9E-10	2.3E-09	2.6E-09	7.8E-08
Pb-211	3.610E+01	m	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Pb-212	1.064E+01	h	2.0E-09	1.8E-09	9.0E-10	5.8E-11	1.9E-13	1.0E-13	5.5E-14
Pb-214	2.680E+01	m	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Bi-210m	3.000E+06	yr	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25
Bi-210	5.012E+00	d	1.2E-11	1.6E-11	6.0E-11	4.9E-10	2.3E-09	2.6E-09	7.8E-08
Bi-211	2.130E+00	m	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Bi-212	6.055E+01	m	2.0E-09	1.8E-09	9.0E-10	5.8E-11	1.9E-13	1.0E-13	5.5E-14
Bi-213	4.565E+01	m	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Bi-214	1.990E+01	m	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Po-210	1.384E+02	d	1.2E-11	1.6E-11	6.0E-11	4.9E-10	2.3E-09	2.6E-09	7.8E-08
Po-211	5.600E-01	s	2.6E-13	2.8E-13	4.3E-13	9.2E-13	1.8E-12	1.9E-12	1.4E-11
Po-212	3.000E-07	s	1.3E-09	1.2E-09	5.8E-10	3.7E-11	1.2E-13	6.4E-14	3.5E-14
Po-213	4.200E-06	s	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.4E-10	8.8E-10	5.4E-08
Po-214	1.643E-04	s	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Po-215	1.780E-03	s	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Po-216	1.500E-01	s	2.0E-09	1.8E-09	9.0E-10	5.8E-11	1.9E-13	1.0E-13	5.5E-14
Po-218	3.050E+00	m	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
At-217	3.230E-02	s	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Rn-219	3.960E+00	s	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Rn-220	5.560E+01	s	2.0E-09	1.8E-09	9.0E-10	5.8E-11	1.9E-13	1.0E-13	5.5E-14
Rn-222	3.824E+00	d	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Fr-221	4.800E+00	m	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Fr-223	2.180E+01	m	1.3E-12	1.4E-12	2.1E-12	4.5E-12	9.1E-12	9.6E-12	7.0E-11
Ra-223	1.143E+01	d	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Ra-224	3.660E+00	d	2.0E-09	1.8E-09	9.0E-10	5.8E-11	1.9E-13	1.0E-13	5.5E-14
Ra-225	1.480E+01	d	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Ra-226	1.600E+03	yr	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Ra-228	6.700E+00	yr	9.1E-16	9.3E-16	1.1E-15	1.7E-15	2.9E-15	3.1E-15	2.2E-14
Ac-225	1.000E+01	d	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Ac-227	2.177E+01	yr	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Ac-228	6.131E+00	h	9.1E-16	9.3E-16	1.1E-15	1.7E-15	2.9E-15	3.1E-15	2.2E-14
Th-227	1.872E+01	d	9.0E-11	1.0E-10	1.5E-10	3.2E-10	6.5E-10	6.8E-10	5.0E-09
Th-228	1.913E+00	yr	2.0E-09	1.8E-09	9.0E-10	5.8E-11	1.9E-13	1.0E-13	5.5E-14
Th-229	7.339E+03	yr	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Th-230	7.700E+04	yr	1.3E-09	1.4E-09	2.1E-09	5.0E-09	1.1E-08	1.2E-08	1.0E-07
Th-231	2.552E+01	h	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.7E-08
Th-232	1.405E+10	yr	9.4E-16	9.6E-16	1.1E-15	1.7E-15	2.9E-15	3.1E-15	2.2E-14
Th-234	2.410E+01	d	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-231	3.277E+04	yr	1.3E-10	1.3E-10	1.7E-10	3.3E-10	6.6E-10	7.1E-10	5.1E-09
Pa-233	2.700E+01	d	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Pa-234m	1.170E+00	m	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-234	6.700E+00	h	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11
U-232	7.200E+01	yr	2.0E-09	1.8E-09	8.8E-10	5.7E-11	1.9E-13	9.5E-14	3.3E-14
U-233	1.585E+05	yr	5.5E-10	7.1E-10	1.9E-09	6.4E-09	1.6E-08	1.8E-08	1.6E-07
U-234	2.445E+05	yr	1.0E-06	1.0E-06	1.1E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06
U-235	7.038E+08	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.7E-08
U-236	2.341E+07	yr	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.2E-08	4.2E-08	4.4E-08
U-237	6.750E+00	d	2.0E-09	1.2E-09	3.5E-11	8.8E-15	8.3E-15	8.3E-15	4.0E-15
U-238	4.468E+09	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
U-240	1.410E+01	h	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Np-236	1.150E+05	yr	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.6E-12
Np-237	2.140E+06	yr	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Np-238	2.117E+00	d	8.2E-11	7.9E-11	5.6E-11	1.5E-11	9.3E-13	6.0E-13	1.5E-30
Np-239	2.355E+00	d	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.4E-08	2.4E-08	1.0E-08
Np-240m	7.400E+00	m	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Pu-236	2.851E+00	yr	3.0E-12	2.9E-13	3.5E-14	3.5E-14	3.4E-14	3.4E-14	3.3E-14
Pu-238	8.774E+01	yr	3.7E-04	3.4E-04	1.9E-04	2.0E-05	1.6E-07	7.5E-08	5.9E-28
Pu-239	2.406E+04	yr	6.7E-05	6.7E-05	6.7E-05	6.6E-05	6.5E-05	6.5E-05	5.0E-05
Pu-240	6.537E+03	yr	1.3E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05	1.1E-05	4.3E-06
Pu-241	1.440E+01	yr	8.0E-05	5.0E-05	1.4E-06	3.6E-10	3.4E-10	3.4E-10	1.6E-10
Pu-242	3.869E+05	yr	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.6E-09
Pu-243	4.956E+00	h	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Pu-244	8.261E+07	yr	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Am-241	4.322E+02	yr	6.7E-05	6.7E-05	6.1E-05	3.9E-05	1.4E-05	1.2E-05	1.7E-10
Am-242m	1.520E+02	yr	1.6E-08	1.6E-08	1.1E-08	3.1E-09	1.9E-10	1.2E-10	3.0E-28

Table 14. Calculated radionuclide activities for sodium-bearing waste in Ci/L for years 2032 through (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Am-242	1.602E+01	h	1.6E-08	1.6E-08	1.1E-08	3.1E-09	1.8E-10	1.2E-10	3.0E-28
Am-243	7.380E+03	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.4E-08	2.4E-08	1.0E-08
Cm-242	1.632E+02	d	1.4E-08	1.3E-08	9.2E-09	2.5E-09	1.5E-10	9.9E-11	2.5E-28
Cm-243	2.850E+01	yr	1.7E-08	1.4E-08	2.3E-09	2.2E-12	7.0E-19	7.1E-20	
Cm-244	1.811E+01	yr	7.2E-07	4.9E-07	2.9E-08	5.5E-13	3.2E-23	1.7E-24	
Cm-245	8.499E+03	yr	3.7E-10	3.7E-10	3.7E-10	3.6E-10	3.4E-10	3.4E-10	1.6E-10
Cm-246	4.731E+03	yr	2.4E-11	2.4E-11	2.4E-11	2.3E-11	2.1E-11	2.1E-11	5.6E-12
Cm-247	1.560E+07	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Cm-248	3.391E+05	yr	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.8E-17
Cf-249	3.505E+02	yr	2.0E-17	2.0E-17	1.7E-17	9.8E-18	2.9E-18	2.4E-18	5.5E-26
Cf-250	1.308E+01	yr	3.8E-18	2.2E-18	4.4E-20	1.5E-25	1.4E-25	1.4E-25	9.6E-26
Cf-251	8.980E+02	yr	3.3E-19	3.3E-19	3.1E-19	2.5E-19	1.5E-19	1.4E-19	1.5E-22
Cf-252	2.638E+00	yr	2.3E-23						

Table 15. Calculated element mass for sodium-bearing waste in g element/L waste for years 1999 through 2022.

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	1.7E-09	1.5E-09	1.4E-09	9.5E-10	8.5E-10	6.8E-10	4.9E-10
He	7.7E-09	2.0E-08	2.5E-08	5.7E-08	6.7E-08	8.4E-08	1.1E-07
Li	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Be	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10
B	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08
C	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05
N	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05
O	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03
F	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12
Ne	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14
Na	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15
Mg	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10
Si	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05
P	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06
S	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08
Cl	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17
Ar	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17
K	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18
Ca	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11
Sc	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13
Ti	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05
V	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06
Mn	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Fe	2.2E-09	1.1E-09	8.6E-10	1.3E-10	7.8E-11	2.7E-11	5.4E-12
Co	3.2E-07	3.0E-07	3.0E-07	2.7E-07	2.7E-07	2.7E-07	2.6E-07
Ni	7.2E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.0E-06
Cu	2.5E-07	2.7E-07	2.7E-07	3.0E-07	3.1E-07	3.3E-07	3.6E-07
Zn	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Ga	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
Ge	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07
As	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07
Se	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05
Br	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05
Kr	5.7E-04	5.7E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04
Rb	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04
Sr	1.1E-03	1.1E-03	1.1E-03	9.9E-04	9.7E-04	9.3E-04	8.9E-04
Y	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04
Zr	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Nb	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06

Table 15. Calculated element mass for sodium-bearing waste in g element/L waste for years 1999 through 2022 (continued).

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Mo	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Tc	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04
Ru	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Rh	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Pd	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Ag	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06
Cd	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
In	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05
Sn	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
Sb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Te	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04
I	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
Xe	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03
Cs	3.2E-03	3.2E-03	3.2E-03	3.0E-03	3.0E-03	3.0E-03	2.9E-03
Ba	2.6E-03	2.7E-03	2.7E-03	2.8E-03	2.8E-03	2.9E-03	2.9E-03
La	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Ce	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03
Pr	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03
Nd	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03
Pm	5.7E-07	3.0E-07	2.3E-07	3.6E-08	2.1E-08	7.3E-09	1.5E-09
Sm	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Eu	9.9E-05	9.8E-05	9.8E-05	9.9E-05	9.9E-05	9.9E-05	1.0E-04
Gd	5.1E-05	5.1E-05	5.1E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05
Tb	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07
Dy	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07
Ho	5.6E-09	5.6E-09	5.6E-09	5.6E-09	5.6E-09	5.6E-09	5.6E-09
Er	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09
Tm	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12
Yb	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13
Lu	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07
Hf	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04
Ta	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05
W	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
Re	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10
Os	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11
Tl	9.8E-18	5.9E-18	5.1E-18	3.4E-18	3.4E-18	3.2E-18	3.1E-18
Pb	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.3E-10	1.3E-10	1.4E-10
Bi	2.1E-15	2.1E-15	2.2E-15	2.9E-15	3.2E-15	3.9E-15	5.3E-15
Po	5.8E-16	6.9E-16	7.3E-16	1.1E-15	1.2E-15	1.5E-15	1.9E-15
At	1.3E-25	1.4E-25	1.5E-25	2.1E-25	2.4E-25	3.0E-25	4.3E-25
Rn	6.5E-17	6.8E-17	7.0E-17	8.9E-17	9.5E-17	1.1E-16	1.3E-16
Fr	1.6E-20	1.8E-20	1.8E-20	2.4E-20	2.5E-20	2.8E-20	3.2E-20
Ra	8.8E-12	9.8E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Ac	5.6E-13	6.3E-13	6.6E-13	8.4E-13	8.8E-13	9.7E-13	1.1E-12
Th	5.7E-08	5.8E-08	5.8E-08	6.2E-08	6.3E-08	6.4E-08	6.7E-08
Pa	2.5E-09	2.5E-09	2.5E-09	2.6E-09	2.6E-09	2.7E-09	2.7E-09
U	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02
Np	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.1E-03
Pu	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03
Am	1.8E-05	1.8E-05	1.8E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
Cm	3.4E-08	3.1E-08	3.0E-08	2.3E-08	2.2E-08	1.9E-08	1.6E-08
Bk	1.1E-24	1.5E-25	7.7E-26	3.7E-32	3.7E-32	3.7E-32	3.7E-32
Cf	5.7E-18	5.6E-18	5.6E-18	5.5E-18	5.4E-18	5.4E-18	5.3E-18
Total	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**

Table 16. Calculated element mass for sodium-bearing waste in g element/L waste for years 2032 through 12000.

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	2.8E-10	1.6E-10	2.5E-12	3.0E-19	2.9E-34	2.9E-34	0.0E+00
He	1.5E-07	1.9E-07	4.3E-07	8.9E-07	1.4E-06	1.5E-06	6.4E-06
Li	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Be	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10
B	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08
C	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05
N	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05
O	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03
F	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12
Ne	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14
Na	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15
Mg	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10
Si	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05
P	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06
S	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08
Cl	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17
Ar	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17
K	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18
Ca	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11
Sc	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13
Ti	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05
V	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06
Mn	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Fe	3.8E-13	2.6E-14	7.1E-23	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	2.6E-07	2.6E-07	2.6E-07	2.8E-07	3.1E-07	3.2E-07	8.0E-07
Ni	7.0E-06	7.0E-06	6.8E-06	6.5E-06	6.4E-06	6.4E-06	6.0E-06
Cu	4.0E-07	4.3E-07	6.4E-07	8.7E-07	9.1E-07	9.1E-07	9.1E-07
Zn	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Ga	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
Ge	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07
As	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07
Se	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.0E-05
Br	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.2E-05
Kr	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04
Rb	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04
Sr	8.3E-04	7.8E-04	6.2E-04	5.9E-04	5.9E-04	5.9E-04	5.9E-04
Y	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04
Zr	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Nb	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.8E-06	7.8E-06	1.0E-05
Mo	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Tc	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.1E-04
Ru	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Rh	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Pd	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Ag	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06
Cd	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
In	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05
Sn	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05
Sb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Te	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04
I	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
Xe	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03
Cs	2.8E-03	2.7E-03	2.5E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03
Ba	3.0E-03	3.1E-03	3.4E-03	3.4E-03	3.4E-03	3.4E-03	3.4E-03
La	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Ce	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03
Pr	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03
Nd	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03
Pm	1.1E-10	8.6E-12	9.2E-17	2.6E-32	0.0E+00	0.0E+00	0.0E+00

Table 16. Calculated element mass for sodium-bearing waste in g element/L waste for years 2032 through 12000 (continued).

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Sm	1.1E-03	1.1E-03	1.0E-03	1.0E-03	1.0E-03	1.0E-03	1.0E-03
Eu	1.0E-04	1.0E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Gd	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05
Tb	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07
Dy	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07
Ho	5.6E-09	5.6E-09	5.6E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09
Er	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.3E-09
Tm	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12
Yb	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13
Lu	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07
Hf	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04
Ta	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05
W	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
Re	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10
Os	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11
Tl	2.9E-18	2.8E-18	1.9E-18	1.8E-18	3.5E-18	3.7E-18	3.0E-17
Pb	1.5E-10	1.6E-10	2.0E-10	3.0E-10	7.6E-10	8.8E-10	1.4E-07
Bi	8.9E-15	1.5E-14	1.8E-13	6.6E-12	1.0E-10	1.4E-10	8.0E-08
Po	2.7E-15	3.6E-15	1.3E-14	1.1E-13	5.2E-13	5.7E-13	1.7E-11
At	7.0E-25	1.1E-24	6.7E-24	7.5E-23	4.7E-22	5.6E-22	3.4E-20
Rn	1.6E-16	2.0E-16	5.4E-16	3.2E-15	1.5E-14	1.8E-14	5.1E-13
Fr	3.9E-20	4.6E-20	1.2E-19	7.9E-19	4.5E-18	5.3E-18	3.1E-16
Ra	2.5E-11	3.0E-11	8.5E-11	4.9E-10	2.4E-09	2.7E-09	7.9E-08
Ac	1.3E-12	1.4E-12	2.1E-12	4.5E-12	9.1E-12	9.6E-12	7.1E-11
Th	7.2E-08	7.7E-08	1.1E-07	2.6E-07	6.0E-07	6.5E-07	5.4E-06
Pa	2.8E-09	3.0E-09	3.8E-09	7.1E-09	1.4E-08	1.5E-08	1.1E-07
U	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02
Np	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.2E-03	5.2E-03	5.1E-03
Pu	1.2E-03	1.2E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	8.3E-04
Am	2.0E-05	2.0E-05	1.8E-05	1.1E-05	4.3E-06	3.7E-06	5.2E-08
Cm	1.1E-08	8.5E-09	2.6E-09	2.2E-09	2.0E-09	2.0E-09	9.7E-10
Bk	3.7E-32	3.7E-32	3.7E-32	3.6E-32	3.5E-32	3.5E-32	2.5E-32
Cf	5.2E-18	5.1E-18	4.4E-18	2.5E-18	8.0E-19	6.7E-19	9.4E-23
Total	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**

5. Zirconium Waste

The calculations for zirconium waste in Wenzel 1997c did not include structural materials and activation products other than Co-60. At the request of the EDF sponsor, structural materials and their activation products are included in the current calculations. Structural materials used in the calculations were provided by M. D. Staiger and are presented on page 1 of Appendix E-1. The input to the ORIGEN2 code requires that all elements be input by their individual stable nuclides. The calculation of the mass of the individual nuclides is presented on pages 3–5 of Appendix E-1.

The ORIGEN2 calculations for zirconium waste began with the revision of ORIGEN2 run ZR1 presented on page 2 of Attachment A of Wenzel 1997c. The input file (ZR1.INP) for the revised run includes the structural materials discussed above. File ZR1.INP is presented in Appendix E-2, pages 1–2. The associated BAT file is also presented in Appendix E-2, page 2. The summarized ORIGEN2 output for the activity of the radionuclides is called ZR1.CI and is presented on pages 3–6 of Attachment E-2. The summarized output for the mass of the different nuclides is called ZR1.G and is presented on pages 7–14 of Appendix E-2.

Fortran program REDUCE1 from Attachment B-1 of Wenzel 1999c was converted from Fortran 77 to Fortran 90 and modified to calculate not only the radionuclide activity but also the mass of the individual nuclides. The program was renamed REDUCEZR. The source list for REDUCEZR is presented on pages 1–2 of Appendix E-3. The output of program REDUCEZR for activity calculation is called REDUCEZR.CI and is presented on pages 3–7 of Appendix E-3. The output of program REDUCEZR for the mass of the individual nuclides is called REDUCEZR.G and is presented on pages 8–18 of Appendix E-3.

A Fortran 90 program called EXTRACT was written to convert the output from program REDUCEZR to the format used as input to the ORIGEN2 code. The source list for EXTRACT is presented on pages 1–2 of Appendix E-4. Program EXTRACT uses a file called MASTER_E that converts the nuclide symbol and atomic number to the identification number used in ORIGEN2. A copy of file MASTER_E is presented on pages 4–11 of Appendix B-4. The output from program EXTRACT (EXTRACT.OUT) is presented on pages 3–10 of Appendix E-4.

The next step in the calculations was to modify ORIGEN2 run ZRDECAY from pages 2–3 of Attachment D of Wenzel 1997c. As before, the updated ORIGEN2 calculations were broken into 2 separate runs. The first run is called ZR_RUN1 and calculates the nuclides decayed between the years 1999 and 2022. The input file (ZR_RUN1.INP) is presented in Appendix E-5, pages 1–3. The associated BAT file is also presented in Appendix E-5, page 4. The summarized ORIGEN2 output for the activity of the radionuclides is called ZR_RUN1.CI and is presented in Appendix E-5, pages 5–7. A Fortran 90 program called ROUNDZR1 was written to format the output and round the results to two places of accuracy. The source list for ROUNDZR1 is presented in Appendix E-6, pages 1–3. Program ROUNDZR1 uses file MASTER to identify the radionuclides, their half-lives, and their order to be included in the output file. A copy of file MASTER is presented in Appendix A-2, pages 4–7. The output from program ROUNDZR1 is called ROUNDZR1.OUT and is presented in Appendix E-6, pages 4–6.

The output of ORIGEN2 run ZR_RUN1 was also requested for the mass of the nuclides present. The output for the mass of the nuclides is called ZR_RUN1.G and is presented in Appendix E-7. A Fortran 90 program called ELEZR1 was written to sum the mass of each isotope of the different elements, normalize the mass to grams of element per gram of zirconium calcine, and to round the output to two places of accuracy. A copy of the source list for program ELEZR1 is presented on pages 1–3 of Appendix E-8. Program ELEZR1 uses the file called SYMBOL, which identifies the elements to be

summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELEZR1 is called ZR_RUN1.ELE and is presented in Appendix E-8, pages 4-5.

The second ORIGEN2 run calculates the nuclides decayed between the years 2032 and 12000. The second run is called ZR_RUN2. The input file (ZR_RUN2.INP) is presented in Appendix E-9, pages 1-3. The associated BAT file is also presented in Appendix E-9, page 4. The summarized ORIGEN2 output for the activity of the radionuclides is called ZR_RUN2.CI and is presented in Appendix E-9, pages 5–7. Fortran program ROUNDZR2 was used to format the data in output file ZR_RUN2.CI and to round the results to two places of accuracy. The source listing for ROUNDZR2 is presented in Appendix E-10, pages 1–3. The output from program ROUNDZR2 is called ROUNDZR2.OUT and is presented in Appendix E-10, pages 4–6.

The output of ORIGEN2 run ZR_RUN2 for the mass of the nuclides is called ZR_RUN2.G and is presented in Appendix E-11. A Fortran 90 program called ELEZR2 was written to sum the mass of each isotope of the different elements, normalize the mass to grams of element per gram of zirconium calcine, and to round the output to two places of accuracy. The source list for ELEZR2 is presented in Appendix E-12, pages 1–3. Program ELEZR2 uses the file called SYMBOL, which identifies the elements to be summed. A copy of file SYMBOL is presented in Appendix A-4, pages 4–5. The output of program ELEZR2 is called ZR_RUN2.ELE and is presented in Appendix E-12, pages 4-5.

Tables 17 and 18 present the calculated radionuclide activities for the requested decay times. As in the original calculations, the results are expressed in Ci/g. Tables 19 and 20 present the calculated mass of the elements as a function of decay time for elements present in the waste that come from fission and structural materials.

Table 17. Calculated radionuclide activities for zirconium calcine in Ci/g for years 1999 through 2022.

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.233E+01	yr	3.3E-06	2.8E-06	2.7E-06	1.8E-06	1.6E-06	1.3E-06	9.2E-07
Be-10	1.510E+06	yr	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14
C-14	5.730E+03	yr	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08
Ca 45	1.626E+02	d	1.1E-23	1.1E-23	1.1E-23	2.1E-28	2.1E-28	2.1E-28	1.9E-32
V 50	1.400E+17	yr	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23
Mn 54	3.123E+02	d	9.6E-13	1.3E-13	5.7E-14	1.9E-16	3.9E-17	1.5E-18	3.0E-20
Fe-55	2.730E+00	yr	2.3E-07	1.2E-07	9.0E-08	1.4E-08	8.2E-09	2.8E-09	5.7E-10
Ni-59	7.600E+04	yr	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09
Co-60	5.271E+00	yr	5.0E-07	3.6E-07	3.1E-07	1.3E-07	9.6E-08	5.7E-08	2.6E-08
Ni-63	1.001E+02	yr	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
Zn 65	2.443E+02	d	6.1E-24	6.1E-24	6.1E-24	4.3E-27	4.3E-27	4.3E-27	4.3E-27
Se-79	1.130E+06	yr	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.2E-09
Rb-87	4.750E+10	yr	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13
Sr-90	2.878E+01	yr	1.9E-03	1.8E-03	1.7E-03	1.5E-03	1.4E-03	1.3E-03	1.1E-03
Y-90	6.410E+01	h	1.9E-03	1.8E-03	1.7E-03	1.5E-03	1.4E-03	1.3E-03	1.1E-03
Zr-93	1.530E+06	yr	9.7E-08	9.7E-08	9.7E-08	9.7E-08	9.7E-08	9.7E-08	9.7E-08
Nb-93m	1.613E+01	yr	5.9E-08	6.3E-08	6.4E-08	7.2E-08	7.4E-08	7.7E-08	8.1E-08
Nb-94	2.030E+04	yr	8.0E-09	8.0E-09	8.0E-09	8.0E-09	8.0E-09	8.0E-09	8.0E-09
Tc-98	4.200E+06	yr	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15
Tc-99	2.111E+05	yr	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07
Rh-102	2.070E+02	d	1.4E-11	7.6E-12	6.0E-12	1.1E-12	7.0E-13	2.7E-13	6.4E-14
Ru-106	3.736E+02	d	5.1E-09	9.1E-10	4.6E-10	3.7E-12	9.4E-13	6.0E-14	9.7E-16
Rh-106	2.980E+01	s	5.1E-09	9.1E-10	4.6E-10	3.7E-12	9.4E-13	6.0E-14	9.7E-16
Pd-107	6.500E+06	yr	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10
Ag-108	2.370E+00	m	6.4E-17	6.3E-17	6.3E-17	6.0E-17	6.0E-17	5.8E-17	5.7E-17
Ag-108m	4.180E+02	yr	7.2E-16	7.1E-16	7.1E-16	6.8E-16	6.7E-16	6.6E-16	6.4E-16
Ag-109m	3.960E+01	s	6.1E-19	1.7E-19	1.0E-19	1.7E-21			
Cd-109	4.626E+02	d	6.1E-19	1.7E-19	7.9E-20				
Ag-110	2.460E+01	s	4.0E-17	3.2E-18	1.1E-18	9.5E-22	1.3E-22		
Ag-110m	2.498E+02	d	3.0E-15	2.4E-16	8.6E-17	7.2E-20			
Cd-113m	1.410E+01	yr	1.1E-07	9.8E-08	9.4E-08	6.7E-08	6.1E-08	5.0E-08	3.8E-08
In-115	4.410E+14	yr	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19
Sn-119m	2.931E+02	d	6.3E-12	4.8E-13	1.7E-13	1.2E-16	1.6E-17	2.7E-19	1.7E-20
Sn-121m	5.500E+01	yr	1.5E-07	1.5E-07	1.4E-07	1.3E-07	1.3E-07	1.2E-07	1.1E-07

Table 17. Calculated radionuclide activities for zirconium calcine in Ci/g for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Te-123	1.000E+13	yr	2.7E-21	2.7E-21	2.7E-21	2.7E-21	2.7E-21	2.7E-21	2.7E-21
Sb-125	2.758E+00	yr	3.6E-06	1.9E-06	1.5E-06	2.6E-07	1.6E-07	5.9E-08	1.3E-08
Te-125m	5.740E+01	d	8.9E-07	4.8E-07	3.7E-07	6.4E-08	3.9E-08	1.4E-08	3.2E-09
Sn-126	1.000E+05	yr	8.2E-09	8.2E-09	8.2E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09
Sb-126	1.246E+01	d	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09
Sb-126m	1.915E+01	m	8.2E-09	8.2E-09	8.2E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09
I-129	1.570E+07	yr	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10
Cs-134	2.065E+00	yr	7.3E-07	3.2E-07	2.3E-07	2.1E-08	1.1E-08	2.9E-09	3.8E-10
Cs-135	2.300E+06	yr	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08
Cs-137	3.007E+01	yr	1.4E-03	1.4E-03	1.3E-03	1.1E-03	1.1E-03	9.9E-04	8.6E-04
Ba-137m	2.552E+00	m	1.4E-03	1.3E-03	1.3E-03	1.1E-03	1.0E-03	9.4E-04	8.1E-04
La-138	1.050E+11	yr	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18
Ce-142	5.000E+16	yr	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13
Ce-144	2.849E+02	d	1.5E-09	1.6E-10	6.6E-11	1.3E-13	2.2E-14	6.2E-16	3.0E-18
Pr-144	1.728E+01	m	1.5E-09	1.6E-10	6.6E-11	1.3E-13	2.2E-14	6.2E-16	3.0E-18
Pr-144m	7.200E+00	m	1.8E-11	1.9E-12	7.9E-13	1.6E-15	2.6E-16	7.4E-18	3.6E-20
Nd-144	2.290E+15	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Pm-146	5.530E+00	yr	7.4E-10	5.4E-10	4.8E-10	2.0E-10	1.5E-10	9.2E-11	4.3E-11
Sm-146	1.030E+08	yr	3.9E-16	3.9E-16	4.0E-16	4.0E-16	4.1E-16	4.1E-16	4.1E-16
Pm-147	2.623E+00	yr	4.6E-05	2.4E-05	1.8E-05	2.9E-06	1.7E-06	5.9E-07	1.2E-07
Sm-147	1.060E+11	yr	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13
Sm-148	7.000E+15	yr	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19
Sm-149	2.000E+15	yr	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20
Eu-150	3.690E+01	yr	1.0E-13	9.5E-14	9.4E-14	8.2E-14	7.9E-14	7.3E-14	6.5E-14
Sm-151	9.000E+01	yr	2.5E-05	2.4E-05	2.4E-05	2.3E-05	2.2E-05	2.2E-05	2.1E-05
Eu-152	1.354E+01	yr	1.1E-07	9.8E-08	9.3E-08	6.5E-08	5.9E-08	4.8E-08	3.5E-08
Gd-152	1.080E+14	yr	1.9E-20	1.9E-20	1.9E-20	2.0E-20	2.0E-20	2.1E-20	2.1E-20
Gd-153	2.416E+02	d	1.7E-17	1.3E-18	4.6E-19	3.0E-22	3.0E-22	3.0E-22	3.0E-22
Eu-154	8.593E+00	yr	1.5E-05	1.2E-05	1.1E-05	6.3E-06	5.3E-06	3.9E-06	2.4E-06
Eu-155	4.761E+00	yr	5.6E-08	3.9E-08	3.4E-08	1.3E-08	9.8E-09	5.6E-09	2.4E-09
Ho-166m	1.200E+03	yr	9.0E-14	9.0E-14	8.9E-14	8.9E-14	8.9E-14	8.9E-14	8.8E-14
Tm-171	1.920E+00	yr	7.9E-20	4.0E-20	4.0E-20				
Lu176	3.780E+10	yr	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18
Lu177	6.734E+00	d	2.3E-25	2.2E-25	2.3E-25	2.5E-30	2.4E-30	2.4E-30	1.4E-34
Lu177m	1.604E+02	d	1.0E-24	1.0E-24	1.0E-24	1.1E-29	1.1E-29	1.1E-29	6.1E-34
Hf182	9.000E+06	yr	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Ta182	1.144E+02	d	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Re187	4.350E+10	yr	2.1E-29	2.1E-29	2.1E-29	2.1E-29	2.1E-29	2.1E-29	2.1E-29
Tl-207	4.770E+00	m	1.2E-12	1.3E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Tl-208	3.053E+00	m	3.5E-13	3.2E-13	3.1E-13	2.9E-13	2.8E-13	2.7E-13	2.6E-13
Tl-209	2.200E+00	m	2.7E-18	2.8E-18	2.8E-18	3.3E-18	3.4E-18	3.8E-18	4.4E-18
Pb-209	3.253E+00	h	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Pb-210	2.230E+01	yr	3.4E-16	5.8E-16	7.1E-16	2.1E-15	2.7E-15	4.1E-15	7.1E-15
Pb-211	3.610E+01	m	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Pb-212	1.064E+01	h	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Pb-214	2.680E+01	m	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Bi-210	5.013E+00	d	3.4E-16	5.8E-16	7.1E-16	2.1E-15	2.7E-15	4.1E-15	7.1E-15
Bi-211	2.140E+00	m	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Bi-212	6.055E+01	m	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Bi-213	4.559E+01	m	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Bi-214	1.990E+01	m	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Po-210	1.384E+02	d	3.4E-16	5.2E-16	6.3E-16	2.1E-15	2.5E-15	4.1E-15	7.1E-15
Po-211	5.160E-01	s	3.4E-15	3.8E-15	3.9E-15	4.9E-15	5.2E-15	5.6E-15	6.2E-15
Po-212	2.990E-07	s	6.2E-13	5.6E-13	5.5E-13	5.1E-13	5.1E-13	4.9E-13	4.6E-13
Po-213	4.200E-06	s	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.7E-16	2.0E-16
Po-214	1.643E-04	s	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Po-215	1.781E-03	s	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Po-216	1.450E-01	s	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Po-218	3.100E+00	m	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
At-217	3.230E-02	s	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Rn-219	3.960E+00	s	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Rn-220	5.560E+01	s	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Rn-222	3.823E+00	d	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Fr-221	4.900E+00	m	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Fr-223	2.180E+00	m	1.7E-14	1.9E-14	1.9E-14	2.4E-14	2.5E-14	2.8E-14	3.0E-14
Ra-223	1.144E+01	d	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Ra-224	3.660E+00	d	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13

Table 17. Calculated radionuclide activities for zirconium calcine in Ci/g for years 1999 through 2022 (continued).

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Ra-225	1.490E+01	d	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Ra-226	1.600E+03	yr	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Ra-228	5.750E+00	yr	3.6E-18	3.9E-18	4.0E-18	4.4E-18	4.5E-18	4.6E-18	4.7E-18
Ac-225	1.000E+01	d	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Ac-227	2.177E+01	yr	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Ac-228	6.150E+00	h	3.6E-18	3.9E-18	4.0E-18	4.4E-18	4.5E-18	4.6E-18	4.7E-18
Th-227	1.872E+01	d	1.2E-12	1.3E-12	1.4E-12	1.7E-12	1.8E-12	2.0E-12	2.2E-12
Th-228	1.912E+00	yr	9.6E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Th-229	7.340E+03	yr	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Th-230	7.538E+04	yr	1.2E-12	1.4E-12	1.5E-12	2.3E-12	2.5E-12	2.9E-12	3.6E-12
Th-231	2.552E+01	h	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11
Th-232	1.405E+10	yr	4.7E-18	4.7E-18	4.7E-18	4.8E-18	4.8E-18	4.9E-18	4.9E-18
Th-234	2.410E+01	d	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-231	3.276E+04	yr	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.2E-12	3.2E-12
Pa-233	2.697E+01	d	3.7E-10	3.7E-10	3.7E-10	3.8E-10	3.8E-10	3.8E-10	3.8E-10
Pa-234m	1.170E+00	m	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-234	6.700E+00	h	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15
U-232	6.890E+01	yr	8.1E-13	8.2E-13	8.2E-13	7.8E-13	7.7E-13	7.4E-13	7.0E-13
U-233	1.592E+05	yr	2.0E-14	2.4E-14	2.6E-14	3.7E-14	4.1E-14	4.7E-14	5.7E-14
U-234	2.455E+05	yr	1.1E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08
U-235	7.038E+08	yr	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11
U-236	2.342E+07	yr	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.0E-10
U-237	6.750E+00	d	3.8E-10	3.4E-10	3.2E-10	2.3E-10	2.1E-10	1.7E-10	1.3E-10
U-238	4.470E+09	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
U-240	1.410E+01	h	1.7E-14	2.0E-14	2.2E-14	3.2E-14	3.5E-14	4.1E-14	4.9E-14
Np-237	2.144E+06	yr	3.7E-10	3.7E-10	3.7E-10	3.8E-10	3.8E-10	3.8E-10	3.8E-10
Np-238	2.117E+00	d	2.4E-15	2.4E-15	2.4E-15	2.3E-15	2.3E-15	2.3E-15	2.2E-15
Np-239	2.356E+00	d	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14
Np-240m	7.220E+00	m	1.7E-14	2.0E-14	2.2E-14	3.2E-14	3.5E-14	4.1E-14	4.9E-14
Pu-236	2.858E+00	yr	1.3E-12	7.2E-13	5.6E-13	1.0E-13	6.3E-14	2.4E-14	5.6E-15
Pu-238	8.770E+01	yr	1.7E-05	1.7E-05	1.7E-05	1.6E-05	1.6E-05	1.5E-05	1.5E-05
Pu-239	2.411E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07
Pu-240	6.563E+03	yr	2.2E-07	2.2E-07	2.2E-07	2.2E-07	2.2E-07	2.2E-07	2.2E-07
Pu-241	1.435E+01	yr	1.5E-05	1.4E-05	1.3E-05	9.3E-06	8.4E-06	7.0E-06	5.2E-06
Pu-242	3.733E+05	yr	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10
Pu-243	4.956E+00	h	1.1E-25	1.3E-25	1.4E-25	2.1E-25	2.3E-25	2.6E-25	3.2E-25
Pu-244	8.080E+07	yr	1.7E-14	2.0E-14	2.2E-14	3.2E-14	3.5E-14	4.1E-14	5.0E-14
Am-241	4.322E+02	yr	1.5E-06	1.5E-06	1.5E-06	1.6E-06	1.7E-06	1.7E-06	1.7E-06
Am-242m	1.410E+02	yr	4.9E-13	4.8E-13	4.8E-13	4.6E-13	4.6E-13	4.5E-13	4.4E-13
Am-242	1.602E+01	h	4.8E-13	4.8E-13	4.8E-13	4.6E-13	4.6E-13	4.5E-13	4.4E-13
Am-243	7.370E+03	yr	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14
Cm-242	1.628E+02	d	4.0E-13	4.0E-13	3.9E-13	3.8E-13	3.8E-13	3.7E-13	3.6E-13
Cm-243	2.910E+01	yr	1.1E-14	1.0E-14	1.0E-14	8.4E-15	8.0E-15	7.3E-15	6.3E-15
Cm-244	1.810E+01	yr	1.2E-13	1.1E-13	1.1E-13	8.1E-14	7.5E-14	6.5E-14	5.1E-14
Cm-245	8.500E+03	yr	2.4E-18	2.4E-18	2.4E-18	2.4E-18	2.4E-18	2.4E-18	2.4E-18
Cm-246	4.730E+03	yr	5.9E-16	6.8E-16	7.1E-16	8.9E-16	9.4E-16	1.0E-15	1.1E-15
Cm-247	1.560E+07	yr	1.1E-25	1.3E-25	1.4E-25	2.1E-25	2.3E-25	2.6E-25	3.2E-25
Cm-248	3.400E+05	yr	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07
Cf-249	3.510E+02	yr							
Cf-250	1.308E+01	yr	2.6E-13	2.2E-13	2.1E-13	1.5E-13	1.3E-13	1.1E-13	7.8E-14
Cf-251	8.980E+02	yr	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19

Table 18. Calculated radionuclide activities for zirconium calcine in Ci/g for years 2032 through 12000.

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.233E+01	yr	5.3E-07	3.0E-07	4.7E-09	5.6E-16	5.4E-31	5.4E-31	
Be-10	1.510E+06	yr	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14
C-14	5.730E+03	yr	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.4E-08	1.4E-08	4.7E-09
V 50	1.400E+17	yr	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23
Mn 54	3.123E+02	d	3.5E-25	1.1E-28					
Fe-55	2.730E+00	yr	4.8E-12	3.3E-13	9.0E-22				
Ni-59	7.600E+04	yr	9.8E-09	9.8E-09	9.8E-09	9.7E-09	9.7E-09	9.7E-09	9.0E-09
Co-60	5.271E+00	yr	6.9E-09	1.9E-09	1.1E-13	6.6E-30			

Table 18. Calculated radionuclide activities for zirconium calcine in Ci/g for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Ni-63	1.001E+02	yr	9.6E-07	8.9E-07	5.1E-07	6.0E-08	5.8E-10	2.8E-10	
Zn 65	2.443E+02	d	1.4E-38						
Se-79	1.130E+06	yr	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.1E-09	9.1E-09	8.3E-09
Rb-87	4.750E+10	yr	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13
Sr-90	2.878E+01	yr	8.7E-04	6.9E-04	1.2E-04	1.4E-07	5.8E-14	6.2E-15	
Y-90	6.410E+01	h	8.7E-04	6.9E-04	1.2E-04	1.4E-07	5.8E-14	6.2E-15	
Zr-93	1.530E+06	yr	5.3E-08	5.3E-08	5.3E-08	5.2E-08	5.2E-08	5.2E-08	5.2E-08
Nb-93m	1.613E+01	yr	4.6E-08	4.8E-08	5.0E-08	5.0E-08	5.0E-08	5.0E-08	5.0E-08
Nb-94	2.030E+04	yr	8.0E-09	8.0E-09	8.0E-09	7.9E-09	7.8E-09	7.7E-09	5.7E-09
Tc-98	4.200E+06	yr	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15
Tc-99	2.111E+05	yr	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.0E-07
Rh-102	2.070E+02	d	5.8E-15	5.4E-16	1.1E-23				
Pd-107	6.500E+06	yr	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10
Ag-108	2.370E+00	m	5.4E-17	5.1E-17	3.4E-17	7.2E-18	2.5E-19	1.5E-19	
Ag-108m	4.180E+02	yr	6.0E-16	5.7E-16	3.8E-16	8.1E-17	2.8E-18	1.7E-18	1.4E-39
Ag-109m	3.960E+01	s	1.2E-26	1.2E-26					
Cd-109	4.626E+02	d	1.2E-26	1.2E-26					
Ag-110	2.460E+01	s	2.0E-31						
Ag-110m	2.498E+02	d	1.5E-29	6.0E-34					
Cd-113m	1.410E+01	yr	2.4E-08	1.5E-08	4.4E-10	6.0E-16	1.2E-28	1.2E-28	
In-115	4.410E+14	yr	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19
Sn-121m	5.500E+01	yr	4.9E-08	4.3E-08	1.5E-08	3.0E-10	5.8E-14	1.6E-14	
Te-123	1.000E+13	yr	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21
Sb-125	2.758E+00	yr	3.2E-10	2.6E-11	2.4E-19				
Te-125m	5.740E+01	d	7.8E-11	6.4E-12	5.8E-20				
Sn-126	1.000E+05	yr	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	7.6E-09
Sb-126	1.246E+01	d	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09
Sb-126m	1.915E+01	m	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	7.6E-09
I-129	1.570E+07	yr	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10
Cs-134	2.065E+00	yr	1.3E-11	4.6E-13	7.2E-24				
Cs-135	2.300E+06	yr	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.8E-08
Cs-137	3.007E+01	yr	6.8E-04	5.4E-04	9.8E-05	1.4E-07	9.1E-14	1.0E-14	
Ba-137m	2.552E+00	m	6.5E-04	5.1E-04	9.3E-05	1.3E-07	8.6E-14	9.8E-15	
La-138	1.050E+11	yr	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18
Ce-142	5.000E+16	yr	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13
Ce-144	2.849E+02	d	4.0E-22	5.4E-26					
Pr-144	1.728E+01	m	4.0E-22	5.4E-26					
Pr-144m	7.200E+00	m	4.8E-24	6.5E-28					
Nd-144	2.290E+15	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Pm-146	5.530E+00	yr	1.2E-11	3.5E-12	3.1E-16	8.9E-32			
Sm-146	1.030E+08	yr	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16
Pm-147	2.623E+00	yr	8.6E-09	6.1E-10	2.0E-18				
Sm-147	1.060E+11	yr	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13
Sm-148	7.000E+15	yr	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19
Sm-149	2.000E+15	yr	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20
Eu-150	3.690E+01	yr	5.4E-14	4.4E-14	1.1E-14	4.5E-17	3.2E-22	3.2E-22	
Sm-151	9.000E+01	yr	1.9E-05	1.8E-05	1.0E-05	1.1E-06	9.9E-09	4.8E-09	
Eu-152	1.354E+01	yr	2.1E-08	1.3E-08	2.9E-10	1.5E-16	3.5E-30	3.5E-30	
Gd-152	1.080E+14	yr	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20
Gd-153	2.416E+02	d	3.0E-32	8.5E-37					
Eu-154	8.593E+00	yr	1.1E-06	4.8E-07	1.2E-09	1.4E-19	5.8E-41		
Eu-155	4.761E+00	yr	6.0E-10	1.5E-10	4.7E-15	2.7E-32			
Ho-166m	1.200E+03	yr	8.8E-14	8.7E-14	8.4E-14	7.1E-14	5.0E-14	4.7E-14	2.8E-16
Tm-171	1.920E+00	yr	5.9E-25	5.9E-25	1.5E-36				
Lu176	3.780E+10	yr	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18
Hf182	9.000E+06	yr	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Ta182	1.144E+02	d	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Re187	4.350E+10	yr	2.1E-29	2.1E-29	2.1E-29	2.1E-29	2.1E-29	2.1E-29	2.1E-29
Tl-207	4.770E+00	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Tl-208	3.053E+00	m	2.3E-13	2.1E-13	1.0E-13	6.8E-15	2.3E-17	1.3E-17	4.1E-17
Tl-209	2.200E+00	m	5.7E-18	7.4E-18	3.1E-17	3.3E-16	2.4E-15	2.9E-15	2.4E-13
Pb-209	3.253E+00	h	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Pb-210	2.230E+01	yr	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Pb-211	3.610E+01	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Pb-212	1.064E+01	h	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Pb-214	2.680E+01	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Bi-210	5.013E+00	d	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09

Table 18. Calculated radionuclide activities for zirconium calcine in Ci/g for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Bi-211	2.140E+00	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Bi-212	6.055E+01	m	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Bi-213	4.559E+01	m	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Bi-214	1.990E+01	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Po-210	1.384E+02	d	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Po-211	5.160E-01	s	6.9E-15	7.5E-15	9.0E-15	1.0E-14	1.3E-14	1.3E-14	4.8E-14
Po-212	2.990E-07	s	4.2E-13	3.8E-13	1.9E-13	1.2E-14	4.2E-17	2.3E-17	7.3E-17
Po-213	4.200E-06	s	2.6E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Po-214	1.643E-04	s	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Po-215	1.781E-03	s	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Po-216	1.450E-01	s	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Po-218	3.100E+00	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
At-217	3.230E-02	s	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Rn-219	3.960E+00	s	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Rn-220	5.560E+01	s	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Rn-222	3.823E+00	d	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Fr-221	4.900E+00	m	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Fr-223	2.180E+00	m	3.4E-14	3.7E-14	4.4E-14	5.2E-14	6.5E-14	6.6E-14	2.4E-13
Ra-223	1.144E+01	d	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Ra-224	3.660E+00	d	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Ra-225	1.490E+01	d	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Ra-226	1.600E+03	yr	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Ra-228	5.750E+00	yr	4.9E-18	5.0E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Ac-225	1.000E+01	d	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Ac-227	2.177E+01	yr	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Ac-228	6.150E+00	h	4.9E-18	5.0E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Th-227	1.872E+01	d	2.4E-12	2.6E-12	3.2E-12	3.7E-12	4.6E-12	4.7E-12	1.7E-11
Th-228	1.912E+00	yr	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Th-229	7.340E+03	yr	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Th-230	7.538E+04	yr	4.7E-12	5.9E-12	1.5E-11	5.8E-11	1.6E-10	1.7E-10	1.5E-09
Th-231	2.552E+01	h	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.8E-11
Th-232	1.405E+10	yr	5.0E-18	5.1E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Th-234	2.410E+01	d	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-231	3.276E+04	yr	3.2E-12	3.2E-12	3.3E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Pa-233	2.697E+01	d	3.9E-10	3.9E-10	4.4E-10	5.6E-10	6.9E-10	7.0E-10	7.7E-10
Pa-234m	1.170E+00	m	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-234	6.700E+00	h	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15
U-232	6.890E+01	yr	6.4E-13	5.8E-13	2.8E-13	1.8E-14	4.9E-17	2.0E-17	
U-233	1.592E+05	yr	7.4E-14	9.1E-14	2.3E-13	8.5E-13	2.6E-12	2.8E-12	3.2E-11
U-234	2.455E+05	yr	1.3E-08	1.3E-08	1.5E-08	1.7E-08	1.8E-08	1.8E-08	1.7E-08
U-235	7.038E+08	yr	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.8E-11
U-236	2.342E+07	yr	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.1E-10	2.1E-10	2.4E-10
U-237	6.750E+00	d	7.9E-11	4.9E-11	1.4E-12	1.6E-18	5.5E-23	5.4E-23	2.6E-23
U-238	4.470E+09	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
U-240	1.410E+01	h	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Np-237	2.144E+06	yr	3.9E-10	3.9E-10	4.4E-10	5.6E-10	6.9E-10	7.0E-10	7.7E-10
Np-238	2.117E+00	d	2.1E-15	2.0E-15	1.4E-15	3.9E-16	2.4E-17	1.5E-17	3.8E-35
Np-239	2.356E+00	d	2.9E-14	2.9E-14	2.9E-14	2.8E-14	2.6E-14	2.6E-14	1.1E-14
Np-240m	7.220E+00	m	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Pu-236	2.858E+00	yr	4.9E-16	4.3E-17	6.6E-25				
Pu-238	8.770E+01	yr	1.3E-05	1.2E-05	6.9E-06	7.3E-07	5.7E-09	2.7E-09	1.5E-32
Pu-239	2.411E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07	1.8E-07
Pu-240	6.563E+03	yr	2.2E-07	2.2E-07	2.2E-07	2.1E-07	2.0E-07	2.0E-07	7.7E-08
Pu-241	1.435E+01	yr	3.2E-06	2.0E-06	5.7E-08	6.5E-14	2.2E-18	2.2E-18	1.1E-18
Pu-242	3.733E+05	yr	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	4.9E-10
Pu-243	4.956E+00	h	4.1E-25	5.0E-25	1.2E-24	3.4E-24	6.8E-24	7.1E-24	1.2E-23
Pu-244	8.080E+07	yr	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Am-241	4.322E+02	yr	1.8E-06	1.8E-06	1.6E-06	1.0E-06	3.9E-07	3.3E-07	2.2E-13
Am-242m	1.410E+02	yr	4.2E-13	4.0E-13	2.9E-13	7.8E-14	4.7E-15	3.1E-15	7.6E-33
Am-242	1.602E+01	h	4.2E-13	4.0E-13	2.8E-13	7.8E-14	4.7E-15	3.1E-15	7.6E-33
Am-243	7.370E+03	yr	2.9E-14	2.9E-14	2.9E-14	2.8E-14	2.6E-14	2.6E-14	1.1E-14
Cm-242	1.628E+02	d	3.4E-13	3.3E-13	2.3E-13	6.4E-14	3.9E-15	2.5E-15	6.3E-33
Cm-243	2.910E+01	yr	4.9E-15	3.9E-15	6.4E-16	6.4E-19	2.0E-25	2.0E-25	
Cm-244	1.810E+01	yr	3.5E-14	2.4E-14	1.4E-15	2.7E-20	1.5E-30	1.5E-30	
Cm-245	8.500E+03	yr	2.4E-18	2.4E-18	2.4E-18	2.3E-18	2.2E-18	2.2E-18	1.1E-18
Cm-246	4.730E+03	yr	1.2E-15	1.2E-15	1.3E-15	1.2E-15	1.1E-15	1.1E-15	3.0E-16
Cm-247	1.560E+07	yr	4.1E-25	5.0E-25	1.2E-24	3.4E-24	6.8E-24	7.1E-24	1.2E-23

Table 18. Calculated radionuclide activities for zirconium calcine in Ci/g for years 2032 through 12000 (continued).

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Cm-248	3.400E+05	yr	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07
Cf-250	1.308E+01	yr	4.6E-14	2.7E-14	5.3E-16	1.6E-22	1.0E-36	1.0E-36	
Cf-251	8.980E+02	yr	2.1E-19	2.1E-19	1.9E-19	1.6E-19	9.7E-20	9.0E-20	8.1E-23

Table 19. Calculated element mass for zirconium calcine in g element/g calcine for years 1999 through 2022.

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	3.4E-10	2.9E-10	2.8E-10	1.9E-10	1.7E-10	1.3E-10	9.6E-11
He	1.8E-09	2.2E-09	2.3E-09	3.3E-09	3.6E-09	4.2E-09	5.0E-09
Li	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12
Be	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12
B	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10
C	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
N	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06
O	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04
F	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14
Ne	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19
Mg	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12
Si	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10
P	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25
Cl	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24
Ar	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19
K	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21
Ca	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12
Sc	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14
Ti	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
V	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08
Mn	1.9E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Fe	9.1E-11	4.7E-11	3.6E-11	5.6E-12	3.3E-12	1.1E-12	2.3E-13
Co	1.9E-09	1.7E-09	1.7E-09	1.5E-09	1.5E-09	1.5E-09	1.5E-09
Ni	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07
Cu	3.9E-09	4.2E-09	4.4E-09	5.4E-09	5.7E-09	6.2E-09	7.0E-09
Zn	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11
Ga	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Ge	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
As	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09
Se	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06
Br	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07
Kr	9.8E-06	9.8E-06	9.8E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06
Rb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Sr	2.4E-05	2.3E-05	2.3E-05	2.1E-05	2.0E-05	2.0E-05	1.8E-05
Y	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
Zr	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Nb	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05
Mo	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05
Tc	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
Ru	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05
Rh	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06
Pd	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06
Ag	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07
Cd	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07
In	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Sn	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07
Sb	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07
Te	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06

Table 19. Calculated element mass for zirconium calcine in g element/g calcine for years 1999 through 2022.

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
I	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Xe	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04
Cs	6.1E-05	6.0E-05	5.9E-05	5.7E-05	5.7E-05	5.5E-05	5.4E-05
Ba	4.0E-05	4.1E-05	4.1E-05	4.3E-05	4.4E-05	4.5E-05	4.7E-05
La	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05
Ce	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05
Pr	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Nd	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Pm	5.0E-08	2.6E-08	2.0E-08	3.1E-09	1.8E-09	6.4E-10	1.3E-10
Sm	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
Eu	1.1E-06	1.1E-06	1.1E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
Gd	3.9E-07	4.0E-07	4.0E-07	4.2E-07	4.2E-07	4.3E-07	4.3E-07
Tb	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Dy	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Ho	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11
Er	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11
Tm	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16
Yb	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17
Lu	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
Hf	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Ta	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
W	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Re	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13
Os	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16
Tl	7.5E-21	8.2E-21	8.4E-21	1.0E-20	1.1E-20	1.1E-20	1.2E-20
Pb	2.1E-14	2.3E-14	2.4E-14	3.1E-14	3.3E-14	3.7E-14	4.4E-14
Bi	6.1E-19	7.4E-19	7.9E-19	1.2E-18	1.3E-18	1.6E-18	2.1E-18
Po	7.5E-20	1.2E-19	1.4E-19	4.7E-19	5.6E-19	9.2E-19	1.6E-18
At	7.7E-29	8.0E-29	8.1E-29	9.4E-29	9.9E-29	1.1E-28	1.3E-28
Rn	2.0E-20	3.0E-20	3.4E-20	7.1E-20	8.4E-20	1.1E-19	1.7E-19
Fr	4.3E-22	4.8E-22	5.0E-22	6.3E-22	6.6E-22	7.1E-22	7.9E-22
Ra	3.0E-15	4.5E-15	5.1E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Ac	1.7E-14	1.9E-14	1.9E-14	2.4E-14	2.5E-14	2.8E-14	3.0E-14
Th	1.0E-10	1.1E-10	1.2E-10	1.6E-10	1.7E-10	1.9E-10	2.2E-10
Pa	6.6E-11	6.6E-11	6.6E-11	6.7E-11	6.7E-11	6.7E-11	6.7E-11
U	5.1E-05	5.1E-05	5.1E-05	5.1E-05	5.1E-05	5.1E-05	5.1E-05
Np	5.3E-07	5.3E-07	5.3E-07	5.3E-07	5.4E-07	5.4E-07	5.4E-07
Pu	6.2E-06	6.1E-06	6.1E-06	6.0E-06	6.0E-06	6.0E-06	5.9E-06
Am	4.2E-07	4.4E-07	4.4E-07	4.8E-07	4.8E-07	4.9E-07	5.1E-07
Cm	4.5E-05	4.5E-05	4.5E-05	4.5E-05	4.5E-05	4.5E-05	4.5E-05
Cf	2.3E-15	2.1E-15	1.9E-15	1.3E-15	1.2E-15	9.8E-16	7.1E-16
Total	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**

Table 20. Calculated element mass for zirconium calcine in g element/g calcine for years 2032 through 12000.

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	5.5E-11	3.1E-11	4.9E-13	5.8E-20	5.6E-35	5.6E-35	0.0E+00
He	6.2E-09	7.4E-09	1.4E-08	2.5E-08	3.2E-08	3.2E-08	7.0E-08
Li	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12
Be	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.3E-12
B	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10
C	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
N	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06

Table 20. Calculated element mass for zirconium calcine in g element/g calcine for years 2032 through 12000 (continued).

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
O	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04
F	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14
Ne	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19
Mg	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12
Si	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10
P	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25
Cl	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24
Ar	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19
K	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21
Ca	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12
Sc	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14
Ti	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
V	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08
Mn	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Fe	1.6E-14	1.1E-15	3.0E-24	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	1.5E-09	1.5E-09	1.6E-09	1.9E-09	2.6E-09	2.7E-09	1.2E-08
Ni	1.4E-07	1.4E-07	1.4E-07	1.3E-07	1.3E-07	1.3E-07	1.2E-07
Cu	8.2E-09	9.3E-09	1.5E-08	2.3E-08	2.4E-08	2.4E-08	2.4E-08
Zn	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11
Ga	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Ge	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
As	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09
Se	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06
Br	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.5E-07	5.5E-07	5.6E-07
Kr	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
Rb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Sr	1.7E-05	1.5E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Y	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
Zr	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Nb	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05
Mo	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05
Tc	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05
Ru	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.7E-05
Rh	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06
Pd	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06
Ag	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07
Cd	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07
In	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Sn	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.8E-07	2.7E-07
Sb	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07
Te	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06
I	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Xe	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04
Cs	5.2E-05	5.0E-05	4.5E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Ba	4.9E-05	5.0E-05	5.5E-05	5.6E-05	5.6E-05	5.6E-05	5.7E-05
La	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05
Ce	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05
Pr	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Nd	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Pm	9.3E-12	6.7E-13	7.0E-19	2.0E-34	0.0E+00	0.0E+00	0.0E+00
Sm	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
Eu	1.3E-06	1.3E-06	1.6E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06
Gd	4.4E-07	4.4E-07	4.4E-07	4.4E-07	4.4E-07	4.4E-07	4.4E-07
Tb	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Dy	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Ho	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11
Er	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11
Tm	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16
Yb	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17

Table 20. Calculated element mass for zirconium calcine in g element/g calcine for years 2032 through 12000 (continued).

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Lu	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
Hf	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Ta	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
W	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Re	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13
Os	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16
Tl	1.4E-20	1.5E-20	1.7E-20	2.0E-20	2.5E-20	2.5E-20	9.1E-20
Pb	5.8E-14	7.1E-14	1.8E-13	8.6E-13	5.8E-12	7.2E-12	2.0E-09
Bi	3.1E-18	4.4E-18	3.0E-17	8.7E-16	1.5E-14	1.9E-14	1.6E-11
Po	3.2E-18	5.7E-18	5.4E-17	1.0E-15	6.4E-15	7.2E-15	2.6E-13
At	1.7E-28	2.1E-28	8.9E-28	9.5E-27	6.8E-26	8.2E-26	6.9E-24
Rn	2.9E-19	4.3E-19	2.6E-18	3.0E-17	1.9E-16	2.2E-16	7.6E-15
Fr	8.8E-22	9.5E-22	1.2E-21	1.4E-21	2.3E-21	2.5E-21	6.9E-20
Ra	4.4E-14	6.8E-14	4.0E-13	4.7E-12	2.9E-11	3.5E-11	1.2E-09
Ac	3.4E-14	3.7E-14	4.4E-14	5.2E-14	6.5E-14	6.6E-14	2.4E-13
Th	2.8E-10	3.4E-10	8.2E-10	3.0E-09	7.8E-09	8.6E-09	7.5E-08
Pa	6.7E-11	6.8E-11	7.0E-11	7.9E-11	9.9E-11	1.0E-10	3.7E-10
U	5.1E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.4E-05
Np	5.5E-07	5.6E-07	6.2E-07	7.9E-07	9.8E-07	9.9E-07	1.1E-06
Pu	5.8E-06	5.7E-06	5.4E-06	5.0E-06	4.9E-06	4.9E-06	4.2E-06
Am	5.2E-07	5.2E-07	4.8E-07	3.0E-07	1.1E-07	9.7E-08	1.2E-13
Cm	4.5E-05	4.5E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Cf	4.2E-16	2.5E-16	5.0E-18	9.8E-20	6.1E-20	5.7E-20	5.1E-23
Total	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**

6. Conclusions

The calculations of radionuclide inventories for INTEC wastes are based on limited analytical data. While rigorous uncertainty analyses have not been done, the results are generally estimated to have an accuracy of ± a factor of 2. The final results have been rounded to two places of accuracy to minimize round-off errors when they are used in subsequent calculations.

It is recommended that additional samples of the INTEC wastes be taken as time permits and analyzed by radiochemical techniques. Should the results of future samples differ significantly from results calculated, this EDF should be updated appropriately.

7. References

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File AL_RUN1.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     ALUMINUM FUEL ELEMENT, 200 GRAM BOL
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     MTR EQUIVALENT FUEL
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  ELEMENT
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      13.5 1   2   5   0
  DEC      16.  2   3   5   0
  DEC      17.  3   4   5   0
  DEC      24.  4   5   5   0
  DEC      26.  5   6   5   0
  DEC      30.  6   7   5   0
  DEC      36.  7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  2   20040 8.605E-01 812070 1.349E-11 812080 6.540E-11 0 0.
  2  812090 2.629E-16 822060 4.883E-07 822070 1.066E-05 0 0.
  2  822080 5.961E-04 822090 1.095E-12 822100 2.219E-06 0 0.
  2  822110 1.044E-10 822120 3.858E-08 822140 2.157E-11 0 0.
  2  832080 6.816E-18 832090 2.831E-08 832101 3.781E-17 0 0.
  2  832100 1.366E-09 832110 6.160E-12 832120 3.659E-09 0 0.
  2  832130 2.574E-13 832140 1.601E-11 842100 3.540E-08 0 0.
  2  842110 7.555E-17 842120 1.936E-19 842130 3.860E-22 0 0.
  2  842140 2.203E-18 842150 8.741E-17 842160 1.539E-13 0 0.
  2  842180 2.501E-12 852170 3.092E-18 862190 1.981E-13 0 0.
  2  862200 5.810E-11 862220 4.599E-09 872210 2.808E-14 0 0.
  2  872230 9.174E-13 882230 5.032E-08 882240 3.365E-07 0 0.
  2  882250 1.270E-10 882260 7.153E-04 882280 6.111E-11 0 0.
  2  892250 8.577E-11 892270 3.555E-05 892280 6.379E-15 0 0.
  2  902270 8.269E-08 902280 6.514E-05 902290 2.340E-05 0 0.
  2  902300 5.732E+00 902310 2.297E-05 902320 1.933E-01 0 0.
  2  902340 5.615E-06 912310 1.575E-01 912330 1.599E-04 0 0.
  2  912341 1.893E-10 912340 8.457E-11 922320 9.724E-06 0 0.
  2  922330 8.360E-04 922340 5.571E+02 922350 1.121E+04 0 0.
  2  922360 8.721E+02 922370 6.100E-09 922380 4.092E+03 0 0.
  2  922400 1.764E-18 932350 7.170E-13 932360 9.782E-04 0 0.
  2  932370 1.681E+03 932380 7.576E-10 932390 1.558E-07 0 0.
  2  932401 3.861E-18 942360 8.400E-08 942380 3.293E+01 0 0.
  2  942390 9.186E+02 942400 9.961E+01 942410 8.210E+00 0 0.
  2  942420 4.480E-01 942430 3.915E-21 942440 2.884E-06 0 0.
  2  952410 3.290E+01 952421 5.050E-04 952420 6.040E-09 0 0.
  2  952430 2.266E-02 962420 1.223E-06 962430 9.219E-06 0 0.
```

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File AL_RUN1.INP (continued)

```
 2  962440 2.753E-04 962450 7.087E-06 962460 9.051E-08 0 0.
 2  962470 1.098E-10 962480 7.457E-13 982490 1.601E-15 0 0.
 2  982500 2.355E-17 982510 1.062E-17 982520 6.403E-20 0 0.
 3   10030 2.980E-01  30060 1.114E-02  30070 3.020E-04 0 0.
 3   40090 5.822E-04  40100 3.881E-03  60140 7.825E-04 0 0.
 3  300660 1.544E-06 300670 6.833E-08 300680 1.347E-10 0 0.
 3  310690 2.790E-14 320700 1.224E-17 310710 1.767E-05 0 0.
 3  320720 2.233E-01 320730 7.800E-01 320740 2.049E+00 0 0.
 3  330750 5.013E+00 320760 1.505E+01 340760 2.165E-02 0 0.
 3  340770 3.377E+01 340780 7.005E+01 340790 1.807E+02 0 0.
 3  350790 5.400E-02 340800 4.346E+02 360800 2.149E-03 0 0.
 3  350810 7.439E+02 360810 1.990E-05 340820 1.177E+03 0 0.
 3  360820 2.954E+00 360830 1.857E+03 360840 3.806E+03 0 0.
 3  360850 1.637E+02 370850 4.508E+03 360860 7.467E+03 0 0.
 3  380860 1.960E+00 370870 9.665E+03 380870 1.391E-02 0 0.
 3  380880 1.392E+04 390890 1.837E+04 380900 1.142E+04 0 0.
 3  390900 2.865E+00 400900 1.083E+04 400910 2.295E+04 0 0.
 3  400920 2.382E+04 400930 2.587E+04 410930 1.625E-01 0 0.
 3  410931 1.658E-01 400940 2.535E+04 410940 3.612E-03 0 0.
 3  420950 2.623E+04 400960 2.607E+04 420960 4.704E+01 0 0.
 3  420970 2.461E+04 420980 2.475E+04 430980 2.288E-02 0 0.
 3  430990 2.529E+04 440990 2.304E+00 421000 2.716E+04 0 0.
 3  441000 5.264E+02 441010 2.205E+04 441020 1.878E+04 0 0.
 3  451020 3.272E-06 451030 1.351E+04 441040 8.543E+03 0 0.
 3  461040 5.034E+02 461050 4.483E+03 441060 1.641E-05 0 0.
 3  451060 1.542E-11 461060 2.196E+03 461070 9.084E+02 0 0.
 3  471070 2.713E-03 461080 4.411E+02 471080 4.879E-16 0 0.
 3  471081 1.545E-07 481080 1.551E-04 471090 2.076E+02 0 0.
 3  471091 1.778E-20 481090 1.800E-14 461100 1.592E+02 0 0.
 3  471100 2.373E-20 471101 1.566E-12 481100 1.827E+01 0 0.
 3  481110 1.277E+02 481120 9.421E+01 481130 7.515E+00 0 0.
 3  481131 4.823E-01 491130 1.332E+00 481140 1.676E+02 0 0.
 3  501140 1.444E-04 491150 6.555E+01 501150 2.701E+00 0 0.
 3  481160 8.475E+01 501160 1.260E+01 501170 8.337E+01 0 0.
 3  501180 9.276E+01 501190 8.884E+01 501191 1.224E-12 0 0.
 3  501200 9.300E+01 501211 3.135E-02 511210 9.762E+01 0 0.
 3  501220 1.043E+02 521220 9.858E-01 501230 2.199E-19 0 0.
 3  511230 1.240E+02 521230 2.602E-03 501240 1.636E+02 0 0.
 3  521240 1.021E+00 511250 2.190E-01 521250 2.150E+02 0 0.
 3  521251 3.062E-03 501260 3.946E+02 511260 1.874E-05 0 0.
 3  511261 1.425E-07 521260 8.312E+00 531270 8.846E+02 0 0.
 3  521280 2.209E+03 541280 6.362E+00 531290 3.971E+03 0 0.
 3  541290 6.789E-02 521300 8.485E+03 541300 2.288E+01 0 0.
 3  541310 1.557E+04 541320 2.535E+04 561320 8.069E-04 0 0.
 3  551330 3.816E+04 541340 4.456E+04 551340 8.028E-02 0 0.
 3  561340 7.894E+02 551350 9.510E+03 561350 1.085E-01 0 0.
 3  541360 6.654E+04 561360 7.676E+01 551370 1.896E+04 0 0.
 3  561370 1.722E+04 561371 2.901E-03 561380 4.050E+04 0 0.
 3  571380 3.290E-01 571390 3.864E+04 581400 3.850E+04 0 0.
 3  591410 3.575E+04 581420 3.609E+04 601420 5.306E+01 0 0.
 3  601430 3.520E+04 581440 1.346E-06 591440 5.685E-11 0 0.
 3  591441 2.842E-13 601440 3.516E+04 601450 2.403E+04 0 0.
 3  601460 1.917E+04 611460 1.473E-03 621460 2.084E-02 0 0.
 3  611470 9.039E+00 621470 1.288E+04 601480 1.089E+04 0 0.
```

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File AL_RUN1.INP (continued)

```
  3  621480 1.026E+03 621490 5.347E+02 601500 4.208E+03 0 0.
  3  621500 7.071E+03 631500 1.035E-06 621510 8.016E+02 0 0.
  3  631510 1.923E+02 621520 3.180E+03 631520 1.901E-01 0 0.
  3  641520 4.050E-01 631530 1.486E+03 641530 3.663E-14 0 0.
  3  621540 5.209E+02 631540 1.602E+01 641540 1.342E+02 0 0.
  3  631550 3.274E+00 641550 1.514E+02 641560 2.120E+02 0 0.
  3  641570 1.783E+00 641580 8.685E+01 651590 9.407E+00 0 0.
  3  641600 3.750E+00 661600 2.373E-01 661610 9.686E-01 0 0.
  3  661620 5.426E-01 661630 2.354E-01 661640 6.689E-02 0 0.
  3  671650 5.202E-02 671661 1.187E-04 681660 1.966E-02 0 0.
  3  681670 6.961E-03 681680 3.019E-03 691690 3.898E-06 0 0.
  3  681700 1.868E-10 701700 1.277E-07 691710 7.971E-14 0 0.
  3  701710 1.571E-09 701720 3.685E-12      0 0.        0 0.
  0
```

File AL_RUN1.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy al_run1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy al_run1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out al_run1.u6 >nul
copy tape13.out+tape11.out al_run1.u11 >nul
ren tape7.out al_run1.pch
ren tape15.out al_run1.dbg
ren tape16.out al_run1.vxs
ren tape50.out al_run1.ech
rem  cleanup files
del tape*.inp
del tape*.out
del al_run1.pch
del al_run1.dbg
del al_run1.vxs
del al_run1.ech
del al_run1.u11
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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al_run1.ci
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Ci/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
TL206	0.000E+00	2.138E-20	2.138E-20	2.138E-20	2.138E-20	2.138E-20	2.138E-20	2.138E-20
TL207	2.570E-03	4.267E-03	4.514E-03	4.607E-03	5.171E-03	5.314E-03	5.568E-03	5.894E-03
TL208	1.927E-02	2.124E-04	1.249E-04	1.067E-04	6.484E-05	6.215E-05	5.861E-05	5.501E-05
TL209	1.076E-07	1.086E-07	1.091E-07	1.092E-07	1.108E-07	1.114E-07	1.126E-07	1.148E-07
PB209	4.977E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
PB210	1.695E-04	4.768E-04	5.489E-04	5.788E-04	8.044E-04	8.734E-04	1.017E-03	1.244E-03
PB211	2.578E-03	4.279E-03	4.527E-03	4.620E-03	5.186E-03	5.329E-03	5.584E-03	5.911E-03
PB212	5.363E-02	5.911E-04	3.478E-04	2.969E-04	1.805E-04	1.730E-04	1.631E-04	1.531E-04
PB214	7.075E-04	1.379E-03	1.504E-03	1.553E-03	1.901E-03	2.000E-03	2.199E-03	2.496E-03
BI208	3.185E-20	3.185E-20	3.185E-20	3.185E-20	3.185E-20	3.185E-20	3.185E-20	3.185E-20
BI210M	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20
BI210	1.696E-04	4.768E-04	5.492E-04	5.792E-04	8.047E-04	8.739E-04	1.017E-03	1.244E-03
BI211	2.578E-03	4.279E-03	4.527E-03	4.620E-03	5.186E-03	5.329E-03	5.584E-03	5.911E-03
BI212	5.362E-02	5.911E-04	3.478E-04	2.969E-04	1.805E-04	1.730E-04	1.631E-04	1.531E-04
BI213	4.980E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
BI214	7.072E-04	1.379E-03	1.504E-03	1.553E-03	1.901E-03	2.000E-03	2.199E-03	2.496E-03
PO210	1.591E-04	4.768E-04	5.293E-04	5.561E-04	8.047E-04	8.479E-04	1.018E-03	1.244E-03
PO211	7.216E-06	1.198E-05	1.268E-05	1.294E-05	1.452E-05	1.492E-05	1.563E-05	1.655E-05
PO212	3.436E-02	3.787E-04	2.228E-04	1.902E-04	1.156E-04	1.108E-04	1.045E-04	9.809E-05
PO213	4.870E-06	4.921E-06	4.940E-06	4.948E-06	5.021E-06	5.046E-06	5.101E-06	5.200E-06
PO214	7.072E-04	1.379E-03	1.503E-03	1.553E-03	1.901E-03	2.000E-03	2.198E-03	2.495E-03
PO215	2.578E-03	4.279E-03	4.527E-03	4.620E-03	5.186E-03	5.329E-03	5.584E-03	5.911E-03
PO216	5.361E-02	5.911E-04	3.478E-04	2.969E-04	1.805E-04	1.730E-04	1.631E-04	1.531E-04
PO218	7.076E-04	1.380E-03	1.504E-03	1.554E-03	1.901E-03	2.001E-03	2.199E-03	2.496E-03
AT217	4.979E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
RN219	2.578E-03	4.279E-03	4.527E-03	4.620E-03	5.186E-03	5.329E-03	5.584E-03	5.911E-03
RN220	5.361E-02	5.911E-04	3.478E-04	2.969E-04	1.805E-04	1.730E-04	1.631E-04	1.531E-04
RN222	7.077E-04	1.380E-03	1.504E-03	1.554E-03	1.901E-03	2.001E-03	2.199E-03	2.496E-03
FR221	4.979E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
FR223	3.550E-05	5.900E-05	6.235E-05	6.361E-05	7.145E-05	7.338E-05	7.691E-05	8.142E-05
RA223	2.578E-03	4.279E-03	4.527E-03	4.620E-03	5.186E-03	5.329E-03	5.584E-03	5.911E-03
RA224	5.362E-02	5.911E-04	3.478E-04	2.969E-04	1.805E-04	1.730E-04	1.631E-04	1.531E-04
RA225	4.981E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
RA226	7.075E-04	1.380E-03	1.504E-03	1.554E-03	1.901E-03	2.001E-03	2.199E-03	2.496E-03
RA228	1.431E-08	1.952E-08	1.991E-08	2.004E-08	2.067E-08	2.079E-08	2.096E-08	2.112E-08
AC225	4.980E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
AC227	2.572E-03	4.275E-03	4.518E-03	4.610E-03	5.177E-03	5.318E-03	5.573E-03	5.900E-03
AC228	1.431E-08	1.952E-08	1.991E-08	2.005E-08	2.068E-08	2.079E-08	2.096E-08	2.112E-08
TH227	2.543E-03	4.220E-03	4.465E-03	4.556E-03	5.114E-03	5.255E-03	5.507E-03	5.829E-03
TH228	5.341E-02	5.890E-04	3.465E-04	2.957E-04	1.803E-04	1.725E-04	1.629E-04	1.530E-04
TH229	4.980E-06	5.030E-06	5.049E-06	5.058E-06	5.131E-06	5.157E-06	5.214E-06	5.314E-06
TH230	1.158E-01	1.162E-01	1.162E-01	1.163E-01	1.165E-01	1.165E-01	1.167E-01	1.169E-01
TH231	1.222E+01	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02
TH232	2.121E-08	2.125E-08	2.125E-08	2.126E-08	2.128E-08	2.128E-08	2.129E-08	2.131E-08
TH234	1.301E-01	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03
PA231	7.442E-03	7.448E-03	7.449E-03	7.449E-03	7.452E-03	7.453E-03	7.454E-03	7.456E-03
PA233	3.320E+00	1.186E+00	1.186E+00	1.186E+00	1.186E+00	1.186E+00	1.187E+00	1.187E+00
PA234M	1.301E-01	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03
PA234	1.691E-04	1.789E-06	1.789E-06	1.789E-06	1.789E-06	1.789E-06	1.789E-06	1.789E-06
U232	2.082E-04	1.845E-04	1.802E-04	1.784E-04	1.669E-04	1.638E-04	1.576E-04	1.488E-04
U233	8.096E-06	7.909E-05	9.260E-05	9.834E-05	1.347E-04	1.456E-04	1.663E-04	1.975E-04
U234	3.482E+00	3.503E+00	3.506E+00	3.508E+00	3.517E+00	3.520E+00	3.525E+00	3.532E+00
U235	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02
U236	5.645E-02	5.645E-02	5.646E-02	5.646E-02	5.646E-02	5.646E-02	5.647E-02	5.647E-02
U237	4.981E-04	1.084E-02	9.609E-03	9.157E-03	6.538E-03	5.938E-03	4.898E-03	3.669E-03
U238	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03
U240	1.634E-12	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11
NP235	1.006E-09	1.799E-13	3.639E-14	1.920E-14	2.189E-16	6.095E-17	4.718E-18	1.249E-19
NP236	1.289E-05	1.289E-05	1.289E-05	1.289E-05	1.289E-05	1.289E-05	1.289E-05	1.289E-05
NP237	1.185E+00	1.186E+00	1.186E+00	1.186E+00	1.186E+00	1.186E+00	1.187E+00	1.187E+00
NP238	1.964E-04	2.308E-05	2.282E-05	2.272E-05	2.201E-05	2.181E-05	2.141E-05	2.083E-05
NP239	3.615E-02	4.513E-03	4.512E-03	4.512E-03	4.509E-03	4.508E-03	4.506E-03	4.504E-03
NP240M	4.089E-10	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11
PU236	4.465E-05	2.793E-06	2.049E-06	1.857E-06	1.287E-06	1.238E-06	1.190E-06	1.167E-06
PU238	5.640E+02	5.069E+02	4.970E+02	4.931E+02	4.666E+02	4.593E+02	4.450E+02	4.244E+02
PU239	5.712E+01	5.710E+01	5.710E+01	5.710E+01	5.708E+01	5.708E+01	5.707E+01	5.706E+01

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al_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Ci/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
PU240	2.271E+01	2.267E+01	2.267E+01	2.267E+01	2.265E+01	2.264E+01	2.263E+01	2.262E+01
PU241	8.462E+02	4.418E+02	3.917E+02	3.733E+02	2.665E+02	2.420E+02	1.996E+02	1.496E+02
PU242	1.711E-03	1.711E-03	1.711E-03	1.711E-03	1.711E-03	1.711E-03	1.711E-03	1.711E-03
PU243	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14
PU244	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11
AM241	1.130E+02	1.239E+02	1.250E+02	1.254E+02	1.276E+02	1.280E+02	1.286E+02	1.290E+02
AM242M	4.910E-03	4.617E-03	4.564E-03	4.544E-03	4.401E-03	4.361E-03	4.282E-03	4.167E-03
AM242	4.885E-03	4.594E-03	4.542E-03	4.521E-03	4.379E-03	4.339E-03	4.261E-03	4.146E-03
AM243	4.519E-03	4.513E-03	4.512E-03	4.512E-03	4.509E-03	4.508E-03	4.506E-03	4.504E-03
CM242	4.045E-03	3.799E-03	3.763E-03	3.744E-03	3.621E-03	3.595E-03	3.532E-03	3.429E-03
CM243	4.761E-04	3.428E-04	3.226E-04	3.149E-04	2.656E-04	2.530E-04	2.295E-04	1.984E-04
CM244	2.228E-02	1.329E-02	1.208E-02	1.162E-02	8.892E-03	8.237E-03	7.068E-03	5.618E-03
CM245	1.217E-06	1.216E-06	1.216E-06	1.216E-06	1.215E-06	1.215E-06	1.214E-06	1.214E-06
CM246	2.781E-08	2.776E-08	2.775E-08	2.774E-08	2.772E-08	2.771E-08	2.769E-08	2.767E-08
CM247	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14
CM248	3.172E-15	3.172E-15	3.172E-15	3.172E-15	3.172E-15	3.172E-15	3.171E-15	3.171E-15
CF249	6.561E-15	6.389E-15	6.357E-15	6.344E-15	6.257E-15	6.233E-15	6.183E-15	6.110E-15
CF250	2.576E-15	1.259E-15	1.103E-15	1.046E-15	7.220E-16	6.494E-16	5.254E-16	3.823E-16
CF251	1.685E-17	1.668E-17	1.664E-17	1.663E-17	1.654E-17	1.652E-17	1.646E-17	1.639E-17
CF252	3.445E-17	9.961E-19	5.096E-19	3.933E-19	6.701E-20	3.180E-20	1.594E-20	1.062E-20
H 3	2.877E+03	1.348E+03	1.172E+03	1.108E+03	7.479E+02	6.685E+02	5.341E+02	3.814E+02
BE 10	8.676E-05	8.676E-05	8.676E-05	8.676E-05	8.675E-05	8.675E-05	8.675E-05	8.675E-05
C 14	3.489E-03	3.483E-03	3.482E-03	3.482E-03	3.479E-03	3.478E-03	3.476E-03	3.474E-03
SE 79	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
KR 81	4.187E-07	4.187E-07	4.186E-07	4.186E-07	4.186E-07	4.186E-07	4.186E-07	4.186E-07
KR 85	6.425E+04	2.684E+04	2.283E+04	2.140E+04	1.361E+04	1.196E+04	9.235E+03	6.266E+03
RB 87	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04
SR 90	1.558E+06	1.130E+06	1.065E+06	1.040E+06	8.802E+05	8.393E+05	7.631E+05	6.615E+05
Y 90	1.559E+06	1.130E+06	1.065E+06	1.040E+06	8.804E+05	8.395E+05	7.632E+05	6.617E+05
ZR 93	6.503E+01	6.503E+01	6.503E+01	6.503E+01	6.503E+01	6.503E+01	6.503E+01	6.503E+01
NB 93M	4.688E+01	5.429E+01	5.519E+01	5.551E+01	5.739E+01	5.782E+01	5.855E+01	5.940E+01
NB 94	6.770E-04	6.767E-04	6.766E-04	6.766E-04	6.765E-04	6.764E-04	6.763E-04	6.762E-04
TC 98	1.989E-05	1.989E-05	1.989E-05	1.989E-05	1.989E-05	1.989E-05	1.989E-05	1.989E-05
TC 99	4.289E+02	4.289E+02	4.289E+02	4.289E+02	4.289E+02	4.289E+02	4.289E+02	4.289E+02
RH102	3.956E-03	1.570E-04	8.638E-05	6.802E-05	1.276E-05	7.914E-06	3.042E-06	7.250E-07
RU106	5.493E-02	5.107E-06	9.152E-07	4.601E-07	3.736E-09	9.443E-10	6.033E-11	9.743E-13
RH106	5.491E-02	5.107E-06	9.152E-07	4.601E-07	3.736E-09	9.443E-10	6.033E-11	9.743E-13
PD107	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01
AG108	3.586E-07	3.331E-07	3.286E-07	3.268E-07	3.145E-07	3.111E-07	3.044E-07	2.946E-07
AG108M	4.028E-06	3.742E-06	3.692E-06	3.671E-06	3.534E-06	3.496E-06	3.420E-06	3.310E-06
AG109M	4.649E-11	2.940E-14	7.516E-15	4.355E-15	9.557E-17	3.208E-17	3.617E-18	1.363E-19
CD109	4.649E-11	2.940E-14	7.516E-15	4.355E-15	9.555E-17	3.208E-17	3.599E-18	1.272E-19
AG110	9.898E-11	1.136E-16	9.024E-18	3.276E-18	2.725E-21	3.592E-22	1.574E-22	2.714E-22
AG110M	7.442E-09	8.543E-15	6.785E-16	2.463E-16	2.049E-19	1.184E-20	1.184E-20	2.041E-20
CD113M	1.046E+02	5.509E+01	4.892E+01	4.665E+01	3.345E+01	3.042E+01	2.516E+01	1.892E+01
IN115	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10
SN119M	5.484E-09	4.799E-15	3.624E-16	1.290E-16	9.317E-20	3.333E-20	2.321E-20	0.000E+00
SN121M	1.854E+00	1.538E+00	1.485E+00	1.465E+00	1.329E+00	1.293E+00	1.223E+00	1.125E+00
SN123	1.808E-15	5.828E-27	5.828E-27	5.828E-27	6.411E-33	6.411E-33	2.523E-36	0.000E+00
TE123	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13
SB125	2.262E+02	7.715E+00	4.127E+00	3.213E+00	5.574E-01	3.379E-01	1.242E-01	2.767E-02
TE125M	5.517E+01	1.882E+00	1.007E+00	7.840E-01	1.360E-01	8.247E-02	3.030E-02	6.751E-03
SN126	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01
SB126	1.567E+00	1.568E+00	1.568E+00	1.568E+00	1.568E+00	1.568E+00	1.568E+00	1.568E+00
SB126M	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01	1.120E+01
I129	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01
CS134	1.039E+02	1.111E+00	4.795E-01	3.426E-01	3.257E-02	1.663E-02	4.334E-03	5.766E-04
CS135	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
CS137	1.650E+06	1.208E+06	1.140E+06	1.114E+06	9.476E+05	9.048E+05	8.249E+05	7.182E+05
BA137M	1.561E+06	1.143E+06	1.078E+06	1.054E+06	8.964E+05	8.560E+05	7.804E+05	6.794E+05
LA138	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09
CE142	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04
CE144	4.296E-03	2.578E-08	2.781E-09	1.141E-09	2.237E-12	3.768E-13	1.069E-14	5.108E-17
PR144	4.297E-03	2.578E-08	2.781E-09	1.141E-09	2.238E-12	3.768E-13	1.069E-14	5.108E-17
PR144M	5.156E-05	3.093E-10	3.337E-11	1.370E-11	2.686E-14	4.522E-15	1.283E-16	6.129E-19

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al_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Ci/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
ND144	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08
PM146	6.561E-01	1.197E-01	8.734E-02	7.700E-02	3.187E-02	2.477E-02	1.496E-02	7.024E-03
SM146	7.293E-07	7.449E-07	7.458E-07	7.461E-07	7.474E-07	7.476E-07	7.479E-07	7.482E-07
PM147	8.383E+03	2.368E+02	1.223E+02	9.391E+01	1.477E+01	8.710E+00	3.027E+00	6.202E-01
SM147	2.928E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04
SM148	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10
SM149	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10
EU150	6.855E-05	5.286E-05	5.037E-05	4.941E-05	4.318E-05	4.155E-05	3.847E-05	3.427E-05
SM151	2.110E+04	1.901E+04	1.865E+04	1.851E+04	1.754E+04	1.727E+04	1.674E+04	1.599E+04
EU152	3.289E+01	1.653E+01	1.455E+01	1.383E+01	9.679E+00	8.741E+00	7.129E+00	5.251E+00
GD152	8.824E-12	9.398E-12	9.468E-12	9.493E-12	9.638E-12	9.671E-12	9.728E-12	9.794E-12
GD153	1.292E-10	9.507E-17	6.938E-18	2.426E-18	1.602E-21	1.602E-21	1.602E-21	1.602E-21
EU154	4.326E+03	1.457E+03	1.191E+03	1.099E+03	6.252E+02	5.321E+02	3.855E+02	2.377E+02
EU155	1.523E+03	2.308E+02	1.628E+02	1.415E+02	5.321E+01	4.023E+01	2.300E+01	9.943E+00
HO166M	2.131E-04	2.115E-04	2.112E-04	2.110E-04	2.102E-04	2.099E-04	2.095E-04	2.087E-04
TM171	8.683E-11	6.637E-13	2.692E-13	1.876E-13	1.499E-14	7.280E-15	1.718E-15	1.969E-16

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Source Listing of Program ROUNDAL1

```
PROGRAM ROUNDAL1

!-------- WRITTEN BY D.R. WENZEL

!            To convert file al_run1.ci for the total Ci in Bin
!            Set 1 to Ci/g and round the results to 2 places of
!            accuracy

       CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
       CHARACTER (LEN=10) :: BLANK, ZERO(7)
       CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
       CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
       CHARACTER (LEN=96) :: BUFFER2
       CHARACTER (LEN=111) :: BUFFER, ORGLINE

       COMMON /AMT/ AMOUNT(9)
       EQUIVALENCE (ORGLINE, BUFFER1(1))
       EQUIVALENCE (BUFFER2, BUFFER3(1))
       EQUIVALENCE (ZERO(1), BUFFER3(27))

       REAL :: DATA(175,7), VALUE(7)

       DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

       OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(2,FILE ='AL_RUN1.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(6,FILE ='ROUNDAL1.OUT', STATUS='UNKNOWN', ERR = 900)

!--------  Conversion from Ci/Bin Set 1 to Ci/g
!             (Bin Set 1/217 cu m) x (1.E-6 cu m/mL) / (1.09 g/mL)
!                  = 4.228E-9

       CORFAC = 4.228E-9
       WRITE(6,600)
  600  FORMAT(1X,'ROUNDAL1.OUT  (Ci/g)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

       LAST = 0
   10  READ(1,1000,END=20) NAME, NAME2
 1000  FORMAT(A12, 5X, A24)
       LAST = LAST + 1
       NUCLIDE(LAST) = NAME
       NUCLIDE2(LAST) = NAME2
       GO TO 10

!-------- ZERO MEMORY

   20  DO  l=1,175
```

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Source Listing of Program ROUNDAL1 (continued)

```
         DO K=1,7
            DATA(l,K) = 0.
         END DO

      END DO

!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35 DO  J=1,3
         READ(2,120) ORGLINE
  120    FORMAT(A111)

         IF(J == 2) THEN
            WRITE(6,120) ORGLINE
         END IF

      END DO

      WRITE(6,605)
  605 FORMAT(/,3X,'Nuclide',5X,'Half-Life',5X,'1999Jul   2002Jan   ', &
             '2003Jan   2010Jan   2012Jan   2016Jan   2022Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50 READ(2,120,END=80) ORGLINE
      WRITE(BUFFER,120) ORGLINE
      READ(BUFFER,400) DESC, VALUE
  400 FORMAT(A12,9X,7(E10.4))
      DO  J=1,175
         IF(DESC == NUCLIDE(J)) THEN
            DO 60 K=1,7
               DATA(J,K) = VALUE(K) * CORFAC
   60       CONTINUE

         END IF

      END DO

      GO TO 50

   80 DO  J=1,LAST
         WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620    FORMAT(2X,A24,7(1PE10.1))
         DO K=1,7
            IF(DATA(J,K) == 0.) THEN
               ZERO(K) = BLANK
            ENDIF

         END DO

         WRITE(6,625) BUFFER2
  625    FORMAT(A96)
```

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Source Listing of Program ROUNDAL1 (continued)

```
      END DO

      GO TO 999

!-------- ERROR STATEMENTS

  900 WRITE(6,9000)
 9000 FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999 CONTINUE
      END PROGRAM ROUNDAL1
```

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File MASTER

H 3	H-3	1.235E+01	yr
BE 10	Be-10	1.600E+06	yr
C 14	C-14	5.729E+03	yr
FE 55	Fe-55	2.600E+00	yr
NI 59	Ni-59	8.000E+04	yr
CO 60	Co-60	5.270E+00	yr
NI 63	Ni-63	9.200E+01	yr
SE 79	Se-79	6.496E+04	yr
RB 87	Rb-87	4.696E+10	yr
SR 90	Sr-90	2.912E+01	yr
Y 90	Y-90	6.400E+01	h
ZR 93	Zr-93	1.530E+06	yr
NB 93M	Nb-93m	1.360E+01	yr
NB 94	Nb-94	2.030E+04	yr
TC 98	Tc-98	4.199E+06	yr
TC 99	Tc-99	2.130E+05	yr
RH102	Rh-102	1.059E+03	d
RU106	Ru-106	3.682E+02	d
RH106	Rh-106	2.990E+01	s
PD107	Pd-107	6.496E+06	yr
AG108	Ag-108	2.370E+00	m
AG108M	Ag-108m	1.270E+02	yr
AG109M	Ag-109m	3.960E+01	s
CD109	Cd-109	4.640E+02	d
AG110	Ag-110	2.460E+01	s
AG110M	Ag-110m	2.499E+02	d
CD113M	Cd-113m	1.459E+01	yr
IN115	In-115	4.997E+14	yr
SN119M	Sn-119m	2.450E+02	d
SN121M	Sn-121m	4.997E+01	yr
TE123	Te-123	1.000E+13	yr
SB125	Sb-125	2.770E+00	yr
TE125M	Te-125m	5.800E+01	d
SN126	Sn-126	1.000E+05	yr
SB126	Sb-126	1.240E+01	d
SB126M	Sb-126m	1.900E+01	m
I129	I-129	1.570E+07	yr
CS134	Cs-134	2.062E+00	yr
CS135	Cs-135	2.300E+06	yr
CS137	Cs-137	3.000E+01	yr
BA137M	Ba-137m	2.552E+00	m
LA138	La-138	1.350E+11	yr
CE142	Ce-142	1.049E+11	yr
CE144	Ce-144	2.843E+02	d
PR144	Pr-144	1.728E+01	m
PR144M	Pr-144m	7.200E+00	m
ND144	Nd-144	2.099E+15	yr
PM146	Pm-146	5.500E+00	yr
SM146	Sm-146	7.000E+07	yr
PM147	Pm-147	2.623E+00	yr
SM147	Sm-147	1.070E+11	yr
SM148	Sm-148	8.001E+15	yr
SM149	Sm-149	9.994E+15	yr

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File MASTER (continued)

EU150	Eu-150	3.600E+01	yr
SM151	Sm-151	8.999E+01	yr
EU152	Eu-152	1.360E+01	yr
GD152	Gd-152	1.080E+14	yr
GD153	Gd-153	2.420E+02	d
EU154	Eu-154	8.600E+00	yr
EU155	Eu-155	4.959E+00	yr
HO166M	Ho-166m	1.200E+03	yr
TM171	Tm-171	1.920E+00	yr
TL207	Tl-207	4.770E+00	m
TL208	Tl-208	3.070E+00	m
TL209	Tl-209	2.200E+00	m
PB209	Pb-209	3.300E+00	h
PB210	Pb-210	2.230E+01	yr
PB211	Pb-211	3.610E+01	m
PB212	Pb-212	1.064E+01	h
PB214	Pb-214	2.680E+01	m
BI210M	Bi-210m	3.000E+06	yr
BI210	Bi-210	5.012E+00	d
BI211	Bi-211	2.130E+00	m
BI212	Bi-212	6.055E+01	m
BI213	Bi-213	4.565E+01	m
BI214	Bi-214	1.990E+01	m
PO210	Po-210	1.384E+02	d
PO211	Po-211	5.600E-01	s
PO212	Po-212	3.000E-07	s
PO213	Po-213	4.200E-06	s
PO214	Po-214	1.643E-04	s
PO215	Po-215	1.780E-03	s
PO216	Po-216	1.500E-01	s
PO218	Po-218	3.050E+00	m
AT217	At-217	3.230E-02	s
RN219	Rn-219	3.960E+00	s
RN220	Rn-220	5.560E+01	s
RN222	Rn-222	3.824E+00	d
FR221	Fr-221	4.800E+00	m
FR223	Fr-223	2.180E+01	m
RA223	Ra-223	1.143E+01	d
RA224	Ra-224	3.660E+00	d
RA225	Ra-225	1.480E+01	d
RA226	Ra-226	1.600E+03	yr
RA228	Ra-228	6.700E+00	yr
AC225	Ac-225	1.000E+01	d
AC227	Ac-227	2.177E+01	yr
AC228	Ac-228	6.131E+00	h
TH227	Th-227	1.872E+01	d
TH228	Th-228	1.913E+00	yr
TH229	Th-229	7.339E+03	yr
TH230	Th-230	7.700E+04	yr
TH231	Th-231	2.552E+01	h
TH232	Th-232	1.405E+10	yr
TH234	Th-234	2.410E+01	d
PA231	Pa-231	3.277E+04	yr

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File MASTER (continued)

PA233	Pa-233	2.700E+01	d
PA234M	Pa-234m	1.170E+00	m
PA234	Pa-234	6.700E+00	h
U232	U-232	7.200E+01	yr
U233	U-233	1.585E+05	yr
U234	U-234	2.445E+05	yr
U235	U-235	7.038E+08	yr
U236	U-236	2.341E+07	yr
U237	U-237	6.750E+00	d
U238	U-238	4.468E+09	yr
U240	U-240	1.410E+01	h
NP235	Np-235	3.961E+02	d
NP236	Np-236	1.150E+05	yr
NP237	Np-237	2.140E+06	yr
NP238	Np-238	2.117E+00	d
NP239	Np-239	2.355E+00	d
NP240M	Np-240m	7.400E+00	m
PU236	Pu-236	2.851E+00	yr
PU238	Pu-238	8.774E+01	yr
PU239	Pu-239	2.406E+04	yr
PU240	Pu-240	6.537E+03	yr
PU241	Pu-241	1.440E+01	yr
PU242	Pu-242	3.869E+05	yr
PU243	Pu-243	4.956E+00	h
PU244	Pu-244	8.261E+07	yr
AM241	Am-241	4.322E+02	yr
AM242M	Am-242m	1.520E+02	yr
AM242	Am-242	1.602E+01	h
AM243	Am-243	7.380E+03	yr
CM242	Cm-242	1.632E+02	d
CM243	Cm-243	2.850E+01	yr
CM244	Cm-244	1.811E+01	yr
CM245	Cm-245	8.499E+03	yr
CM246	Cm-246	4.731E+03	yr
CM247	Cm-247	1.560E+07	yr
CM248	Cm-248	3.391E+05	yr
CF249	Cf-249	3.505E+02	yr
CF250	Cf-250	1.308E+01	yr
CF251	Cf-251	8.980E+02	yr
CF252	Cf-252	2.638E+00	yr
more activation			
CA 45	Ca-45	1.630E+02	d
V 50	V-50	4.000E+16	yr
MN 54	Mn-54	3.125E+02	d
FE 55	Fe-55	2.600E+00	yr
LU176	Lu-176	3.000E+10	yr
LU177	Lu-177	6.709E+00	d
HF182	Hf-182	9.000E+06	yr
TA182	Ta-182	1.150E+02	d
RE187	Re-187	5.000E+10	yr

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ROUNDAL1.OUT (Ci/g)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	5.7E-06	5.0E-06	4.7E-06	3.2E-06	2.8E-06	2.3E-06	1.6E-06
Be-10	1.600E+06	yr	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
C-14	5.729E+03	yr	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11	1.5E-11
Fe-55	2.600E+00	yr							
Ni-59	8.000E+04	yr							
Co-60	5.270E+00	yr							
Ni-63	9.200E+01	yr							
Se-79	6.496E+04	yr	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08
Rb-87	4.696E+10	yr	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12
Sr-90	2.912E+01	yr	4.8E-03	4.5E-03	4.4E-03	3.7E-03	3.5E-03	3.2E-03	2.8E-03
Y-90	6.400E+01	h	4.8E-03	4.5E-03	4.4E-03	3.7E-03	3.5E-03	3.2E-03	2.8E-03
Zr-93	1.530E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Nb-93m	1.360E+01	yr	2.3E-07	2.3E-07	2.3E-07	2.4E-07	2.4E-07	2.5E-07	2.5E-07
Nb-94	2.030E+04	yr	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12	2.9E-12
Tc-98	4.199E+06	yr	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14
Tc-99	2.130E+05	yr	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Rh-102	1.059E+03	d	6.6E-13	3.7E-13	2.9E-13	5.4E-14	3.3E-14	1.3E-14	3.1E-15
Ru-106	3.682E+02	d	2.2E-14	3.9E-15	1.9E-15	1.6E-17	4.0E-18	2.6E-19	4.1E-21
Rh-106	2.990E+01	s	2.2E-14	3.9E-15	1.9E-15	1.6E-17	4.0E-18	2.6E-19	4.1E-21
Pd-107	6.496E+06	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Ag-108	2.370E+00	m	1.4E-15	1.4E-15	1.4E-15	1.3E-15	1.3E-15	1.3E-15	1.2E-15
Ag-108m	1.270E+02	yr	1.6E-14	1.6E-14	1.6E-14	1.5E-14	1.5E-14	1.4E-14	1.4E-14
Ag-109m	3.960E+01	s	1.2E-22	3.2E-23	1.8E-23	4.0E-25	1.4E-25	1.5E-26	5.8E-28
Cd-109	4.640E+02	d	1.2E-22	3.2E-23	1.8E-23	4.0E-25	1.4E-25	1.5E-26	5.4E-28
Ag-110	2.460E+01	s	4.8E-25	3.8E-26	1.4E-26	1.2E-29	1.5E-30	6.7E-31	1.1E-30
Ag-110m	2.499E+02	d	3.6E-23	2.9E-24	1.0E-24	8.7E-28	5.0E-29	5.0E-29	8.6E-29
Cd-113m	1.459E+01	yr	2.3E-07	2.1E-07	2.0E-07	1.4E-07	1.3E-07	1.1E-07	8.0E-08
In-115	4.997E+14	yr	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18
Sn-119m	2.450E+02	d	2.0E-23	1.5E-24	5.5E-25	3.9E-28	1.4E-28	9.8E-29	
Sn-121m	4.997E+01	yr	6.5E-09	6.3E-09	6.2E-09	5.6E-09	5.5E-09	5.2E-09	4.8E-09
Te-123	1.000E+13	yr	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21
Sb-125	2.770E+00	yr	3.3E-08	1.7E-08	1.4E-08	2.4E-09	1.4E-09	5.3E-10	1.2E-10
Te-125m	5.800E+01	d	8.0E-09	4.3E-09	3.3E-09	5.8E-10	3.5E-10	1.3E-10	2.9E-11
Sn-126	1.000E+05	yr	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08
Sb-126	1.240E+01	d	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Sb-126m	1.900E+01	m	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08
I-129	1.570E+07	yr	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09
Cs-134	2.062E+00	yr	4.7E-09	2.0E-09	1.4E-09	1.4E-10	7.0E-11	1.8E-11	2.4E-12
Cs-135	2.300E+06	yr	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08
Cs-137	3.000E+01	yr	5.1E-03	4.8E-03	4.7E-03	4.0E-03	3.8E-03	3.5E-03	3.0E-03
Ba-137m	2.552E+00	m	4.8E-03	4.6E-03	4.5E-03	3.8E-03	3.6E-03	3.3E-03	2.9E-03
La-138	1.350E+11	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Ce-142	1.049E+11	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Ce-144	2.843E+02	d	1.1E-16	1.2E-17	4.8E-18	9.5E-21	1.6E-21	4.5E-23	2.2E-25
Pr-144	1.728E+01	m	1.1E-16	1.2E-17	4.8E-18	9.5E-21	1.6E-21	4.5E-23	2.2E-25
Pr-144m	7.200E+00	m	1.3E-18	1.4E-19	5.8E-20	1.1E-22	1.9E-23	5.4E-25	2.6E-27
Nd-144	2.099E+15	yr	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16
Pm-146	5.500E+00	yr	5.1E-10	3.7E-10	3.3E-10	1.3E-10	1.0E-10	6.3E-11	3.0E-11
Sm-146	7.000E+07	yr	3.1E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15
Pm-147	2.623E+00	yr	1.0E-06	5.2E-07	4.0E-07	6.2E-08	3.7E-08	1.3E-08	2.6E-09
Sm-147	1.070E+11	yr	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12
Sm-148	8.001E+15	yr	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18
Sm-149	9.994E+15	yr	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19
Eu-150	3.600E+01	yr	2.2E-13	2.1E-13	2.1E-13	1.8E-13	1.8E-13	1.6E-13	1.4E-13
Sm-151	8.999E+01	yr	8.0E-05	7.9E-05	7.8E-05	7.4E-05	7.3E-05	7.1E-05	6.8E-05
Eu-152	1.360E+01	yr	7.0E-08	6.2E-08	5.8E-08	4.1E-08	3.7E-08	3.0E-08	2.2E-08
Gd-152	1.080E+14	yr	4.0E-20	4.0E-20	4.0E-20	4.1E-20	4.1E-20	4.1E-20	4.1E-20
Gd-153	2.420E+02	d	4.0E-25	2.9E-26	1.0E-26	6.8E-30	6.8E-30	6.8E-30	6.8E-30
Eu-154	8.600E+00	yr	6.2E-06	5.0E-06	4.6E-06	2.6E-06	2.2E-06	1.6E-06	1.0E-06
Eu-155	4.959E+00	yr	9.8E-07	6.9E-07	6.0E-07	2.2E-07	1.7E-07	9.7E-08	4.2E-08
Ho-166m	1.200E+03	yr	8.9E-13	8.9E-13	8.9E-13	8.9E-13	8.9E-13	8.9E-13	8.8E-13
Tm-171	1.920E+00	yr	2.8E-21	1.1E-21	7.9E-22	6.3E-23	3.1E-23	7.3E-24	8.3E-25
Tl-207	4.770E+00	m	1.8E-11	1.9E-11	1.9E-11	2.2E-11	2.2E-11	2.4E-11	2.5E-11
Tl-208	3.070E+00	m	9.0E-13	5.3E-13	4.5E-13	2.7E-13	2.6E-13	2.5E-13	2.3E-13
Tl-209	2.200E+00	m	4.6E-16	4.6E-16	4.6E-16	4.7E-16	4.7E-16	4.8E-16	4.9E-16
Pb-209	3.300E+00	h	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14

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ROUNDAL1.OUT (Ci/g) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pb-210	2.230E+01	yr	2.0E-12	2.3E-12	2.4E-12	3.4E-12	3.7E-12	4.3E-12	5.3E-12
Pb-211	3.610E+01	m	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Pb-212	1.064E+01	h	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Pb-214	2.680E+01	m	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Bi-210m	3.000E+06	yr	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29
Bi-210	5.012E+00	d	2.0E-12	2.3E-12	2.4E-12	3.4E-12	3.7E-12	4.3E-12	5.3E-12
Bi-211	2.130E+00	m	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Bi-212	6.055E+01	m	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Bi-213	4.565E+01	m	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Bi-214	1.990E+01	m	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Po-210	1.384E+02	d	2.0E-12	2.2E-12	2.4E-12	3.4E-12	3.6E-12	4.3E-12	5.3E-12
Po-211	5.600E-01	s	5.1E-14	5.4E-14	5.5E-14	6.1E-14	6.3E-14	6.6E-14	7.0E-14
Po-212	3.000E-07	s	1.6E-12	9.4E-13	8.0E-13	4.9E-13	4.7E-13	4.4E-13	4.1E-13
Po-213	4.200E-06	s	2.1E-14	2.1E-14	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14
Po-214	1.643E-04	s	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Po-215	1.780E-03	s	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Po-216	1.500E-01	s	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Po-218	3.050E+00	m	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
At-217	3.230E-02	s	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Rn-219	3.960E+00	s	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Rn-220	5.560E+01	s	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Rn-222	3.824E+00	d	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Fr-221	4.800E+00	m	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Fr-223	2.180E+01	m	2.5E-13	2.6E-13	2.7E-13	3.0E-13	3.1E-13	3.3E-13	3.4E-13
Ra-223	1.143E+01	d	1.8E-11	1.9E-11	2.0E-11	2.2E-11	2.3E-11	2.4E-11	2.5E-11
Ra-224	3.660E+00	d	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Ra-225	1.480E+01	d	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Ra-226	1.600E+03	yr	5.8E-12	6.4E-12	6.6E-12	8.0E-12	8.5E-12	9.3E-12	1.1E-11
Ra-228	6.700E+00	yr	8.3E-17	8.4E-17	8.5E-17	8.7E-17	8.8E-17	8.9E-17	8.9E-17
Ac-225	1.000E+01	d	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Ac-227	2.177E+01	yr	1.8E-11	1.9E-11	1.9E-11	2.2E-11	2.2E-11	2.4E-11	2.5E-11
Ac-228	6.131E+00	h	8.3E-17	8.4E-17	8.5E-17	8.7E-17	8.8E-17	8.9E-17	8.9E-17
Th-227	1.872E+01	d	1.8E-11	1.9E-11	1.9E-11	2.2E-11	2.2E-11	2.3E-11	2.5E-11
Th-228	1.913E+00	yr	2.5E-12	1.5E-12	1.3E-12	7.6E-13	7.3E-13	6.9E-13	6.5E-13
Th-229	7.339E+03	yr	2.1E-14	2.1E-14	2.1E-14	2.2E-14	2.2E-14	2.2E-14	2.2E-14
Th-230	7.700E+04	yr	4.9E-10	4.9E-10	4.9E-10	4.9E-10	4.9E-10	4.9E-10	4.9E-10
Th-231	2.552E+01	h	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
Th-232	1.405E+10	yr	9.0E-17	9.0E-17	9.0E-17	9.0E-17	9.0E-17	9.0E-17	9.0E-17
Th-234	2.410E+01	d	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-231	3.277E+04	yr	3.1E-11	3.1E-11	3.1E-11	3.2E-11	3.2E-11	3.2E-11	3.2E-11
Pa-233	2.700E+01	d	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09
Pa-234m	1.170E+00	m	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-234	6.700E+00	h	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15
U-232	7.200E+01	yr	7.8E-13	7.6E-13	7.5E-13	7.1E-13	6.9E-13	6.7E-13	6.3E-13
U-233	1.585E+05	yr	3.3E-13	3.9E-13	4.2E-13	5.7E-13	6.2E-13	7.0E-13	8.4E-13
U-234	2.445E+05	yr	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08
U-235	7.038E+08	yr	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
U-236	2.341E+07	yr	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10
U-237	6.750E+00	d	4.6E-11	4.1E-11	3.9E-11	2.8E-11	2.5E-11	2.1E-11	1.6E-11
U-238	4.468E+09	yr	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
U-240	1.410E+01	h	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Np-235	3.961E+02	d	7.6E-22	1.5E-22	8.1E-23	9.3E-25	2.6E-25	2.0E-26	5.3E-28
Np-236	1.150E+05	yr	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14
Np-237	2.140E+06	yr	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09	5.0E-09
Np-238	2.117E+00	d	9.8E-14	9.6E-14	9.6E-14	9.3E-14	9.2E-14	9.1E-14	8.8E-14
Np-239	2.355E+00	d	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
Np-240m	7.400E+00	m	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Pu-236	2.851E+00	yr	1.2E-14	8.7E-15	7.9E-15	5.4E-15	5.2E-15	5.0E-15	4.9E-15
Pu-238	8.774E+01	yr	2.1E-06	2.1E-06	2.1E-06	2.0E-06	1.9E-06	1.9E-06	1.8E-06
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07
Pu-240	6.537E+03	yr	9.6E-08	9.6E-08	9.6E-08	9.6E-08	9.6E-08	9.6E-08	9.6E-08
Pu-241	1.440E+01	yr	1.9E-06	1.7E-06	1.6E-06	1.1E-06	1.0E-06	8.4E-07	6.3E-07
Pu-242	3.869E+05	yr	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12
Pu-243	4.956E+00	h	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Pu-244	8.261E+07	yr	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Am-241	4.322E+02	yr	5.2E-07	5.3E-07	5.3E-07	5.4E-07	5.4E-07	5.4E-07	5.5E-07

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ROUNDAL1.OUT (Ci/g) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Am-242m	1.520E+02	yr	2.0E-11	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.8E-11	1.8E-11
Am-242	1.602E+01	h	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.8E-11	1.8E-11
Am-243	7.380E+03	yr	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
Cm-242	1.632E+02	d	1.6E-11	1.6E-11	1.6E-11	1.5E-11	1.5E-11	1.5E-11	1.4E-11
Cm-243	2.850E+01	yr	1.4E-12	1.4E-12	1.3E-12	1.1E-12	1.1E-12	9.7E-13	8.4E-13
Cm-244	1.811E+01	yr	5.6E-11	5.1E-11	4.9E-11	3.8E-11	3.5E-11	3.0E-11	2.4E-11
Cm-245	8.499E+03	yr	5.1E-15	5.1E-15	5.1E-15	5.1E-15	5.1E-15	5.1E-15	5.1E-15
Cm-246	4.731E+03	yr	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16
Cm-247	1.560E+07	yr	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Cm-248	3.391E+05	yr	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23
Cf-249	3.505E+02	yr	2.7E-23	2.7E-23	2.7E-23	2.6E-23	2.6E-23	2.6E-23	2.6E-23
Cf-250	1.308E+01	yr	5.3E-24	4.7E-24	4.4E-24	3.1E-24	2.7E-24	2.2E-24	1.6E-24
Cf-251	8.980E+02	yr	7.1E-26	7.0E-26	7.0E-26	7.0E-26	7.0E-26	7.0E-26	6.9E-26
Cf-252	2.638E+00	yr	4.2E-27	2.2E-27	1.7E-27	2.8E-28	1.3E-28	6.7E-29	4.5E-29
Ca-45	1.630E+02	d							
V-50	4.000E+16	yr							
Mn-54	3.125E+02	d							
Fe-55	2.600E+00	yr							
Lu-176	3.000E+10	yr							
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr							
Ta-182	1.150E+02	d							
Re-187	5.000E+10	yr							

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al_run1.g
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

g/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
HE 4	8.605E-01	9.378E-01	9.516E-01	9.571E-01	9.946E-01	1.005E+00	1.026E+00	1.056E+00
TL206	0.000E+00	9.810E-29	9.810E-29	9.810E-29	9.810E-29	9.810E-29	9.810E-29	9.810E-29
TL207	1.349E-11	2.240E-11	2.370E-11	2.418E-11	2.714E-11	2.789E-11	2.923E-11	3.094E-11
TL208	6.540E-11	7.209E-13	4.241E-13	3.622E-13	2.201E-13	2.110E-13	1.990E-13	1.867E-13
TL209	2.629E-16	2.656E-16	2.666E-16	2.670E-16	2.709E-16	2.723E-16	2.753E-16	2.806E-16
PB206	4.883E-07	2.141E-06	2.641E-06	2.861E-06	4.772E-06	5.433E-06	6.930E-06	9.630E-06
PB207	1.066E-05	2.952E-05	3.393E-05	3.577E-05	4.955E-05	5.376E-05	6.252E-05	7.635E-05
PB208	5.961E-04	6.563E-04	6.567E-04	6.569E-04	6.575E-04	6.576E-04	6.579E-04	6.583E-04
PB209	1.095E-12	1.107E-12	1.111E-12	1.113E-12	1.129E-12	1.134E-12	1.147E-12	1.169E-12
PB210	2.219E-06	6.243E-06	7.187E-06	7.579E-06	1.053E-05	1.144E-05	1.331E-05	1.629E-05
PB211	1.044E-10	1.733E-10	1.833E-10	1.871E-10	2.100E-10	2.158E-10	2.261E-10	2.394E-10
PB212	3.858E-08	4.252E-10	2.502E-10	2.136E-10	1.298E-10	1.244E-10	1.174E-10	1.101E-10
PB214	2.157E-11	4.205E-11	4.584E-11	4.736E-11	5.796E-11	6.098E-11	6.703E-11	7.610E-11
BI208	6.816E-18	6.816E-18	6.816E-18	6.816E-18	6.816E-18	6.816E-18	6.816E-18	6.816E-18
BI209	2.831E-08	5.564E-08	6.074E-08	6.279E-08	7.722E-08	8.139E-08	8.979E-08	1.026E-07
BI210M	3.781E-17	3.781E-17	3.781E-17	3.781E-17	3.781E-17	3.781E-17	3.781E-17	3.781E-17
BI210	1.366E-09	3.842E-09	4.424E-09	4.666E-09	6.483E-09	7.041E-09	8.196E-09	1.002E-08
BI211	6.160E-12	1.022E-11	1.082E-11	1.104E-11	1.239E-11	1.273E-11	1.334E-11	1.412E-11
BI212	3.659E-09	4.033E-11	2.373E-11	2.026E-11	1.232E-11	1.180E-11	1.113E-11	1.045E-11
BI213	2.574E-13	2.600E-13	2.610E-13	2.614E-13	2.652E-13	2.666E-13	2.695E-13	2.747E-13
BI214	1.601E-11	3.123E-11	3.404E-11	3.517E-11	4.304E-11	4.528E-11	4.977E-11	5.651E-11
PO210	3.540E-08	1.061E-07	1.178E-07	1.238E-07	1.791E-07	1.887E-07	2.265E-07	2.769E-07
PO211	7.555E-17	1.254E-16	1.327E-16	1.354E-16	1.520E-16	1.562E-16	1.637E-16	1.733E-16
PO212	1.936E-19	2.134E-21	1.256E-21	1.072E-21	6.516E-22	6.245E-22	5.890E-22	5.527E-22
PO213	3.860E-22	3.901E-22	3.916E-22	3.922E-22	3.979E-22	3.999E-22	4.044E-22	4.121E-22
PO214	2.203E-18	4.296E-18	4.683E-18	4.838E-18	5.921E-18	6.230E-18	6.848E-18	7.774E-18
PO215	8.741E-17	1.451E-16	1.535E-16	1.566E-16	1.758E-16	1.807E-16	1.893E-16	2.004E-16
PO216	1.539E-13	1.697E-15	9.983E-16	8.524E-16	5.181E-16	4.966E-16	4.683E-16	4.395E-16
PO218	2.501E-12	4.876E-12	5.316E-12	5.492E-12	6.720E-12	7.071E-12	7.773E-12	8.824E-12
AT217	3.092E-18	3.124E-18	3.136E-18	3.141E-18	3.187E-18	3.203E-18	3.238E-18	3.300E-18
RN219	1.981E-13	3.288E-13	3.478E-13	3.550E-13	3.985E-13	4.095E-13	4.291E-13	4.542E-13
RN220	5.810E-11	6.406E-13	3.769E-13	3.218E-13	1.956E-13	1.875E-13	1.768E-13	1.659E-13
RN222	4.599E-09	8.966E-09	9.774E-09	1.010E-08	1.236E-08	1.300E-08	1.429E-08	1.622E-08
FR221	2.808E-14	2.837E-14	2.847E-14	2.852E-14	2.894E-14	2.908E-14	2.940E-14	2.997E-14
FR223	9.174E-13	1.525E-12	1.611E-12	1.644E-12	1.846E-12	1.896E-12	1.988E-12	2.104E-12
RA223	5.032E-08	8.352E-08	8.836E-08	9.018E-08	1.012E-07	1.040E-07	1.090E-07	1.154E-07
RA224	3.365E-07	3.709E-09	2.182E-09	1.863E-09	1.133E-09	1.086E-09	1.024E-09	9.608E-10
RA225	1.270E-10	1.282E-10	1.287E-10	1.290E-10	1.308E-10	1.315E-10	1.329E-10	1.355E-10
RA226	7.153E-04	1.395E-03	1.520E-03	1.571E-03	1.922E-03	2.023E-03	2.223E-03	2.524E-03
RA228	6.111E-11	8.337E-11	8.505E-11	8.562E-11	8.831E-11	8.879E-11	8.951E-11	9.019E-11
AC225	8.577E-11	8.664E-11	8.697E-11	8.711E-11	8.838E-11	8.882E-11	8.981E-11	9.153E-11
AC227	3.555E-05	5.908E-05	6.243E-05	6.370E-05	7.155E-05	7.348E-05	7.701E-05	8.154E-05
AC228	6.379E-15	8.702E-15	8.879E-15	8.938E-15	9.218E-15	9.269E-15	9.344E-15	9.415E-15
TH227	8.269E-08	1.372E-07	1.452E-07	1.482E-07	1.663E-07	1.709E-07	1.791E-07	1.896E-07
TH228	6.514E-05	7.182E-07	4.226E-07	3.606E-07	2.199E-07	2.104E-07	1.987E-07	1.866E-07
TH229	2.340E-05	2.364E-05	2.373E-05	2.377E-05	2.411E-05	2.423E-05	2.450E-05	2.497E-05
TH230	5.732E+00	5.752E+00	5.756E+00	5.758E+00	5.768E+00	5.771E+00	5.777E+00	5.786E+00
TH231	2.297E-05	4.558E-08	4.558E-08	4.558E-08	4.558E-08	4.558E-08	4.558E-08	4.558E-08
TH232	1.933E-01	1.936E-01	1.937E-01	1.937E-01	1.939E-01	1.940E-01	1.941E-01	1.942E-01
TH234	5.615E-06	5.941E-08	5.941E-08	5.941E-08	5.941E-08	5.941E-08	5.941E-08	5.941E-08
PA231	1.575E-01	1.576E-01	1.576E-01	1.577E-01	1.577E-01	1.577E-01	1.577E-01	1.578E-01
PA233	1.599E-04	5.712E-05	5.712E-05	5.713E-05	5.714E-05	5.714E-05	5.715E-05	5.716E-05
PA234M	1.893E-10	2.003E-12	2.003E-12	2.003E-12	2.003E-12	2.003E-12	2.003E-12	2.003E-12
PA234	8.457E-11	8.947E-13	8.947E-13	8.947E-13	8.947E-13	8.947E-13	8.947E-13	8.947E-13
U232	9.724E-06	8.616E-06	8.414E-06	8.334E-06	7.795E-06	7.648E-06	7.361E-06	6.951E-06
U233	8.360E-04	8.167E-03	9.562E-03	1.016E-02	1.390E-02	1.503E-02	1.718E-02	2.039E-02
U234	5.571E+02	5.604E+02	5.609E+02	5.611E+02	5.627E+02	5.631E+02	5.639E+02	5.651E+02
U235	1.121E+04	1.121E+04	1.121E+04	1.121E+04	1.121E+04	1.121E+04	1.121E+04	1.121E+04
U236	8.721E+02	8.722E+02	8.723E+02	8.723E+02	8.723E+02	8.724E+02	8.724E+02	8.725E+02
U237	6.100E-09	1.327E-07	1.177E-07	1.121E-07	8.006E-08	7.271E-08	5.998E-08	4.493E-08
U238	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03
U240	1.764E-18	5.516E-17	5.516E-17	5.516E-17	5.516E-17	5.516E-17	5.516E-17	5.516E-17
NP235	7.170E-13	1.282E-16	2.593E-17	1.368E-17	1.559E-19	4.343E-20	3.362E-21	8.901E-23
NP236	9.782E-04	9.781E-04	9.781E-04	9.781E-04	9.781E-04	9.780E-04	9.780E-04	9.780E-04
NP237	1.681E+03	1.682E+03	1.682E+03	1.682E+03	1.682E+03	1.682E+03	1.683E+03	1.683E+03
NP238	7.576E-10	8.903E-11	8.802E-11	8.762E-11	8.487E-11	8.410E-11	8.258E-11	8.035E-11

Appendix A-3
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al_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

g/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
NP239	1.558E-07	1.945E-08	1.944E-08	1.944E-08	1.943E-08	1.943E-08	1.942E-08	1.941E-08
NP240M	3.861E-18	4.825E-19	4.825E-19	4.825E-19	4.825E-19	4.825E-19	4.825E-19	4.825E-19
PU236	8.400E-08	5.254E-09	3.855E-09	3.494E-09	2.422E-09	2.329E-09	2.238E-09	2.195E-09
PU238	3.293E+01	2.960E+01	2.902E+01	2.879E+01	2.724E+01	2.682E+01	2.598E+01	2.478E+01
PU239	9.186E+02	9.182E+02	9.182E+02	9.182E+02	9.180E+02	9.179E+02	9.178E+02	9.176E+02
PU240	9.961E+01	9.947E+01	9.944E+01	9.943E+01	9.936E+01	9.934E+01	9.929E+01	9.923E+01
PU241	8.210E+00	4.287E+00	3.801E+00	3.622E+00	2.586E+00	2.348E+00	1.937E+00	1.451E+00
PU242	4.480E-01	4.480E-01	4.480E-01	4.480E-01	4.480E-01	4.480E-01	4.480E-01	4.480E-01
PU243	3.915E-21	3.915E-21	3.915E-21	3.915E-21	3.914E-21	3.914E-21	3.914E-21	3.914E-21
PU244	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06
AM241	3.290E+01	3.607E+01	3.641E+01	3.653E+01	3.716E+01	3.727E+01	3.744E+01	3.757E+01
AM242M	5.050E-04	4.749E-04	4.695E-04	4.673E-04	4.527E-04	4.485E-04	4.404E-04	4.285E-04
AM242	6.040E-09	5.680E-09	5.616E-09	5.590E-09	5.415E-09	5.366E-09	5.269E-09	5.126E-09
AM243	2.266E-02	2.263E-02	2.263E-02	2.262E-02	2.261E-02	2.260E-02	2.260E-02	2.258E-02
CM242	1.223E-06	1.149E-06	1.138E-06	1.132E-06	1.095E-06	1.087E-06	1.068E-06	1.037E-06
CM243	9.219E-06	6.639E-06	6.247E-06	6.097E-06	5.143E-06	4.898E-06	4.444E-06	3.841E-06
CM244	2.753E-04	1.642E-04	1.492E-04	1.436E-04	1.099E-04	1.018E-04	8.732E-05	6.941E-05
CM245	7.087E-06	7.079E-06	7.078E-06	7.077E-06	7.073E-06	7.072E-06	7.070E-06	7.066E-06
CM246	9.051E-08	9.033E-08	9.030E-08	9.028E-08	9.019E-08	9.017E-08	9.011E-08	9.003E-08
CM247	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10
CM248	7.457E-13	7.457E-13	7.457E-13	7.457E-13	7.457E-13	7.457E-13	7.457E-13	7.456E-13
CF249	1.601E-15	1.559E-15	1.551E-15	1.548E-15	1.527E-15	1.521E-15	1.509E-15	1.491E-15
CF250	2.355E-17	1.152E-17	1.009E-17	9.567E-18	6.602E-18	5.938E-18	4.804E-18	3.496E-18
CF251	1.062E-17	1.051E-17	1.049E-17	1.048E-17	1.043E-17	1.041E-17	1.038E-17	1.033E-17
CF252	6.403E-20	1.852E-21	9.473E-22	7.311E-22	1.246E-22	5.910E-23	2.963E-23	1.974E-23
SF250	0.000E+00	1.409E-08	1.661E-08	1.761E-08	2.454E-08	2.648E-08	3.033E-08	3.600E-08
H 3	2.980E-01	1.397E-01	1.214E-01	1.148E-01	7.748E-02	6.925E-02	5.532E-02	3.950E-02
LI 6	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02
LI 7	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04
BE 9	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04
BE 10	3.881E-03	3.881E-03	3.881E-03	3.881E-03	3.881E-03	3.881E-03	3.881E-03	3.881E-03
C 14	7.825E-04	7.812E-04	7.810E-04	7.809E-04	7.802E-04	7.800E-04	7.797E-04	7.791E-04
ZN 66	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06
ZN 67	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08
ZN 68	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10
GA 69	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14
GE 70	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17
GA 71	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05
GE 72	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01
GE 73	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01
GE 74	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00
AS 75	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00
GE 76	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01
SE 76	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02
SE 77	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01
SE 78	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01
SE 79	1.807E+02	1.807E+02	1.807E+02	1.807E+02	1.807E+02	1.806E+02	1.806E+02	1.806E+02
BR 79	5.400E-02	8.003E-02	8.485E-02	8.678E-02	1.003E-01	1.041E-01	1.118E-01	1.234E-01
SE 80	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02
KR 80	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03
BR 81	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02
KR 81	1.990E-05	1.990E-05	1.990E-05	1.990E-05	1.990E-05	1.990E-05	1.990E-05	1.990E-05
SE 82	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03
KR 82	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00
KR 83	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03
KR 84	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03
KR 85	1.637E+02	6.838E+01	5.818E+01	5.453E+01	3.468E+01	3.048E+01	2.353E+01	1.596E+01
RB 85	4.508E+03	4.603E+03	4.614E+03	4.617E+03	4.637E+03	4.641E+03	4.648E+03	4.656E+03
KR 86	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03
SR 86	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00
RB 87	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03
SR 87	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02	1.391E-02
SR 88	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04
Y 89	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04
SR 90	1.142E+04	8.282E+03	7.803E+03	7.620E+03	6.450E+03	6.150E+03	5.592E+03	4.848E+03

Appendix A-3
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al_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

g/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
Y 90	2.865E+00	2.077E+00	1.957E+00	1.911E+00	1.618E+00	1.542E+00	1.402E+00	1.216E+00
ZR 90	1.083E+04	1.397E+04	1.445E+04	1.463E+04	1.580E+04	1.610E+04	1.666E+04	1.740E+04
ZR 91	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04
ZR 92	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04
ZR 93	2.587E+04	2.587E+04	2.587E+04	2.587E+04	2.587E+04	2.587E+04	2.587E+04	2.587E+04
NB 93	1.625E-01	2.945E-01	3.207E-01	3.312E-01	4.066E-01	4.286E-01	4.729E-01	5.402E-01
NB 93M	1.658E-01	1.920E-01	1.952E-01	1.963E-01	2.030E-01	2.045E-01	2.071E-01	2.101E-01
ZR 94	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04
NB 94	3.612E-03	3.610E-03	3.610E-03	3.610E-03	3.609E-03	3.609E-03	3.608E-03	3.608E-03
MO 95	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04
ZR 96	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04
MO 96	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01
MO 97	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04
MO 98	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04
TC 98	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02
TC 99	2.529E+04	2.529E+04	2.529E+04	2.529E+04	2.529E+04	2.529E+04	2.529E+04	2.529E+04
RU 99	2.304E+00	3.415E+00	3.621E+00	3.703E+00	4.279E+00	4.444E+00	4.773E+00	5.266E+00
MO100	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04
RU100	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02
RU101	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04
RU102	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04
RH102	3.272E-06	1.299E-07	7.144E-08	5.625E-08	1.056E-08	6.545E-09	2.516E-09	5.996E-10
RH103	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04
RU104	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03
PD104	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02
PD105	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03
RU106	1.641E-05	1.526E-09	2.734E-10	1.375E-10	1.116E-12	2.821E-13	1.802E-14	2.911E-16
RH106	1.542E-11	1.434E-15	2.570E-16	1.292E-16	1.049E-18	2.652E-19	1.694E-20	2.736E-22
PD106	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03
PD107	9.084E+02	9.084E+02	9.084E+02	9.084E+02	9.084E+02	9.084E+02	9.084E+02	9.084E+02
AG107	2.713E-03	4.022E-03	4.264E-03	4.361E-03	5.039E-03	5.233E-03	5.621E-03	6.202E-03
PD108	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02
AG108	4.879E-16	4.532E-16	4.471E-16	4.446E-16	4.280E-16	4.233E-16	4.142E-16	4.008E-16
AG108M	1.545E-07	1.435E-07	1.416E-07	1.408E-07	1.355E-07	1.341E-07	1.312E-07	1.269E-07
CD108	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04
AG109	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02
AG109M	1.778E-20	1.124E-23	2.874E-24	1.666E-24	3.655E-26	1.227E-26	1.383E-27	5.212E-29
CD109	1.800E-14	1.138E-17	2.910E-18	1.686E-18	3.699E-20	1.242E-20	1.394E-21	4.925E-23
PD110	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02
AG110	2.373E-20	2.724E-26	2.164E-27	7.855E-28	6.532E-31	8.611E-32	3.774E-32	6.508E-32
AG110M	1.566E-12	1.798E-18	1.428E-19	5.183E-20	4.311E-23	2.490E-24	2.490E-24	4.294E-24
CD110	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01
CD111	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02
CD112	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01
CD113	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00
CD113M	4.823E-01	2.540E-01	2.255E-01	2.151E-01	1.542E-01	1.402E-01	1.160E-01	8.720E-02
IN113	1.332E+00	1.560E+00	1.589E+00	1.599E+00	1.660E+00	1.674E+00	1.698E+00	1.727E+00
CD114	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02
SN114	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04
IN115	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01
SN115	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00
CD116	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01
SN116	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01
SN117	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01
SN118	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01
SN119	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01
SN119M	1.224E-12	1.071E-18	8.090E-20	2.879E-20	2.080E-23	7.440E-24	5.181E-24	0.000E+00
SN120	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01
SN121M	3.135E-02	2.600E-02	2.511E-02	2.476E-02	2.247E-02	2.186E-02	2.068E-02	1.903E-02
SB121	9.762E+01	9.763E+01	9.763E+01	9.763E+01	9.763E+01	9.763E+01	9.763E+01	9.763E+01
SN122	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02
TE122	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01
SN123	2.199E-19	7.088E-31	7.088E-31	7.088E-31	7.797E-37	7.797E-37	3.068E-40	0.000E+00
SB123	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02
TE123	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03
SN124	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02

Appendix A-3
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al_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

g/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
TE124	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00
SB125	2.190E-01	7.469E-03	3.995E-03	3.111E-03	5.396E-04	3.271E-04	1.202E-04	2.679E-05
TE125	2.150E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02
TE125M	3.062E-03	1.045E-04	5.588E-05	4.351E-05	7.548E-06	4.577E-06	1.682E-06	3.747E-07
SN126	3.946E+02	3.946E+02	3.946E+02	3.946E+02	3.945E+02	3.945E+02	3.945E+02	3.945E+02
SB126	1.874E-05	1.875E-05	1.875E-05	1.875E-05	1.874E-05	1.874E-05	1.874E-05	1.874E-05
SB126M	1.425E-07	1.425E-07	1.425E-07	1.425E-07	1.425E-07	1.425E-07	1.425E-07	1.425E-07
TE126	8.312E+00	8.349E+00	8.356E+00	8.358E+00	8.378E+00	8.383E+00	8.394E+00	8.410E+00
I127	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02
TE128	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03
XE128	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00
I129	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03
XE129	6.789E-02	7.026E-02	7.070E-02	7.087E-02	7.210E-02	7.245E-02	7.315E-02	7.420E-02
TE130	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03
XE130	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01
XE131	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04
XE132	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04
BA132	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04
CS133	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04
XE134	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04
CS134	8.028E-02	8.584E-04	3.704E-04	2.647E-04	2.516E-05	1.285E-05	3.348E-06	4.455E-07
BA134	7.894E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02
CS135	9.510E+03	9.510E+03	9.510E+03	9.510E+03	9.510E+03	9.510E+03	9.510E+03	9.510E+03
BA135	1.085E-01	1.472E-01	1.544E-01	1.572E-01	1.773E-01	1.830E-01	1.945E-01	2.117E-01
XE136	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04
BA136	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01
CS137	1.896E+04	1.388E+04	1.310E+04	1.280E+04	1.089E+04	1.040E+04	9.480E+03	8.253E+03
BA137	1.722E+04	2.230E+04	2.308E+04	2.338E+04	2.529E+04	2.578E+04	2.670E+04	2.793E+04
BA137M	2.901E-03	2.123E-03	2.004E-03	1.958E-03	1.666E-03	1.591E-03	1.450E-03	1.263E-03
BA138	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04
LA138	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01
LA139	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04
CE140	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04
PR141	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04
CE142	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04
ND142	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01
ND143	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04
CE144	1.346E-06	8.077E-12	8.715E-13	3.577E-13	7.010E-16	1.181E-16	3.349E-18	1.600E-20
PR144	5.685E-11	3.411E-16	3.680E-17	1.510E-17	2.961E-20	4.985E-21	1.414E-22	6.758E-25
PR144M	2.842E-13	1.705E-18	1.840E-19	7.549E-20	1.480E-22	2.492E-23	7.069E-25	3.378E-27
ND144	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04
ND145	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04
ND146	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04
PM146	1.473E-03	2.687E-04	1.961E-04	1.729E-04	7.155E-05	5.561E-05	3.359E-05	1.577E-05
SM146	2.084E-02	2.129E-02	2.131E-02	2.132E-02	2.136E-02	2.136E-02	2.137E-02	2.138E-02
PM147	9.039E+00	2.553E-01	1.319E-01	1.013E-01	1.593E-02	9.391E-03	3.264E-03	6.688E-04
SM147	1.288E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04
ND148	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04
SM148	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03
SM149	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02
ND150	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03
SM150	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03
EU150	1.035E-06	7.981E-07	7.606E-07	7.461E-07	6.520E-07	6.274E-07	5.809E-07	5.175E-07
SM151	8.016E+02	7.224E+02	7.087E+02	7.032E+02	6.663E+02	6.561E+02	6.362E+02	6.075E+02
EU151	1.923E+02	2.715E+02	2.852E+02	2.907E+02	3.276E+02	3.378E+02	3.577E+02	3.864E+02
SM152	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03
EU152	1.901E-01	9.554E-02	8.411E-02	7.993E-02	5.595E-02	5.052E-02	4.121E-02	3.035E-02
GD152	4.050E-01	4.313E-01	4.345E-01	4.357E-01	4.424E-01	4.439E-01	4.465E-01	4.495E-01
EU153	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03
GD153	3.663E-14	2.695E-20	1.967E-21	6.877E-22	4.541E-25	4.541E-25	4.541E-25	4.541E-25
SM154	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02
EU154	1.602E+01	5.397E+00	4.412E+00	4.070E+00	2.315E+00	1.971E+00	1.427E+00	8.802E-01
GD154	1.342E+02	1.448E+02	1.458E+02	1.461E+02	1.479E+02	1.482E+02	1.488E+02	1.493E+02
EU155	3.274E+00	4.961E-01	3.498E-01	3.042E-01	1.144E-01	8.646E-02	4.943E-02	2.137E-02
GD155	1.514E+02	1.542E+02	1.543E+02	1.544E+02	1.546E+02	1.546E+02	1.546E+02	1.547E+02
GD156	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02

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al_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

g/Bin Set 1	13.5YR	16.0YR	17.0YR	24.0YR	26.0YR	30.0YR	36.0YR
GD157	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00
GD158	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01
TB159	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00
GD160	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00
DY160	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01
DY161	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01
DY162	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01
DY163	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01
DY164	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02
HO165	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02
HO166M	1.187E-04	1.178E-04	1.176E-04	1.175E-04	1.171E-04	1.169E-04	1.167E-04	1.163E-04
ER166	1.966E-02	1.966E-02	1.966E-02	1.966E-02	1.966E-02	1.966E-02	1.966E-02	1.966E-02
ER167	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03
ER168	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03
TM169	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06
ER170	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10
YB170	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07
TM171	7.971E-14	6.093E-16	2.471E-16	1.722E-16	1.376E-17	6.683E-18	1.577E-18	1.808E-19
YB171	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09
YB172	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12

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Source Listing of Program ELEAL1

```
      PROGRAM ELEAL1

!-------- WRITTEN BY D.R. WENZEL

!            To sum the g/Bin Set 1 calcine for each of the nuclides,
!            normalize the mass to g/g calcine, and round
!            the output table  to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=85) :: TITLE
      LOGICAL :: FIRST
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='AL_RUN1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='AL_RUN1.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

!--------  Conversion from Ci/Bin Set 1 to Ci/g
!             (Bin Set 1/217 cu m) x (1.E-6 mL/cu m) x (mL/1.09 g)
!                  = 4.228E-9

      CORFAC = 4.228E-9
      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'AL_RUN1.ELE     g/g Al calcine')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'1999Jul   2002Jan   2003Jan   2010' &
             'Jan   2012Jan   2016Jan   2022Jan')

!--------- Skip the next 2 lines of data
```

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Source Listing of Program ELEAL1 (continued)

```
      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) ELE, (OLD(J),J=1,7)
  310 FORMAT(1X,A2,18X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J) * CORFAC
      END DO

      GO TO 60

!--------- Write element total

   80 REWIND(3)

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999

!-------- ERROR STATEMENTS

  900 WRITE(6,9000)
 9000 FORMAT(2X,'ERROR IN OPENING FILE 3')
      GO TO 999

  910 WRITE(6,9010)
 9010 FORMAT(2X,'ERROR IN OPENING FILE 4')
      GO TO 999

  920 WRITE(6,9020)
 9020 FORMAT(2X,'ERROR IN OPENING FILE 6')
      GO TO 999

!-------- PROGRAM END
```

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Source Listing of Program ELEAL1 (continued)

```
 999  CONTINUE
      END PROGRAM ELEAL1
```

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File SYMBOL

H	H
HE	He
LI	Li
BE	Be
B	B
C	C
N	N
O	O
F	F
NE	Ne
NA	Na
MG	Mg
AL	Al
SI	Si
P	P
S	S
CL	Cl
AR	Ar
K	K
CA	Ca
SC	Sc
TI	Ti
V	V
CR	Cr
MN	Mn
FE	Fe
CO	Co
NI	Ni
CU	Cu
ZN	Zn
GA	Ga
GE	Ge
AS	As
SE	Se
BR	Br
KR	Kr
RB	Rb
SR	Sr
Y	Y
ZR	Zr
NB	Nb
MO	Mo
TC	Tc
RU	Ru
RH	Rh
PD	Pd
AG	Ag
CD	Cd
IN	In
SN	Sn
SB	Sb
TE	Te
I	I
XE	Xe
CS	Cs

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File SYMBOL (continued)

```
BA   Ba
LA   La
CE   Ce
PR   Pr
ND   Nd
PM   Pm
SM   Sm
EU   Eu
GD   Gd
TB   Tb
DY   Dy
HO   Ho
ER   Er
TM   Tm
YB   Yb
LU   Lu
HF   Hf
TA   Ta
 W    W
RE   Re
OS   Os
IR   Ir
PT   Pt
AU   Au
HG   Hg
TL   Tl
PB   Pb
BI   Bi
PO   Po
AT   At
RN   Rn
FR   Fr
RA   Ra
AC   Ac
TH   Th
PA   Pa
 U    U
NP   Np
PU   Pu
AM   Am
CM   Cm
BK   Bk
CF   Cf
```

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AL_RUN1.ELE g/g Al calcine
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	5.9E-10	5.1E-10	4.9E-10	3.3E-10	2.9E-10	2.3E-10	1.7E-10
He	4.0E-09	4.0E-09	4.0E-09	4.2E-09	4.2E-09	4.3E-09	4.5E-09
Li	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11
Be	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
C	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12	3.3E-12
Zn	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15
Ga	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14
Ge	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08
As	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08
Se	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06
Br	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.1E-06
Kr	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05
Rb	6.0E-05	6.0E-05	6.0E-05	6.0E-05	6.0E-05	6.1E-05	6.1E-05
Sr	9.4E-05	9.2E-05	9.1E-05	8.6E-05	8.5E-05	8.3E-05	7.9E-05
Y	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05
Zr	5.8E-04	5.9E-04	5.9E-04	5.9E-04	5.9E-04	5.9E-04	6.0E-04
Nb	2.1E-09	2.2E-09	2.2E-09	2.6E-09	2.7E-09	2.9E-09	3.2E-09
Mo	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04
Tc	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Ru	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04
Rh	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05
Pd	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05
Ag	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07
Cd	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06
In	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
Sn	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06
Sb	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07
Te	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05
I	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Xe	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04
Cs	2.6E-04	2.6E-04	2.6E-04	2.5E-04	2.5E-04	2.4E-04	2.4E-04
Ba	2.7E-04	2.7E-04	2.7E-04	2.8E-04	2.8E-04	2.9E-04	2.9E-04
La	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04
Ce	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04
Pr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Nd	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04
Pm	1.1E-09	5.6E-10	4.3E-10	6.8E-11	4.0E-11	1.4E-11	2.9E-12
Sm	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Eu	7.5E-06	7.5E-06	7.5E-06	7.7E-06	7.7E-06	7.8E-06	7.9E-06
Gd	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06
Tb	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08
Dy	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09
Ho	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10
Er	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10
Tm	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Yb	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16
Tl	9.8E-20	1.0E-19	1.0E-19	1.2E-19	1.2E-19	1.2E-19	1.3E-19
Pb	2.9E-12	3.0E-12	3.0E-12	3.1E-12	3.1E-12	3.1E-12	3.2E-12
Bi	2.5E-16	2.8E-16	2.9E-16	3.5E-16	3.7E-16	4.1E-16	4.8E-16
Po	4.5E-16	5.0E-16	5.2E-16	7.6E-16	8.0E-16	9.6E-16	1.2E-15
At	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.4E-26	1.4E-26	1.4E-26
Rn	3.8E-17	4.1E-17	4.3E-17	5.2E-17	5.5E-17	6.0E-17	6.9E-17

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AL_RUN1.ELE g/g Al calcine (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 13:52:03

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Fr	6.6E-21	6.9E-21	7.1E-21	7.9E-21	8.1E-21	8.5E-21	9.0E-21
Ra	5.9E-12	6.4E-12	6.6E-12	8.1E-12	8.6E-12	9.4E-12	1.1E-11
Ac	2.5E-13	2.6E-13	2.7E-13	3.0E-13	3.1E-13	3.3E-13	3.4E-13
Th	2.5E-08	2.5E-08	2.5E-08	2.5E-08	2.5E-08	2.5E-08	2.5E-08
Pa	6.7E-10	6.7E-10	6.7E-10	6.7E-10	6.7E-10	6.7E-10	6.7E-10
U	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05
Np	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
Pu	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06
Am	1.5E-07	1.5E-07	1.5E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Cm	7.6E-13	6.9E-13	6.7E-13	5.2E-13	4.9E-13	4.2E-13	3.4E-13
Cf	6.7E-24	6.6E-24	6.6E-24	6.5E-24	6.5E-24	6.4E-24	6.4E-24
Total	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**

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File AL_RUN2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     ALUMINUM FUEL ELEMENT, 200 GRAM BOL
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     MTR EQUIVALENT FUEL
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  ELEMENT
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      46.  1   2   5   0
  DEC      56.  2   3   5   0
  DEC     130.  3   4   5   0
  DEC     414.  4   5   5   0
  DEC    1030.  5   6   5   0
  DEC    1114.  6   7   5   0
  DEC   10014.  7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  2   20040 8.605E-01 812070 1.349E-11 812080 6.540E-11 0 0.
  2  812090 2.629E-16 822060 4.883E-07 822070 1.066E-05 0 0.
  2  822080 5.961E-04 822090 1.095E-12 822100 2.219E-06 0 0.
  2  822110 1.044E-10 822120 3.858E-08 822140 2.157E-11 0 0.
  2  832080 6.816E-18 832090 2.831E-08 832101 3.781E-17 0 0.
  2  832100 1.366E-09 832110 6.160E-12 832120 3.659E-09 0 0.
  2  832130 2.574E-13 832140 1.601E-11 842100 3.540E-08 0 0.
  2  842110 7.555E-17 842120 1.936E-19 842130 3.860E-22 0 0.
  2  842140 2.203E-18 842150 8.741E-17 842160 1.539E-13 0 0.
  2  842180 2.501E-12 852170 3.092E-18 862190 1.981E-13 0 0.
  2  862200 5.810E-11 862220 4.599E-09 872210 2.808E-14 0 0.
  2  872230 9.174E-13 882230 5.032E-08 882240 3.365E-07 0 0.
  2  882250 1.270E-10 882260 7.153E-04 882280 6.111E-11 0 0.
  2  892250 8.577E-11 892270 3.555E-05 892280 6.379E-15 0 0.
  2  902270 8.269E-08 902280 6.514E-05 902290 2.340E-05 0 0.
  2  902300 5.732E+00 902310 2.297E-05 902320 1.933E-01 0 0.
  2  902340 5.615E-06 912310 1.575E-01 912330 1.599E-04 0 0.
  2  912341 1.893E-10 912340 8.457E-11 922320 9.724E-06 0 0.
  2  922330 8.360E-04 922340 5.571E+02 922350 1.121E+04 0 0.
  2  922360 8.721E+02 922370 6.100E-09 922380 4.092E+03 0 0.
  2  922400 1.764E-18 932350 7.170E-13 932360 9.782E-04 0 0.
  2  932370 1.681E+03 932380 7.576E-10 932390 1.558E-07 0 0.
  2  932401 3.861E-18 942360 8.400E-08 942380 3.293E+01 0 0.
  2  942390 9.186E+02 942400 9.961E+01 942410 8.210E+00 0 0.
  2  942420 4.480E-01 942430 3.915E-21 942440 2.884E-06 0 0.
  2  952410 3.290E+01 952421 5.050E-04 952420 6.040E-09 0 0.
  2  952430 2.266E-02 962420 1.223E-06 962430 9.219E-06 0 0.
  2  962440 2.753E-04 962450 7.087E-06 962460 9.051E-08 0 0.
```

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File AL_RUN2.INP (continued)

```
 2  962470 1.098E-10 962480 7.457E-13 982490 1.601E-15 0 0.
 2  982500 2.355E-17 982510 1.062E-17 982520 6.403E-20 0 0.
 3   10030 2.980E-01  30060 1.114E-02  30070 3.020E-04 0 0.
 3   40090 5.822E-04  40100 3.881E-03  60140 7.825E-04 0 0.
 3  300660 1.544E-06 300670 6.833E-08 300680 1.347E-10 0 0.
 3  310690 2.790E-14 320700 1.224E-17 310710 1.767E-05 0 0.
 3  320720 2.233E-01 320730 7.800E-01 320740 2.049E+00 0 0.
 3  330750 5.013E+00 320760 1.505E+01 340760 2.165E-02 0 0.
 3  340770 3.377E+01 340780 7.005E+01 340790 1.807E+02 0 0.
 3  350790 5.400E-02 340800 4.346E+02 360800 2.149E-03 0 0.
 3  350810 7.439E+02 360810 1.990E-05 340820 1.177E+03 0 0.
 3  360820 2.954E+00 360830 1.857E+03 360840 3.806E+03 0 0.
 3  360850 1.637E+02 370850 4.508E+03 360860 7.467E+03 0 0.
 3  380860 1.960E+00 370870 9.665E+03 380870 1.391E-02 0 0.
 3  380880 1.392E+04 390890 1.837E+04 380900 1.142E+04 0 0.
 3  390900 2.865E+00 400900 1.083E+04 400910 2.295E+04 0 0.
 3  400920 2.382E+04 400930 2.587E+04 410930 1.625E-01 0 0.
 3  410931 1.658E-01 400940 2.535E+04 410940 3.612E-03 0 0.
 3  420950 2.623E+04 400960 2.607E+04 420960 4.704E+01 0 0.
 3  420970 2.461E+04 420980 2.475E+04 430980 2.288E-02 0 0.
 3  430990 2.529E+04 440990 2.304E+00 421000 2.716E+04 0 0.
 3  441000 5.264E+02 441010 2.205E+04 441020 1.878E+04 0 0.
 3  451020 3.272E-06 451030 1.351E+04 441040 8.543E+03 0 0.
 3  461040 5.034E+02 461050 4.483E+03 441060 1.641E-05 0 0.
 3  451060 1.542E-11 461060 2.196E+03 461070 9.084E+02 0 0.
 3  471070 2.713E-03 461080 4.411E+02 471080 4.879E-16 0 0.
 3  471081 1.545E-07 481080 1.551E-04 471090 2.076E+02 0 0.
 3  471091 1.778E-20 481090 1.800E-14 461100 1.592E+02 0 0.
 3  471100 2.373E-20 471101 1.566E-12 481100 1.827E+01 0 0.
 3  481110 1.277E+02 481120 9.421E+01 481130 7.515E+00 0 0.
 3  481131 4.823E-01 491130 1.332E+00 481140 1.676E+02 0 0.
 3  501140 1.444E-04 491150 6.555E+01 501150 2.701E+00 0 0.
 3  481160 8.475E+01 501160 1.260E+01 501170 8.337E+01 0 0.
 3  501180 9.276E+01 501190 8.884E+01 501191 1.224E-12 0 0.
 3  501200 9.300E+01 501211 3.135E-02 511210 9.762E+01 0 0.
 3  501220 1.043E+02 521220 9.858E-01 501230 2.199E-19 0 0.
 3  511230 1.240E+02 521230 2.602E-03 501240 1.636E+02 0 0.
 3  521240 1.021E+00 511250 2.190E-01 521250 2.150E+02 0 0.
 3  521251 3.062E-03 501260 3.946E+02 511260 1.874E-05 0 0.
 3  511261 1.425E-07 521260 8.312E+00 531270 8.846E+02 0 0.
 3  521280 2.209E+03 541280 6.362E+00 531290 3.971E+03 0 0.
 3  541290 6.789E-02 521300 8.485E+03 541300 2.288E+01 0 0.
 3  541310 1.557E+04 541320 2.535E+04 561320 8.069E-04 0 0.
 3  551330 3.816E+04 541340 4.456E+04 551340 8.028E-02 0 0.
 3  561340 7.894E+02 551350 9.510E+03 561350 1.085E-01 0 0.
 3  541360 6.654E+04 561360 7.676E+01 551370 1.896E+04 0 0.
 3  561370 1.722E+04 561371 2.901E-03 561380 4.050E+04 0 0.
 3  571380 3.290E-01 571390 3.864E+04 581400 3.850E+04 0 0.
 3  591410 3.575E+04 581420 3.609E+04 601420 5.306E+01 0 0.
 3  601430 3.520E+04 581440 1.346E-06 591440 5.685E-11 0 0.
 3  591441 2.842E-13 601440 3.516E+04 601450 2.403E+04 0 0.
 3  601460 1.917E+04 611460 1.473E-03 621460 2.084E-02 0 0.
 3  611470 9.039E+00 621470 1.288E+04 601480 1.089E+04 0 0.
 3  621480 1.026E+03 621490 5.347E+02 601500 4.208E+03 0 0.
```

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File AL_RUN2.INP (continued)

```
  3  621500 7.071E+03 631500 1.035E-06 621510 8.016E+02 0 0.
  3  631510 1.923E+02 621520 3.180E+03 631520 1.901E-01 0 0.
  3  641520 4.050E-01 631530 1.486E+03 641530 3.663E-14 0 0.
  3  621540 5.209E+02 631540 1.602E+01 641540 1.342E+02 0 0.
  3  631550 3.274E+00 641550 1.514E+02 641560 2.120E+02 0 0.
  3  641570 1.783E+00 641580 8.685E+01 651590 9.407E+00 0 0.
  3  641600 3.750E+00 661600 2.373E-01 661610 9.686E-01 0 0.
  3  661620 5.426E-01 661630 2.354E-01 661640 6.689E-02 0 0.
  3  671650 5.202E-02 671661 1.187E-04 681660 1.966E-02 0 0.
  3  681670 6.961E-03 681680 3.019E-03 691690 3.898E-06 0 0.
  3  681700 1.868E-10 701700 1.277E-07 691710 7.971E-14 0 0.
  3  701710 1.571E-09 701720 3.685E-12      0 0.        0 0.
  0
```

File AL_RUN2.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy al_run2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy al_run2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out al_run2.u6 >nul
copy tape13.out+tape11.out al_run2.u11 >nul
ren tape7.out al_run2.pch
ren tape15.out al_run2.dbg
ren tape16.out al_run2.vxs
ren tape50.out al_run2.ech
rem  cleanup files
del tape*.inp
del tape*.out
del al_run2.pch
del al_run2.dbg
del al_run2.vxs
del al_run2.ech
del al_run2.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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al_run2.ci
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Ci/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
TL206	0.000E+00	2.138E-20	2.138E-20	2.138E-20	2.138E-20	2.137E-20	2.137E-20	2.133E-20
TL207	2.570E-03	6.309E-03	6.627E-03	7.382E-03	7.575E-03	7.789E-03	7.805E-03	1.068E-02
TL208	1.927E-02	4.994E-05	4.539E-05	2.248E-05	1.852E-06	4.243E-07	4.251E-07	4.105E-07
TL209	1.076E-07	1.192E-07	1.246E-07	1.978E-07	1.009E-06	5.589E-06	6.505E-06	3.983E-04
PB209	4.977E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
PB210	1.695E-04	1.648E-03	2.075E-03	5.556E-03	2.069E-02	4.840E-02	5.073E-02	3.504E-01
PB211	2.578E-03	6.326E-03	6.646E-03	7.402E-03	7.596E-03	7.811E-03	7.827E-03	1.071E-02
PB212	5.363E-02	1.390E-04	1.263E-04	6.256E-05	5.155E-06	1.181E-06	1.183E-06	1.143E-06
PB214	7.075E-04	2.991E-03	3.485E-03	7.117E-03	2.069E-02	4.841E-02	5.203E-02	3.505E-01
BI208	3.185E-20	3.184E-20	3.184E-20	3.184E-20	3.182E-20	3.179E-20	3.178E-20	3.125E-20
BI210M	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.146E-20	2.141E-20
BI210	1.696E-04	1.648E-03	2.076E-03	5.556E-03	2.069E-02	4.840E-02	5.073E-02	3.504E-01
BI211	2.578E-03	6.326E-03	6.646E-03	7.402E-03	7.596E-03	7.811E-03	7.827E-03	1.071E-02
BI212	5.362E-02	1.390E-04	1.263E-04	6.256E-05	5.155E-06	1.181E-06	1.183E-06	1.143E-06
BI213	4.980E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
BI214	7.072E-04	2.991E-03	3.485E-03	7.117E-03	2.069E-02	4.841E-02	5.203E-02	3.505E-01
PO210	1.591E-04	1.648E-03	2.076E-03	5.556E-03	2.069E-02	4.840E-02	5.073E-02	3.504E-01
PO211	7.216E-06	1.771E-05	1.861E-05	2.073E-05	2.127E-05	2.187E-05	2.191E-05	2.997E-05
PO212	3.436E-02	8.904E-05	8.094E-05	4.008E-05	3.303E-06	7.566E-07	7.581E-07	7.320E-07
PO213	4.870E-06	5.397E-06	5.645E-06	8.961E-06	4.571E-05	2.532E-04	2.946E-04	1.804E-02
PO214	7.072E-04	2.990E-03	3.484E-03	7.116E-03	2.068E-02	4.840E-02	5.202E-02	3.504E-01
PO215	2.578E-03	6.326E-03	6.646E-03	7.402E-03	7.596E-03	7.811E-03	7.827E-03	1.071E-02
PO216	5.361E-02	1.390E-04	1.263E-04	6.256E-05	5.155E-06	1.181E-06	1.183E-06	1.143E-06
PO218	7.076E-04	2.991E-03	3.486E-03	7.118E-03	2.069E-02	4.842E-02	5.204E-02	3.505E-01
AT217	4.979E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
RN219	2.578E-03	6.326E-03	6.646E-03	7.402E-03	7.596E-03	7.811E-03	7.827E-03	1.071E-02
RN220	5.361E-02	1.390E-04	1.263E-04	6.256E-05	5.155E-06	1.181E-06	1.183E-06	1.143E-06
RN222	7.077E-04	2.991E-03	3.486E-03	7.118E-03	2.069E-02	4.842E-02	5.204E-02	3.505E-01
FR221	4.979E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
FR223	3.550E-05	8.728E-05	9.156E-05	1.021E-04	1.048E-04	1.078E-04	1.080E-04	1.477E-04
RA223	2.578E-03	6.326E-03	6.646E-03	7.402E-03	7.596E-03	7.811E-03	7.827E-03	1.071E-02
RA224	5.362E-02	1.390E-04	1.263E-04	6.256E-05	5.155E-06	1.181E-06	1.183E-06	1.143E-06
RA225	4.981E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
RA226	7.075E-04	2.991E-03	3.486E-03	7.118E-03	2.069E-02	4.842E-02	5.204E-02	3.505E-01
RA228	1.431E-08	2.125E-08	2.132E-08	2.158E-08	2.236E-08	2.409E-08	2.433E-08	5.029E-08
AC225	4.980E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
AC227	2.572E-03	6.325E-03	6.635E-03	7.401E-03	7.596E-03	7.811E-03	7.826E-03	1.071E-02
AC228	1.431E-08	2.125E-08	2.132E-08	2.158E-08	2.236E-08	2.409E-08	2.433E-08	5.029E-08
TH227	2.543E-03	6.239E-03	6.554E-03	7.300E-03	7.491E-03	7.703E-03	7.719E-03	1.056E-02
TH228	5.341E-02	1.390E-04	1.263E-04	6.256E-05	5.155E-06	1.181E-06	1.183E-06	1.143E-06
TH229	4.980E-06	5.516E-06	5.770E-06	9.159E-06	4.672E-05	2.588E-04	3.012E-04	1.844E-02
TH230	1.158E-01	1.172E-01	1.175E-01	1.198E-01	1.288E-01	1.484E-01	1.511E-01	4.187E-01
TH231	1.222E+01	2.424E-02	2.424E-02	2.425E-02	2.426E-02	2.430E-02	2.430E-02	2.473E-02
TH232	2.121E-08	2.134E-08	2.136E-08	2.157E-08	2.236E-08	2.409E-08	2.433E-08	5.029E-08
TH234	1.301E-01	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03
PA231	7.442E-03	7.460E-03	7.463E-03	7.490E-03	7.590E-03	7.806E-03	7.835E-03	1.070E-02
PA233	3.320E+00	1.187E+00	1.188E+00	1.191E+00	1.199E+00	1.208E+00	1.209E+00	1.210E+00
PA234M	1.301E-01	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03
PA234	1.691E-04	1.789E-06	1.789E-06	1.789E-06	1.789E-06	1.789E-06	1.789E-06	1.789E-06
U232	2.082E-04	1.353E-04	1.230E-04	6.089E-05	5.024E-06	1.156E-06	1.144E-06	1.092E-06
U233	8.096E-06	2.477E-04	2.996E-04	6.843E-04	2.167E-03	5.401E-03	5.843E-03	5.188E-02
U234	3.482E+00	3.544E+00	3.554E+00	3.611E+00	3.673E+00	3.674E+00	3.673E+00	3.582E+00
U235	2.424E-02	2.424E-02	2.424E-02	2.425E-02	2.426E-02	2.430E-02	2.430E-02	2.473E-02
U236	5.645E-02	5.648E-02	5.648E-02	5.653E-02	5.672E-02	5.710E-02	5.715E-02	6.058E-02
U237	4.981E-04	2.267E-03	1.401E-03	3.975E-05	7.480E-11	2.747E-11	2.728E-11	1.320E-11
U238	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03	1.376E-03
U240	1.634E-12	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11
NP235	1.006E-09	1.709E-22	1.709E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	1.289E-05	1.289E-05	1.289E-05	1.288E-05	1.286E-05	1.281E-05	1.280E-05	1.214E-05
NP237	1.185E+00	1.187E+00	1.188E+00	1.191E+00	1.199E+00	1.208E+00	1.209E+00	1.210E+00
NP238	1.964E-04	1.990E-05	1.902E-05	1.357E-05	3.717E-06	2.240E-07	1.527E-07	3.620E-25
NP239	3.615E-02	4.500E-03	4.495E-03	4.464E-03	4.347E-03	4.102E-03	4.070E-03	1.764E-03
NP240M	4.089E-10	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11	5.110E-11
PU236	4.465E-05	1.161E-06	1.160E-06	1.159E-06	1.157E-06	1.153E-06	1.152E-06	1.092E-06
PU238	5.640E+02	3.921E+02	3.624E+02	2.020E+02	2.143E+01	1.651E-01	8.505E-02	1.422E-22
PU239	5.712E+01	5.705E+01	5.703E+01	5.691E+01	5.645E+01	5.545E+01	5.532E+01	4.281E+01

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al_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Ci/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
PU240	2.271E+01	2.260E+01	2.257E+01	2.240E+01	2.173E+01	2.036E+01	2.018E+01	7.853E+00
PU241	8.462E+02	9.242E+01	5.711E+01	1.620E+00	3.051E-06	1.121E-06	1.113E-06	5.388E-07
PU242	1.711E-03	1.711E-03	1.711E-03	1.711E-03	1.710E-03	1.708E-03	1.708E-03	1.681E-03
PU243	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14
PU244	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11	5.117E-11
AM241	1.130E+02	1.288E+02	1.279E+02	1.153E+02	7.317E+01	2.725E+01	2.381E+01	1.561E-05
AM242M	4.910E-03	3.981E-03	3.803E-03	2.714E-03	7.434E-04	4.480E-05	3.055E-05	7.240E-23
AM242	4.885E-03	3.961E-03	3.784E-03	2.701E-03	7.396E-04	4.458E-05	3.039E-05	7.204E-23
AM243	4.519E-03	4.500E-03	4.495E-03	4.464E-03	4.347E-03	4.102E-03	4.070E-03	1.764E-03
CM242	4.045E-03	3.276E-03	3.130E-03	2.233E-03	6.117E-04	3.687E-05	2.514E-05	5.975E-23
CM243	4.761E-04	1.555E-04	1.220E-04	2.016E-05	2.020E-08	6.296E-15	8.162E-16	0.000E+00
CM244	2.228E-02	3.831E-03	2.613E-03	1.538E-04	2.926E-09	1.686E-19	8.027E-21	0.000E+00
CM245	1.217E-06	1.213E-06	1.212E-06	1.204E-06	1.177E-06	1.119E-06	1.112E-06	5.379E-07
CM246	2.781E-08	2.763E-08	2.759E-08	2.729E-08	2.618E-08	2.392E-08	2.363E-08	6.413E-09
CM247	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14	1.019E-14
CM248	3.172E-15	3.171E-15	3.171E-15	3.171E-15	3.169E-15	3.165E-15	3.164E-15	3.107E-15
CF249	6.561E-15	5.991E-15	5.873E-15	5.074E-15	2.893E-15	8.557E-16	7.247E-16	1.643E-23
CF250	2.576E-15	2.250E-16	1.325E-16	2.624E-18	7.644E-25	5.096E-39	5.096E-39	0.000E+00
CF251	1.685E-17	1.626E-17	1.614E-17	1.524E-17	1.224E-17	7.609E-18	7.132E-18	7.493E-21
CF252	3.445E-17	1.941E-22	1.941E-22	6.979E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H 3	2.877E+03	2.176E+02	1.241E+02	1.949E+00	2.327E-07	2.241E-22	2.241E-22	0.000E+00
BE 10	8.676E-05	8.675E-05	8.675E-05	8.675E-05	8.674E-05	8.672E-05	8.671E-05	8.638E-05
C 14	3.489E-03	3.470E-03	3.466E-03	3.435E-03	3.319E-03	3.080E-03	3.049E-03	1.039E-03
SE 79	1.259E+01	1.259E+01	1.259E+01	1.258E+01	1.254E+01	1.246E+01	1.244E+01	1.132E+01
KR 81	4.187E-07	4.186E-07	4.186E-07	4.185E-07	4.181E-07	4.172E-07	4.171E-07	4.051E-07
KR 85	6.425E+04	3.282E+03	1.719E+03	1.437E+01	1.522E-07	7.665E-25	7.665E-25	0.000E+00
RB 87	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04	8.460E-04
SR 90	1.558E+06	5.214E+05	4.110E+05	7.061E+04	8.161E+01	3.500E-05	4.740E-06	0.000E+00
Y 90	1.559E+06	5.215E+05	4.111E+05	7.062E+04	8.189E+01	3.501E-05	4.741E-06	0.000E+00
ZR 93	6.503E+01	6.503E+01	6.503E+01	6.503E+01	6.502E+01	6.500E+01	6.500E+01	6.473E+01
NB 93M	4.688E+01	6.035E+01	6.092E+01	6.175E+01	6.177E+01	6.175E+01	6.175E+01	6.150E+01
NB 94	6.770E-04	6.759E-04	6.757E-04	6.740E-04	6.675E-04	6.536E-04	6.517E-04	4.809E-04
TC 98	1.989E-05	1.989E-05	1.989E-05	1.989E-05	1.989E-05	1.988E-05	1.988E-05	1.985E-05
TC 99	4.289E+02	4.289E+02	4.288E+02	4.287E+02	4.283E+02	4.275E+02	4.274E+02	4.152E+02
RH102	3.956E-03	6.642E-08	6.085E-09	1.267E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU106	5.493E-02	1.005E-15	1.028E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	5.491E-02	1.005E-15	1.037E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.674E-01	4.669E-01
AG108	3.586E-07	2.789E-07	2.641E-07	1.764E-07	3.743E-08	1.298E-09	8.206E-10	6.597E-31
AG108M	4.028E-06	3.134E-06	2.968E-06	1.982E-06	4.206E-07	1.458E-08	9.220E-09	7.411E-30
AG109M	4.649E-11	5.850E-22	5.850E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	4.649E-11	5.850E-22	5.850E-22	1.578E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110	9.898E-11	5.690E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110M	7.442E-09	4.279E-29	1.703E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD113M	1.046E+02	1.176E+01	7.314E+00	2.174E-01	3.001E-07	5.846E-20	0.000E+00	0.000E+00
IN115	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10	4.079E-10
SN119M	5.484E-09	1.251E-29	4.071E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN121M	1.854E+00	9.797E-01	8.528E-01	3.055E-01	5.947E-03	1.157E-06	3.610E-07	0.000E+00
TE123	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13	7.565E-13
SB125	2.262E+02	2.266E-03	1.855E-04	1.683E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125M	5.517E+01	5.528E-04	4.527E-05	4.106E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	1.120E+01	1.120E+01	1.120E+01	1.119E+01	1.117E+01	1.112E+01	1.111E+01	1.045E+01
SB126	1.567E+00	1.567E+00	1.567E+00	1.567E+00	1.563E+00	1.557E+00	1.556E+00	1.463E+00
SB126M	1.120E+01	1.120E+01	1.120E+01	1.119E+01	1.117E+01	1.112E+01	1.111E+01	1.045E+01
I129	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.013E-01	7.010E-01
CS134	1.039E+02	2.000E-05	6.935E-07	1.090E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS135	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.092E+01
CS137	1.650E+06	5.700E+05	4.524E+05	8.184E+04	1.156E+02	7.615E-05	1.093E-05	0.000E+00
BA137M	1.561E+06	5.392E+05	4.280E+05	7.742E+04	1.094E+02	7.204E-05	1.034E-05	0.000E+00
LA138	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09	6.316E-09
CE142	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04	8.664E-04
CE144	4.296E-03	6.922E-21	9.381E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144	4.297E-03	6.923E-21	9.382E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144M	5.156E-05	8.307E-23	1.126E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND144	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08	4.161E-08

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al_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Ci/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
PM146	6.561E-01	1.989E-03	5.641E-04	5.025E-08	1.436E-23	0.000E+00	0.000E+00	0.000E+00
SM146	7.293E-07	7.483E-07	7.483E-07	7.484E-07	7.484E-07	7.484E-07	7.484E-07	7.483E-07
PM147	8.383E+03	4.417E-02	3.145E-03	1.015E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	2.928E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04	2.930E-04
SM148	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10	3.099E-10
SM149	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10	1.284E-10
EU150	6.855E-05	2.827E-05	2.332E-05	5.610E-06	2.367E-08	1.672E-13	3.317E-14	0.000E+00
SM151	2.110E+04	1.480E+04	1.371E+04	7.751E+03	8.698E+02	7.566E+00	3.962E+00	0.000E+00
EU152	3.289E+01	3.154E+00	1.895E+00	4.362E-02	2.258E-08	5.240E-22	5.240E-22	0.000E+00
GD152	8.824E-12	9.867E-12	9.912E-12	9.977E-12	9.978E-12	9.978E-12	9.978E-12	9.978E-12
GD153	1.292E-10	1.632E-31	4.673E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EU154	4.326E+03	1.062E+02	4.742E+01	1.219E-01	1.397E-11	3.831E-33	3.831E-33	0.000E+00
EU155	1.523E+03	2.445E+00	6.044E-01	1.947E-05	1.123E-22	0.000E+00	0.000E+00	0.000E+00
HO166M	2.131E-04	2.075E-04	2.063E-04	1.977E-04	1.678E-04	1.176E-04	1.120E-04	6.557E-07
TM171	8.683E-11	5.326E-18	1.561E-19	3.899E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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Source Listing of Program ROUNDAL2

```
PROGRAM roundal2

!-------- WRITTEN BY D.R. WENZEL

!            To convert file al_run2.ci for the total Ci in Bin
!            Set 1 to Ci/g and round the results to 2 places of
!            accuracy

       CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
       CHARACTER (LEN=10) :: BLANK, ZERO(7)
       CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
       CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
       CHARACTER (LEN=96) :: BUFFER2
       CHARACTER (LEN=111) :: BUFFER, ORGLINE

       COMMON /AMT/ AMOUNT(9)
       EQUIVALENCE (ORGLINE, BUFFER1(1))
       EQUIVALENCE (BUFFER2, BUFFER3(1))
       EQUIVALENCE (ZERO(1), BUFFER3(27))

       REAL :: DATA(175,7), VALUE(7)

       DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

       OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(2,FILE ='AL_RUN2.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(6,FILE ='ROUNDAL2.OUT', STATUS='UNKNOWN', ERR = 900)

!--------  Conversion from Ci/Bin Set 1 to Ci/g
!             (Bin Set 1/217 cu m) x (1.E-6 cu m/mL) / (1.09 g/mL)
!                  = 4.228E-9

       CORFAC = 4.228E-9
       WRITE(6,600)
  600  FORMAT(1X,'ROUNDAL2.OUT  (Ci/g)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

       LAST = 0
   10  READ(1,1000,END=20) NAME, NAME2
 1000  FORMAT(A12, 5X, A24)
       LAST = LAST + 1
       NUCLIDE(LAST) = NAME
       NUCLIDE2(LAST) = NAME2
       GO TO 10

!-------- ZERO MEMORY

   20  DO  l=1,175
```

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Source Listing of Program ROUNDAL2 (continued)

```
         DO K=1,7
            DATA(l,K) = 0.
       END DO

      END DO

!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35 DO  J=1,3
         READ(2,120) ORGLINE
  120    FORMAT(A111)

         IF(J == 2) THEN
            WRITE(6,120) ORGLINE
         END IF

      END DO

      WRITE(6,605)
  605 FORMAT(/,3X,'Nuclide',5X,'Half-Life',5X,'2032Jan   2042Jan   ', &
            '2116Jan   2400Jan   3016Jan   3110Jan   12000Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50 READ(2,120,END=80) ORGLINE
      WRITE(BUFFER,120) ORGLINE
      READ(BUFFER,400) DESC, VALUE
  400 FORMAT(A12,9X,7(E10.4))
      DO  J=1,175
         IF(DESC == NUCLIDE(J)) THEN
            DO 60 K=1,7
               DATA(J,K) = VALUE(K) * CORFAC
   60       CONTINUE

         END IF

      END DO

      GO TO 50

   80 DO  J=1,LAST
         WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620    FORMAT(2X,A24,7(1PE10.1))
         DO K=1,7
            IF(DATA(J,K) == 0.) THEN
               ZERO(K) = BLANK
            ENDIF

         END DO

         WRITE(6,625) BUFFER2
  625    FORMAT(A96)
```

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Source Listing of Program ROUNDAL2 (continued)

```
      END DO

      GO TO 999
!-------- ERROR STATEMENTS

  900 WRITE(6,9000)
 9000 FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999 CONTINUE
      END PROGRAM ROUNDAL2
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See Appendix A-2, pages 4-6, for a listing of file MASTER.

Appendix A-6
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ROUNDAL2.OUT (Ci/g)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	9.2E-07	5.2E-07	8.2E-09	9.8E-16	9.5E-31	9.5E-31	
Be-10	1.600E+06	yr	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
C-14	5.729E+03	yr	1.5E-11	1.5E-11	1.5E-11	1.4E-11	1.3E-11	1.3E-11	4.4E-12
Fe-55	2.600E+00	yr							
Ni-59	8.000E+04	yr							
Co-60	5.270E+00	yr							
Ni-63	9.200E+01	yr							
Se-79	6.496E+04	yr	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	4.8E-08
Rb-87	4.696E+10	yr	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12	3.6E-12
Sr-90	2.912E+01	yr	2.2E-03	1.7E-03	3.0E-04	3.5E-07	1.5E-13	2.0E-14	
Y-90	6.400E+01	h	2.2E-03	1.7E-03	3.0E-04	3.5E-07	1.5E-13	2.0E-14	
Zr-93	1.530E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Nb-93m	1.360E+01	yr	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07
Nb-94	2.030E+04	yr	2.9E-12	2.9E-12	2.8E-12	2.8E-12	2.8E-12	2.8E-12	2.0E-12
Tc-98	4.199E+06	yr	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14	8.4E-14
Tc-99	2.130E+05	yr	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Rh-102	1.059E+03	d	2.8E-16	2.6E-17	5.4E-25				
Ru-106	3.682E+02	d							
Rh-106	2.990E+01	s							
Pd-107	6.496E+06	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Ag-108	2.370E+00	m	1.2E-15	1.1E-15	7.5E-16	1.6E-16	5.5E-18	3.5E-18	2.8E-39
Ag-108m	1.270E+02	yr	1.3E-14	1.3E-14					
Ag-109m	3.960E+01	s							
Cd-109	4.640E+02	d							
Ag-110	2.460E+01	s	2.4E-39						
Ag-110m	2.499E+02	d	1.8E-37	7.2E-42					
Cd-113m	1.459E+01	yr	5.0E-08	3.1E-08	9.2E-10	1.3E-15	2.5E-28		
In-115	4.997E+14	yr	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18	1.7E-18
Sn-119m	2.450E+02	d	5.3E-38	1.7E-42					
Sn-121m	4.997E+01	yr	4.1E-09	3.6E-09	1.3E-09	2.5E-11	4.9E-15	1.5E-15	
Te-123	1.000E+13	yr	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21	3.2E-21
Sb-125	2.770E+00	yr	9.6E-12	7.8E-13	7.1E-21				
Te-125m	5.800E+01	d	2.3E-12	1.9E-13	1.7E-21				
Sn-126	1.000E+05	yr	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.4E-08
Sb-126	1.240E+01	d	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.2E-09
Sb-126m	1.900E+01	m	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.7E-08	4.4E-08
I-129	1.570E+07	yr	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09	3.0E-09
Cs-134	2.062E+00	yr	8.5E-14	2.9E-15	4.6E-26				
Cs-135	2.300E+06	yr	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08	4.6E-08
Cs-137	3.000E+01	yr	2.4E-03	1.9E-03	3.5E-04	4.9E-07	3.2E-13	4.6E-14	
Ba-137m	2.552E+00	m	2.3E-03	1.8E-03	3.3E-04	4.6E-07	3.0E-13	4.4E-14	
La-138	1.350E+11	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Ce-142	1.049E+11	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Ce-144	2.843E+02	d	2.9E-29	4.0E-33					
Pr-144	1.728E+01	m	2.9E-29	4.0E-33					
Pr-144m	7.200E+00	m	3.5E-31	4.8E-35					
Nd-144	2.099E+15	yr	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16	1.8E-16
Pm-146	5.500E+00	yr	8.4E-12	2.4E-12	2.1E-16	6.1E-32			
Sm-146	7.000E+07	yr	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15	3.2E-15
Pm-147	2.623E+00	yr	1.9E-10	1.3E-11	4.3E-20				
Sm-147	1.070E+11	yr	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12	1.2E-12
Sm-148	8.001E+15	yr	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18	1.3E-18
Sm-149	9.994E+15	yr	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19	5.4E-19
Eu-150	3.600E+01	yr	1.2E-13	9.9E-14	2.4E-14	1.0E-16	7.1E-22	1.4E-22	
Sm-151	8.999E+01	yr	6.3E-05	5.8E-05	3.3E-05	3.7E-06	3.2E-08	1.7E-08	
Eu-152	1.360E+01	yr	1.3E-08	8.0E-09	1.8E-10	9.5E-17	2.2E-30	2.2E-30	
Gd-152	1.080E+14	yr	4.2E-20	4.2E-20	4.2E-20	4.2E-20	4.2E-20	4.2E-20	4.2E-20
Gd-153	2.420E+02	d							
Eu-154	8.600E+00	yr	4.5E-07	2.0E-07	5.2E-10	5.9E-20	1.6E-41	1.6E-41	
Eu-155	4.959E+00	yr	1.0E-08	2.6E-09	8.2E-14	4.7E-31			
Ho-166m	1.200E+03	yr	8.8E-13	8.7E-13	8.4E-13	7.1E-13	5.0E-13	4.7E-13	2.8E-15
Tm-171	1.920E+00	yr	2.3E-26	6.6E-28	1.6E-39				
Tl-207	4.770E+00	m	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Tl-208	3.070E+00	m	2.1E-13	1.9E-13	9.5E-14	7.8E-15	1.8E-15	1.8E-15	1.7E-15
Tl-209	2.200E+00	m	5.0E-16	5.3E-16	8.4E-16	4.3E-15	2.4E-14	2.8E-14	1.7E-12

Appendix A-6
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ROUNDAL2.OUT (Ci/g) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.300E+00	h	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Pb-210	2.230E+01	yr	7.0E-12	8.8E-12	2.3E-11	8.7E-11	2.0E-10	2.1E-10	1.5E-09
Pb-211	3.610E+01	m	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Pb-212	1.064E+01	h	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Pb-214	2.680E+01	m	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Bi-210m	3.000E+06	yr	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29	9.1E-29
Bi-210	5.012E+00	d	7.0E-12	8.8E-12	2.3E-11	8.7E-11	2.0E-10	2.1E-10	1.5E-09
Bi-211	2.130E+00	m	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Bi-212	6.055E+01	m	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Bi-213	4.565E+01	m	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Bi-214	1.990E+01	m	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Po-210	1.384E+02	d	7.0E-12	8.8E-12	2.3E-11	8.7E-11	2.0E-10	2.1E-10	1.5E-09
Po-211	5.600E-01	s	7.5E-14	7.9E-14	8.8E-14	9.0E-14	9.2E-14	9.3E-14	1.3E-13
Po-212	3.000E-07	s	3.8E-13	3.4E-13	1.7E-13	1.4E-14	3.2E-15	3.2E-15	3.1E-15
Po-213	4.200E-06	s	2.3E-14	2.4E-14	3.8E-14	1.9E-13	1.1E-12	1.2E-12	7.6E-11
Po-214	1.643E-04	s	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Po-215	1.780E-03	s	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Po-216	1.500E-01	s	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Po-218	3.050E+00	m	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
At-217	3.230E-02	s	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Rn-219	3.960E+00	s	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Rn-220	5.560E+01	s	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Rn-222	3.824E+00	d	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Fr-221	4.800E+00	m	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Fr-223	2.180E+01	m	3.7E-13	3.9E-13	4.3E-13	4.4E-13	4.6E-13	4.6E-13	6.2E-13
Ra-223	1.143E+01	d	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Ra-224	3.660E+00	d	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Ra-225	1.480E+01	d	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Ra-226	1.600E+03	yr	1.3E-11	1.5E-11	3.0E-11	8.7E-11	2.0E-10	2.2E-10	1.5E-09
Ra-228	6.700E+00	yr	9.0E-17	9.0E-17	9.1E-17	9.5E-17	1.0E-16	1.0E-16	2.1E-16
Ac-225	1.000E+01	d	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Ac-227	2.177E+01	yr	2.7E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Ac-228	6.131E+00	h	9.0E-17	9.0E-17	9.1E-17	9.5E-17	1.0E-16	1.0E-16	2.1E-16
Th-227	1.872E+01	d	2.6E-11	2.8E-11	3.1E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Th-228	1.913E+00	yr	5.9E-13	5.3E-13	2.6E-13	2.2E-14	5.0E-15	5.0E-15	4.8E-15
Th-229	7.339E+03	yr	2.3E-14	2.4E-14	3.9E-14	2.0E-13	1.1E-12	1.3E-12	7.8E-11
Th-230	7.700E+04	yr	5.0E-10	5.0E-10	5.1E-10	5.4E-10	6.3E-10	6.4E-10	1.8E-09
Th-231	2.552E+01	h	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
Th-232	1.405E+10	yr	9.0E-17	9.0E-17	9.1E-17	9.5E-17	1.0E-16	1.0E-16	2.1E-16
Th-234	2.410E+01	d	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-231	3.277E+04	yr	3.2E-11	3.2E-11	3.2E-11	3.2E-11	3.3E-11	3.3E-11	4.5E-11
Pa-233	2.700E+01	d	5.0E-09	5.0E-09	5.0E-09	5.1E-09	5.1E-09	5.1E-09	5.1E-09
Pa-234m	1.170E+00	m	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
Pa-234	6.700E+00	h	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15	7.6E-15
U-232	7.200E+01	yr	5.7E-13	5.2E-13	2.6E-13	2.1E-14	4.9E-15	4.8E-15	4.6E-15
U-233	1.585E+05	yr	1.0E-12	1.3E-12	2.9E-12	9.2E-12	2.3E-11	2.5E-11	2.2E-10
U-234	2.445E+05	yr	1.5E-08	1.5E-08	1.5E-08	1.6E-08	1.6E-08	1.6E-08	1.5E-08
U-235	7.038E+08	yr	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10	1.0E-10
U-236	2.341E+07	yr	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.4E-10	2.6E-10
U-237	6.750E+00	d	9.6E-12	5.9E-12	1.7E-13	3.2E-19	1.2E-19	1.2E-19	5.6E-20
U-238	4.468E+09	yr	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12	5.8E-12
U-240	1.410E+01	h	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Np-236	1.150E+05	yr	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.4E-14	5.1E-14
Np-237	2.140E+06	yr	5.0E-09	5.0E-09	5.0E-09	5.1E-09	5.1E-09	5.1E-09	5.1E-09
Np-238	2.117E+00	d	8.4E-14	8.0E-14	5.7E-14	1.6E-14	9.5E-16	6.5E-16	1.5E-33
Np-239	2.355E+00	d	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.7E-11	1.7E-11	7.5E-12
Np-240m	7.400E+00	m	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Pu-236	2.851E+00	yr	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.6E-15
Pu-238	8.774E+01	yr	1.7E-06	1.5E-06	8.5E-07	9.1E-08	7.0E-10	3.6E-10	6.0E-31
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07	1.8E-07
Pu-240	6.537E+03	yr	9.6E-08	9.5E-08	9.5E-08	9.2E-08	8.6E-08	8.5E-08	3.3E-08
Pu-241	1.440E+01	yr	3.9E-07	2.4E-07	6.8E-09	1.3E-14	4.7E-15	4.7E-15	2.3E-15
Pu-242	3.869E+05	yr	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.2E-12	7.1E-12
Pu-243	4.956E+00	h	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23

Appendix A-6
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ROUNDAL2.OUT (Ci/g) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pu-244	8.261E+07	yr	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Am-241	4.322E+02	yr	5.4E-07	5.4E-07	4.9E-07	3.1E-07	1.2E-07	1.0E-07	6.6E-14
Am-242m	1.520E+02	yr	1.7E-11	1.6E-11	1.1E-11	3.1E-12	1.9E-13	1.3E-13	3.1E-31
Am-242	1.602E+01	h	1.7E-11	1.6E-11	1.1E-11	3.1E-12	1.9E-13	1.3E-13	3.0E-31
Am-243	7.380E+03	yr	1.9E-11	1.9E-11	1.9E-11	1.8E-11	1.7E-11	1.7E-11	7.5E-12
Cm-242	1.632E+02	d	1.4E-11	1.3E-11	9.4E-12	2.6E-12	1.6E-13	1.1E-13	2.5E-31
Cm-243	2.850E+01	yr	6.6E-13	5.2E-13	8.5E-14	8.5E-17	2.7E-23	3.5E-24	
Cm-244	1.811E+01	yr	1.6E-11	1.1E-11	6.5E-13	1.2E-17	7.1E-28	3.4E-29	
Cm-245	8.499E+03	yr	5.1E-15	5.1E-15	5.1E-15	5.0E-15	4.7E-15	4.7E-15	2.3E-15
Cm-246	4.731E+03	yr	1.2E-16	1.2E-16	1.2E-16	1.1E-16	1.0E-16	1.0E-16	2.7E-17
Cm-247	1.560E+07	yr	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23	4.3E-23
Cm-248	3.391E+05	yr	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23	1.3E-23
Cf-249	3.505E+02	yr	2.5E-23	2.5E-23	2.1E-23	1.2E-23	3.6E-24	3.1E-24	6.9E-32
Cf-250	1.308E+01	yr	9.5E-25	5.6E-25	1.1E-26	3.2E-33			
Cf-251	8.980E+02	yr	6.9E-26	6.8E-26	6.4E-26	5.2E-26	3.2E-26	3.0E-26	3.2E-29
Cf-252	2.638E+00	yr	8.2E-31	8.2E-31	3.0E-39				
Ca-45	1.630E+02	d							
V-50	4.000E+16	yr							
Mn-54	3.125E+02	d							
Fe-55	2.600E+00	yr							
Lu-176	3.000E+10	yr							
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr							
Ta-182	1.150E+02	d							
Re-187	5.000E+10	yr							

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al_run2.g
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

g/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
HE 4	8.605E-01	1.104E+00	1.150E+00	1.426E+00	1.992E+00	2.628E+00	2.697E+00	7.521E+00
TL206	0.000E+00	9.810E-29	9.810E-29	9.809E-29	9.809E-29	9.807E-29	9.807E-29	9.787E-29
TL207	1.349E-11	3.311E-11	3.479E-11	3.875E-11	3.976E-11	4.089E-11	4.097E-11	5.603E-11
TL208	6.540E-11	1.695E-13	1.541E-13	7.630E-14	6.287E-15	1.440E-15	1.443E-15	1.394E-15
TL209	2.629E-16	2.912E-16	3.046E-16	4.836E-16	2.467E-15	1.366E-14	1.590E-14	9.736E-13
PB206	4.883E-07	1.543E-05	2.286E-05	1.351E-04	1.615E-03	1.002E-02	1.169E-02	7.575E-01
PB207	1.066E-05	1.009E-04	1.270E-04	3.395E-04	1.197E-03	3.099E-03	3.362E-03	3.658E-02
PB208	5.961E-04	6.589E-04	6.594E-04	6.621E-04	6.647E-04	6.651E-04	6.652E-04	6.693E-04
PB209	1.095E-12	1.214E-12	1.269E-12	2.015E-12	1.028E-11	5.693E-11	6.625E-11	4.057E-09
PB210	2.219E-06	2.157E-05	2.717E-05	7.274E-05	2.708E-04	6.337E-04	6.642E-04	4.588E-03
PB211	1.044E-10	2.562E-10	2.691E-10	2.997E-10	3.076E-10	3.163E-10	3.169E-10	4.335E-10
PB212	3.858E-08	9.998E-11	9.088E-11	4.500E-11	3.708E-12	8.496E-13	8.512E-13	8.220E-13
PB214	2.157E-11	9.119E-11	1.063E-10	2.170E-10	6.308E-10	1.476E-09	1.586E-09	1.069E-08
BI208	6.816E-18	6.815E-18	6.815E-18	6.814E-18	6.811E-18	6.803E-18	6.802E-18	6.689E-18
BI209	2.831E-08	1.245E-07	1.473E-07	3.643E-07	3.206E-06	3.766E-05	4.718E-05	2.687E-02
BI210M	3.781E-17	3.781E-17	3.781E-17	3.781E-17	3.781E-17	3.780E-17	3.780E-17	3.772E-17
BI210	1.366E-09	1.327E-08	1.673E-08	4.476E-08	1.667E-07	3.899E-07	4.087E-07	2.823E-06
BI211	6.160E-12	1.511E-11	1.588E-11	1.769E-11	1.815E-11	1.866E-11	1.870E-11	2.558E-11
BI212	3.659E-09	9.484E-12	8.621E-12	4.269E-12	3.518E-13	8.059E-14	8.074E-14	7.797E-14
BI213	2.574E-13	2.851E-13	2.982E-13	4.734E-13	2.415E-12	1.338E-11	1.557E-11	9.532E-10
BI214	1.601E-11	6.771E-11	7.890E-11	1.611E-10	4.684E-10	1.096E-09	1.178E-09	7.934E-09
PO210	3.540E-08	3.667E-07	4.620E-07	1.236E-06	4.603E-06	1.077E-05	1.129E-05	7.798E-05
PO211	7.555E-17	1.854E-16	1.948E-16	2.170E-16	2.227E-16	2.290E-16	2.294E-16	3.138E-16
PO212	1.936E-19	5.018E-22	4.561E-22	2.259E-22	1.861E-23	4.264E-24	4.272E-24	4.125E-24
PO213	3.860E-22	4.278E-22	4.474E-22	7.103E-22	3.623E-21	2.007E-20	2.335E-20	1.430E-18
PO214	2.203E-18	9.315E-18	1.085E-17	2.217E-17	6.444E-17	1.508E-16	1.620E-16	1.092E-15
PO215	8.741E-17	2.145E-16	2.253E-16	2.510E-16	2.576E-16	2.649E-16	2.654E-16	3.630E-16
PO216	1.539E-13	3.990E-16	3.627E-16	1.796E-16	1.480E-17	3.390E-18	3.397E-18	3.280E-18
PO218	2.501E-12	1.057E-11	1.232E-11	2.516E-11	7.314E-11	1.711E-10	1.839E-10	1.239E-09
AT217	3.092E-18	3.426E-18	3.583E-18	5.688E-18	2.902E-17	1.607E-16	1.870E-16	1.145E-14
RN219	1.981E-13	4.861E-13	5.106E-13	5.688E-13	5.837E-13	6.002E-13	6.014E-13	8.226E-13
RN220	5.810E-11	1.506E-13	1.369E-13	6.780E-14	5.587E-15	1.280E-15	1.282E-15	1.238E-15
RN222	4.599E-09	1.944E-08	2.265E-08	4.626E-08	1.345E-07	3.146E-07	3.382E-07	2.278E-06
FR221	2.808E-14	3.111E-14	3.254E-14	5.165E-14	2.635E-13	1.459E-12	1.698E-12	1.040E-10
FR223	9.174E-13	2.256E-12	2.366E-12	2.639E-12	2.709E-12	2.786E-12	2.791E-12	3.818E-12
RA223	5.032E-08	1.235E-07	1.297E-07	1.445E-07	1.483E-07	1.525E-07	1.528E-07	2.090E-07
RA224	3.365E-07	8.722E-10	7.928E-10	3.926E-10	3.235E-11	7.411E-12	7.425E-12	7.170E-12
RA225	1.270E-10	1.406E-10	1.471E-10	2.335E-10	1.191E-09	6.598E-09	7.679E-09	4.702E-07
RA226	7.153E-04	3.024E-03	3.524E-03	7.197E-03	2.092E-02	4.895E-02	5.261E-02	3.544E-01
RA228	6.111E-11	9.077E-11	9.105E-11	9.218E-11	9.552E-11	1.029E-10	1.039E-10	2.148E-10
AC225	8.577E-11	9.501E-11	9.938E-11	1.578E-10	8.047E-10	4.457E-09	5.187E-09	3.176E-07
AC227	3.555E-05	8.741E-05	9.169E-05	1.023E-04	1.050E-04	1.079E-04	1.081E-04	1.479E-04
AC228	6.379E-15	9.474E-15	9.504E-15	9.622E-15	9.971E-15	1.074E-14	1.085E-14	2.242E-14
TH227	8.269E-08	2.029E-07	2.131E-07	2.374E-07	2.436E-07	2.505E-07	2.510E-07	3.433E-07
TH228	6.514E-05	1.695E-07	1.540E-07	7.629E-08	6.286E-09	1.440E-09	1.443E-09	1.393E-09
TH229	2.340E-05	2.592E-05	2.711E-05	4.304E-05	2.196E-04	1.216E-03	1.415E-03	8.665E-02
TH230	5.732E+00	5.802E+00	5.817E+00	5.931E+00	6.378E+00	7.349E+00	7.481E+00	2.073E+01
TH231	2.297E-05	4.558E-08	4.559E-08	4.559E-08	4.562E-08	4.569E-08	4.570E-08	4.650E-08
TH232	1.933E-01	1.945E-01	1.947E-01	1.966E-01	2.038E-01	2.196E-01	2.218E-01	4.584E-01
TH234	5.615E-06	5.941E-08	5.941E-08	5.941E-08	5.941E-08	5.941E-08	5.941E-08	5.941E-08
PA231	1.575E-01	1.579E-01	1.579E-01	1.585E-01	1.606E-01	1.652E-01	1.658E-01	2.265E-01
PA233	1.599E-04	5.718E-05	5.720E-05	5.734E-05	5.775E-05	5.818E-05	5.821E-05	5.828E-05
PA234M	1.893E-10	2.003E-12	2.003E-12	2.003E-12	2.003E-12	2.003E-12	2.003E-12	2.003E-12
PA234	8.457E-11	8.947E-13	8.947E-13	8.947E-13	8.947E-13	8.947E-13	8.947E-13	8.947E-13
U232	9.724E-06	6.318E-06	5.743E-06	2.844E-06	2.346E-07	5.401E-08	5.344E-08	5.101E-08
U233	8.360E-04	2.558E-02	3.094E-02	7.066E-02	2.237E-01	5.577E-01	6.033E-01	5.357E+00
U234	5.571E+02	5.669E+02	5.686E+02	5.777E+02	5.876E+02	5.878E+02	5.876E+02	5.730E+02
U235	1.121E+04	1.121E+04	1.121E+04	1.121E+04	1.122E+04	1.124E+04	1.124E+04	1.144E+04
U236	8.721E+02	8.726E+02	8.727E+02	8.734E+02	8.763E+02	8.822E+02	8.830E+02	9.359E+02
U237	6.100E-09	2.776E-08	1.716E-08	4.868E-10	9.161E-16	3.364E-16	3.341E-16	1.617E-16
U238	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03	4.092E+03
U240	1.764E-18	5.516E-17	5.516E-17	5.516E-17	5.516E-17	5.516E-17	5.516E-17	5.516E-17
NP235	7.170E-13	1.218E-25	1.218E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	9.782E-04	9.779E-04	9.779E-04	9.774E-04	9.758E-04	9.721E-04	9.717E-04	9.209E-04
NP237	1.681E+03	1.684E+03	1.684E+03	1.688E+03	1.700E+03	1.713E+03	1.714E+03	1.716E+03
NP238	7.576E-10	7.677E-11	7.335E-11	5.234E-11	1.434E-11	8.640E-13	5.891E-13	1.396E-30

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al_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

g/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
NP239	1.558E-07	1.939E-08	1.937E-08	1.924E-08	1.873E-08	1.768E-08	1.754E-08	7.603E-09
NP240M	3.861E-18	4.825E-19	4.825E-19	4.825E-19	4.825E-19	4.825E-19	4.825E-19	4.825E-19
PU236	8.400E-08	2.183E-09	2.182E-09	2.181E-09	2.177E-09	2.169E-09	2.168E-09	2.055E-09
PU238	3.293E+01	2.290E+01	2.116E+01	1.179E+01	1.251E+00	9.641E-03	4.966E-03	8.303E-24
PU239	9.186E+02	9.174E+02	9.171E+02	9.152E+02	9.077E+02	8.917E+02	8.896E+02	6.884E+02
PU240	9.961E+01	9.913E+01	9.902E+01	9.825E+01	9.533E+01	8.930E+01	8.851E+01	3.445E+01
PU241	8.210E+00	8.967E-01	5.541E-01	1.572E-02	2.960E-08	1.088E-08	1.080E-08	5.228E-09
PU242	4.480E-01	4.480E-01	4.480E-01	4.479E-01	4.477E-01	4.473E-01	4.472E-01	4.401E-01
PU243	3.915E-21	3.914E-21	3.914E-21	3.914E-21	3.914E-21	3.914E-21	3.914E-21	3.913E-21
PU244	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06	2.884E-06
AM241	3.290E+01	3.752E+01	3.726E+01	3.359E+01	2.131E+01	7.935E+00	6.935E+00	4.548E-06
AM242M	5.050E-04	4.094E-04	3.912E-04	2.792E-04	7.646E-05	4.608E-06	3.142E-06	7.447E-24
AM242	6.040E-09	4.898E-09	4.680E-09	3.339E-09	9.146E-10	5.512E-11	3.758E-11	8.908E-29
AM243	2.266E-02	2.256E-02	2.254E-02	2.239E-02	2.180E-02	2.057E-02	2.041E-02	8.847E-03
CM242	1.223E-06	9.903E-07	9.462E-07	6.752E-07	1.849E-07	1.115E-08	7.599E-09	1.806E-26
CM243	9.219E-06	3.012E-06	2.362E-06	3.905E-07	3.913E-10	1.219E-16	1.581E-17	0.000E+00
CM244	2.753E-04	4.733E-05	3.228E-05	1.901E-06	3.615E-11	2.083E-21	9.917E-23	0.000E+00
CM245	7.087E-06	7.060E-06	7.055E-06	7.012E-06	6.852E-06	6.516E-06	6.471E-06	3.132E-06
CM246	9.051E-08	8.990E-08	8.977E-08	8.880E-08	8.518E-08	7.783E-08	7.688E-08	2.087E-08
CM247	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10	1.098E-10
CM248	7.457E-13	7.456E-13	7.456E-13	7.455E-13	7.451E-13	7.441E-13	7.440E-13	7.306E-13
CF249	1.601E-15	1.462E-15	1.433E-15	1.238E-15	7.060E-16	2.088E-16	1.768E-16	4.009E-24
CF250	2.355E-17	2.058E-18	1.211E-18	2.400E-20	6.990E-27	4.659E-41	4.659E-41	0.000E+00
CF251	1.062E-17	1.025E-17	1.017E-17	9.606E-18	7.715E-18	4.796E-18	4.495E-18	4.723E-21
CF252	6.403E-20	3.608E-25	3.608E-25	1.297E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	0.000E+00	4.520E-08	5.410E-08	1.130E-07	2.866E-07	6.062E-07	6.479E-07	3.509E-06
H 3	2.980E-01	2.254E-02	1.286E-02	2.019E-04	2.410E-11	2.321E-26	2.321E-26	0.000E+00
LI 6	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02	1.114E-02
LI 7	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04	3.020E-04
BE 9	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04	5.822E-04
BE 10	3.881E-03	3.881E-03	3.881E-03	3.881E-03	3.880E-03	3.879E-03	3.879E-03	3.864E-03
C 14	7.825E-04	7.782E-04	7.772E-04	7.703E-04	7.443E-04	6.908E-04	6.838E-04	2.330E-04
ZN 66	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06	1.544E-06
ZN 67	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08	6.833E-08
ZN 68	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10	1.347E-10
GA 69	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14	2.790E-14
GE 70	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17	1.224E-17
GA 71	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05	1.767E-05
GE 72	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01	2.233E-01
GE 73	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01
GE 74	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00	2.049E+00
AS 75	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00	5.013E+00
GE 76	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01	1.505E+01
SE 76	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02	2.165E-02
SE 77	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01	3.377E+01
SE 78	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01	7.005E+01
SE 79	1.807E+02	1.806E+02	1.806E+02	1.804E+02	1.799E+02	1.787E+02	1.786E+02	1.624E+02
BR 79	5.400E-02	1.427E-01	1.619E-01	3.045E-01	8.505E-01	2.029E+00	2.189E+00	1.837E+01
SE 80	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02	4.346E+02
KR 80	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03	2.149E-03
BR 81	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02	7.439E+02
KR 81	1.990E-05	1.990E-05	1.990E-05	1.989E-05	1.987E-05	1.983E-05	1.983E-05	1.925E-05
SE 82	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03	1.177E+03
KR 82	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00	2.954E+00
KR 83	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03	1.857E+03
KR 84	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03	3.806E+03
KR 85	1.637E+02	8.362E+00	4.380E+00	3.660E-02	3.877E-10	1.953E-27	1.953E-27	0.000E+00
RB 85	4.508E+03	4.663E+03	4.667E+03	4.672E+03	4.672E+03	4.672E+03	4.672E+03	4.672E+03
KR 86	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03	7.467E+03
SR 86	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00	1.960E+00
RB 87	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03	9.665E+03
SR 87	1.391E-02	1.392E-02	1.392E-02	1.393E-02	1.397E-02	1.406E-02	1.407E-02	1.534E-02
SR 88	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04	1.392E+04
Y 89	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04	1.837E+04
SR 90	1.142E+04	3.821E+03	3.012E+03	5.174E+02	5.980E-01	2.565E-07	3.474E-08	0.000E+00

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al_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

g/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
Y 90	2.865E+00	9.582E-01	7.552E-01	1.298E-01	1.504E-04	6.432E-11	8.711E-12	0.000E+00
ZR 90	1.083E+04	1.843E+04	1.924E+04	2.174E+04	2.225E+04	2.225E+04	2.225E+04	2.225E+04
ZR 91	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04	2.295E+04
ZR 92	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04	2.382E+04
ZR 93	2.587E+04	2.587E+04	2.587E+04	2.587E+04	2.587E+04	2.586E+04	2.586E+04	2.575E+04
NB 93	1.625E-01	6.540E-01	7.692E-01	1.634E+00	4.962E+00	1.218E+01	1.316E+01	1.172E+02
NB 93M	1.658E-01	2.134E-01	2.154E-01	2.184E-01	2.184E-01	2.184E-01	2.184E-01	2.175E-01
ZR 94	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04
NB 94	3.612E-03	3.606E-03	3.605E-03	3.596E-03	3.561E-03	3.487E-03	3.477E-03	2.566E-03
MO 95	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04	2.623E+04
ZR 96	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04	2.607E+04
MO 96	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01	4.704E+01
MO 97	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04	2.461E+04
MO 98	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04	2.475E+04
TC 98	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.288E-02	2.284E-02
TC 99	2.529E+04	2.529E+04	2.529E+04	2.528E+04	2.526E+04	2.521E+04	2.520E+04	2.448E+04
RU 99	2.304E+00	6.089E+00	6.912E+00	1.300E+01	3.635E+01	8.693E+01	9.382E+01	8.131E+02
MO100	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04	2.716E+04
RU100	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02	5.264E+02
RU101	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04	2.205E+04
RU102	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04	1.878E+04
RH102	3.272E-06	5.494E-11	5.033E-12	1.048E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04	1.351E+04
RU104	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03	8.543E+03
PD104	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02	5.034E+02
PD105	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03	4.483E+03
RU106	1.641E-05	3.003E-19	3.070E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	1.542E-11	2.823E-25	2.913E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD106	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03	2.196E+03
PD107	9.084E+02	9.084E+02	9.084E+02	9.084E+02	9.084E+02	9.083E+02	9.083E+02	9.074E+02
AG107	2.713E-03	7.172E-03	8.141E-03	1.531E-02	4.284E-02	1.025E-01	1.107E-01	9.728E-01
PD108	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02	4.411E+02
AG108	4.879E-16	3.795E-16	3.594E-16	2.400E-16	5.094E-17	1.766E-18	1.117E-18	8.976E-40
AG108M	1.545E-07	1.202E-07	1.138E-07	7.600E-08	1.613E-08	5.593E-10	3.536E-10	2.842E-31
CD108	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04	1.551E-04
AG109	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02	2.076E+02
AG109M	1.778E-20	2.237E-31	2.237E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	1.800E-14	2.265E-25	2.265E-25	6.110E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD110	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02	1.592E+02
AG110	2.373E-20	1.364E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110M	1.566E-12	9.003E-33	3.584E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD110	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01	1.827E+01
CD111	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02	1.277E+02
CD112	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01	9.421E+01
CD113	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00	7.515E+00
CD113M	4.823E-01	5.422E-02	3.372E-02	1.002E-03	1.383E-09	2.695E-22	0.000E+00	0.000E+00
IN113	1.332E+00	1.760E+00	1.780E+00	1.813E+00	1.814E+00	1.814E+00	1.814E+00	1.814E+00
CD114	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02	1.676E+02
SN114	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04	1.444E-04
IN115	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01	6.555E+01
SN115	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00	2.701E+00
CD116	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01	8.475E+01
SN116	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01	1.260E+01
SN117	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01	8.337E+01
SN118	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01	9.276E+01
SN119	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01	8.884E+01
SN119M	1.224E-12	2.791E-33	9.088E-38	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN120	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01	9.300E+01
SN121M	3.135E-02	1.656E-02	1.442E-02	5.166E-03	1.005E-04	1.957E-08	6.103E-09	0.000E+00
SB121	9.762E+01	9.763E+01	9.764E+01	9.765E+01	9.765E+01	9.765E+01	9.765E+01	9.765E+01
SN122	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02	1.043E+02
TE122	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01	9.858E-01
SB123	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02	1.240E+02
TE123	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03	2.602E-03
SN124	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02	1.636E+02
TE124	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00	1.021E+00

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al_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

g/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
SB125	2.190E-01	2.193E-06	1.796E-07	1.629E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125	2.150E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02	2.152E+02
TE125M	3.062E-03	3.068E-08	2.512E-09	2.279E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	3.946E+02	3.945E+02	3.944E+02	3.942E+02	3.935E+02	3.918E+02	3.916E+02	3.681E+02
SB126	1.874E-05	1.874E-05	1.874E-05	1.873E-05	1.869E-05	1.861E-05	1.860E-05	1.749E-05
SB126M	1.425E-07	1.425E-07	1.425E-07	1.424E-07	1.421E-07	1.415E-07	1.414E-07	1.330E-07
TE126	8.312E+00	8.438E+00	8.465E+00	8.667E+00	9.443E+00	1.112E+01	1.135E+01	3.477E+01
I127	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02	8.846E+02
TE128	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03	2.209E+03
XE128	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00	6.362E+00
I129	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.971E+03	3.969E+03
XE129	6.789E-02	7.596E-02	7.771E-02	9.068E-02	1.405E-01	2.485E-01	2.632E-01	1.823E+00
TE130	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03	8.485E+03
XE130	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01	2.288E+01
XE131	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04	1.557E+04
XE132	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04	2.535E+04
BA132	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04	8.069E-04
CS133	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04	3.816E+04
XE134	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04	4.456E+04
CS134	8.028E-02	1.545E-08	5.358E-10	8.423E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA134	7.894E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02	7.895E+02
CS135	9.510E+03	9.510E+03	9.510E+03	9.510E+03	9.509E+03	9.507E+03	9.507E+03	9.481E+03
BA135	1.085E-01	2.403E-01	2.690E-01	4.811E-01	1.295E+00	3.060E+00	3.301E+00	2.877E+01
XE136	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04	6.654E+04
BA136	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01	7.676E+01
CS137	1.896E+04	6.550E+03	5.199E+03	9.405E+02	1.329E+00	8.751E-07	1.256E-07	0.000E+00
BA137	1.722E+04	2.963E+04	3.098E+04	3.524E+04	3.618E+04	3.618E+04	3.618E+04	3.618E+04
BA137M	2.901E-03	1.002E-03	7.953E-04	1.439E-04	2.033E-07	1.339E-13	1.922E-14	0.000E+00
BA138	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04	4.050E+04
LA138	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01	3.290E-01
LA139	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04	3.864E+04
CE140	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04	3.850E+04
PR141	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04	3.575E+04
CE142	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04	3.609E+04
ND142	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01	5.306E+01
ND143	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04	3.520E+04
CE144	1.346E-06	2.169E-24	2.940E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144	5.685E-11	9.159E-29	1.241E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144M	2.842E-13	4.579E-31	6.205E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND144	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04	3.516E+04
ND145	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04	2.403E+04
ND146	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04	1.917E+04
PM146	1.473E-03	4.466E-06	1.266E-06	1.128E-10	3.223E-26	0.000E+00	0.000E+00	0.000E+00
SM146	2.084E-02	2.138E-02	2.138E-02	2.138E-02	2.138E-02	2.138E-02	2.138E-02	2.138E-02
PM147	9.039E+00	4.762E-05	3.391E-06	1.094E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	1.288E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04	1.289E+04
ND148	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04	1.089E+04
SM148	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03	1.026E+03
SM149	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02	5.347E+02
ND150	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03	4.208E+03
SM150	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03	7.071E+03
EU150	1.035E-06	4.269E-07	3.521E-07	8.470E-08	3.574E-10	2.524E-15	5.009E-16	0.000E+00
SM151	8.016E+02	5.625E+02	5.208E+02	2.945E+02	3.305E+01	2.875E-01	1.505E-01	0.000E+00
EU151	1.923E+02	4.314E+02	4.731E+02	6.994E+02	9.609E+02	9.936E+02	9.937E+02	9.939E+02
SM152	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03	3.180E+03
EU152	1.901E-01	1.823E-02	1.095E-02	2.521E-04	1.305E-10	3.029E-24	3.029E-24	0.000E+00
GD152	4.050E-01	4.529E-01	4.549E-01	4.579E-01	4.580E-01	4.580E-01	4.580E-01	4.580E-01
EU153	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03	1.486E+03
GD153	3.663E-14	4.626E-35	1.325E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM154	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02	5.209E+02
EU154	1.602E+01	3.931E-01	1.756E-01	4.513E-04	5.172E-14	1.419E-35	1.419E-35	0.000E+00
GD154	1.342E+02	1.498E+02	1.500E+02	1.502E+02	1.502E+02	1.502E+02	1.502E+02	1.502E+02
EU155	3.274E+00	5.256E-03	1.299E-03	4.185E-08	2.413E-25	0.000E+00	0.000E+00	0.000E+00
GD155	1.514E+02	1.547E+02	1.547E+02	1.547E+02	1.547E+02	1.547E+02	1.547E+02	1.547E+02
GD156	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02	2.120E+02
GD157	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00	1.783E+00

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al_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

g/Bin Set 1	46.0YR	56.0YR	130.0YR	414.0YR	1030.0YR	1114.0YR	1.0E+04YR
GD158	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01	8.685E+01
TB159	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00	9.407E+00
GD160	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00	3.750E+00
DY160	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01	2.373E-01
DY161	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01	9.686E-01
DY162	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01	5.426E-01
DY163	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01	2.354E-01
DY164	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02	6.689E-02
HO165	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02	5.202E-02
HO166M	1.187E-04	1.156E-04	1.149E-04	1.101E-04	9.345E-05	6.547E-05	6.237E-05	3.652E-07
ER166	1.966E-02	1.966E-02	1.966E-02	1.967E-02	1.969E-02	1.971E-02	1.972E-02	1.978E-02
ER167	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03	6.961E-03
ER168	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03	3.019E-03
TM169	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06	3.898E-06
ER170	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10	1.868E-10
YB170	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07	1.277E-07
TM171	7.971E-14	4.890E-21	1.433E-22	3.579E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB171	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09	1.571E-09
YB172	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12	3.685E-12

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Source Listing of Program ELEAL2 (continued)

```
      PROGRAM ELEAL2

!-------- WRITTEN BY D.R. WENZEL

!            To sum the g/Bin Set 1 calcine for each of the nuclides,
!            normalize the mass to g/g calcine, and round
!            the output table  to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=85) :: TITLE
      LOGICAL :: FIRST
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='AL_RUN2.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='AL_RUN2.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

!--------  Conversion from Ci/Bin Set 1 to Ci/g
!             (Bin Set 1/217 cu m) x (1.E-6 mL/cu m) x (mL/1.09 g)
!                  = 4.228E-9

      CORFAC = 4.228E-9
      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'AL_RUN2.ELE     g/g Al calcine')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'2032Jan   2042Jan   2116Jan   2400' &
             'Jan   3016Jan   3110Jan   12000Jan')

!--------- Skip the next 2 lines of data
```

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Page 2 of 5

Source Listing of Program ELEAL2 (continued)

```
      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) ELE, (OLD(J),J=1,7)
  310 FORMAT(1X,A2,18X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J) * CORFAC
      END DO

      GO TO 60

!--------- Write element total

   80 REWIND(3)

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999

!-------- ERROR STATEMENTS

  900 WRITE(6,9000)
 9000 FORMAT(2X,'ERROR IN OPENING FILE 3')
      GO TO 999

  910 WRITE(6,9010)
 9010 FORMAT(2X,'ERROR IN OPENING FILE 4')
      GO TO 999

  920 WRITE(6,9020)
 9020 FORMAT(2X,'ERROR IN OPENING FILE 6')
      GO TO 999

!-------- PROGRAM END
```

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Page 3 of 5

Source Listing of Program ELEAL2 (continued)

```
  999  CONTINUE
       END PROGRAM ELEAL2
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

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AL_RUN2.ELE g/g Al calcine
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	9.5E-11	5.4E-11	8.5E-13	1.0E-19	9.8E-35	9.8E-35	0.0E+00
He	4.7E-09	4.9E-09	6.0E-09	8.4E-09	1.1E-08	1.1E-08	3.2E-08
Li	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11	4.8E-11
Be	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11	1.9E-11
C	3.3E-12	3.3E-12	3.3E-12	3.1E-12	2.9E-12	2.9E-12	9.9E-13
Zn	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15	6.8E-15
Ga	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14	7.5E-14
Ge	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08	7.7E-08
As	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08	2.1E-08
Se	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	7.9E-06
Br	3.1E-06	3.1E-06	3.1E-06	3.1E-06	3.2E-06	3.2E-06	3.2E-06
Kr	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05	5.6E-05
Rb	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05
Sr	7.5E-05	7.2E-05	6.1E-05	5.9E-05	5.9E-05	5.9E-05	5.9E-05
Y	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05	7.8E-05
Zr	6.0E-04	6.1E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04
Nb	3.7E-09	4.2E-09	7.8E-09	2.2E-08	5.2E-08	5.7E-08	5.0E-07
Mo	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04	4.3E-04
Tc	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.0E-04
Ru	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04	2.1E-04
Rh	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05	5.7E-05
Pd	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05	3.7E-05
Ag	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07	8.8E-07
Cd	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06	2.1E-06
In	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
Sn	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.4E-06	4.3E-06
Sb	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07	9.4E-07
Te	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05	4.6E-05
I	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Xe	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04	6.4E-04
Cs	2.3E-04	2.2E-04	2.1E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04
Ba	3.0E-04	3.1E-04	3.2E-04	3.3E-04	3.3E-04	3.3E-04	3.3E-04
La	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04
Ce	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04	3.2E-04
Pr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Nd	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04	5.4E-04
Pm	2.2E-13	2.0E-14	4.8E-19	1.4E-34	0.0E+00	0.0E+00	0.0E+00
Sm	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Eu	8.1E-06	8.3E-06	9.2E-06	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Gd	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06
Tb	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08	4.0E-08
Dy	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09	8.7E-09
Ho	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10	2.2E-10
Er	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10	1.3E-10
Tm	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Yb	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16	5.5E-16
Tl	1.4E-19	1.5E-19	1.6E-19	1.7E-19	1.7E-19	1.7E-19	2.4E-19
Pb	3.4E-12	3.5E-12	5.1E-12	1.6E-11	6.1E-11	6.9E-11	3.4E-09
Bi	5.8E-16	6.9E-16	1.7E-15	1.4E-14	1.6E-13	2.0E-13	1.1E-10
Po	1.6E-15	2.0E-15	5.2E-15	1.9E-14	4.6E-14	4.8E-14	3.3E-13
At	1.4E-26	1.5E-26	2.4E-26	1.2E-25	6.8E-25	7.9E-25	4.8E-23
Rn	8.2E-17	9.6E-17	2.0E-16	5.7E-16	1.3E-15	1.4E-15	9.6E-15

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AL_RUN2.ELE g/g Al calcine (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 18:40:46

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Fr	9.7E-21	1.0E-20	1.1E-20	1.3E-20	1.8E-20	1.9E-20	4.6E-19
Ra	1.3E-11	1.5E-11	3.0E-11	8.8E-11	2.1E-10	2.2E-10	1.5E-09
Ac	3.7E-13	3.9E-13	4.3E-13	4.4E-13	4.6E-13	4.6E-13	6.3E-13
Th	2.5E-08	2.5E-08	2.6E-08	2.8E-08	3.2E-08	3.3E-08	9.0E-08
Pa	6.7E-10	6.7E-10	6.7E-10	6.8E-10	7.0E-10	7.0E-10	9.6E-10
U	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.1E-05	7.2E-05
Np	7.1E-06	7.1E-06	7.1E-06	7.2E-06	7.2E-06	7.2E-06	7.3E-06
Pu	4.4E-06	4.4E-06	4.3E-06	4.2E-06	4.1E-06	4.1E-06	3.1E-06
Am	1.6E-07	1.6E-07	1.4E-07	9.0E-08	3.4E-08	2.9E-08	3.7E-11
Cm	2.5E-13	1.8E-13	4.3E-14	3.0E-14	2.8E-14	2.8E-14	1.3E-14
Cf	6.2E-24	6.1E-24	5.3E-24	3.0E-24	9.0E-25	7.7E-25	2.0E-29
Total	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**	**4.4E-03**

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File CO_AL.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) MTR
  BAS     ONE MTR ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE MTR ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP     400.0   .4065  1   2   3 2
  IRP     800.0   .4065  2   3   3 0
  IRP    1600.0   .4065  3   4   3 0
  IRP    2000.0   .4065  4   5   3 0
  IRP    3100.0   .4065  5   6   3 0
  IRP    3336.0   .4065  6   7   3 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC       3.1   1   2   5   4
  DEC       3.2   2   3   5   0
  DEC       3.3   3   4   5   0
  DEC       3.4   4   5   5   0
  DEC       3.5   5   6   5   0
  DEC       3.6   6   7   5   0
  DEC       3.7   7   8   5   0
  DEC       3.8   8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340  2.317 922350   200. 922360  .4343  922380  11.53 FUEL 93.3%
  0
```

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File CO_AL.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy co_al.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy co_al.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out co_al.u6 >nul
copy tape13.out+tape11.out co_al.u11 >nul
ren tape7.out co_al.pch
ren tape15.out co_al.dbg
ren tape16.out co_al.vxs
ren tape50.out co_al.ech
rem  cleanup files
del tape*.inp
del tape*.out
del co_al.pch
del co_al.dbg
del co_al.vxs
del co_al.ech
del co_al.u11
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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co_al.ci
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
TL206	5.801E-24	5.801E-24	5.801E-24	5.801E-24	5.801E-24	5.801E-24	5.801E-24	5.801E-24	5.801E-24
TL207	2.138E-11	1.926E-09	1.946E-09	2.008E-09	2.089E-09	2.177E-09	2.268E-09	2.362E-09	2.457E-09
TL208	6.473E-08	1.136E-06	1.167E-06	1.191E-06	1.214E-06	1.237E-06	1.260E-06	1.281E-06	1.303E-06
TL209	1.012E-12	8.687E-13	8.738E-13	8.883E-13	9.059E-13	9.241E-13	9.425E-13	9.609E-13	9.794E-13
PB209	4.687E-11	4.022E-11	4.045E-11	4.113E-11	4.194E-11	4.278E-11	4.363E-11	4.449E-11	4.534E-11
PB210	2.639E-13	1.020E-11	1.106E-11	1.197E-11	1.292E-11	1.393E-11	1.499E-11	1.611E-11	1.728E-11
PB211	2.144E-11	1.931E-09	1.951E-09	2.013E-09	2.095E-09	2.183E-09	2.275E-09	2.368E-09	2.463E-09
PB212	1.801E-07	3.161E-06	3.248E-06	3.315E-06	3.380E-06	3.443E-06	3.506E-06	3.566E-06	3.626E-06
PB214	3.342E-12	2.809E-10	2.947E-10	3.115E-10	3.287E-10	3.463E-10	3.645E-10	3.831E-10	4.021E-10
BI208	8.650E-24	8.650E-24	8.650E-24	8.650E-24	8.650E-24	8.650E-24	8.650E-24	8.650E-24	8.650E-24
BI210M	5.824E-24	5.824E-24	5.824E-24	5.824E-24	5.824E-24	5.824E-24	5.824E-24	5.824E-24	5.824E-24
BI210	2.286E-13	1.020E-11	1.089E-11	1.178E-11	1.273E-11	1.373E-11	1.478E-11	1.588E-11	1.704E-11
BI211	2.144E-11	1.931E-09	1.951E-09	2.013E-09	2.095E-09	2.183E-09	2.275E-09	2.368E-09	2.463E-09
BI212	1.801E-07	3.161E-06	3.248E-06	3.315E-06	3.380E-06	3.443E-06	3.506E-06	3.566E-06	3.626E-06
BI213	4.684E-11	4.022E-11	4.045E-11	4.113E-11	4.194E-11	4.278E-11	4.363E-11	4.449E-11	4.534E-11
BI214	3.342E-12	2.809E-10	2.947E-10	3.115E-10	3.287E-10	3.463E-10	3.645E-10	3.831E-10	4.021E-10
PO210	3.462E-14	6.779E-12	7.401E-12	8.060E-12	8.764E-12	9.512E-12	1.031E-11	1.115E-11	1.204E-11
PO211	6.003E-14	5.408E-12	5.463E-12	5.637E-12	5.865E-12	6.113E-12	6.369E-12	6.631E-12	6.898E-12
PO212	1.154E-07	2.025E-06	2.081E-06	2.124E-06	2.165E-06	2.206E-06	2.246E-06	2.285E-06	2.323E-06
PO213	4.583E-11	3.935E-11	3.958E-11	4.024E-11	4.103E-11	4.186E-11	4.269E-11	4.353E-11	4.436E-11
PO214	6.517E-11	2.808E-10	2.947E-10	3.114E-10	3.286E-10	3.463E-10	3.644E-10	3.830E-10	4.020E-10
PO215	2.143E-11	1.931E-09	1.951E-09	2.013E-09	2.095E-09	2.183E-09	2.275E-09	2.368E-09	2.463E-09
PO216	1.801E-07	3.161E-06	3.248E-06	3.314E-06	3.379E-06	3.443E-06	3.505E-06	3.566E-06	3.625E-06
PO218	3.343E-12	2.809E-10	2.948E-10	3.115E-10	3.287E-10	3.464E-10	3.645E-10	3.831E-10	4.022E-10
AT217	4.684E-11	4.022E-11	4.045E-11	4.113E-11	4.194E-11	4.278E-11	4.363E-11	4.449E-11	4.534E-11
RN218	6.183E-11	2.538E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27
RN219	2.143E-11	1.931E-09	1.951E-09	2.013E-09	2.095E-09	2.183E-09	2.275E-09	2.368E-09	2.463E-09
RN220	1.801E-07	3.161E-06	3.248E-06	3.314E-06	3.379E-06	3.443E-06	3.505E-06	3.566E-06	3.625E-06
RN222	3.343E-12	2.809E-10	2.948E-10	3.115E-10	3.287E-10	3.464E-10	3.645E-10	3.831E-10	4.022E-10
FR221	4.684E-11	4.022E-11	4.045E-11	4.113E-11	4.194E-11	4.278E-11	4.363E-11	4.449E-11	4.534E-11
FR223	6.187E-13	2.665E-11	2.786E-11	2.908E-11	3.034E-11	3.161E-11	3.291E-11	3.423E-11	3.557E-11
RA222	6.183E-11	2.538E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27
RA223	2.143E-11	1.931E-09	1.951E-09	2.013E-09	2.095E-09	2.183E-09	2.275E-09	2.368E-09	2.463E-09
RA224	1.801E-07	3.161E-06	3.248E-06	3.314E-06	3.379E-06	3.443E-06	3.505E-06	3.566E-06	3.625E-06
RA225	6.181E-11	4.022E-11	4.066E-11	4.143E-11	4.227E-11	4.312E-11	4.397E-11	4.482E-11	4.568E-11
RA226	3.553E-12	2.809E-10	2.973E-10	3.141E-10	3.314E-10	3.491E-10	3.673E-10	3.860E-10	4.051E-10
RA228	1.109E-16	2.090E-14	2.212E-14	2.336E-14	2.463E-14	2.593E-14	2.727E-14	2.863E-14	3.002E-14
AC225	4.684E-11	4.022E-11	4.045E-11	4.113E-11	4.194E-11	4.278E-11	4.363E-11	4.449E-11	4.534E-11
AC227	4.483E-11	1.931E-09	2.019E-09	2.108E-09	2.198E-09	2.291E-09	2.385E-09	2.480E-09	2.578E-09
AC228	1.732E-09	2.090E-14	2.212E-14	2.336E-14	2.463E-14	2.594E-14	2.727E-14	2.863E-14	3.002E-14
TH226	6.183E-11	2.537E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27	2.536E-27
TH227	2.886E-11	1.905E-09	1.943E-09	2.018E-09	2.103E-09	2.192E-09	2.284E-09	2.377E-09	2.471E-09
TH228	1.929E-07	3.161E-06	3.229E-06	3.295E-06	3.359E-06	3.423E-06	3.484E-06	3.545E-06	3.604E-06
TH229	1.471E-11	4.022E-11	4.106E-11	4.191E-11	4.276E-11	4.362E-11	4.447E-11	4.532E-11	4.618E-11
TH230	4.089E-08	3.724E-07	3.831E-07	3.938E-07	4.045E-07	4.152E-07	4.259E-07	4.366E-07	4.473E-07
TH231	3.026E-03	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04
TH232	8.250E-15	1.367E-13	1.408E-13	1.450E-13	1.491E-13	1.533E-13	1.574E-13	1.615E-13	1.657E-13
TH234	3.653E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06
PA231	1.058E-08	2.909E-08	2.970E-08	3.032E-08	3.093E-08	3.154E-08	3.216E-08	3.277E-08	3.338E-08
PA233	1.963E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04
PA234M	1.035E-05	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06
PA234	6.674E-06	4.768E-09	4.768E-09	4.768E-09	4.768E-09	4.768E-09	4.768E-09	4.768E-09	4.768E-09
U230	6.179E-11	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27	2.535E-27
U232	3.666E-06	5.046E-06	5.073E-06	5.099E-06	5.124E-06	5.148E-06	5.172E-06	5.194E-06	5.217E-06
U233	8.448E-08	8.969E-08	8.987E-08	9.004E-08	9.021E-08	9.038E-08	9.055E-08	9.072E-08	9.089E-08
U234	1.188E-02	1.188E-02	1.188E-02	1.188E-02	1.188E-02	1.188E-02	1.188E-02	1.188E-02	1.188E-02
U235	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04	2.783E-04
U236	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04
U237	6.804E+03	7.359E-05	7.324E-05	7.289E-05	7.254E-05	7.219E-05	7.184E-05	7.150E-05	7.116E-05
U238	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06	3.668E-06
U240	2.667E-02	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12
NP235	6.603E-06	9.102E-07	8.538E-07	8.009E-07	7.513E-07	7.048E-07	6.612E-07	6.202E-07	5.818E-07
NP236	2.735E-09	2.735E-09	2.735E-09	2.735E-09	2.735E-09	2.735E-09	2.735E-09	2.735E-09	2.735E-09
NP237	3.326E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04	3.914E-04
NP238	8.350E+02	6.243E-08	6.240E-08	6.237E-08	6.234E-08	6.231E-08	6.228E-08	6.226E-08	6.223E-08
NP239	4.242E+03	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05
NP240M	2.946E+00	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12	1.054E-12
PU236	6.759E-05	3.304E-05	3.225E-05	3.147E-05	3.072E-05	2.998E-05	2.926E-05	2.856E-05	2.787E-05
PU237	8.211E-04	2.752E-11	1.580E-11	9.066E-12	5.203E-12	2.987E-12	1.714E-12	9.839E-13	5.647E-13
PU238	6.601E-01	6.983E-01	6.977E-01	6.972E-01	6.966E-01	6.961E-01	6.955E-01	6.950E-01	6.944E-01
PU239	2.138E-02	2.252E-02	2.252E-02	2.252E-02	2.252E-02	2.252E-02	2.252E-02	2.252E-02	2.252E-02
PU240	1.159E-02	1.158E-02	1.158E-02	1.158E-02	1.158E-02	1.158E-02	1.158E-02	1.158E-02	1.158E-02
PU241	3.483E+00	3.000E+00	2.986E+00	2.971E+00	2.957E+00	2.943E+00	2.929E+00	2.915E+00	2.901E+00
PU242	1.134E-05	1.134E-05	1.134E-05	1.134E-05	1.134E-05	1.134E-05	1.134E-05	1.134E-05	1.134E-05
PU243	5.971E+00	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15
PU244	1.055E-12	1.055E-12	1.055E-12	1.055E-12	1.055E-12	1.055E-12	1.055E-12	1.055E-12	1.055E-12

Appendix B-1
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co_al.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
PU246	3.926E-09	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23
AM241	4.933E-04	1.653E-02	1.701E-02	1.749E-02	1.796E-02	1.843E-02	1.890E-02	1.936E-02	1.982E-02
AM242M	1.266E-05	1.248E-05	1.248E-05	1.247E-05	1.247E-05	1.246E-05	1.246E-05	1.245E-05	1.244E-05
AM242	6.945E-01	1.242E-05	1.242E-05	1.241E-05	1.241E-05	1.240E-05	1.239E-05	1.239E-05	1.238E-05
AM243	3.687E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.732E-05	3.731E-05	3.731E-05
AM245	9.134E-06	3.732E-18	3.448E-18	3.186E-18	2.944E-18	2.720E-18	2.513E-18	2.322E-18	2.145E-18
AM246	3.928E-09	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23	2.780E-23
CM241	1.841E-08	6.266E-18	3.046E-18	1.657E-18	9.014E-19	2.675E-19	2.675E-19	2.675E-19	2.675E-19
CM242	6.076E-02	5.250E-04	4.510E-04	3.877E-04	3.334E-04	2.870E-04	2.472E-04	2.132E-04	1.840E-04
CM243	7.409E-06	6.871E-06	6.854E-06	6.837E-06	6.821E-06	6.804E-06	6.788E-06	6.771E-06	6.755E-06
CM244	1.252E-03	1.115E-03	1.111E-03	1.106E-03	1.102E-03	1.098E-03	1.094E-03	1.089E-03	1.085E-03
CM245	5.058E-08	5.057E-08	5.057E-08	5.057E-08	5.057E-08	5.057E-08	5.057E-08	5.057E-08	5.057E-08
CM246	2.730E-09	2.729E-09	2.729E-09	2.729E-09	2.729E-09	2.729E-09	2.729E-09	2.728E-09	2.728E-09
CM247	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15	2.277E-15
CM248	1.640E-15	1.640E-15	1.640E-15	1.640E-15	1.640E-15	1.640E-15	1.640E-15	1.640E-15	1.640E-15
CM250	1.112E-22	1.112E-22	1.112E-22	1.112E-22	1.112E-22	1.112E-22	1.112E-22	1.112E-22	1.112E-22
BK249	2.968E-12	2.573E-13	2.378E-13	2.197E-13	2.030E-13	1.875E-13	1.733E-13	1.601E-13	1.479E-13
BK250	2.220E-11	2.024E-20	2.024E-20	2.024E-20	2.024E-20	2.024E-20	2.024E-20	2.024E-20	2.024E-20
CF249	1.429E-16	6.943E-15	6.991E-15	7.034E-15	7.075E-15	7.112E-15	7.146E-15	7.178E-15	7.207E-15
CF250	2.437E-14	2.121E-14	2.109E-14	2.098E-14	2.087E-14	2.076E-14	2.065E-14	2.054E-14	2.043E-14
CF251	7.275E-17	7.258E-17	7.258E-17	7.257E-17	7.257E-17	7.256E-17	7.255E-17	7.255E-17	7.254E-17
CF252	3.718E-15	1.646E-15	1.604E-15	1.562E-15	1.522E-15	1.482E-15	1.444E-15	1.406E-15	1.370E-15
CF253	2.289E-16	1.676E-35	1.676E-35	1.676E-35	1.676E-35	1.676E-35	1.676E-35	1.676E-35	1.676E-35
CF254	8.683E-19	2.018E-24	2.018E-24	2.018E-24	2.018E-24	2.018E-24	2.018E-24	2.018E-24	2.018E-24
ES253	4.338E-17	3.501E-32	3.501E-32	3.501E-32	3.501E-32	3.501E-32	3.501E-32	3.501E-32	3.501E-32
ES254	7.277E-20	2.022E-20	2.022E-20	2.022E-20	2.022E-20	2.022E-20	2.022E-20	2.022E-20	2.022E-20
ES255	0.000E+00	1.448E-31	1.448E-31	1.448E-31	1.448E-31	1.448E-31	1.448E-31	1.448E-31	1.448E-31
H 3	7.917E-01	6.653E-01	6.616E-01	6.579E-01	6.542E-01	6.505E-01	6.469E-01	6.433E-01	6.397E-01
BE 10	5.037E-09	5.037E-09	5.037E-09	5.037E-09	5.037E-09	5.037E-09	5.037E-09	5.037E-09	5.037E-09
C 14	2.032E-07	2.031E-07	2.031E-07	2.031E-07	2.031E-07	2.031E-07	2.031E-07	2.031E-07	2.031E-07
SE 79	7.301E-04	7.301E-04	7.301E-04	7.301E-04	7.301E-04	7.301E-04	7.301E-04	7.301E-04	7.301E-04
KR 81	4.725E-11	4.725E-11	4.725E-11	4.725E-11	4.725E-11	4.725E-11	4.725E-11	4.725E-11	4.725E-11
KR 85	2.229E+01	1.827E+01	1.816E+01	1.804E+01	1.792E+01	1.781E+01	1.769E+01	1.758E+01	1.747E+01
RB 86	6.374E+00	3.433E-18	5.055E-19	5.055E-19	5.055E-19	5.055E-19	5.055E-19	5.055E-19	5.055E-19
RB 87	4.901E-08	4.904E-08	4.904E-08	4.904E-08	4.904E-08	4.904E-08	4.904E-08	4.904E-08	4.904E-08
SR 89	1.374E+04	2.444E-03	1.481E-03	8.968E-04	5.432E-04	3.290E-04	1.993E-04	1.207E-04	7.312E-05
SR 90	1.750E+02	1.625E+02	1.621E+02	1.617E+02	1.614E+02	1.610E+02	1.606E+02	1.602E+02	1.598E+02
Y 90	1.821E+02	1.626E+02	1.622E+02	1.618E+02	1.614E+02	1.610E+02	1.606E+02	1.603E+02	1.599E+02
Y 91	1.585E+04	2.388E-02	1.549E-02	1.005E-02	6.520E-03	4.230E-03	2.744E-03	1.780E-03	1.155E-03
ZR 93	3.745E-03	3.762E-03	3.762E-03	3.762E-03	3.762E-03	3.762E-03	3.762E-03	3.762E-03	3.762E-03
NB 93M	3.518E-05	5.523E-04	5.677E-04	5.829E-04	5.981E-04	6.133E-04	6.283E-04	6.433E-04	6.582E-04
NB 94	3.991E-08	3.991E-08	3.991E-08	3.991E-08	3.991E-08	3.991E-08	3.991E-08	3.991E-08	3.991E-08
ZR 95	1.685E+04	7.930E-02	5.339E-02	3.594E-02	2.420E-02	1.629E-02	1.097E-02	7.382E-03	4.970E-03
NB 95	1.277E+04	1.761E-01	1.185E-01	7.978E-02	5.371E-02	3.616E-02	2.434E-02	1.639E-02	1.103E-02
NB 95M	1.172E+02	5.883E-04	3.966E-04	2.670E-04	1.797E-04	1.210E-04	8.146E-05	5.484E-05	3.692E-05
TC 98	2.641E-09	2.641E-09	2.641E-09	2.641E-09	2.641E-09	2.641E-09	2.641E-09	2.641E-09	2.641E-09
TC 99	2.347E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02	2.424E-02
RH102	3.566E-04	1.700E-04	1.659E-04	1.620E-04	1.582E-04	1.545E-04	1.508E-04	1.473E-04	1.438E-04
RU103	9.711E+03	2.044E-05	1.073E-05	5.631E-06	2.956E-06	1.552E-06	8.146E-07	4.276E-07	2.245E-07
RH103M	8.753E+03	1.842E-05	9.671E-06	5.077E-06	2.665E-06	1.399E-06	7.343E-07	3.855E-07	2.023E-07
RU106	3.363E+02	3.990E+01	3.725E+01	3.477E+01	3.246E+01	3.030E+01	2.829E+01	2.641E+01	2.466E+01
RH106	6.269E+02	3.990E+01	3.725E+01	3.477E+01	3.246E+01	3.030E+01	2.829E+01	2.641E+01	2.466E+01
PD107	2.767E-05	2.768E-05	2.768E-05	2.768E-05	2.768E-05	2.768E-05	2.768E-05	2.768E-05	2.768E-05
AG108	6.009E-04	4.552E-11	4.549E-11	4.547E-11	4.544E-11	4.542E-11	4.539E-11	4.537E-11	4.534E-11
AG108M	5.202E-10	5.114E-10	5.112E-10	5.109E-10	5.106E-10	5.103E-10	5.100E-10	5.098E-10	5.095E-10
AG109M	2.051E+02	6.056E-09	5.735E-09	5.430E-09	5.142E-09	4.869E-09	4.610E-09	4.366E-09	4.134E-09
CD109	3.287E-08	6.056E-09	5.735E-09	5.430E-09	5.142E-09	4.869E-09	4.610E-09	4.366E-09	4.134E-09
AG110	6.477E+01	2.908E-04	2.628E-04	2.374E-04	2.146E-04	1.939E-04	1.752E-04	1.583E-04	1.431E-04
AG110M	5.055E-01	2.186E-02	1.976E-02	1.785E-02	1.613E-02	1.458E-02	1.317E-02	1.190E-02	1.076E-02
CD113M	2.330E-02	2.014E-02	2.004E-02	1.995E-02	1.985E-02	1.976E-02	1.966E-02	1.957E-02	1.948E-02
IN114	6.136E-04	1.725E-11	1.034E-11	6.202E-12	3.720E-12	2.231E-12	1.338E-12	8.022E-13	4.811E-13
IN114M	1.379E-04	1.802E-11	1.081E-11	6.481E-12	3.887E-12	2.331E-12	1.398E-12	8.383E-13	5.027E-13
CD115M	4.274E+00	9.719E-08	5.509E-08	3.123E-08	1.770E-08	1.003E-08	5.687E-09	3.223E-09	1.827E-09
IN115	1.756E-14	1.925E-14	1.925E-14	1.925E-14	1.925E-14	1.925E-14	1.925E-14	1.925E-14	1.925E-14
IN115M	5.069E+01	6.831E-12	3.872E-12	2.195E-12	1.244E-12	7.051E-13	3.997E-13	2.265E-13	1.284E-13
SN119M	2.853E-01	1.159E-02	1.046E-02	9.429E-03	8.504E-03	7.669E-03	6.916E-03	6.237E-03	5.625E-03
SN121M	1.594E-04	1.527E-04	1.525E-04	1.523E-04	1.521E-04	1.519E-04	1.517E-04	1.515E-04	1.513E-04
SN123	1.017E+01	2.337E-02	1.921E-02	1.579E-02	1.298E-02	1.067E-02	8.770E-03	7.209E-03	5.926E-03
TE123	1.454E-16	2.026E-16	2.026E-16	2.026E-16	2.026E-16	2.027E-16	2.027E-16	2.027E-16	2.027E-16
TE123M	1.750E-03	2.482E-06	2.009E-06	1.626E-06	1.316E-06	1.065E-06	8.618E-07	6.975E-07	5.645E-07
SB124	1.472E+00	3.203E-06	2.104E-06	1.381E-06	9.071E-07	5.956E-07	3.911E-07	2.568E-07	1.687E-07
SB125	1.187E+01	5.699E+00	5.558E+00	5.421E+00	5.287E+00	5.156E+00	5.029E+00	4.904E+00	4.783E+00
TE125M	1.391E+00	1.390E+00	1.356E+00	1.323E+00	1.290E+00	1.258E+00	1.227E+00	1.197E+00	1.167E+00
SN126	6.517E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04
SB126	4.089E+00	9.123E-05	9.124E-05	9.124E-05	9.124E-05	9.124E-05	9.124E-05	9.124E-05	9.124E-05

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co_al.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
SB126M	1.805E+00	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04	6.516E-04
TE127	5.137E+02	3.341E-02	2.649E-02	2.100E-02	1.665E-02	1.320E-02	1.046E-02	8.293E-03	6.574E-03
TE127M	4.291E+01	3.411E-02	2.704E-02	2.144E-02	1.699E-02	1.347E-02	1.068E-02	8.467E-03	6.712E-03
XE127	1.330E-04	5.793E-14	2.890E-14	1.442E-14	7.195E-15	3.590E-15	1.791E-15	8.933E-16	4.456E-16
TE129	2.273E+03	1.523E-08	7.168E-09	3.374E-09	1.588E-09	7.476E-10	3.519E-10	1.656E-10	7.797E-11
TE129M	3.246E+02	2.339E-08	1.101E-08	5.183E-09	2.440E-09	1.148E-09	5.406E-10	2.545E-10	1.198E-10
I129	3.848E-05	4.047E-05	4.047E-05	4.047E-05	4.047E-05	4.047E-05	4.047E-05	4.047E-05	4.047E-05
CS134	1.270E+02	4.482E+01	4.334E+01	4.191E+01	4.052E+01	3.918E+01	3.789E+01	3.664E+01	3.542E+01
CS135	3.306E-04	3.385E-04	3.385E-04	3.385E-04	3.385E-04	3.385E-04	3.385E-04	3.385E-04	3.385E-04
CS137	1.819E+02	1.693E+02	1.690E+02	1.686E+02	1.682E+02	1.678E+02	1.674E+02	1.670E+02	1.666E+02
BA137M	1.730E+02	1.602E+02	1.598E+02	1.595E+02	1.591E+02	1.587E+02	1.584E+02	1.580E+02	1.576E+02
LA138	3.458E-13	3.458E-13	3.458E-13	3.458E-13	3.458E-13	3.458E-13	3.458E-13	3.458E-13	3.458E-13
CE141	1.867E+04	6.161E-07	2.828E-07	1.298E-07	5.958E-08	2.735E-08	1.255E-08	5.761E-09	2.644E-09
CE142	5.039E-08	5.043E-08	5.043E-08	5.043E-08	5.043E-08	5.043E-08	5.043E-08	5.043E-08	5.043E-08
CE144	5.275E+03	3.336E+02	3.051E+02	2.791E+02	2.554E+02	2.336E+02	2.137E+02	1.955E+02	1.788E+02
PR144	5.594E+03	3.336E+02	3.052E+02	2.792E+02	2.554E+02	2.336E+02	2.137E+02	1.955E+02	1.788E+02
PR144M	6.342E+01	4.003E+00	3.662E+00	3.350E+00	3.064E+00	2.803E+00	2.564E+00	2.346E+00	2.146E+00
ND144	5.878E-13	2.420E-12	2.431E-12	2.441E-12	2.449E-12	2.458E-12	2.465E-12	2.472E-12	2.478E-12
PM146	2.574E-03	1.742E-03	1.720E-03	1.698E-03	1.677E-03	1.656E-03	1.635E-03	1.615E-03	1.595E-03
SM146	1.634E-11	4.054E-11	4.117E-11	4.180E-11	4.242E-11	4.303E-11	4.363E-11	4.422E-11	4.481E-11
PM147	4.881E+02	2.535E+02	2.469E+02	2.405E+02	2.342E+02	2.281E+02	2.221E+02	2.163E+02	2.107E+02
SM147	5.724E-10	8.455E-09	8.617E-09	8.775E-09	8.929E-09	9.079E-09	9.224E-09	9.366E-09	9.505E-09
PM148	1.474E+03	3.780E-08	2.048E-08	1.109E-08	6.008E-09	3.255E-09	1.763E-09	9.550E-10	5.173E-10
PM148M	1.204E+02	6.711E-07	3.635E-07	1.969E-07	1.067E-07	5.778E-08	3.130E-08	1.696E-08	9.185E-09
SM148	2.419E-14	2.860E-14	2.860E-14	2.860E-14	2.860E-14	2.860E-14	2.860E-14	2.860E-14	2.860E-14
SM149	2.474E-15	5.903E-15	5.903E-15	5.903E-15	5.903E-15	5.903E-15	5.903E-15	5.903E-15	5.903E-15
EU150	6.326E-09	5.959E-09	5.948E-09	5.936E-09	5.925E-09	5.913E-09	5.902E-09	5.891E-09	5.879E-09
SM151	7.416E-01	7.743E-01	7.737E-01	7.731E-01	7.725E-01	7.719E-01	7.713E-01	7.707E-01	7.701E-01
EU152	5.081E-03	4.338E-03	4.316E-03	4.294E-03	4.272E-03	4.251E-03	4.229E-03	4.208E-03	4.186E-03
GD152	2.092E-16	2.372E-16	2.380E-16	2.388E-16	2.395E-16	2.403E-16	2.411E-16	2.418E-16	2.426E-16
GD153	1.926E-02	7.522E-04	6.775E-04	6.102E-04	5.496E-04	4.950E-04	4.459E-04	4.016E-04	3.617E-04
EU154	5.721E+00	4.456E+00	4.421E+00	4.385E+00	4.350E+00	4.315E+00	4.280E+00	4.246E+00	4.212E+00
EU155	4.173E+00	2.706E+00	2.669E+00	2.632E+00	2.595E+00	2.559E+00	2.523E+00	2.488E+00	2.454E+00
TB160	2.424E-01	4.681E-06	3.298E-06	2.324E-06	1.637E-06	1.154E-06	8.128E-07	5.727E-07	4.035E-07
HO166M	3.611E-08	3.605E-08	3.604E-08	3.604E-08	3.604E-08	3.604E-08	3.604E-08	3.603E-08	3.603E-08
TM170	3.880E-07	8.678E-10	7.127E-10	5.853E-10	4.807E-10	3.948E-10	3.242E-10	2.663E-10	2.187E-10
TM171	2.141E-09	6.992E-10	6.744E-10	6.505E-10	6.274E-10	6.052E-10	5.837E-10	5.630E-10	5.430E-10

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co_al.g
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
HE 4	5.756E-07	1.926E-05	1.985E-05	2.044E-05	2.104E-05	2.163E-05	2.222E-05	2.281E-05	2.340E-05
TL206	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32
TL207	1.122E-19	1.011E-17	1.021E-17	1.054E-17	1.096E-17	1.143E-17	1.191E-17	1.240E-17	1.289E-17
TL208	2.197E-16	3.856E-15	3.962E-15	4.043E-15	4.122E-15	4.200E-15	4.276E-15	4.350E-15	4.423E-15
TL209	2.473E-21	2.123E-21	2.136E-21	2.171E-21	2.214E-21	2.259E-21	2.304E-21	2.349E-21	2.394E-21
PB206	1.059E-18	2.429E-15	2.712E-15	3.020E-15	3.356E-15	3.721E-15	4.116E-15	4.544E-15	5.007E-15
PB207	7.884E-16	1.025E-12	1.103E-12	1.182E-12	1.265E-12	1.350E-12	1.440E-12	1.533E-12	1.630E-12
PB208	8.944E-12	2.290E-09	2.419E-09	2.550E-09	2.685E-09	2.822E-09	2.961E-09	3.103E-09	3.247E-09
PB209	1.031E-17	8.847E-18	8.900E-18	9.048E-18	9.226E-18	9.412E-18	9.599E-18	9.787E-18	9.975E-18
PB210	3.456E-15	1.335E-13	1.448E-13	1.567E-13	1.692E-13	1.824E-13	1.963E-13	2.109E-13	2.262E-13
PB211	8.682E-19	7.821E-17	7.901E-17	8.152E-17	8.482E-17	8.840E-17	9.211E-17	9.589E-17	9.975E-17
PB212	1.296E-13	2.274E-12	2.337E-12	2.385E-12	2.431E-12	2.477E-12	2.522E-12	2.566E-12	2.609E-12
PB214	1.019E-19	8.563E-18	8.986E-18	9.496E-18	1.002E-17	1.056E-17	1.111E-17	1.168E-17	1.226E-17
BI208	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21
BI209	1.851E-15	3.731E-14	3.895E-14	4.061E-14	4.231E-14	4.403E-14	4.579E-14	4.758E-14	4.941E-14
BI210M	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20
BI210	1.842E-18	8.217E-17	8.771E-17	9.493E-17	1.026E-16	1.106E-16	1.191E-16	1.280E-16	1.373E-16
BI211	5.122E-20	4.614E-18	4.662E-18	4.810E-18	5.005E-18	5.216E-18	5.435E-18	5.658E-18	5.886E-18
BI212	1.229E-14	2.157E-13	2.217E-13	2.262E-13	2.306E-13	2.350E-13	2.392E-13	2.434E-13	2.474E-13
BI213	2.421E-18	2.079E-18	2.091E-18	2.126E-18	2.168E-18	2.211E-18	2.255E-18	2.300E-18	2.344E-18
BI214	7.566E-20	6.358E-18	6.672E-18	7.051E-18	7.441E-18	7.841E-18	8.251E-18	8.672E-18	9.103E-18
PO210	7.703E-18	1.509E-15	1.647E-15	1.794E-15	1.950E-15	2.117E-15	2.294E-15	2.481E-15	2.679E-15
PO211	6.285E-25	5.661E-23	5.719E-23	5.902E-23	6.140E-23	6.399E-23	6.668E-23	6.942E-23	7.221E-23
PO212	6.504E-25	1.141E-23	1.173E-23	1.197E-23	1.220E-23	1.243E-23	1.266E-23	1.288E-23	1.309E-23
PO213	3.633E-27	3.119E-27	3.137E-27	3.189E-27	3.252E-27	3.318E-27	3.384E-27	3.450E-27	3.516E-27
PO214	2.030E-25	8.748E-25	9.179E-25	9.701E-25	1.024E-24	1.079E-24	1.135E-24	1.193E-24	1.252E-24
PO215	7.266E-25	6.549E-23	6.616E-23	6.827E-23	7.103E-23	7.402E-23	7.713E-23	8.030E-23	8.353E-23
PO216	5.172E-19	9.075E-18	9.323E-18	9.514E-18	9.701E-18	9.884E-18	1.006E-17	1.024E-17	1.041E-17
PO218	1.182E-20	9.929E-19	1.042E-18	1.101E-18	1.162E-18	1.224E-18	1.289E-18	1.354E-18	1.422E-18
AT217	2.909E-23	2.497E-23	2.512E-23	2.554E-23	2.605E-23	2.657E-23	2.710E-23	2.763E-23	2.816E-23
RN218	4.180E-23	1.716E-39	1.714E-39	1.714E-39	1.714E-39	1.714E-39	1.714E-39	1.714E-39	1.714E-39
RN219	1.647E-21	1.484E-19	1.499E-19	1.547E-19	1.610E-19	1.677E-19	1.748E-19	1.820E-19	1.893E-19
RN220	1.952E-16	3.426E-15	3.520E-15	3.592E-15	3.662E-15	3.731E-15	3.799E-15	3.865E-15	3.929E-15
RN222	2.172E-17	1.826E-15	1.916E-15	2.025E-15	2.136E-15	2.251E-15	2.369E-15	2.490E-15	2.614E-15
FR221	2.642E-19	2.268E-19	2.281E-19	2.319E-19	2.365E-19	2.413E-19	2.461E-19	2.509E-19	2.557E-19
FR223	1.599E-20	6.888E-19	7.199E-19	7.517E-19	7.840E-19	8.169E-19	8.505E-19	8.846E-19	9.193E-19
RA222	4.621E-20	1.897E-36	1.895E-36	1.895E-36	1.895E-36	1.895E-36	1.895E-36	1.895E-36	1.895E-36
RA223	4.183E-16	3.770E-14	3.808E-14	3.930E-14	4.089E-14	4.261E-14	4.440E-14	4.622E-14	4.808E-14
RA224	1.131E-12	1.984E-11	2.038E-11	2.080E-11	2.121E-11	2.161E-11	2.200E-11	2.238E-11	2.275E-11
RA225	1.576E-15	1.025E-15	1.037E-15	1.056E-15	1.078E-15	1.099E-15	1.121E-15	1.143E-15	1.165E-15
RA226	3.592E-12	2.840E-10	3.005E-10	3.175E-10	3.350E-10	3.529E-10	3.713E-10	3.902E-10	4.096E-10
RA228	4.739E-19	8.928E-17	9.446E-17	9.977E-17	1.052E-16	1.108E-16	1.165E-16	1.223E-16	1.282E-16
AC225	8.067E-16	6.927E-16	6.968E-16	7.084E-16	7.223E-16	7.369E-16	7.515E-16	7.662E-16	7.810E-16
AC227	6.195E-13	2.669E-11	2.790E-11	2.913E-11	3.038E-11	3.165E-11	3.295E-11	3.428E-11	3.562E-11
AC228	7.721E-16	9.319E-21	9.861E-21	1.042E-20	1.098E-20	1.156E-20	1.216E-20	1.276E-20	1.338E-20
TH226	2.303E-18	9.451E-35	9.444E-35	9.444E-35	9.444E-35	9.444E-35	9.444E-35	9.444E-35	9.444E-35
TH227	9.385E-16	6.194E-14	6.320E-14	6.563E-14	6.840E-14	7.130E-14	7.427E-14	7.729E-14	8.037E-14
TH228	2.352E-10	3.855E-09	3.937E-09	4.018E-09	4.097E-09	4.174E-09	4.249E-09	4.323E-09	4.395E-09
TH229	6.913E-11	1.890E-10	1.930E-10	1.969E-10	2.009E-10	2.050E-10	2.090E-10	2.130E-10	2.170E-10
TH230	2.025E-06	1.844E-05	1.897E-05	1.950E-05	2.003E-05	2.056E-05	2.109E-05	2.162E-05	2.215E-05
TH231	5.690E-09	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10
TH232	7.520E-08	1.246E-06	1.284E-06	1.321E-06	1.359E-06	1.397E-06	1.435E-06	1.472E-06	1.510E-06
TH234	1.577E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10
PA231	2.238E-07	6.157E-07	6.286E-07	6.416E-07	6.546E-07	6.676E-07	6.805E-07	6.935E-07	7.065E-07
PA233	9.454E-09	1.885E-08	1.885E-08	1.885E-08	1.885E-08	1.885E-08	1.885E-08	1.885E-08	1.885E-08
PA234M	1.507E-14	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15
PA234	3.338E-12	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15
U230	2.263E-15	9.283E-32	9.283E-32	9.283E-32	9.283E-32	9.283E-32	9.283E-32	9.283E-32	9.283E-32
U232	1.712E-07	2.357E-07	2.369E-07	2.381E-07	2.393E-07	2.404E-07	2.415E-07	2.426E-07	2.436E-07
U233	8.724E-06	9.262E-06	9.280E-06	9.297E-06	9.315E-06	9.333E-06	9.350E-06	9.368E-06	9.386E-06
U234	1.900E+00	1.901E+00	1.901E+00	1.901E+00	1.901E+00	1.901E+00	1.901E+00	1.901E+00	1.901E+00
U235	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02
U236	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01
U237	8.333E-02	9.013E-10	8.969E-10	8.926E-10	8.883E-10	8.841E-10	8.798E-10	8.756E-10	8.714E-10
U238	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01
U240	2.879E-08	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18
NP235	4.704E-09	6.485E-10	6.083E-10	5.707E-10	5.353E-10	5.022E-10	4.711E-10	4.419E-10	4.146E-10
NP236	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07
NP237	4.716E-01	5.550E-01	5.550E-01	5.550E-01	5.550E-01	5.550E-01	5.550E-01	5.550E-01	5.550E-01
NP238	3.220E-03	2.408E-13	2.407E-13	2.405E-13	2.404E-13	2.403E-13	2.402E-13	2.401E-13	2.400E-13
NP239	1.828E-02	1.608E-10	1.608E-10	1.608E-10	1.608E-10	1.608E-10	1.608E-10	1.608E-10	1.608E-10
NP240M	2.781E-08	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21
PU236	1.272E-07	6.216E-08	6.067E-08	5.921E-08	5.779E-08	5.640E-08	5.504E-08	5.372E-08	5.243E-08
PU237	6.793E-08	2.277E-15	1.307E-15	7.500E-16	4.305E-16	2.471E-16	1.418E-16	8.140E-17	4.672E-17
PU238	3.854E-02	4.077E-02	4.074E-02	4.071E-02	4.068E-02	4.064E-02	4.061E-02	4.058E-02	4.055E-02
PU239	3.438E-01	3.622E-01	3.622E-01	3.622E-01	3.622E-01	3.622E-01	3.622E-01	3.622E-01	3.622E-01

Appendix B-1
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co_al.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
PU240	5.082E-02	5.081E-02	5.081E-02	5.081E-02	5.081E-02	5.081E-02	5.081E-02	5.081E-02	5.081E-02
PU241	3.379E-02	2.911E-02	2.897E-02	2.883E-02	2.869E-02	2.855E-02	2.842E-02	2.828E-02	2.814E-02
PU242	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03
PU243	2.293E-06	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22
PU244	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08
PU246	8.022E-14	5.679E-28	5.679E-28	5.679E-28	5.679E-28	5.679E-28	5.679E-28	5.679E-28	5.679E-28
AM241	1.437E-04	4.816E-03	4.955E-03	5.093E-03	5.230E-03	5.367E-03	5.504E-03	5.639E-03	5.774E-03
AM242M	1.302E-06	1.284E-06	1.284E-06	1.283E-06	1.282E-06	1.282E-06	1.281E-06	1.281E-06	1.280E-06
AM242	8.587E-07	1.536E-11	1.535E-11	1.535E-11	1.534E-11	1.533E-11	1.533E-11	1.532E-11	1.531E-11
AM243	1.849E-04	1.871E-04	1.871E-04	1.871E-04	1.871E-04	1.871E-04	1.871E-04	1.871E-04	1.871E-04
AM245	1.478E-12	6.037E-25	5.578E-25	5.154E-25	4.762E-25	4.400E-25	4.065E-25	3.756E-25	3.470E-25
AM246	1.284E-16	9.088E-31	9.089E-31	9.089E-31	9.089E-31	9.089E-31	9.089E-31	9.089E-31	9.089E-31
CM241	1.223E-12	4.162E-22	2.023E-22	1.100E-22	5.987E-23	1.777E-23	1.777E-23	1.777E-23	1.777E-23
CM242	1.837E-05	1.587E-07	1.364E-07	1.172E-07	1.008E-07	8.676E-08	7.474E-08	6.445E-08	5.563E-08
CM243	1.435E-07	1.330E-07	1.327E-07	1.324E-07	1.321E-07	1.318E-07	1.314E-07	1.311E-07	1.308E-07
CM244	1.547E-05	1.377E-05	1.372E-05	1.367E-05	1.362E-05	1.356E-05	1.351E-05	1.346E-05	1.341E-05
CM245	2.945E-07	2.944E-07	2.944E-07	2.944E-07	2.944E-07	2.944E-07	2.944E-07	2.944E-07	2.944E-07
CM246	8.884E-09	8.880E-09	8.879E-09	8.879E-09	8.879E-09	8.879E-09	8.879E-09	8.879E-09	8.879E-09
CM247	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11
CM248	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13
CM250	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21
BK249	1.811E-15	1.570E-16	1.450E-16	1.340E-16	1.238E-16	1.144E-16	1.057E-16	9.765E-17	9.022E-17
BK250	5.705E-18	5.200E-27	5.202E-27	5.202E-27	5.202E-27	5.202E-27	5.202E-27	5.202E-27	5.202E-27
CF249	3.487E-17	1.694E-15	1.706E-15	1.716E-15	1.726E-15	1.735E-15	1.744E-15	1.751E-15	1.758E-15
CF250	2.228E-16	1.939E-16	1.929E-16	1.919E-16	1.908E-16	1.898E-16	1.888E-16	1.878E-16	1.868E-16
CF251	4.585E-17	4.575E-17	4.574E-17	4.574E-17	4.573E-17	4.573E-17	4.573E-17	4.572E-17	4.572E-17
CF252	6.911E-18	3.060E-18	2.981E-18	2.904E-18	2.828E-18	2.755E-18	2.684E-18	2.614E-18	2.546E-18
CF253	7.898E-21	5.782E-40	5.782E-40	5.782E-40	5.782E-40	5.782E-40	5.782E-40	5.782E-40	5.782E-40
CF254	1.021E-22	2.373E-28	2.373E-28	2.373E-28	2.373E-28	2.373E-28	2.373E-28	2.373E-28	2.373E-28
ES253	1.720E-21	1.388E-36	1.388E-36	1.388E-36	1.388E-36	1.388E-36	1.388E-36	1.388E-36	1.388E-36
ES254	3.901E-23	1.084E-23	1.084E-23	1.084E-23	1.084E-23	1.084E-23	1.084E-23	1.084E-23	1.084E-23
ES255	0.000E+00	1.102E-35	1.102E-35	1.102E-35	1.102E-35	1.102E-35	1.102E-35	1.102E-35	1.102E-35
SF250	2.713E-13	6.920E-12	7.087E-12	7.254E-12	7.421E-12	7.587E-12	7.753E-12	7.918E-12	8.083E-12
H 3	8.201E-05	6.891E-05	6.853E-05	6.814E-05	6.776E-05	6.738E-05	6.701E-05	6.663E-05	6.626E-05
LI 6	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07
LI 7	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08
BE 9	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08
BE 10	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07
C 14	4.556E-08	4.555E-08	4.555E-08	4.555E-08	4.555E-08	4.555E-08	4.554E-08	4.554E-08	4.554E-08
ZN 66	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11
ZN 67	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12
ZN 68	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14
GA 69	8.549E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18
GE 70	9.226E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21
GA 71	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09
GE 72	1.264E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05
GE 73	4.483E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05
GE 74	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04
AS 75	2.891E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
GE 76	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04
SE 76	2.760E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06
SE 77	1.904E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03
SE 78	4.077E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03
SE 79	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02
BR 79	2.177E-08	3.683E-07	3.795E-07	3.907E-07	4.018E-07	4.130E-07	4.242E-07	4.354E-07	4.466E-07
SE 80	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
KR 80	1.252E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07
BR 81	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02
KR 81	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09
SE 82	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02
KR 82	3.453E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04
KR 83	1.024E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01
KR 84	2.257E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01
KR 85	5.678E-02	4.656E-02	4.626E-02	4.596E-02	4.566E-02	4.537E-02	4.508E-02	4.479E-02	4.450E-02
RB 85	2.135E-01	2.242E-01	2.245E-01	2.248E-01	2.251E-01	2.254E-01	2.257E-01	2.260E-01	2.263E-01
KR 86	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01
RB 86	7.830E-05	4.216E-23	6.210E-24	6.210E-24	6.210E-24	6.210E-24	6.210E-24	6.210E-24	6.210E-24
SR 86	1.626E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04
RB 87	5.599E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01
SR 87	9.284E-07	9.289E-07	9.289E-07	9.289E-07	9.289E-07	9.289E-07	9.289E-07	9.289E-07	9.289E-07
SR 88	8.062E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01
SR 89	4.726E-01	8.410E-08	5.094E-08	3.085E-08	1.869E-08	1.132E-08	6.857E-09	4.153E-09	2.516E-09
Y 89	5.923E-01	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00
SR 90	1.282E+00	1.191E+00	1.188E+00	1.185E+00	1.182E+00	1.180E+00	1.177E+00	1.174E+00	1.171E+00
Y 90	3.345E-04	2.987E-04	2.980E-04	2.973E-04	2.966E-04	2.959E-04	2.951E-04	2.944E-04	2.937E-04

Appendix B-1
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co_al.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
ZR 90	7.754E-03	9.899E-02	1.018E-01	1.046E-01	1.075E-01	1.103E-01	1.131E-01	1.159E-01	1.187E-01
Y 91	6.460E-01	9.733E-07	6.314E-07	4.096E-07	2.657E-07	1.724E-07	1.118E-07	7.256E-08	4.707E-08
ZR 91	6.788E-01	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00
ZR 92	1.378E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00
ZR 93	1.490E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00
NB 93	9.491E-09	2.825E-07	2.960E-07	3.098E-07	3.238E-07	3.381E-07	3.527E-07	3.675E-07	3.826E-07
NB 93M	1.244E-07	1.953E-06	2.008E-06	2.062E-06	2.115E-06	2.169E-06	2.222E-06	2.275E-06	2.328E-06
ZR 94	1.474E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00
NB 94	2.129E-07	2.129E-07	2.129E-07	2.129E-07	2.129E-07	2.129E-07	2.129E-07	2.129E-07	2.129E-07
ZR 95	7.839E-01	3.690E-06	2.484E-06	1.672E-06	1.126E-06	7.579E-07	5.102E-07	3.435E-07	2.312E-07
NB 95	3.263E-01	4.500E-06	3.030E-06	2.039E-06	1.373E-06	9.242E-07	6.222E-07	4.189E-07	2.820E-07
NB 95M	3.076E-04	1.544E-09	1.041E-09	7.007E-10	4.717E-10	3.176E-10	2.138E-10	1.439E-10	9.689E-11
MO 95	4.072E-01	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00
ZR 96	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00
MO 96	6.211E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03
MO 97	1.415E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00
MO 98	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00
TC 98	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06
TC 99	1.384E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00
RU 99	8.587E-07	1.528E-05	1.574E-05	1.621E-05	1.667E-05	1.714E-05	1.760E-05	1.807E-05	1.853E-05
MO100	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00
RU100	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02
RU101	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00
RU102	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00
RH102	2.949E-07	1.406E-07	1.373E-07	1.340E-07	1.308E-07	1.278E-07	1.247E-07	1.218E-07	1.189E-07
RU103	3.008E-01	6.330E-10	3.323E-10	1.744E-10	9.156E-11	4.806E-11	2.523E-11	1.324E-11	6.952E-12
RH103	4.468E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01
RH103M	2.690E-04	5.661E-13	2.972E-13	1.560E-13	8.189E-14	4.298E-14	2.256E-14	1.184E-14	6.217E-15
RU104	5.001E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01
PD104	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02
PD105	2.413E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01
RU106	1.005E-01	1.192E-02	1.113E-02	1.039E-02	9.698E-03	9.054E-03	8.452E-03	7.890E-03	7.366E-03
RH106	1.760E-07	1.120E-08	1.046E-08	9.765E-09	9.116E-09	8.510E-09	7.944E-09	7.417E-09	6.924E-09
PD106	4.584E-02	1.344E-01	1.352E-01	1.359E-01	1.366E-01	1.373E-01	1.379E-01	1.384E-01	1.390E-01
PD107	5.378E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02
AG107	1.065E-09	1.886E-08	1.943E-08	2.001E-08	2.058E-08	2.115E-08	2.173E-08	2.230E-08	2.288E-08
PD108	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02
AG108	8.176E-13	6.194E-20	6.190E-20	6.187E-20	6.183E-20	6.180E-20	6.177E-20	6.173E-20	6.170E-20
AG108M	1.995E-11	1.961E-11	1.960E-11	1.959E-11	1.958E-11	1.957E-11	1.956E-11	1.955E-11	1.954E-11
CD108	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08
AG109	1.170E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02
AG109M	7.844E-08	2.316E-18	2.193E-18	2.077E-18	1.966E-18	1.862E-18	1.763E-18	1.670E-18	1.581E-18
CD109	1.273E-11	2.345E-12	2.220E-12	2.102E-12	1.991E-12	1.885E-12	1.785E-12	1.690E-12	1.600E-12
PD110	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03
AG110	1.553E-08	6.972E-14	6.300E-14	5.693E-14	5.144E-14	4.649E-14	4.201E-14	3.796E-14	3.430E-14
AG110M	1.064E-04	4.600E-06	4.157E-06	3.757E-06	3.395E-06	3.068E-06	2.772E-06	2.505E-06	2.264E-06
CD110	2.315E-03	2.417E-03	2.418E-03	2.418E-03	2.418E-03	2.419E-03	2.419E-03	2.419E-03	2.419E-03
CD111	6.904E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03
CD112	5.522E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03
CD113	1.687E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04
CD113M	1.074E-04	9.282E-05	9.238E-05	9.194E-05	9.151E-05	9.107E-05	9.064E-05	9.021E-05	8.979E-05
IN113	9.379E-07	1.565E-05	1.609E-05	1.653E-05	1.696E-05	1.740E-05	1.783E-05	1.826E-05	1.869E-05
CD114	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02
IN114	4.456E-13	1.252E-20	7.511E-21	4.504E-21	2.701E-21	1.620E-21	9.715E-22	5.826E-22	3.494E-22
IN114M	5.960E-09	7.786E-16	4.670E-16	2.800E-16	1.679E-16	1.007E-16	6.040E-17	3.622E-17	2.172E-17
SN114	1.438E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08
CD115M	1.678E-04	3.816E-12	2.163E-12	1.226E-12	6.949E-13	3.939E-13	2.232E-13	1.265E-13	7.173E-14
IN115	2.821E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03
IN115M	7.995E-06	1.077E-18	6.107E-19	3.462E-19	1.962E-19	1.112E-19	6.304E-20	3.573E-20	2.025E-20
SN115	1.522E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04
CD116	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03
SN116	1.476E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03
SN117	4.833E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03
SN118	5.399E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03
SN119	5.103E-03	5.165E-03	5.165E-03	5.165E-03	5.165E-03	5.165E-03	5.166E-03	5.166E-03	5.166E-03
SN119M	6.368E-05	2.588E-06	2.334E-06	2.105E-06	1.898E-06	1.712E-06	1.544E-06	1.392E-06	1.256E-06
SN120	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03
SN121M	2.696E-06	2.582E-06	2.579E-06	2.575E-06	2.571E-06	2.568E-06	2.564E-06	2.561E-06	2.557E-06
SB121	5.536E-03	5.602E-03	5.602E-03	5.602E-03	5.602E-03	5.602E-03	5.602E-03	5.602E-03	5.602E-03
SN122	6.068E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03
TE122	1.234E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04
SN123	1.237E-03	2.842E-06	2.336E-06	1.920E-06	1.578E-06	1.298E-06	1.067E-06	8.767E-07	7.207E-07
SB123	5.902E-03	7.137E-03	7.138E-03	7.138E-03	7.139E-03	7.139E-03	7.139E-03	7.139E-03	7.139E-03
TE123	5.000E-07	6.968E-07	6.969E-07	6.969E-07	6.970E-07	6.970E-07	6.970E-07	6.970E-07	6.971E-07
TE123M	1.972E-07	2.797E-10	2.264E-10	1.832E-10	1.483E-10	1.200E-10	9.712E-11	7.860E-11	6.361E-11
SN124	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03

Appendix B-1
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co_al.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
SB124	8.410E-05	1.830E-10	1.202E-10	7.893E-11	5.183E-11	3.404E-11	2.235E-11	1.468E-11	9.638E-12
TE124	4.714E-05	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04
SB125	1.150E-02	5.517E-03	5.381E-03	5.248E-03	5.118E-03	4.992E-03	4.868E-03	4.748E-03	4.630E-03
TE125	4.613E-04	6.929E-03	7.067E-03	7.202E-03	7.333E-03	7.461E-03	7.587E-03	7.709E-03	7.828E-03
TE125M	7.717E-05	7.717E-05	7.526E-05	7.340E-05	7.159E-05	6.982E-05	6.809E-05	6.641E-05	6.477E-05
SN126	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02
SB126	4.889E-05	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09
SB126M	2.298E-08	8.293E-12	8.293E-12	8.293E-12	8.293E-12	8.293E-12	8.293E-12	8.293E-12	8.293E-12
TE126	4.501E-04	4.995E-04	4.995E-04	4.996E-04	4.996E-04	4.996E-04	4.996E-04	4.996E-04	4.996E-04
TE127	1.946E-04	1.266E-08	1.003E-08	7.953E-09	6.305E-09	4.998E-09	3.962E-09	3.141E-09	2.490E-09
TE127M	4.548E-03	3.615E-06	2.866E-06	2.272E-06	1.801E-06	1.428E-06	1.132E-06	8.972E-07	7.113E-07
I127	4.416E-02	5.095E-02	5.095E-02	5.095E-02	5.095E-02	5.095E-02	5.095E-02	5.095E-02	5.095E-02
XE127	4.707E-09	2.051E-18	1.023E-18	5.105E-19	2.547E-19	1.271E-19	6.340E-20	3.162E-20	1.577E-20
TE128	1.283E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01
XE128	8.405E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04
TE129	1.085E-04	7.268E-16	3.421E-16	1.610E-16	7.580E-17	3.568E-17	1.680E-17	7.906E-18	3.722E-18
TE129M	1.077E-02	7.762E-13	3.654E-13	1.720E-13	8.095E-14	3.811E-14	1.794E-14	8.443E-15	3.974E-15
I129	2.179E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01
XE129	1.824E-05	1.859E-05	1.859E-05	1.859E-05	1.859E-05	1.860E-05	1.860E-05	1.860E-05	1.860E-05
TE130	4.927E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01
XE130	2.935E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03
XE131	7.688E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01
XE132	1.478E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00
BA132	9.137E-08	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07
CS133	2.008E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00
XE134	2.597E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00
CS134	9.815E-02	3.463E-02	3.348E-02	3.238E-02	3.131E-02	3.027E-02	2.927E-02	2.830E-02	2.737E-02
BA134	3.828E-03	6.738E-02	6.852E-02	6.963E-02	7.070E-02	7.173E-02	7.273E-02	7.370E-02	7.464E-02
CS135	2.870E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01
BA135	7.450E-06	7.752E-06	7.760E-06	7.769E-06	7.778E-06	7.787E-06	7.796E-06	7.805E-06	7.814E-06
XE136	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00
BA136	4.044E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03
CS137	2.090E+00	1.946E+00	1.942E+00	1.937E+00	1.933E+00	1.928E+00	1.924E+00	1.919E+00	1.915E+00
BA137	9.414E-03	1.539E-01	1.584E-01	1.629E-01	1.674E-01	1.718E-01	1.763E-01	1.807E-01	1.851E-01
BA137M	3.215E-07	2.977E-07	2.970E-07	2.963E-07	2.957E-07	2.950E-07	2.943E-07	2.936E-07	2.929E-07
BA138	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00
LA138	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05
LA139	2.236E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
CE140	1.916E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
CE141	6.551E-01	2.162E-11	9.924E-12	4.555E-12	2.091E-12	9.596E-13	4.405E-13	2.022E-13	9.280E-14
PR141	1.407E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00
CE142	2.099E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00
ND142	7.029E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03
ND143	1.620E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00
CE144	1.653E+00	1.045E-01	9.562E-02	8.747E-02	8.002E-02	7.320E-02	6.696E-02	6.125E-02	5.604E-02
PR144	7.401E-05	4.414E-06	4.037E-06	3.693E-06	3.379E-06	3.091E-06	2.827E-06	2.586E-06	2.366E-06
PR144M	3.496E-07	2.206E-08	2.018E-08	1.846E-08	1.689E-08	1.545E-08	1.413E-08	1.293E-08	1.183E-08
ND144	4.966E-01	2.045E+00	2.054E+00	2.062E+00	2.070E+00	2.077E+00	2.083E+00	2.089E+00	2.094E+00
ND145	1.360E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00
ND146	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00
PM146	5.779E-06	3.910E-06	3.861E-06	3.813E-06	3.765E-06	3.718E-06	3.671E-06	3.625E-06	3.580E-06
SM146	4.668E-07	1.158E-06	1.176E-06	1.194E-06	1.212E-06	1.229E-06	1.247E-06	1.264E-06	1.281E-06
PM147	5.263E-01	2.734E-01	2.662E-01	2.593E-01	2.525E-01	2.459E-01	2.395E-01	2.333E-01	2.272E-01
SM147	2.518E-02	3.719E-01	3.790E-01	3.860E-01	3.927E-01	3.993E-01	4.057E-01	4.120E-01	4.180E-01
ND148	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01
PM148	8.968E-03	2.300E-13	1.246E-13	6.749E-14	3.656E-14	1.980E-14	1.073E-14	5.811E-15	3.148E-15
PM148M	5.632E-03	3.140E-11	1.701E-11	9.214E-12	4.991E-12	2.704E-12	1.464E-12	7.933E-13	4.297E-13
SM148	8.010E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02
SM149	1.030E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02
ND150	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01
SM150	4.608E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01
EU150	9.551E-11	8.997E-11	8.980E-11	8.963E-11	8.946E-11	8.928E-11	8.911E-11	8.894E-11	8.877E-11
SM151	2.818E-02	2.942E-02	2.940E-02	2.938E-02	2.935E-02	2.933E-02	2.931E-02	2.928E-02	2.926E-02
EU151	1.477E-05	7.257E-04	7.483E-04	7.710E-04	7.936E-04	8.162E-04	8.388E-04	8.613E-04	8.839E-04
SM152	1.801E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01
EU152	2.937E-05	2.508E-05	2.495E-05	2.482E-05	2.470E-05	2.457E-05	2.444E-05	2.432E-05	2.420E-05
GD152	9.600E-06	1.089E-05	1.092E-05	1.096E-05	1.099E-05	1.103E-05	1.106E-05	1.110E-05	1.113E-05
EU153	1.097E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
GD153	5.460E-06	2.132E-07	1.920E-07	1.730E-07	1.558E-07	1.403E-07	1.264E-07	1.138E-07	1.025E-07
SM154	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02
EU154	2.119E-02	1.650E-02	1.637E-02	1.624E-02	1.611E-02	1.598E-02	1.585E-02	1.572E-02	1.560E-02
GD154	1.908E-04	4.875E-03	5.007E-03	5.139E-03	5.269E-03	5.398E-03	5.527E-03	5.654E-03	5.780E-03
EU155	8.968E-03	5.816E-03	5.735E-03	5.656E-03	5.577E-03	5.500E-03	5.424E-03	5.348E-03	5.274E-03
GD155	1.779E-05	3.172E-03	3.253E-03	3.332E-03	3.411E-03	3.488E-03	3.565E-03	3.640E-03	3.714E-03
GD156	1.391E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02
GD157	5.689E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05

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co_al.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/11/02 at 08:30:29

	3336.0HR	3.1YR	3.2YR	3.3YR	3.4YR	3.5YR	3.6YR	3.7YR	3.8YR
GD158	6.091E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03
TB159	5.677E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04
GD160	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04
TB160	2.147E-05	4.145E-10	2.921E-10	2.058E-10	1.450E-10	1.022E-10	7.198E-11	5.072E-11	3.573E-11
DY160	8.770E-06	3.023E-05	3.023E-05	3.023E-05	3.023E-05	3.023E-05	3.023E-05	3.024E-05	3.024E-05
DY161	4.991E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05
DY162	3.436E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05
DY163	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05
DY164	4.678E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06
HO165	4.824E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06
HO166M	2.011E-08	2.008E-08	2.008E-08	2.007E-08	2.007E-08	2.007E-08	2.007E-08	2.007E-08	2.007E-08
ER166	1.453E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06
ER167	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07
ER168	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07
TM169	7.180E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10
ER170	1.271E-14	1.073E-13	1.073E-13	1.074E-13	1.074E-13	1.074E-13	1.074E-13	1.074E-13	1.075E-13
TM170	6.493E-11	1.452E-13	1.193E-13	9.795E-14	8.044E-14	6.607E-14	5.426E-14	4.456E-14	3.660E-14
YB170	8.603E-12	7.329E-11	7.332E-11	7.334E-11	7.336E-11	7.337E-11	7.338E-11	7.339E-11	7.340E-11
TM171	1.965E-12	6.418E-13	6.191E-13	5.971E-13	5.759E-13	5.555E-13	5.358E-13	5.168E-13	4.985E-13
YB171	1.371E-13	1.461E-12	1.483E-12	1.505E-12	1.527E-12	1.547E-12	1.567E-12	1.586E-12	1.604E-12
YB172	9.830E-15	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14

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File CO_ZR.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       5.1   1   2   5   4
  DEC       5.2   2   3   5   0
  DEC       5.3   3   4   5   0
  DEC       5.4   4   5   5   0
  DEC       5.5   5   6   5   0
  DEC       5.6   6   7   5   0
  DEC       5.7   7   8   5   0
  DEC       5.8   8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
```

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File CO_ZR.INP (continued)

```
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File CO_ZR.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy co_zr.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy co_zr.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out co_zr.u6 >nul
copy tape13.out+tape11.out co_zr.u11 >nul
ren tape7.out co_zr.pch
ren tape15.out co_zr.dbg
ren tape16.out co_zr.vxs
ren tape50.out co_zr.ech
rem  cleanup files
del tape*.inp
del tape*.out
del co_zr.pch
del co_zr.dbg
del co_zr.vxs
del co_zr.ech
del co_zr.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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co_zr.ci
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
H 3	7.812E-07	5.867E-07	5.835E-07	5.802E-07	5.769E-07	5.737E-07	5.705E-07	5.673E-07	5.641E-07
BE 10	1.753E-09	1.753E-09	1.753E-09	1.753E-09	1.753E-09	1.753E-09	1.753E-09	1.753E-09	1.753E-09
C 14	1.480E-02	1.479E-02	1.479E-02	1.479E-02	1.479E-02	1.479E-02	1.479E-02	1.479E-02	1.479E-02
SI 32	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22
P 32	3.414E-16	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22	2.076E-22
AR 39	5.144E-19	5.076E-19	5.076E-19	5.076E-19	5.076E-19	5.076E-19	5.076E-19	5.076E-19	5.076E-19
AR 42	5.691E-19	5.114E-19	5.114E-19	5.114E-19	5.114E-19	5.114E-19	5.114E-19	5.114E-19	5.114E-19
K 42	6.710E-12	5.115E-19	5.115E-19	5.115E-19	5.115E-19	5.115E-19	5.115E-19	5.115E-19	5.115E-19
CA 45	5.412E-05	1.961E-08	1.678E-08	1.437E-08	1.230E-08	1.053E-08	9.017E-09	7.719E-09	6.608E-09
SC 46	7.191E-03	1.462E-09	1.081E-09	7.990E-10	5.906E-10	4.366E-10	3.228E-10	2.386E-10	1.764E-10
V 50	3.917E-17	3.917E-17	3.917E-17	3.917E-17	3.917E-17	3.917E-17	3.917E-17	3.917E-17	3.917E-17
CR 51	1.828E+02	1.058E-18	9.128E-20	9.128E-20	9.128E-20	9.128E-20	9.128E-20	9.128E-20	9.128E-20
MN 54	2.934E+00	4.711E-02	4.344E-02	4.006E-02	3.695E-02	3.407E-02	3.142E-02	2.897E-02	2.672E-02
FE 55	2.704E+01	6.942E+00	6.759E+00	6.581E+00	6.408E+00	6.240E+00	6.076E+00	5.916E+00	5.760E+00
FE 59	1.325E+00	4.583E-13	2.611E-13	1.487E-13	8.474E-14	4.828E-14	2.751E-14	1.567E-14	8.928E-15
CO 58	1.361E+01	1.625E-07	1.137E-07	7.947E-08	5.557E-08	3.886E-08	2.717E-08	1.900E-08	1.329E-08
CO 60	1.430E-01	7.311E-02	7.215E-02	7.121E-02	7.028E-02	6.936E-02	6.845E-02	6.756E-02	6.668E-02
NI 59	8.585E-03	8.585E-03	8.585E-03	8.585E-03	8.585E-03	8.585E-03	8.585E-03	8.585E-03	8.585E-03
NI 63	1.298E+00	1.249E+00	1.248E+00	1.247E+00	1.246E+00	1.245E+00	1.244E+00	1.243E+00	1.242E+00
ZN 65	6.260E-07	3.142E-09	2.832E-09	2.553E-09	2.301E-09	2.074E-09	1.869E-09	1.685E-09	1.519E-09
SR 89	4.485E+00	3.526E-11	2.136E-11	1.294E-11	7.836E-12	4.747E-12	2.875E-12	1.741E-12	1.055E-12
SR 90	2.107E-04	1.867E-04	1.862E-04	1.858E-04	1.853E-04	1.849E-04	1.844E-04	1.840E-04	1.836E-04
Y 90	1.788E+02	1.867E-04	1.863E-04	1.858E-04	1.854E-04	1.849E-04	1.845E-04	1.841E-04	1.836E-04
Y 91	1.145E+01	2.982E-09	1.935E-09	1.255E-09	8.143E-10	5.283E-10	3.427E-10	2.223E-10	1.442E-10
ZR 93	4.609E-02	4.609E-02	4.609E-02	4.609E-02	4.609E-02	4.609E-02	4.609E-02	4.609E-02	4.609E-02
ZR 95	5.356E+03	9.216E-06	6.204E-06	4.177E-06	2.812E-06	1.893E-06	1.274E-06	8.579E-07	5.776E-07
NB 93M	4.412E-03	1.342E-02	1.358E-02	1.373E-02	1.388E-02	1.404E-02	1.419E-02	1.434E-02	1.449E-02
NB 94	7.379E-03	7.377E-03	7.377E-03	7.377E-03	7.377E-03	7.377E-03	7.377E-03	7.377E-03	7.377E-03
NB 95	5.195E+03	2.046E-05	1.377E-05	9.272E-06	6.242E-06	4.202E-06	2.829E-06	1.904E-06	1.282E-06
NB 95M	3.731E+01	6.837E-08	4.609E-08	3.103E-08	2.089E-08	1.406E-08	9.467E-09	6.373E-09	4.290E-09
TC 98	3.276E-14	3.276E-14	3.276E-14	3.276E-14	3.276E-14	3.276E-14	3.276E-14	3.276E-14	3.276E-14
TC 99	3.751E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07
RU103	7.770E-11	4.126E-25	4.126E-25	4.126E-25	4.126E-25	4.126E-25	4.126E-25	4.126E-25	4.126E-25
RU106	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26
RH102	1.908E-19	5.992E-20	5.992E-20	5.992E-20	5.992E-20	5.992E-20	5.992E-20	5.992E-20	5.992E-20
RH106	2.524E-18	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26	4.717E-26
PD107	8.267E-36	1.850E-35	1.850E-35	1.850E-35	1.850E-35	1.850E-35	1.850E-35	1.850E-35	1.850E-35
CD115M	3.929E-04	1.047E-16	5.939E-17	3.343E-17	1.882E-17	1.059E-17	5.964E-18	3.539E-18	2.100E-18
IN113M	9.465E+01	1.272E-03	1.021E-03	8.193E-04	6.575E-04	5.277E-04	4.235E-04	3.399E-04	2.728E-04
IN114	2.222E+01	3.854E-11	2.312E-11	1.386E-11	8.313E-12	4.986E-12	2.990E-12	1.793E-12	1.075E-12
IN114M	8.515E+00	4.028E-11	2.415E-11	1.448E-11	8.687E-12	5.209E-12	3.124E-12	1.874E-12	1.124E-12
IN115	7.812E-18	7.908E-18	7.908E-18	7.908E-18	7.908E-18	7.908E-18	7.908E-18	7.908E-18	7.908E-18
SN113	9.460E+01	1.271E-03	1.020E-03	8.188E-04	6.571E-04	5.274E-04	4.233E-04	3.397E-04	2.726E-04
SN119M	6.755E+02	3.476E+00	3.134E+00	2.827E+00	2.549E+00	2.299E+00	2.073E+00	1.870E+00	1.686E+00
SN121M	9.142E-02	8.517E-02	8.506E-02	8.494E-02	8.482E-02	8.470E-02	8.459E-02	8.447E-02	8.435E-02
SN123	3.559E+01	1.622E-03	1.333E-03	1.096E-03	9.009E-04	7.406E-04	6.087E-04	5.004E-04	4.113E-04
SB124	1.536E+00	7.433E-10	4.881E-10	3.205E-10	2.105E-10	1.382E-10	9.076E-11	5.960E-11	3.914E-11
SB125	2.197E+02	6.202E+01	6.049E+01	5.899E+01	5.753E+01	5.611E+01	5.473E+01	5.337E+01	5.205E+01
TE123	3.299E-14	3.775E-14	3.775E-14	3.775E-14	3.775E-14	3.775E-14	3.775E-14	3.775E-14	3.775E-14
TE123M	1.451E-01	2.993E-06	2.423E-06	1.961E-06	1.587E-06	1.284E-06	1.039E-06	8.413E-07	6.809E-07
TE125M	4.782E+01	1.513E+01	1.476E+01	1.439E+01	1.404E+01	1.369E+01	1.335E+01	1.302E+01	1.270E+01
TE127	2.052E-02	8.912E-09	7.065E-09	5.601E-09	4.440E-09	3.520E-09	2.790E-09	2.212E-09	1.753E-09
TE127M	1.268E-03	9.098E-09	7.213E-09	5.718E-09	4.533E-09	3.593E-09	2.849E-09	2.258E-09	1.790E-09
TE129	1.708E-08	5.532E-27	5.527E-27	5.527E-27	5.527E-27	5.527E-27	5.527E-27	5.527E-27	5.527E-27
TE129M	4.155E-10	8.498E-27	8.498E-27	8.498E-27	8.498E-27	8.498E-27	8.498E-27	8.498E-27	8.498E-27
I129	4.661E-16	4.687E-16	4.687E-16	4.687E-16	4.687E-16	4.687E-16	4.687E-16	4.687E-16	4.687E-16
XE127	5.262E-10	2.094E-25	2.094E-25	2.094E-25	2.094E-25	2.094E-25	2.094E-25	2.094E-25	2.094E-25
CS134	1.294E-18	2.423E-19	2.423E-19	2.423E-19	2.423E-19	2.423E-19	2.423E-19	2.423E-19	2.423E-19
CS135	4.746E-33	2.159E-32	2.159E-32	2.159E-32	2.159E-32	2.159E-32	2.159E-32	2.159E-32	2.159E-32
CS137	6.001E-38	5.806E-37	5.806E-37	5.806E-37	5.806E-37	5.806E-37	5.806E-37	5.806E-37	5.806E-37
BA133	5.173E-32	1.012E-31	1.012E-31	1.012E-31	1.012E-31	1.012E-31	1.012E-31	1.012E-31	1.012E-31
TM170	1.704E-15	7.422E-20	7.422E-20	7.422E-20	7.422E-20	7.422E-20	7.422E-20	7.422E-20	7.422E-20
TM171	6.465E-17	1.027E-17	9.895E-18	9.538E-18	9.194E-18	8.862E-18	8.542E-18	8.234E-18	7.936E-18
LU176	1.328E-11	1.328E-11	1.328E-11	1.328E-11	1.328E-11	1.328E-11	1.328E-11	1.328E-11	1.328E-11
LU177	5.312E-01	7.029E-08	5.970E-08	5.070E-08	4.306E-08	3.657E-08	3.106E-08	2.638E-08	2.240E-08
LU177M	1.268E-03	3.057E-07	2.596E-07	2.205E-07	1.873E-07	1.590E-07	1.351E-07	1.147E-07	9.743E-08
HF175	6.307E+00	6.154E-08	4.286E-08	2.985E-08	2.079E-08	1.448E-08	1.009E-08	7.026E-09	4.893E-09
HF181	1.313E+02	7.793E-12	4.289E-12	2.361E-12	1.299E-12	7.151E-13	3.935E-13	2.166E-13	1.192E-13
HF182	5.745E-08	5.745E-08	5.745E-08	5.745E-08	5.745E-08	5.745E-08	5.745E-08	5.745E-08	5.745E-08
TA182	5.959E+01	7.926E-04	6.360E-04	5.104E-04	4.095E-04	3.286E-04	2.637E-04	2.116E-04	1.698E-04
W185	2.533E-02	8.646E-10	6.172E-10	4.406E-10	3.145E-10	2.245E-10	1.603E-10	1.144E-10	8.166E-11
W188	1.395E-08	1.160E-16	8.047E-17	5.582E-17	3.872E-17	2.686E-17	1.863E-17	1.307E-17	9.173E-18
RE187	1.287E-16	1.296E-16	1.296E-16	1.296E-16	1.296E-16	1.296E-16	1.296E-16	1.296E-16	1.296E-16
RE188	6.000E-07	1.172E-16	8.138E-17	5.645E-17	3.915E-17	2.716E-17	1.884E-17	1.321E-17	9.267E-18
OS194	1.954E-24	1.954E-24	1.954E-24	1.954E-24	1.954E-24	1.954E-24	1.954E-24	1.954E-24	1.954E-24
IR192	5.601E-14	4.334E-20	4.334E-20	4.334E-20	4.334E-20	4.334E-20	4.334E-20	4.334E-20	4.334E-20

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co_zr.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
IR192M	4.244E-20	4.182E-20	4.182E-20	4.182E-20	4.182E-20	4.182E-20	4.182E-20	4.182E-20	4.182E-20
IR194	4.132E-16	1.955E-24	1.955E-24	1.955E-24	1.955E-24	1.955E-24	1.955E-24	1.955E-24	1.955E-24
PT193	9.494E-20	9.519E-20	9.519E-20	9.519E-20	9.519E-20	9.519E-20	9.519E-20	9.519E-20	9.519E-20
TL206	4.844E-21	4.844E-21	4.844E-21	4.844E-21	4.844E-21	4.844E-21	4.844E-21	4.844E-21	4.844E-21
TL207	7.215E-09	2.615E-08	2.625E-08	2.659E-08	2.704E-08	2.752E-08	2.802E-08	2.852E-08	2.903E-08
TL208	6.998E-06	4.444E-05	4.531E-05	4.589E-05	4.647E-05	4.703E-05	4.759E-05	4.814E-05	4.868E-05
TL209	4.390E-11	1.665E-11	1.666E-11	1.669E-11	1.673E-11	1.676E-11	1.680E-11	1.684E-11	1.688E-11
PB209	2.037E-09	7.709E-10	7.714E-10	7.727E-10	7.744E-10	7.760E-10	7.778E-10	7.795E-10	7.813E-10
PB210	6.560E-12	7.504E-12	7.552E-12	7.602E-12	7.654E-12	7.709E-12	7.766E-12	7.826E-12	7.888E-12
PB211	7.235E-09	2.622E-08	2.632E-08	2.667E-08	2.712E-08	2.760E-08	2.810E-08	2.860E-08	2.912E-08
PB212	1.948E-05	1.237E-04	1.261E-04	1.277E-04	1.293E-04	1.309E-04	1.325E-04	1.340E-04	1.355E-04
PB214	2.127E-12	2.261E-11	2.326E-11	2.404E-11	2.485E-11	2.567E-11	2.651E-11	2.737E-11	2.825E-11
BI208	5.624E-21	5.624E-21	5.624E-21	5.624E-21	5.624E-21	5.624E-21	5.624E-21	5.624E-21	5.624E-21
BI210M	4.863E-21	4.863E-21	4.863E-21	4.863E-21	4.863E-21	4.863E-21	4.863E-21	4.863E-21	4.863E-21
BI210	6.481E-12	7.508E-12	7.542E-12	7.592E-12	7.644E-12	7.698E-12	7.755E-12	7.814E-12	7.875E-12
BI211	7.235E-09	2.622E-08	2.632E-08	2.667E-08	2.712E-08	2.760E-08	2.810E-08	2.860E-08	2.912E-08
BI212	1.948E-05	1.237E-04	1.261E-04	1.277E-04	1.293E-04	1.309E-04	1.325E-04	1.340E-04	1.355E-04
BI213	2.032E-09	7.709E-10	7.714E-10	7.727E-10	7.744E-10	7.760E-10	7.778E-10	7.795E-10	7.813E-10
BI214	2.127E-12	2.261E-11	2.326E-11	2.404E-11	2.485E-11	2.567E-11	2.651E-11	2.737E-11	2.825E-11
PO210	4.211E-12	7.508E-12	7.510E-12	7.520E-12	7.536E-12	7.559E-12	7.587E-12	7.620E-12	7.658E-12
PO211	2.026E-11	7.342E-11	7.371E-11	7.467E-11	7.593E-11	7.728E-11	7.868E-11	8.009E-11	8.152E-11
PO212	1.248E-05	7.925E-05	8.079E-05	8.183E-05	8.286E-05	8.387E-05	8.486E-05	8.584E-05	8.680E-05
PO213	1.988E-09	7.543E-10	7.548E-10	7.560E-10	7.576E-10	7.593E-10	7.610E-10	7.627E-10	7.644E-10
PO214	2.076E-10	2.260E-11	2.325E-11	2.404E-11	2.484E-11	2.567E-11	2.651E-11	2.737E-11	2.824E-11
PO215	7.235E-09	2.622E-08	2.632E-08	2.667E-08	2.712E-08	2.760E-08	2.810E-08	2.860E-08	2.912E-08
PO216	1.948E-05	1.237E-04	1.261E-04	1.277E-04	1.293E-04	1.309E-04	1.324E-04	1.340E-04	1.355E-04
PO218	2.127E-12	2.261E-11	2.326E-11	2.405E-11	2.485E-11	2.568E-11	2.652E-11	2.738E-11	2.826E-11
AT217	2.032E-09	7.709E-10	7.714E-10	7.727E-10	7.744E-10	7.760E-10	7.778E-10	7.795E-10	7.813E-10
RN219	7.235E-09	2.622E-08	2.632E-08	2.667E-08	2.712E-08	2.760E-08	2.810E-08	2.860E-08	2.912E-08
RN220	1.948E-05	1.237E-04	1.261E-04	1.277E-04	1.293E-04	1.309E-04	1.324E-04	1.340E-04	1.355E-04
RN222	2.127E-12	2.261E-11	2.326E-11	2.405E-11	2.485E-11	2.568E-11	2.652E-11	2.738E-11	2.826E-11
FR221	2.032E-09	7.709E-10	7.714E-10	7.727E-10	7.744E-10	7.760E-10	7.778E-10	7.795E-10	7.813E-10
FR223	1.004E-10	3.616E-10	3.684E-10	3.752E-10	3.821E-10	3.890E-10	3.960E-10	4.030E-10	4.102E-10
RA223	7.235E-09	2.622E-08	2.632E-08	2.667E-08	2.712E-08	2.760E-08	2.810E-08	2.860E-08	2.912E-08
RA224	1.948E-05	1.237E-04	1.261E-04	1.277E-04	1.293E-04	1.309E-04	1.324E-04	1.340E-04	1.355E-04
RA225	2.087E-09	7.709E-10	7.718E-10	7.733E-10	7.750E-10	7.767E-10	7.784E-10	7.802E-10	7.819E-10
RA226	2.146E-12	2.261E-11	2.338E-11	2.417E-11	2.498E-11	2.580E-11	2.665E-11	2.751E-11	2.839E-11
RA228	1.285E-13	7.924E-13	8.102E-13	8.282E-13	8.464E-13	8.647E-13	8.832E-13	9.018E-13	9.206E-13
AC225	2.032E-09	7.709E-10	7.714E-10	7.727E-10	7.743E-10	7.760E-10	7.777E-10	7.795E-10	7.812E-10
AC227	7.278E-09	2.621E-08	2.670E-08	2.719E-08	2.769E-08	2.819E-08	2.870E-08	2.921E-08	2.972E-08
AC228	5.130E-08	7.924E-13	8.103E-13	8.283E-13	8.465E-13	8.648E-13	8.833E-13	9.019E-13	9.207E-13
TH227	7.136E-09	2.586E-08	2.607E-08	2.648E-08	2.695E-08	2.744E-08	2.793E-08	2.843E-08	2.894E-08
TH228	1.967E-05	1.237E-04	1.253E-04	1.269E-04	1.285E-04	1.301E-04	1.316E-04	1.332E-04	1.346E-04
TH229	7.115E-10	7.709E-10	7.726E-10	7.743E-10	7.760E-10	7.777E-10	7.794E-10	7.812E-10	7.830E-10
TH230	3.041E-09	1.761E-08	1.802E-08	1.844E-08	1.886E-08	1.929E-08	1.972E-08	2.015E-08	2.059E-08
TH231	9.064E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04
TH232	8.375E-13	2.511E-12	2.544E-12	2.577E-12	2.610E-12	2.643E-12	2.675E-12	2.708E-12	2.741E-12
TH234	2.889E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06
PA231	8.558E-08	1.790E-07	1.809E-07	1.828E-07	1.847E-07	1.866E-07	1.885E-07	1.904E-07	1.923E-07
PA233	4.612E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03
PA234M	3.337E-05	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06
PA234	3.061E-05	3.744E-09	3.744E-09	3.744E-09	3.744E-09	3.744E-09	3.744E-09	3.744E-09	3.744E-09
U232	6.530E-05	1.695E-04	1.704E-04	1.713E-04	1.721E-04	1.730E-04	1.738E-04	1.746E-04	1.753E-04
U233	7.026E-08	1.758E-07	1.779E-07	1.800E-07	1.820E-07	1.841E-07	1.862E-07	1.883E-07	1.903E-07
U234	1.786E-04	4.545E-04	4.598E-04	4.650E-04	4.703E-04	4.756E-04	4.809E-04	4.862E-04	4.915E-04
U235	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04	8.650E-04
U236	6.653E-03	6.653E-03	6.653E-03	6.653E-03	6.653E-03	6.653E-03	6.653E-03	6.653E-03	6.653E-03
U237	9.421E+03	1.726E-05	1.717E-05	1.709E-05	1.701E-05	1.693E-05	1.685E-05	1.677E-05	1.669E-05
U238	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06	2.880E-06
U240	5.196E-05	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13
NP235	4.563E-05	1.751E-06	1.643E-06	1.541E-06	1.446E-06	1.356E-06	1.272E-06	1.194E-06	1.120E-06
NP236	4.940E-08	4.940E-08	4.940E-08	4.940E-08	4.940E-08	4.940E-08	4.940E-08	4.940E-08	4.940E-08
NP237	4.654E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03	4.735E-03
NP238	2.425E+03	4.783E-07	4.781E-07	4.779E-07	4.777E-07	4.775E-07	4.772E-07	4.770E-07	4.768E-07
NP239	8.563E+01	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05
NP240M	1.081E-02	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13	2.244E-13
PU236	3.906E-03	1.136E-03	1.108E-03	1.082E-03	1.056E-03	1.030E-03	1.006E-03	9.815E-04	9.579E-04
PU237	9.141E-03	4.611E-15	2.646E-15	1.519E-15	8.717E-16	5.003E-16	2.873E-16	1.650E-16	9.479E-17
PU238	1.931E+01	1.870E+01	1.869E+01	1.867E+01	1.866E+01	1.864E+01	1.863E+01	1.861E+01	1.860E+01
PU239	1.003E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02	1.005E-02
PU240	7.658E-03	7.654E-03	7.654E-03	7.654E-03	7.654E-03	7.654E-03	7.654E-03	7.654E-03	7.654E-03
PU241	8.992E-01	7.035E-01	7.001E-01	6.967E-01	6.934E-01	6.901E-01	6.867E-01	6.834E-01	6.802E-01
PU242	4.641E-06	4.642E-06	4.642E-06	4.642E-06	4.642E-06	4.642E-06	4.642E-06	4.642E-06	4.642E-06
PU243	3.981E-01	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14
PU244	2.246E-13	2.247E-13	2.247E-13	2.247E-13	2.247E-13	2.247E-13	2.247E-13	2.247E-13	2.247E-13

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co_zr.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
PU246	1.968E-11	7.470E-23	7.470E-23	7.470E-23	7.470E-23	7.470E-23	7.470E-23	7.470E-23	7.470E-23
AM241	1.053E-03	7.538E-03	7.649E-03	7.760E-03	7.870E-03	7.980E-03	8.089E-03	8.198E-03	8.306E-03
AM242M	9.791E-05	9.566E-05	9.562E-05	9.557E-05	9.553E-05	9.549E-05	9.544E-05	9.540E-05	9.536E-05
AM242	2.537E-01	9.518E-05	9.514E-05	9.510E-05	9.505E-05	9.501E-05	9.497E-05	9.492E-05	9.488E-05
AM243	2.296E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05	2.297E-05
AM245	1.506E-07	8.500E-18	7.854E-18	7.256E-18	6.704E-18	6.194E-18	5.723E-18	5.288E-18	4.886E-18
AM246	1.968E-11	7.470E-23	7.471E-23	7.471E-23	7.471E-23	7.471E-23	7.471E-23	7.471E-23	7.471E-23
CM241	1.622E-08	4.302E-24	4.302E-24	4.302E-24	4.302E-24	4.302E-24	4.302E-24	4.302E-24	4.302E-24
CM242	1.174E-01	1.220E-04	1.158E-04	1.104E-04	1.058E-04	1.019E-04	9.853E-05	9.563E-05	9.315E-05
CM243	2.912E-05	2.572E-05	2.566E-05	2.560E-05	2.554E-05	2.547E-05	2.541E-05	2.535E-05	2.529E-05
CM244	1.315E-03	1.082E-03	1.078E-03	1.073E-03	1.069E-03	1.065E-03	1.061E-03	1.057E-03	1.053E-03
CM245	6.304E-08	6.301E-08	6.301E-08	6.301E-08	6.301E-08	6.301E-08	6.301E-08	6.301E-08	6.301E-08
CM246	6.789E-09	6.784E-09	6.784E-09	6.784E-09	6.784E-09	6.783E-09	6.783E-09	6.783E-09	6.783E-09
CM247	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14	1.067E-14
CM248	1.464E-14	1.464E-14	1.464E-14	1.464E-14	1.464E-14	1.464E-14	1.464E-14	1.464E-14	1.464E-14
CM250	2.974E-22	2.988E-22	2.988E-22	2.988E-22	2.988E-22	2.988E-22	2.988E-22	2.988E-22	2.988E-22
BK249	3.309E-11	5.861E-13	5.415E-13	5.003E-13	4.622E-13	4.271E-13	3.946E-13	3.646E-13	3.369E-13
BK250	4.778E-11	4.245E-19	4.245E-19	4.245E-19	4.245E-19	4.245E-19	4.245E-19	4.245E-19	4.245E-19
CF249	1.589E-14	9.645E-14	9.654E-14	9.662E-14	9.670E-14	9.677E-14	9.683E-14	9.689E-14	9.694E-14
CF250	3.729E-13	2.856E-13	2.841E-13	2.826E-13	2.811E-13	2.796E-13	2.781E-13	2.767E-13	2.752E-13
CF251	1.679E-15	1.672E-15	1.672E-15	1.672E-15	1.672E-15	1.672E-15	1.672E-15	1.672E-15	1.672E-15
CF252	1.729E-13	4.526E-14	4.409E-14	4.295E-14	4.183E-14	4.075E-14	3.969E-14	3.866E-14	3.766E-14
CF254	4.786E-17	2.579E-26	2.579E-26	2.579E-26	2.579E-26	2.579E-26	2.579E-26	2.579E-26	2.579E-26
ES254	4.326E-17	4.243E-19	4.243E-19	4.243E-19	4.243E-19	4.243E-19	4.243E-19	4.243E-19	4.243E-19
ES255	1.904E-18	7.986E-33	7.986E-33	7.986E-33	7.986E-33	7.986E-33	7.986E-33	7.986E-33	7.986E-33
H 3	5.806E+00	4.360E+00	4.336E+00	4.312E+00	4.288E+00	4.264E+00	4.240E+00	4.216E+00	4.192E+00
BE 10	4.196E-08	4.196E-08	4.196E-08	4.196E-08	4.196E-08	4.196E-08	4.196E-08	4.196E-08	4.196E-08
C 14	1.692E-06	1.691E-06	1.691E-06	1.691E-06	1.691E-06	1.691E-06	1.691E-06	1.691E-06	1.691E-06
SE 79	6.079E-03	6.079E-03	6.079E-03	6.079E-03	6.079E-03	6.079E-03	6.079E-03	6.079E-03	6.079E-03
KR 81	8.776E-10	8.776E-10	8.776E-10	8.776E-10	8.776E-10	8.776E-10	8.776E-10	8.776E-10	8.776E-10
KR 85	1.616E+02	1.162E+02	1.155E+02	1.147E+02	1.140E+02	1.132E+02	1.125E+02	1.118E+02	1.111E+02
RB 87	4.092E-07	4.092E-07	4.092E-07	4.092E-07	4.092E-07	4.092E-07	4.092E-07	4.092E-07	4.092E-07
SR 89	1.008E+04	7.926E-08	4.801E-08	2.908E-08	1.761E-08	1.067E-08	6.462E-09	3.914E-09	2.371E-09
SR 90	1.382E+03	1.224E+03	1.221E+03	1.218E+03	1.216E+03	1.213E+03	1.210E+03	1.207E+03	1.204E+03
Y 90	1.412E+03	1.225E+03	1.222E+03	1.219E+03	1.216E+03	1.213E+03	1.210E+03	1.207E+03	1.204E+03
Y 91	1.232E+04	3.231E-06	2.096E-06	1.360E-06	8.822E-07	5.723E-07	3.713E-07	2.409E-07	1.563E-07
ZR 93	3.125E-02	3.126E-02	3.126E-02	3.126E-02	3.126E-02	3.126E-02	3.126E-02	3.126E-02	3.126E-02
NB 93M	3.505E-03	9.500E-03	9.602E-03	9.704E-03	9.806E-03	9.907E-03	1.001E-02	1.011E-02	1.021E-02
NB 94	3.100E-07	3.100E-07	3.100E-07	3.100E-07	3.100E-07	3.100E-07	3.100E-07	3.100E-07	3.100E-07
ZR 95	1.354E+04	2.329E-05	1.568E-05	1.056E-05	7.107E-06	4.785E-06	3.221E-06	2.169E-06	1.460E-06
NB 95	1.361E+04	5.172E-05	3.481E-05	2.344E-05	1.578E-05	1.062E-05	7.150E-06	4.813E-06	3.240E-06
NB 95M	9.495E+01	1.728E-07	1.165E-07	7.842E-08	5.280E-08	3.554E-08	2.393E-08	1.611E-08	1.084E-08
TC 98	3.974E-08	3.974E-08	3.974E-08	3.974E-08	3.974E-08	3.974E-08	3.974E-08	3.974E-08	3.974E-08
TC 99	1.950E-01	1.955E-01	1.955E-01	1.955E-01	1.955E-01	1.955E-01	1.955E-01	1.955E-01	1.955E-01
RH102	6.436E-03	1.902E-03	1.857E-03	1.813E-03	1.770E-03	1.729E-03	1.688E-03	1.648E-03	1.609E-03
RU103	6.672E+03	3.543E-11	1.860E-11	9.763E-12	5.125E-12	2.690E-12	1.412E-12	7.413E-13	3.891E-13
RH103M	6.012E+03	3.194E-11	1.677E-11	8.802E-12	4.620E-12	2.425E-12	1.273E-12	6.683E-13	3.508E-13
RU106	8.686E+02	2.605E+01	2.432E+01	2.270E+01	2.119E+01	1.978E+01	1.847E+01	1.724E+01	1.610E+01
RH106	9.317E+02	2.605E+01	2.432E+01	2.270E+01	2.119E+01	1.978E+01	1.847E+01	1.724E+01	1.610E+01
PD107	2.178E-04	2.178E-04	2.178E-04	2.178E-04	2.178E-04	2.178E-04	2.178E-04	2.178E-04	2.178E-04
AG108	7.020E-04	6.946E-10	6.942E-10	6.939E-10	6.935E-10	6.931E-10	6.927E-10	6.923E-10	6.920E-10
AG108M	8.025E-09	7.805E-09	7.800E-09	7.796E-09	7.792E-09	7.788E-09	7.783E-09	7.779E-09	7.775E-09
AG109M	1.335E+02	3.614E-08	3.422E-08	3.240E-08	3.068E-08	2.905E-08	2.751E-08	2.605E-08	2.467E-08
CD109	5.841E-07	3.614E-08	3.422E-08	3.240E-08	3.068E-08	2.905E-08	2.751E-08	2.605E-08	2.467E-08
AG110	7.834E+01	1.947E-04	1.759E-04	1.590E-04	1.436E-04	1.298E-04	1.173E-04	1.060E-04	9.578E-05
AG110M	2.567E+00	1.464E-02	1.323E-02	1.195E-02	1.080E-02	9.759E-03	8.819E-03	7.969E-03	7.201E-03
CD113M	1.906E-01	1.496E-01	1.489E-01	1.482E-01	1.475E-01	1.468E-01	1.461E-01	1.454E-01	1.447E-01
IN114	2.417E-02	4.151E-14	2.489E-14	1.493E-14	8.952E-15	5.369E-15	3.219E-15	1.931E-15	1.158E-15
IN114M	9.169E-03	4.337E-14	2.601E-14	1.560E-14	9.354E-15	5.610E-15	3.364E-15	2.017E-15	1.210E-15
CD115M	3.097E+00	8.254E-13	4.679E-13	2.652E-13	1.503E-13	8.520E-14	4.830E-14	2.737E-14	1.552E-14
IN115	6.915E-14	7.032E-14	7.032E-14	7.032E-14	7.032E-14	7.032E-14	7.032E-14	7.032E-14	7.032E-14
IN115M	3.247E+01	5.801E-17	3.288E-17	1.864E-17	1.056E-17	5.988E-18	3.394E-18	1.924E-18	1.091E-18
SN119M	6.374E-01	3.281E-03	2.959E-03	2.669E-03	2.407E-03	2.171E-03	1.957E-03	1.765E-03	1.592E-03
SN121M	1.275E-03	1.188E-03	1.186E-03	1.184E-03	1.183E-03	1.181E-03	1.179E-03	1.178E-03	1.176E-03
SN123	1.212E+01	5.523E-04	4.540E-04	3.732E-04	3.068E-04	2.522E-04	2.073E-04	1.704E-04	1.401E-04
TE123	6.391E-15	7.289E-15	7.289E-15	7.289E-15	7.289E-15	7.289E-15	7.289E-15	7.289E-15	7.289E-15
TE123M	2.742E-02	5.655E-07	4.577E-07	3.704E-07	2.998E-07	2.426E-07	1.964E-07	1.589E-07	1.286E-07
SB124	3.634E+00	1.758E-09	1.154E-09	7.581E-10	4.978E-10	3.269E-10	2.147E-10	1.410E-10	9.257E-11
SB125	6.065E+01	1.702E+01	1.659E+01	1.618E+01	1.578E+01	1.539E+01	1.501E+01	1.464E+01	1.428E+01
TE125M	1.365E+01	4.151E+00	4.049E+00	3.949E+00	3.851E+00	3.756E+00	3.663E+00	3.573E+00	3.484E+00
SN126	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03
SB126	3.027E+00	7.550E-04	7.551E-04	7.551E-04	7.551E-04	7.551E-04	7.551E-04	7.551E-04	7.551E-04
SB126M	1.161E+00	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03	5.393E-03
TE127	3.401E+02	3.398E-04	2.694E-04	2.135E-04	1.693E-04	1.342E-04	1.064E-04	8.434E-05	6.686E-05
TE127M	4.660E+01	3.469E-04	2.750E-04	2.180E-04	1.728E-04	1.370E-04	1.086E-04	8.610E-05	6.826E-05

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co_zr.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
XE127	1.051E-04	4.183E-20	4.183E-20	4.183E-20	4.183E-20	4.183E-20	4.183E-20	4.183E-20	4.183E-20
TE129	1.451E+03	2.863E-15	1.348E-15	6.345E-16	2.987E-16	1.405E-16	6.612E-17	3.123E-17	1.475E-17
TE129M	2.140E+02	4.399E-15	2.071E-15	9.748E-16	4.586E-16	2.158E-16	1.015E-16	4.797E-17	2.267E-17
I129	3.241E-04	3.254E-04	3.254E-04	3.254E-04	3.254E-04	3.254E-04	3.254E-04	3.254E-04	3.254E-04
CS134	1.455E+03	2.620E+02	2.533E+02	2.449E+02	2.368E+02	2.290E+02	2.214E+02	2.141E+02	2.070E+02
CS135	1.047E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02	1.048E-02
CS137	1.437E+03	1.277E+03	1.274E+03	1.271E+03	1.268E+03	1.266E+03	1.263E+03	1.260E+03	1.257E+03
BA137M	1.360E+03	1.208E+03	1.206E+03	1.203E+03	1.200E+03	1.197E+03	1.194E+03	1.192E+03	1.189E+03
LA138	2.631E-12	2.631E-12	2.631E-12	2.631E-12	2.631E-12	2.631E-12	2.631E-12	2.631E-12	2.631E-12
CE141	1.236E+04	7.028E-14	3.226E-14	1.481E-14	6.796E-15	3.119E-15	1.432E-15	6.573E-16	3.015E-16
CE142	4.183E-07	4.183E-07	4.183E-07	4.183E-07	4.183E-07	4.183E-07	4.183E-07	4.183E-07	4.183E-07
CE144	1.145E+04	1.220E+02	1.116E+02	1.021E+02	9.336E+01	8.541E+01	7.813E+01	7.147E+01	6.538E+01
PR144	1.149E+04	1.220E+02	1.116E+02	1.021E+02	9.337E+01	8.541E+01	7.813E+01	7.147E+01	6.538E+01
PR144M	1.375E+02	1.464E+00	1.339E+00	1.225E+00	1.120E+00	1.025E+00	9.376E-01	8.577E-01	7.846E-01
ND144	1.939E-11	2.359E-11	2.359E-11	2.360E-11	2.360E-11	2.360E-11	2.360E-11	2.361E-11	2.361E-11
PM146	2.209E-02	1.162E-02	1.147E-02	1.133E-02	1.119E-02	1.105E-02	1.091E-02	1.077E-02	1.064E-02
SM146	2.861E-09	3.166E-09	3.170E-09	3.174E-09	3.178E-09	3.182E-09	3.186E-09	3.190E-09	3.194E-09
PM147	1.949E+03	5.213E+02	5.077E+02	4.945E+02	4.816E+02	4.690E+02	4.568E+02	4.449E+02	4.333E+02
SM147	4.213E-08	7.852E-08	7.886E-08	7.918E-08	7.950E-08	7.981E-08	8.011E-08	8.040E-08	8.068E-08
PM148	2.092E+03	4.983E-13	2.699E-13	1.462E-13	7.921E-14	4.291E-14	2.324E-14	1.259E-14	6.819E-15
PM148M	3.354E+02	8.847E-12	4.793E-12	2.596E-12	1.406E-12	7.618E-13	4.126E-13	2.235E-13	1.211E-13
SM148	6.979E-13	7.065E-13	7.065E-13	7.065E-13	7.065E-13	7.065E-13	7.065E-13	7.065E-13	7.065E-13
SM149	6.754E-15	8.921E-15	8.921E-15	8.921E-15	8.921E-15	8.921E-15	8.921E-15	8.921E-15	8.921E-15
EU150	3.005E-07	2.724E-07	2.718E-07	2.713E-07	2.708E-07	2.703E-07	2.698E-07	2.692E-07	2.687E-07
SM151	4.307E+00	4.173E+00	4.170E+00	4.167E+00	4.163E+00	4.160E+00	4.157E+00	4.154E+00	4.151E+00
EU152	2.107E-01	1.625E-01	1.616E-01	1.608E-01	1.600E-01	1.592E-01	1.584E-01	1.576E-01	1.568E-01
GD152	2.421E-14	2.591E-14	2.594E-14	2.597E-14	2.599E-14	2.602E-14	2.605E-14	2.608E-14	2.611E-14
GD153	1.527E-01	7.359E-04	6.628E-04	5.969E-04	5.376E-04	4.842E-04	4.361E-04	3.928E-04	3.538E-04
EU154	6.988E+01	4.633E+01	4.596E+01	4.559E+01	4.522E+01	4.486E+01	4.450E+01	4.414E+01	4.379E+01
EU155	3.712E+01	1.820E+01	1.795E+01	1.770E+01	1.745E+01	1.721E+01	1.697E+01	1.674E+01	1.650E+01
TB160	8.874E-01	1.558E-08	1.098E-08	7.734E-09	5.449E-09	3.840E-09	2.705E-09	1.906E-09	1.343E-09
HO166M	8.309E-07	8.284E-07	8.284E-07	8.284E-07	8.283E-07	8.283E-07	8.282E-07	8.282E-07	8.281E-07
TM170	6.559E-06	2.858E-10	2.347E-10	1.928E-10	1.583E-10	1.300E-10	1.068E-10	8.770E-11	7.202E-11
TM171	6.258E-08	9.927E-09	9.575E-09	9.236E-09	8.908E-09	8.592E-09	8.288E-09	7.994E-09	7.710E-09

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co_zr.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	6.078E-11	6.044E-11	6.010E-11	5.976E-11	5.943E-11	5.909E-11	5.876E-11	5.844E-11
HE 3	1.385E-12	2.153E-11	2.187E-11	2.221E-11	2.254E-11	2.288E-11	2.321E-11	2.354E-11	2.387E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08
B 10	4.994E-13	6.726E-13	6.760E-13	6.794E-13	6.828E-13	6.862E-13	6.896E-13	6.930E-13	6.964E-13
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.317E-03	3.317E-03	3.317E-03	3.317E-03	3.317E-03	3.317E-03	3.317E-03	3.317E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.489E-20	1.489E-20	1.489E-20	1.489E-20	1.489E-20	1.489E-20	1.489E-20	1.489E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	1.982E-21	1.982E-21	1.982E-21	1.982E-21	1.982E-21	1.982E-21	1.982E-21	1.982E-21
K 39	1.746E-23	2.157E-22	2.157E-22	2.157E-22	2.157E-22	2.157E-22	2.157E-22	2.157E-22	2.157E-22
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	8.469E-26	8.469E-26	8.469E-26	8.469E-26	8.469E-26	8.469E-26	8.469E-26	8.469E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	1.101E-12	9.423E-13	8.067E-13	6.906E-13	5.912E-13	5.062E-13	4.333E-13	3.710E-13
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	4.314E-14	3.189E-14	2.358E-14	1.743E-14	1.288E-14	9.524E-15	7.041E-15	5.205E-15
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	1.144E-23	9.874E-25	9.874E-25	9.874E-25	9.874E-25	9.874E-25	9.874E-25	9.874E-25
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	6.086E-06	5.612E-06	5.175E-06	4.773E-06	4.401E-06	4.059E-06	3.743E-06	3.452E-06
MN 55	7.699E-03	1.573E-02	1.581E-02	1.588E-02	1.595E-02	1.601E-02	1.608E-02	1.614E-02	1.621E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	2.776E-03	2.703E-03	2.631E-03	2.562E-03	2.495E-03	2.429E-03	2.365E-03	2.303E-03
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.314E-18	5.306E-18	3.023E-18	1.722E-18	9.812E-19	5.590E-19	3.185E-19	1.815E-19
CO 58	4.277E-04	5.107E-12	3.571E-12	2.497E-12	1.746E-12	1.221E-12	8.540E-13	5.971E-13	4.176E-13
CO 59	1.843E-03	1.875E-03	1.875E-03	1.875E-03	1.876E-03	1.876E-03	1.876E-03	1.876E-03	1.876E-03
CO 60	1.264E-04	6.463E-05	6.379E-05	6.295E-05	6.213E-05	6.132E-05	6.052E-05	5.973E-05	5.895E-05
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01

Appendix B-2
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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.023E-02	2.022E-02	2.020E-02	2.019E-02	2.017E-02	2.016E-02	2.014E-02	2.013E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	1.134E-03	1.149E-03	1.164E-03	1.179E-03	1.195E-03	1.210E-03	1.225E-03	1.240E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	3.812E-13	3.436E-13	3.097E-13	2.792E-13	2.517E-13	2.268E-13	2.045E-13	1.843E-13
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.213E-15	7.348E-16	4.451E-16	2.696E-16	1.633E-16	9.891E-17	5.991E-17	3.629E-17
SR 90	1.544E-06	1.368E-06	1.365E-06	1.361E-06	1.358E-06	1.355E-06	1.352E-06	1.348E-06	1.345E-06
Y 89	2.396E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.430E-10	3.422E-10	3.414E-10	3.406E-10	3.398E-10	3.390E-10	3.382E-10	3.374E-10
Y 91	4.667E-04	1.216E-13	7.886E-14	5.116E-14	3.319E-14	2.153E-14	1.397E-14	9.061E-15	5.878E-15
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.288E-10	2.887E-10	1.943E-10	1.308E-10	8.808E-11	5.930E-11	3.992E-11	2.687E-11
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 93	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	4.747E-05	4.802E-05	4.856E-05	4.910E-05	4.964E-05	5.017E-05	5.070E-05	5.123E-05
NB 94	3.937E-02	3.936E-02	3.936E-02	3.936E-02	3.936E-02	3.936E-02	3.936E-02	3.936E-02	3.936E-02
NB 95	1.328E-01	5.230E-10	3.521E-10	2.370E-10	1.596E-10	1.074E-10	7.231E-11	4.868E-11	3.277E-11
NB 95M	9.792E-05	1.794E-13	1.210E-13	8.143E-14	5.482E-14	3.690E-14	2.484E-14	1.673E-14	1.126E-14
MO 94	2.903E-06	9.759E-06	9.893E-06	1.003E-05	1.016E-05	1.030E-05	1.043E-05	1.056E-05	1.070E-05
MO 95	2.820E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	3.627E-17	3.689E-17	3.752E-17	3.814E-17	3.876E-17	3.938E-17	4.001E-17	4.063E-17
RU 99	6.727E-11	4.383E-10	4.456E-10	4.529E-10	4.602E-10	4.674E-10	4.747E-10	4.820E-10	4.893E-10
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	1.278E-29	1.278E-29	1.278E-29	1.278E-29	1.278E-29	1.278E-29	1.278E-29	1.278E-29
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29
RH102	1.578E-22	4.956E-23	4.956E-23	4.956E-23	4.956E-23	4.956E-23	4.956E-23	4.956E-23	4.956E-23
RH103	6.390E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	4.110E-21	2.332E-21	1.313E-21	7.389E-22	4.159E-22	2.341E-22	1.390E-22	8.246E-23
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	7.601E-11	6.101E-11	4.896E-11	3.929E-11	3.154E-11	2.531E-11	2.031E-11	1.630E-11
IN114	1.614E-08	2.799E-20	1.679E-20	1.007E-20	6.037E-21	3.621E-21	2.171E-21	1.302E-21	7.809E-22
IN114M	3.679E-04	1.740E-15	1.044E-15	6.259E-16	3.754E-16	2.251E-16	1.350E-16	8.096E-17	4.855E-17
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.266E-07	1.016E-07	8.152E-08	6.543E-08	5.251E-08	4.214E-08	3.382E-08	2.714E-08
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02

Appendix B-2
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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
SN119	8.423E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	7.758E-04	6.996E-04	6.309E-04	5.690E-04	5.131E-04	4.628E-04	4.173E-04	3.764E-04
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.440E-03	1.438E-03	1.436E-03	1.434E-03	1.432E-03	1.430E-03	1.428E-03	1.426E-03
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	1.973E-07	1.622E-07	1.333E-07	1.096E-07	9.007E-08	7.404E-08	6.086E-08	5.003E-08
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SB121	2.832E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01
SB123	2.498E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	4.247E-14	2.789E-14	1.831E-14	1.203E-14	7.897E-15	5.186E-15	3.405E-15	2.236E-15
SB125	2.127E-01	6.004E-02	5.856E-02	5.711E-02	5.570E-02	5.432E-02	5.298E-02	5.167E-02	5.039E-02
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	3.373E-10	2.730E-10	2.209E-10	1.788E-10	1.447E-10	1.171E-10	9.480E-11	7.672E-11
TE124	6.257E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	2.827E-01	2.842E-01	2.856E-01	2.871E-01	2.884E-01	2.898E-01	2.911E-01	2.924E-01
TE125M	2.654E-03	8.398E-04	8.190E-04	7.988E-04	7.790E-04	7.598E-04	7.410E-04	7.227E-04	7.048E-04
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	3.375E-15	2.676E-15	2.121E-15	1.682E-15	1.333E-15	1.057E-15	8.378E-16	6.641E-16
TE127M	1.344E-07	9.642E-13	7.644E-13	6.059E-13	4.804E-13	3.808E-13	3.019E-13	2.393E-13	1.897E-13
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	2.640E-34	2.638E-34	2.638E-34	2.638E-34	2.638E-34	2.638E-34	2.638E-34	2.638E-34
TE129M	1.379E-14	2.820E-31	2.820E-31	2.820E-31	2.820E-31	2.820E-31	2.820E-31	2.820E-31	2.820E-31
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
XE127	1.863E-14	7.413E-30	7.413E-30	7.413E-30	7.413E-30	7.413E-30	7.413E-30	7.413E-30	7.413E-30
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	1.872E-22	1.872E-22	1.872E-22	1.872E-22	1.872E-22	1.872E-22	1.872E-22	1.872E-22
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	8.923E-22	8.923E-22	8.923E-22	8.923E-22	8.923E-22	8.923E-22	8.923E-22	8.923E-22
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER170	6.143E-22	1.031E-21	1.031E-21	1.031E-21	1.031E-21	1.031E-21	1.031E-21	1.031E-21	1.031E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	1.242E-23	1.242E-23	1.242E-23	1.242E-23	1.242E-23	1.242E-23	1.242E-23	1.242E-23
TM171	5.935E-20	9.424E-21	9.084E-21	8.756E-21	8.440E-21	8.135E-21	7.841E-21	7.558E-21	7.286E-21
YB170	4.405E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	7.336E-20	7.370E-20	7.403E-20	7.435E-20	7.465E-20	7.495E-20	7.523E-20	7.550E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	6.390E-13	5.427E-13	4.609E-13	3.915E-13	3.325E-13	2.824E-13	2.398E-13	2.037E-13
LU177M	2.662E-07	6.420E-11	5.452E-11	4.631E-11	3.933E-11	3.340E-11	2.837E-11	2.409E-11	2.046E-11
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	5.771E-12	4.019E-12	2.799E-12	1.950E-12	1.358E-12	9.459E-13	6.588E-13	4.589E-13
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	4.578E-16	2.520E-16	1.387E-16	7.632E-17	4.200E-17	2.312E-17	1.272E-17	7.003E-18
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01
TA182	9.547E-03	1.270E-07	1.019E-07	8.177E-08	6.562E-08	5.265E-08	4.225E-08	3.390E-08	2.721E-08
W182	7.216E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.196E-14	6.564E-14	4.686E-14	3.345E-14	2.388E-14	1.704E-14	1.217E-14	8.685E-15
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	1.159E-20	8.037E-21	5.575E-21	3.867E-21	2.682E-21	1.861E-21	1.306E-21	9.162E-22
RE185	7.346E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05

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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	1.193E-22	8.286E-23	5.748E-23	3.987E-23	2.765E-23	1.918E-23	1.345E-23	9.436E-24
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	2.632E-19	2.679E-19	2.726E-19	2.773E-19	2.820E-19	2.867E-19	2.914E-19	2.961E-19
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS192	3.158E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	4.715E-24	4.715E-24	4.715E-24	4.715E-24	4.715E-24	4.715E-24	4.715E-24	4.715E-24
IR192M	5.491E-21	5.410E-21	5.410E-21	5.410E-21	5.410E-21	5.410E-21	5.410E-21	5.410E-21	5.410E-21
IR193	8.109E-19	8.111E-19	8.111E-19	8.111E-19	8.111E-19	8.111E-19	8.111E-19	8.111E-19	8.111E-19
IR194	4.896E-22	2.316E-30	2.317E-30	2.317E-30	2.317E-30	2.317E-30	2.317E-30	2.317E-30	2.317E-30
PT192	6.270E-18	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.568E-20	2.568E-20	2.568E-20	2.568E-20	2.568E-20	2.568E-20	2.568E-20	2.568E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	9.178E-04	9.324E-04	9.469E-04	9.614E-04	9.759E-04	9.903E-04	1.005E-03	1.019E-03
TL206	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29
TL207	3.787E-17	1.372E-16	1.378E-16	1.396E-16	1.419E-16	1.445E-16	1.471E-16	1.497E-16	1.524E-16
TL208	2.376E-14	1.509E-13	1.538E-13	1.558E-13	1.577E-13	1.597E-13	1.616E-13	1.634E-13	1.652E-13
TL209	1.073E-19	4.070E-20	4.073E-20	4.080E-20	4.088E-20	4.097E-20	4.106E-20	4.116E-20	4.125E-20
PB206	1.520E-15	1.532E-14	1.562E-14	1.592E-14	1.622E-14	1.653E-14	1.683E-14	1.713E-14	1.744E-14
PB207	6.465E-12	3.832E-11	3.937E-11	4.043E-11	4.151E-11	4.261E-11	4.373E-11	4.487E-11	4.603E-11
PB208	9.394E-09	1.588E-07	1.638E-07	1.689E-07	1.740E-07	1.793E-07	1.845E-07	1.899E-07	1.953E-07
PB209	4.482E-16	1.696E-16	1.697E-16	1.700E-16	1.703E-16	1.707E-16	1.711E-16	1.715E-16	1.719E-16
PB210	8.589E-14	9.825E-14	9.888E-14	9.953E-14	1.002E-13	1.009E-13	1.017E-13	1.025E-13	1.033E-13
PB211	2.930E-16	1.062E-15	1.066E-15	1.080E-15	1.098E-15	1.118E-15	1.138E-15	1.158E-15	1.179E-15
PB212	1.401E-11	8.899E-11	9.071E-11	9.189E-11	9.304E-11	9.417E-11	9.529E-11	9.638E-11	9.746E-11
PB214	6.485E-20	6.892E-19	7.091E-19	7.331E-19	7.576E-19	7.827E-19	8.083E-19	8.345E-19	8.613E-19
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	2.372E-12	2.403E-12	2.435E-12	2.466E-12	2.498E-12	2.529E-12	2.561E-12	2.593E-12
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	6.049E-17	6.077E-17	6.116E-17	6.158E-17	6.202E-17	6.248E-17	6.295E-17	6.345E-17
BI211	1.729E-17	6.265E-17	6.289E-17	6.371E-17	6.479E-17	6.595E-17	6.714E-17	6.834E-17	6.956E-17
BI212	1.329E-12	8.441E-12	8.605E-12	8.716E-12	8.825E-12	8.933E-12	9.039E-12	9.143E-12	9.245E-12
BI213	1.051E-16	3.985E-17	3.988E-17	3.994E-17	4.003E-17	4.011E-17	4.020E-17	4.029E-17	4.038E-17
BI214	4.815E-20	5.118E-19	5.266E-19	5.443E-19	5.626E-19	5.812E-19	6.002E-19	6.197E-19	6.395E-19
PO210	9.371E-16	1.671E-15	1.671E-15	1.673E-15	1.677E-15	1.682E-15	1.688E-15	1.696E-15	1.704E-15
PO211	2.121E-22	7.686E-22	7.717E-22	7.817E-22	7.949E-22	8.091E-22	8.237E-22	8.385E-22	8.535E-22
PO212	7.032E-23	4.466E-22	4.553E-22	4.611E-22	4.669E-22	4.726E-22	4.782E-22	4.837E-22	4.891E-22
PO213	1.576E-25	5.979E-26	5.982E-26	5.993E-26	6.005E-26	6.018E-26	6.032E-26	6.045E-26	6.059E-26
PO214	6.468E-25	7.041E-26	7.244E-26	7.489E-26	7.739E-26	7.995E-26	8.257E-26	8.525E-26	8.799E-26
PO215	2.453E-22	8.891E-22	8.926E-22	9.042E-22	9.195E-22	9.359E-22	9.528E-22	9.699E-22	9.872E-22
PO216	5.591E-17	3.551E-16	3.619E-16	3.666E-16	3.712E-16	3.757E-16	3.802E-16	3.846E-16	3.888E-16
PO218	7.519E-21	7.992E-20	8.223E-20	8.501E-20	8.785E-20	9.076E-20	9.373E-20	9.677E-20	9.987E-20
AT217	1.262E-21	4.788E-22	4.791E-22	4.799E-22	4.809E-22	4.819E-22	4.830E-22	4.841E-22	4.852E-22
RN219	5.560E-19	2.015E-18	2.023E-18	2.049E-18	2.084E-18	2.121E-18	2.159E-18	2.198E-18	2.237E-18
RN220	2.111E-14	1.341E-13	1.366E-13	1.384E-13	1.401E-13	1.419E-13	1.435E-13	1.452E-13	1.468E-13
RN222	1.382E-17	1.469E-16	1.512E-16	1.563E-16	1.615E-16	1.669E-16	1.723E-16	1.779E-16	1.836E-16
FR221	1.146E-17	4.348E-18	4.350E-18	4.358E-18	4.367E-18	4.376E-18	4.386E-18	4.396E-18	4.406E-18
FR223	2.596E-18	9.346E-18	9.521E-18	9.697E-18	9.874E-18	1.005E-17	1.023E-17	1.042E-17	1.060E-17
RA223	1.412E-13	5.118E-13	5.138E-13	5.205E-13	5.293E-13	5.388E-13	5.485E-13	5.583E-13	5.683E-13
RA224	1.222E-10	7.763E-10	7.912E-10	8.014E-10	8.115E-10	8.214E-10	8.311E-10	8.407E-10	8.501E-10
RA225	5.321E-14	1.966E-14	1.968E-14	1.972E-14	1.976E-14	1.980E-14	1.985E-14	1.989E-14	1.994E-14
RA226	2.170E-12	2.286E-11	2.364E-11	2.444E-11	2.525E-11	2.609E-11	2.694E-11	2.781E-11	2.870E-11
RA228	5.488E-16	3.384E-15	3.461E-15	3.538E-15	3.615E-15	3.693E-15	3.772E-15	3.852E-15	3.932E-15
AC225	3.500E-14	1.328E-14	1.329E-14	1.331E-14	1.334E-14	1.337E-14	1.340E-14	1.343E-14	1.346E-14
AC227	1.006E-10	3.622E-10	3.689E-10	3.757E-10	3.826E-10	3.895E-10	3.965E-10	4.036E-10	4.107E-10
AC228	2.287E-14	3.533E-19	3.613E-19	3.693E-19	3.774E-19	3.856E-19	3.938E-19	4.021E-19	4.105E-19
TH227	2.321E-13	8.410E-13	8.477E-13	8.611E-13	8.764E-13	8.923E-13	9.084E-13	9.246E-13	9.411E-13
TH228	2.398E-08	1.508E-07	1.528E-07	1.548E-07	1.568E-07	1.587E-07	1.605E-07	1.624E-07	1.642E-07
TH229	3.343E-09	3.623E-09	3.630E-09	3.638E-09	3.646E-09	3.654E-09	3.663E-09	3.671E-09	3.679E-09
TH230	1.506E-07	8.722E-07	8.926E-07	9.132E-07	9.340E-07	9.551E-07	9.764E-07	9.980E-07	1.020E-06
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	2.289E-05	2.319E-05	2.349E-05	2.379E-05	2.409E-05	2.439E-05	2.468E-05	2.498E-05
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	3.788E-06	3.828E-06	3.868E-06	3.909E-06	3.949E-06	3.989E-06	4.030E-06	4.070E-06
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U232	3.050E-06	7.914E-06	7.957E-06	7.999E-06	8.039E-06	8.078E-06	8.116E-06	8.153E-06	8.189E-06
U233	7.255E-06	1.816E-05	1.837E-05	1.858E-05	1.880E-05	1.901E-05	1.923E-05	1.944E-05	1.965E-05
U234	2.856E-02	7.270E-02	7.355E-02	7.440E-02	7.524E-02	7.609E-02	7.693E-02	7.778E-02	7.862E-02

Appendix B-2
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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.113E-10	2.103E-10	2.093E-10	2.083E-10	2.073E-10	2.063E-10	2.053E-10	2.043E-10
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.248E-09	1.171E-09	1.098E-09	1.030E-09	9.664E-10	9.065E-10	8.504E-10	7.978E-10
NP236	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.845E-12	1.844E-12	1.843E-12	1.842E-12	1.841E-12	1.841E-12	1.840E-12	1.839E-12
NP239	3.690E-04	9.900E-11	9.900E-11	9.900E-11	9.900E-11	9.900E-11	9.900E-11	9.900E-11	9.900E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	2.136E-06	2.085E-06	2.035E-06	1.986E-06	1.938E-06	1.892E-06	1.846E-06	1.802E-06
PU237	7.562E-07	3.815E-19	2.189E-19	1.257E-19	7.212E-20	4.139E-20	2.377E-20	1.365E-20	7.842E-21
PU238	1.127E+00	1.092E+00	1.091E+00	1.090E+00	1.089E+00	1.088E+00	1.088E+00	1.087E+00	1.086E+00
PU239	1.613E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01
PU240	3.359E-02	3.358E-02	3.358E-02	3.358E-02	3.358E-02	3.358E-02	3.358E-02	3.358E-02	3.358E-02
PU241	8.725E-03	6.826E-03	6.793E-03	6.760E-03	6.728E-03	6.695E-03	6.663E-03	6.631E-03	6.599E-03
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	1.526E-27	1.526E-27	1.526E-27	1.526E-27	1.526E-27	1.526E-27	1.526E-27	1.526E-27
AM241	3.068E-04	2.196E-03	2.228E-03	2.260E-03	2.292E-03	2.324E-03	2.356E-03	2.388E-03	2.419E-03
AM242M	1.007E-05	9.839E-06	9.835E-06	9.830E-06	9.826E-06	9.821E-06	9.817E-06	9.812E-06	9.808E-06
AM242	3.137E-07	1.177E-10	1.176E-10	1.176E-10	1.175E-10	1.175E-10	1.174E-10	1.174E-10	1.173E-10
AM243	1.151E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04
AM245	2.436E-14	1.375E-24	1.270E-24	1.174E-24	1.085E-24	1.002E-24	9.258E-25	8.554E-25	7.903E-25
AM246	6.436E-19	2.442E-30	2.443E-30	2.443E-30	2.443E-30	2.443E-30	2.443E-30	2.443E-30	2.443E-30
CM241	1.077E-12	2.857E-28	2.857E-28	2.857E-28	2.857E-28	2.857E-28	2.857E-28	2.857E-28	2.857E-28
CM242	3.549E-05	3.689E-08	3.501E-08	3.339E-08	3.200E-08	3.081E-08	2.979E-08	2.891E-08	2.816E-08
CM243	5.639E-07	4.981E-07	4.969E-07	4.957E-07	4.945E-07	4.933E-07	4.921E-07	4.909E-07	4.897E-07
CM244	1.624E-05	1.337E-05	1.331E-05	1.326E-05	1.321E-05	1.316E-05	1.311E-05	1.306E-05	1.301E-05
CM245	3.670E-07	3.669E-07	3.669E-07	3.669E-07	3.669E-07	3.668E-07	3.668E-07	3.668E-07	3.668E-07
CM246	2.209E-08	2.208E-08	2.208E-08	2.207E-08	2.207E-08	2.207E-08	2.207E-08	2.207E-08	2.207E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12
CM250	3.617E-21	3.634E-21	3.634E-21	3.634E-21	3.634E-21	3.634E-21	3.634E-21	3.634E-21	3.634E-21
BK249	2.019E-14	3.575E-16	3.303E-16	3.052E-16	2.820E-16	2.605E-16	2.407E-16	2.224E-16	2.055E-16
BK250	1.228E-17	1.091E-25	1.091E-25	1.091E-25	1.091E-25	1.091E-25	1.091E-25	1.091E-25	1.091E-25
CF249	3.877E-15	2.353E-14	2.356E-14	2.358E-14	2.359E-14	2.361E-14	2.363E-14	2.364E-14	2.365E-14
CF250	3.409E-15	2.611E-15	2.598E-15	2.584E-15	2.570E-15	2.557E-15	2.543E-15	2.530E-15	2.516E-15
CF251	1.058E-15	1.054E-15	1.054E-15	1.054E-15	1.054E-15	1.054E-15	1.054E-15	1.054E-15	1.053E-15
CF252	3.213E-16	8.413E-17	8.195E-17	7.983E-17	7.776E-17	7.574E-17	7.378E-17	7.186E-17	7.000E-17
CF254	5.630E-21	3.033E-30	3.033E-30	3.033E-30	3.033E-30	3.033E-30	3.033E-30	3.033E-30	3.033E-30
ES254	2.319E-20	2.274E-22	2.274E-22	2.274E-22	2.274E-22	2.274E-22	2.274E-22	2.274E-22	2.274E-22
ES255	1.450E-22	6.080E-37	6.080E-37	6.080E-37	6.080E-37	6.080E-37	6.080E-37	6.080E-37	6.080E-37
SF250	2.226E-11	1.165E-10	1.183E-10	1.200E-10	1.218E-10	1.236E-10	1.253E-10	1.271E-10	1.288E-10
H 3	6.014E-04	4.517E-04	4.491E-04	4.466E-04	4.441E-04	4.416E-04	4.392E-04	4.367E-04	4.343E-04
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07	3.792E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02
BR 79	2.253E-06	7.000E-06	7.093E-06	7.186E-06	7.279E-06	7.372E-06	7.465E-06	7.558E-06	7.651E-06
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03

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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	2.961E-01	2.942E-01	2.923E-01	2.904E-01	2.885E-01	2.866E-01	2.848E-01	2.830E-01
RB 85	1.846E+00	1.962E+00	1.964E+00	1.966E+00	1.968E+00	1.970E+00	1.972E+00	1.974E+00	1.975E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.727E-12	1.652E-12	1.000E-12	6.060E-13	3.670E-13	2.223E-13	1.347E-13	8.156E-14
Y 89	8.536E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	8.971E+00	8.950E+00	8.929E+00	8.907E+00	8.886E+00	8.865E+00	8.844E+00	8.823E+00
Y 90	2.594E-03	2.250E-03	2.245E-03	2.239E-03	2.234E-03	2.229E-03	2.223E-03	2.218E-03	2.213E-03
ZR 90	6.404E-01	1.799E+00	1.820E+00	1.841E+00	1.862E+00	1.884E+00	1.905E+00	1.926E+00	1.947E+00
Y 91	5.021E-01	1.317E-10	8.543E-11	5.542E-11	3.596E-11	2.333E-11	1.513E-11	9.817E-12	6.369E-12
ZR 91	1.058E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	9.331E-06	9.531E-06	9.733E-06	9.937E-06	1.014E-05	1.035E-05	1.056E-05	1.077E-05
NB 93M	1.239E-05	3.360E-05	3.396E-05	3.432E-05	3.468E-05	3.504E-05	3.539E-05	3.575E-05	3.610E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06
ZR 95	6.298E-01	1.084E-09	7.297E-10	4.912E-10	3.307E-10	2.226E-10	1.499E-10	1.009E-10	6.793E-11
NB 95	3.479E-01	1.322E-09	8.899E-10	5.991E-10	4.033E-10	2.715E-10	1.828E-10	1.230E-10	8.283E-11
NB 95M	2.492E-04	4.535E-13	3.057E-13	2.058E-13	1.386E-13	9.328E-14	6.280E-14	4.228E-14	2.846E-14
MO 95	1.132E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.572E-05	4.572E-05	4.572E-05	4.572E-05	4.572E-05	4.572E-05	4.572E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	2.853E-04	2.891E-04	2.928E-04	2.966E-04	3.004E-04	3.041E-04	3.079E-04	3.116E-04
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	1.573E-06	1.536E-06	1.500E-06	1.464E-06	1.430E-06	1.396E-06	1.363E-06	1.331E-06
RU103	2.067E-01	1.097E-15	5.761E-16	3.024E-16	1.587E-16	8.333E-17	4.374E-17	2.296E-17	1.205E-17
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	9.815E-19	5.152E-19	2.704E-19	1.420E-19	7.452E-20	3.912E-20	2.053E-20	1.078E-20
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	7.782E-03	7.265E-03	6.782E-03	6.331E-03	5.910E-03	5.518E-03	5.151E-03	4.809E-03
RH106	2.616E-07	7.314E-09	6.828E-09	6.375E-09	5.951E-09	5.556E-09	5.186E-09	4.842E-09	4.520E-09
PD106	7.981E-01	1.050E+00	1.050E+00	1.051E+00	1.051E+00	1.052E+00	1.052E+00	1.052E+00	1.053E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	3.397E-07	3.442E-07	3.487E-07	3.532E-07	3.577E-07	3.623E-07	3.668E-07	3.713E-07
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.452E-19	9.446E-19	9.441E-19	9.436E-19	9.431E-19	9.426E-19	9.421E-19	9.416E-19
AG108M	3.078E-10	2.993E-10	2.992E-10	2.990E-10	2.988E-10	2.987E-10	2.985E-10	2.983E-10	2.982E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.382E-17	1.309E-17	1.239E-17	1.173E-17	1.111E-17	1.052E-17	9.963E-18	9.433E-18
CD109	2.261E-10	1.399E-11	1.325E-11	1.255E-11	1.188E-11	1.125E-11	1.065E-11	1.009E-11	9.550E-12
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	4.667E-14	4.217E-14	3.811E-14	3.444E-14	3.112E-14	2.812E-14	2.541E-14	2.296E-14
AG110M	5.402E-04	3.080E-06	2.783E-06	2.515E-06	2.272E-06	2.054E-06	1.856E-06	1.677E-06	1.515E-06
CD110	3.243E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.454E-04	4.454E-04	4.454E-04	4.454E-04	4.454E-04	4.454E-04	4.454E-04	4.454E-04
CD113M	8.787E-04	6.897E-04	6.864E-04	6.832E-04	6.799E-04	6.767E-04	6.735E-04	6.703E-04	6.671E-04
IN113	9.476E-05	2.837E-04	2.869E-04	2.902E-04	2.934E-04	2.966E-04	2.999E-04	3.030E-04	3.062E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.014E-23	1.808E-23	1.084E-23	6.501E-24	3.899E-24	2.338E-24	1.402E-24	8.408E-25
IN114M	3.962E-07	1.874E-18	1.124E-18	6.740E-19	4.042E-19	2.424E-19	1.454E-19	8.717E-20	5.227E-20
SN114	6.664E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	3.241E-17	1.837E-17	1.041E-17	5.901E-18	3.345E-18	1.896E-18	1.075E-18	6.092E-19
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	9.150E-24	5.187E-24	2.940E-24	1.666E-24	9.445E-25	5.354E-25	3.035E-25	1.720E-25
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02

Appendix B-2
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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	7.324E-07	6.605E-07	5.957E-07	5.372E-07	4.845E-07	4.369E-07	3.940E-07	3.553E-07
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.008E-05	2.005E-05	2.002E-05	1.999E-05	1.997E-05	1.994E-05	1.991E-05	1.988E-05
SB121	4.515E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	6.717E-08	5.522E-08	4.539E-08	3.731E-08	3.067E-08	2.521E-08	2.072E-08	1.703E-08
SB123	5.702E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	6.373E-11	5.158E-11	4.174E-11	3.378E-11	2.734E-11	2.213E-11	1.791E-11	1.449E-11
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	1.005E-13	6.597E-14	4.332E-14	2.845E-14	1.868E-14	1.227E-14	8.055E-15	5.290E-15
TE124	1.566E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SB125	5.871E-02	1.647E-02	1.607E-02	1.567E-02	1.528E-02	1.490E-02	1.453E-02	1.418E-02	1.383E-02
TE125	4.338E-02	8.646E-02	8.687E-02	8.728E-02	8.767E-02	8.805E-02	8.842E-02	8.879E-02	8.914E-02
TE125M	7.575E-04	2.304E-04	2.247E-04	2.192E-04	2.137E-04	2.085E-04	2.033E-04	1.983E-04	1.934E-04
SN126	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01
SB126	3.619E-05	9.027E-09	9.028E-09	9.028E-09	9.028E-09	9.028E-09	9.028E-09	9.028E-09	9.028E-09
SB126M	1.478E-08	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11
TE126	4.547E-03	4.590E-03	4.590E-03	4.590E-03	4.590E-03	4.590E-03	4.591E-03	4.591E-03	4.591E-03
TE127	1.288E-04	1.287E-10	1.020E-10	8.088E-11	6.412E-11	5.083E-11	4.029E-11	3.194E-11	2.532E-11
TE127M	4.938E-03	3.676E-08	2.914E-08	2.310E-08	1.832E-08	1.452E-08	1.151E-08	9.125E-09	7.234E-09
I127	3.994E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	1.481E-24	1.481E-24	1.481E-24	1.481E-24	1.481E-24	1.481E-24	1.481E-24	1.481E-24
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	1.367E-22	6.434E-23	3.029E-23	1.426E-23	6.707E-24	3.156E-24	1.490E-24	7.042E-25
TE129M	7.102E-03	1.460E-19	6.871E-20	3.234E-20	1.522E-20	7.160E-21	3.368E-21	1.592E-21	7.521E-22
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.534E-05	6.534E-05	6.535E-05	6.536E-05	6.537E-05	6.538E-05	6.538E-05	6.539E-05
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	2.024E-01	1.957E-01	1.892E-01	1.830E-01	1.769E-01	1.711E-01	1.654E-01	1.599E-01
BA134	6.001E-01	1.522E+00	1.528E+00	1.535E+00	1.541E+00	1.547E+00	1.553E+00	1.559E+00	1.564E+00
CS135	9.090E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00
BA135	2.738E-03	2.753E-03	2.753E-03	2.753E-03	2.754E-03	2.754E-03	2.754E-03	2.754E-03	2.755E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
CS137	1.651E+01	1.468E+01	1.464E+01	1.461E+01	1.458E+01	1.454E+01	1.451E+01	1.448E+01	1.444E+01
BA137	9.727E-01	2.808E+00	2.842E+00	2.876E+00	2.910E+00	2.943E+00	2.977E+00	3.010E+00	3.044E+00
BA137M	2.527E-06	2.246E-06	2.240E-06	2.235E-06	2.230E-06	2.225E-06	2.220E-06	2.215E-06	2.210E-06
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	2.466E-18	1.132E-18	5.196E-19	2.385E-19	1.095E-19	5.025E-20	2.307E-20	1.058E-20
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	3.822E-02	3.496E-02	3.198E-02	2.926E-02	2.676E-02	2.448E-02	2.240E-02	2.049E-02
PR144	1.520E-04	1.614E-06	1.476E-06	1.350E-06	1.235E-06	1.130E-06	1.034E-06	9.456E-07	8.651E-07
PR144M	7.579E-07	8.067E-09	7.379E-09	6.750E-09	6.175E-09	5.649E-09	5.168E-09	4.727E-09	4.324E-09
ND144	1.638E+01	1.993E+01	1.993E+01	1.994E+01	1.994E+01	1.994E+01	1.995E+01	1.995E+01	1.995E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	2.608E-05	2.575E-05	2.543E-05	2.511E-05	2.480E-05	2.449E-05	2.418E-05	2.388E-05
SM146	8.176E-05	9.046E-05	9.059E-05	9.070E-05	9.082E-05	9.094E-05	9.105E-05	9.117E-05	9.128E-05
PM147	2.102E+00	5.621E-01	5.475E-01	5.332E-01	5.193E-01	5.057E-01	4.926E-01	4.797E-01	4.672E-01
SM147	1.853E+00	3.454E+00	3.468E+00	3.483E+00	3.497E+00	3.510E+00	3.523E+00	3.536E+00	3.549E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	3.032E-18	1.642E-18	8.897E-19	4.819E-19	2.611E-19	1.414E-19	7.661E-20	4.149E-20
PM148M	1.569E-02	4.139E-16	2.242E-16	1.215E-16	6.579E-17	3.564E-17	1.931E-17	1.046E-17	5.665E-18
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.112E-09	4.104E-09	4.096E-09	4.089E-09	4.081E-09	4.073E-09	4.065E-09	4.057E-09
SM151	1.636E-01	1.586E-01	1.584E-01	1.583E-01	1.582E-01	1.581E-01	1.580E-01	1.578E-01	1.577E-01

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co_zr.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:00:37

	1826.0D	5.1YR	5.2YR	5.3YR	5.4YR	5.5YR	5.6YR	5.7YR	5.8YR
EU151	2.742E-04	6.626E-03	6.749E-03	6.871E-03	6.992E-03	7.114E-03	7.236E-03	7.358E-03	7.479E-03
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	9.390E-04	9.343E-04	9.295E-04	9.248E-04	9.201E-04	9.154E-04	9.107E-04	9.061E-04
GD152	1.111E-03	1.189E-03	1.190E-03	1.192E-03	1.193E-03	1.194E-03	1.196E-03	1.197E-03	1.198E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	2.086E-07	1.879E-07	1.692E-07	1.524E-07	1.373E-07	1.236E-07	1.113E-07	1.003E-07
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	1.716E-01	1.702E-01	1.688E-01	1.675E-01	1.661E-01	1.648E-01	1.635E-01	1.622E-01
GD154	2.826E-02	1.155E-01	1.169E-01	1.182E-01	1.196E-01	1.209E-01	1.223E-01	1.236E-01	1.249E-01
EU155	7.979E-02	3.912E-02	3.857E-02	3.804E-02	3.751E-02	3.699E-02	3.648E-02	3.597E-02	3.547E-02
GD155	1.034E-03	4.171E-02	4.225E-02	4.279E-02	4.331E-02	4.383E-02	4.435E-02	4.485E-02	4.535E-02
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	1.380E-12	9.721E-13	6.849E-13	4.826E-13	3.400E-13	2.396E-13	1.688E-13	1.189E-13
DY160	3.786E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.614E-07	4.614E-07	4.614E-07	4.614E-07	4.613E-07	4.613E-07	4.613E-07	4.612E-07
ER166	1.514E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	4.782E-14	3.927E-14	3.226E-14	2.649E-14	2.176E-14	1.787E-14	1.468E-14	1.205E-14
YB170	1.875E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	9.113E-12	8.790E-12	8.478E-12	8.178E-12	7.888E-12	7.608E-12	7.338E-12	7.078E-12
YB171	6.068E-11	1.090E-10	1.093E-10	1.097E-10	1.100E-10	1.102E-10	1.105E-10	1.108E-10	1.111E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

Appendix B-3

Source Listing of Program ADJ185G

```
      PROGRAM ADJ185G


!-------- Written by D.R. Wenzel

!            To adjust the initial radionuclide source term
!            for wastes in WM-185 to g/L

      CHARACTER (LEN=1) :: BUFFER1(111)
      CHARACTER (LEN=12) :: CS137, DESC, NAME, NUCLIDE(700)
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9),FLAG
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      LOGICAL :: FLAG

      REAL * 4 DATA(2,8,700), DATAOUT(700), GRAMS(2), RESULT(700),    &
               VALUE(9)

      DATA CS137 /' CS137      '/

!-------- GRAMS(1) = grams of U in Al inventory
!         GRAMS(2) = grams of U in Zr inventory

      DATA GRAMS /153.,512./

!-------- Coprocessing was a blend of aluminum and zirconium disolved
!         fuels.  The aluminum stream was used to complex the
!         zirconium stream.  However, there wsas not enough disolved
!         aluminum fuel to complex all of the disolved zirconium
!         fuel   Only 70% of the zirconium stream was complexed
!         with the aluminum stream.  The remaining 30% of the zirconium
!         stream was complexed with aluminum nitrate.

!-------- COPROC = fraction of coprocessing that is from the
!         Al stream.  Remainder is from the Zr stream

      COPROC = .435

!-------- FRACT = fraction of coprocessing.  Remainder is Zr

      FRACT = .7

!-------- Open output file

      OPEN(6,FILE ='ADJ185G.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1X,'ADJ185G.OUT   Results are in g/L and are ',          &
             'normalized to Cs-137')

!-------- READ MASTER LIST OF RADIONUCLIDES

      OPEN(1,FILE ='MASTER_A', STATUS='OLD',FORM='FORMATTED', ERR = 900)
```

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Source Listing of Program ADJ185G (continued)

```
      LAST = 0

!--------Read list of radionuclides to be included on the final output

    5 READ(1,1000,END=20) NAME
 1000 FORMAT(A12)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      IF(NAME == CS137) NUMCS137 = LAST
      GO TO 5

!--------Calculate for 3.6 yr Al waste and 5.1 yr Zr wastes

!-------- Zero memory

   20 DO  I=1,2
         DO  L=1,700
            DO  K=1,8
               DATA(I,K,L) = 0.
               DATAOUT(L) = 0.
            END DO

         END DO

      END DO

!-------- Read radionuclide inventories

      DO  I=1,2
         CALL FILEOPN(I)
         IF(FLAG) GO TO 900

!-------- Read first 4 lines of the file

   35    DO  J=1,4
            READ(1,1020) ORGLINE
 1020       FORMAT(A111)
         END DO

!-------- Read radionuclide inventories for Al and Zr fuels
!        and normalize each to 1 g U EOL

   50    READ(1,1020,END=80) ORGLINE
         WRITE(buffer,1020) ORGLINE
         READ(buffer,4000) DESC, (VALUE(J),J=1,9)
 4000    FORMAT(A12,9X,9(1X,E9.4))
         DO  J=1,700
            IF(DESC == NUCLIDE(J)) THEN
               DO  K=1,8
                  DATA(I,K,J) = DATA(I,K,J) + VALUE(K) / GRAMS(I)
               END DO

            END IF
```

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Source Listing of Program ADJ185G (continued)

```
          END DO

          GO TO 50

   80  END DO

       DO  J=1,LAST

!------- Blend waste from 5.1 year old Zr fuel and 3.6 yr old Al fuel

          DATAOUT(J) = (DATA(1,6,J) * FRACT * COPROC + DATA(2,1,J) *   &
                       (1. - FRACT) + DATA(2,1,J) * FRACT *            &
                       ( 1. - COPROC))

       END DO

       CSNORM = 1. / DATAOUT(NUMCS137)

       DO  J=1,LAST

!------- Normalize the mix to Cs-137 amount in g/mL

          RESULT(J) = DATAOUT(J) * 1.15E-02 * CSNORM

          IF(RESULT(J) > 0.) THEN
             WRITE(6,610) NUCLIDE(J), RESULT(J)
  610        FORMAT(A12,1PE10.2)
          END IF

       END DO

  300  CONTINUE

       GO TO 999


!-------- Error statements

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ADJ185G

       SUBROUTINE FILEOPN(I)

!------- This subroutine loads the desired file


       INTEGER, INTENT(IN OUT) :: i
       COMMON /AMT/ AMOUNT(9),FLAG
```

Appendix B-3
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Source Listing of Program ADJ185G (continued)

```
      LOGICAL :: FLAG

      FLAG = .FALSE.
      CLOSE(1)
      SELECT CASE ( i )
         CASE (    1)
            GO TO 1
         CASE (    2)
            GO TO 2
      END SELECT

!-------- OPEN DESIRED INPUT FILE

    1 OPEN(1,FILE ='CO_AL.G', STATUS='OLD',FORM='FORMATTED',      &
           ERR = 900)

      RETURN

    2 OPEN(1,FILE ='CO_ZR.G', STATUS='OLD',FORM='FORMATTED',      &
           ERR = 900)

      RETURN

  900 FLAG = .TRUE.
      RETURN
      END SUBROUTINE FILEOPN
```

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Nuclides in File MASTER_A

H 1	CR 53	RE187	RA224	CM247	Y 90	IN114	BA136	HO165
H 2	CR 54	RE188	RA225	CM248	ZR 90	IN114M	CS137	HO166M
HE 3	MN 54	OS186	RA226	CM250	Y 91	SN114	BA137	ER166
B 10	MN 55	OS187	RA228	BK249	ZR 91	CD115M	BA137M	ER167
B 11	FE 54	OS188	AC225	BK250	ZR 92	IN115	BA138	ER168
C 12	FE 55	OS189	AC227	CF249	ZR 93	IN115M	LA138	TM169
C 13	FE 56	OS190	AC228	CF250	NB 93	SN115	LA139	ER170
N 14	FE 57	OS192	TH227	CF251	NB 93M	CD116	CE140	TM170
N 15	FE 58	OS194	TH228	CF252	ZR 94	SN116	CE141	YB170
O 16	FE 59	IR191	TH229	CF254	NB 94	SN117	PR141	TM171
O 17	CO 58	IR192	TH230	ES254	ZR 95	SN118	CE142	YB171
O 18	CO 59	IR192M	TH231	ES255	NB 95	SN119	ND142	
F 19	CO 60	IR193	TH232	SF250	NB 95M	SN119M	ND143	
NE 20	NI 58	IR194	TH234	H 3	MO 95	SN120	CE144	
NE 21	NI 59	PT192	PA231	LI 6	ZR 96	SN121M	PR144	
NE 22	NI 60	PT193	PA233	LI 7	MO 96	SB121	PR144M	
NA 23	NI 61	PT194	PA234M	BE 9	MO 97	SN122	ND144	
MG 24	NI 62	PT195	PA234	BE 10	MO 98	TE122	ND145	
MG 25	NI 63	HE 4	U232	C 14	TC 98	SN123	ND146	
MG 26	NI 64	TL206	U233	ZN 66	TC 99	SB123	PM146	
AL 27	CU 63	TL207	U234	ZN 67	RU 99	TE123	SM146	
SI 28	CU 65	TL208	U235	ZN 68	MO100	TE123M	PM147	
SI 29	ZN 64	TL209	U236	GA 69	RU100	SN124	SM147	
SI 30	ZN 65	PB206	U237	ZN 70	RU101	SB124	ND148	
SI 32	MO 94	PB207	U238	GE 70	RU102	TE124	PM148	
P 31	RU 98	PB208	U240	GA 71	RH102	SB125	PM148M	
P 32	IN113M	PB209	NP235	GE 72	RU103	TE125	SM148	
S 32	SN112	PB210	NP236	GE 73	RH103	TE125M	SM149	
S 34	SN113	PB211	NP237	GE 74	RH103M	SN126	ND150	
CL 37	YB172	PB212	NP238	AS 75	RU104	SB126	SM150	
AR 38	YB173	PB214	NP239	GE 76	PD104	SB126M	EU150	
AR 39	YB174	BI208	NP240M	SE 76	PD105	TE126	SM151	
AR 40	LU175	BI209	PU236	SE 77	RU106	TE127	EU151	
AR 42	LU176	BI210M	PU237	SE 78	RH106	TE127M	SM152	
K 39	LU177	BI210	PU238	SE 79	PD106	I127	EU152	
K 41	LU177M	BI211	PU239	BR 79	PD107	XE127	GD152	
K 42	HF174	BI212	PU240	SE 80	AG107	TE128	EU153	
CA 42	HF175	BI213	PU241	KR 80	PD108	XE128	GD153	
CA 43	HF176	BI214	PU242	BR 81	AG108	TE129	SM154	
CA 44	HF177	PO210	PU243	KR 81	AG108M	TE129M	EU154	
CA 45	HF178	PO211	PU244	SE 82	CD108	I129	GD154	
CA 46	HF179	PO212	PU246	KR 82	AG109	XE129	EU155	
SC 45	HF180	PO213	AM241	KR 83	AG109M	TE130	GD155	
SC 46	HF181	PO214	AM242M	KR 84	CD109	XE130	GD156	
TI 46	HF182	PO215	AM242	KR 85	PD110	XE131	GD157	
TI 47	TA181	PO216	AM243	RB 85	AG110	XE132	GD158	
TI 48	TA182	PO218	AM245	KR 86	AG110M	BA132	TB159	
TI 49	W182	AT217	AM246	SR 86	CD110	CS133	GD160	
TI 50	W183	RN219	CM241	RB 87	CD111	XE134	TB160	
V 50	W184	RN220	CM242	SR 87	CD112	CS134	DY160	
V 51	W185	RN222	CM243	SR 88	CD113	BA134	DY161	
CR 50	W186	FR221	CM244	SR 89	CD113M	CS135	DY162	
CR 51	W188	FR223	CM245	Y 89	IN113	BA135	DY163	
CR 52	RE185	RA223	CM246	SR 90	CD114	XE136	DY164	

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ADJ185G.OUT Results are in g/L and are normalized to Cs-137

H 2	5.18E-10
HE 3	1.41E-14
B 10	4.42E-16
B 11	2.57E-07
C 12	6.09E-04
C 13	8.39E-06
N 14	8.16E-04
N 15	3.13E-06
O 16	4.91E-02
O 17	1.97E-05
O 18	9.84E-05
F 19	4.97E-11
NE 20	4.59E-16
NE 21	3.58E-15
NE 22	7.58E-18
NA 23	6.95E-22
MG 24	1.61E-09
MG 25	3.79E-13
MG 26	2.52E-16
AL 27	8.21E-04
SI 28	2.84E-07
SI 29	3.36E-11
SI 30	4.37E-15
SI 32	7.93E-27
P 31	1.86E-19
P 32	4.78E-31
S 32	9.59E-24
S 34	2.14E-25
CL 37	2.38E-19
AR 38	3.78E-23
AR 39	9.79E-24
AR 40	9.12E-16
AR 42	1.30E-24
K 39	1.42E-25
K 41	2.92E-17
K 42	5.57E-29
CA 42	5.08E-19
CA 43	6.86E-11
CA 44	5.23E-10
CA 45	7.24E-16
CA 46	6.22E-11
SC 45	1.08E-11
SC 46	2.84E-17
TI 46	3.28E-05
TI 47	2.99E-05
TI 48	3.00E-04
TI 49	2.57E-05
TI 50	2.23E-05
V 50	1.44E-07
V 51	3.86E-05
CR 50	1.74E-03
CR 51	7.52E-27
CR 52	3.43E-02
CR 53	3.90E-03

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

CR 54	1.07E-03
MN 54	4.00E-09
MN 55	1.03E-05
FE 54	3.62E-03
FE 55	1.82E-06
FE 56	5.63E-02
FE 57	1.50E-03
FE 58	1.81E-04
FE 59	6.12E-21
CO 58	3.36E-15
CO 59	1.23E-06
CO 60	4.25E-08
NI 58	1.39E-02
NI 59	7.45E-05
NI 60	5.34E-03
NI 61	2.52E-04
NI 62	7.23E-04
NI 63	1.33E-05
NI 64	1.86E-04
CU 63	7.45E-07
CU 65	4.08E-07
ZN 64	2.33E-10
ZN 65	2.51E-16
MO 94	6.41E-09
RU 98	2.38E-20
IN113M	5.00E-14
SN112	6.12E-03
SN113	8.32E-11
YB172	2.24E-13
YB173	1.40E-13
YB174	6.39E-15
LU175	5.28E-06
LU176	1.29E-07
LU177	4.20E-16
LU177M	4.22E-14
HF174	7.10E-06
HF175	3.79E-15
HF176	3.19E-04
HF177	1.07E-04
HF178	1.91E-03
HF179	2.50E-03
HF180	3.30E-03
HF181	3.01E-19
HF182	1.73E-07
TA181	3.93E-04
TA182	8.35E-11
W182	5.37E-05
W183	5.58E-05
W184	3.37E-06
W185	6.04E-17
W186	5.43E-11
W188	7.62E-24
RE185	6.60E-09
RE187	2.23E-12

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

RE188	7.84E-26
OS186	8.14E-10
OS187	1.73E-22
OS188	7.16E-14
OS189	4.98E-16
OS190	1.76E-17
OS192	3.99E-22
OS194	4.18E-30
IR191	4.37E-20
IR192	3.10E-27
IR192M	3.56E-24
IR193	5.33E-22
IR194	1.52E-33
PT192	7.93E-21
PT193	1.69E-23
PT194	2.81E-23
PT195	1.83E-29
HE 4	2.41E-06
TL206	1.46E-32
TL207	1.02E-19
TL208	1.03E-16
TL209	2.90E-23
PB206	1.40E-17
PB207	2.66E-14
PB208	1.07E-10
PB209	1.21E-19
PB210	2.54E-16
PB211	7.87E-19
PB212	6.09E-14
PB214	1.12E-20
BI208	7.93E-22
BI209	1.60E-15
BI210M	5.64E-21
BI210	1.54E-19
BI211	4.64E-20
BI212	5.78E-15
BI213	2.84E-20
BI214	8.28E-21
PO210	3.31E-18
PO211	5.69E-25
PO212	3.06E-25
PO213	4.26E-29
PO214	1.14E-27
PO215	6.59E-25
PO216	2.43E-19
PO218	1.29E-21
AT217	3.41E-25
RN219	1.49E-21
RN220	9.18E-17
RN222	2.38E-18
FR221	3.09E-21
FR223	6.96E-21
RA223	3.79E-16
RA224	5.31E-13

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

RA225	1.40E-17
RA226	3.73E-13
RA228	2.34E-18
AC225	9.45E-18
AC227	2.70E-13
AC228	2.44E-22
TH227	6.24E-16
TH228	1.03E-10
TH229	2.58E-12
TH230	2.09E-08
TH231	1.57E-12
TH232	1.64E-08
TH234	2.34E-13
PA231	3.14E-09
PA233	1.68E-10
PA234M	7.89E-18
PA234	3.53E-18
U232	5.43E-09
U233	2.09E-08
U234	1.88E-03
U235	3.87E-01
U236	8.01E-02
U237	9.86E-13
U238	1.61E-02
U240	1.25E-21
NP235	1.27E-12
NP236	2.66E-09
NP237	4.95E-03
NP238	1.44E-15
NP239	2.20E-13
NP240M	1.10E-23
PU236	1.46E-09
PU237	1.37E-19
PU238	7.57E-04
PU239	4.55E-04
PU240	7.10E-05
PU241	3.19E-05
PU242	3.66E-06
PU243	3.54E-24
PU244	6.56E-11
PU246	1.55E-30
AM241	6.74E-06
AM242M	7.70E-09
AM242	9.21E-14
AM243	2.56E-07
AM245	1.30E-27
AM246	2.48E-33
CM241	1.71E-26
CM242	9.62E-11
CM243	4.54E-10
CM244	2.18E-08
CM245	5.25E-10
CM246	2.31E-11
CM247	9.91E-14

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

CM248	2.63E-15
CM250	3.69E-24
BK249	3.37E-19
BK250	7.67E-29
CF249	1.71E-17
CF250	1.90E-18
CF251	7.37E-19
CF252	5.79E-20
CF254	2.30E-31
ES254	1.60E-25
ES255	1.10E-38
SF250	8.40E-14
H 3	3.61E-07
LI 6	2.69E-09
LI 7	1.13E-10
BE 9	2.72E-09
BE 10	1.50E-09
C 14	2.18E-06
ZN 66	7.11E-10
ZN 67	3.35E-13
ZN 68	3.86E-09
GA 69	5.96E-12
ZN 70	1.32E-08
GE 70	1.71E-14
GA 71	7.43E-12
GE 72	8.14E-08
GE 73	2.85E-07
GE 74	7.70E-07
AS 75	1.85E-06
GE 76	5.62E-06
SE 76	3.27E-08
SE 77	1.23E-05
SE 78	2.64E-05
SE 79	6.74E-05
BR 79	5.01E-09
SE 80	1.62E-04
KR 80	8.28E-10
BR 81	2.72E-04
KR 81	2.96E-11
SE 82	4.40E-04
KR 82	6.60E-06
KR 83	6.11E-04
KR 84	1.50E-03
KR 85	2.38E-04
RB 85	1.51E-03
KR 86	2.79E-03
SR 86	3.40E-06
RB 87	3.61E-03
SR 87	2.52E-07
SR 88	5.23E-03
SR 89	6.60E-12
Y 89	6.86E-03
SR 90	7.03E-03
Y 90	1.76E-06

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

ZR 90	2.07E+01
Y 91	1.08E-10
ZR 91	4.51E+00
ZR 92	6.92E+00
ZR 93	2.17E-02
NB 93	4.07E-03
NB 93M	5.54E-08
ZR 94	7.00E+00
NB 94	2.59E-05
ZR 95	4.92E-10
NB 95	6.00E-10
NB 95M	2.06E-13
MO 95	1.16E-02
ZR 96	1.13E+00
MO 96	3.42E-04
MO 97	1.24E-02
MO 98	9.22E-03
TC 98	3.30E-08
TC 99	8.95E-03
RU 99	2.04E-07
MO100	1.01E-02
RU100	7.26E-04
RU101	8.09E-03
RU102	7.16E-03
RH102	1.15E-09
RU103	2.43E-14
RH103	3.92E-03
RH103M	2.17E-17
RU104	3.18E-03
PD104	1.33E-03
PD105	1.66E-03
RU106	1.33E-05
RH106	1.25E-11
PD106	8.23E-04
PD107	3.30E-04
AG107	2.44E-10
PD108	1.60E-04
AG108	6.81E-22
AG108M	2.16E-13
CD108	1.99E-10
AG109	6.54E-05
AG109M	1.08E-20
CD109	1.09E-14
PD110	5.84E-05
AG110	7.11E-17
AG110M	4.69E-09
CD110	2.40E-05
CD111	4.66E-05
CD112	3.58E-05
CD113	4.66E-07
CD113M	5.41E-07
IN113	6.33E-05
CD114	6.48E-05
IN114	1.93E-23

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

IN114M	1.20E-18
SN114	4.15E-03
CD115M	2.15E-16
IN115	1.04E-05
IN115M	6.07E-23
SN115	2.15E-03
CD116	3.15E-05
SN116	9.20E-02
SN117	4.93E-02
SN118	1.54E-01
SN119	5.55E-02
SN119M	5.12E-07
SN120	2.08E-01
SN121M	9.62E-07
SB121	2.22E-04
SN122	2.96E-02
TE122	9.66E-06
SN123	1.20E-09
SB123	6.46E-05
TE123	1.02E-07
TE123M	3.57E-13
SN124	3.68E-02
SB124	2.16E-14
TE124	1.76E-06
SB125	5.50E-05
TE125	2.50E-04
TE125M	7.69E-07
SN126	1.47E-04
SB126	6.98E-12
SB126M	5.31E-14
TE126	4.94E-06
TE127	3.90E-12
TE127M	1.11E-09
I127	3.16E-04
XE127	6.10E-23
TE128	8.24E-04
XE128	1.19E-05
TE129	1.62E-20
TE129M	1.73E-17
I129	1.43E-03
XE129	6.08E-08
TE130	3.17E-03
XE130	5.92E-05
XE131	4.80E-03
XE132	1.05E-02
BA132	9.04E-09
CS133	1.32E-02
XE134	1.66E-02
CS134	1.61E-04
BA134	1.07E-03
CS135	6.26E-03
BA135	1.82E-06
XE136	2.21E-02
BA136	1.63E-04

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

CS137	1.15E-02
BA137	2.02E-03
BA137M	1.76E-09
BA138	1.51E-02
LA138	1.07E-07
LA139	1.44E-02
CE140	1.42E-02
CE141	4.24E-16
PR141	1.32E-02
CE142	1.35E-02
ND142	1.87E-04
ND143	1.10E-02
CE144	8.96E-05
PR144	3.78E-09
PR144M	1.89E-11
ND144	1.51E-02
ND145	8.51E-03
ND146	7.66E-03
PM146	2.07E-08
SM146	6.06E-08
PM147	6.00E-04
SM147	2.66E-03
ND148	4.03E-03
PM148	1.03E-17
PM148M	1.41E-15
SM148	1.63E-03
SM149	4.81E-05
ND150	1.56E-03
SM150	2.84E-03
EU150	2.79E-12
SM151	1.32E-04
EU151	5.16E-06
SM152	1.14E-03
EU152	6.41E-07
GD152	7.92E-07
EU153	8.50E-04
GD153	2.59E-10
SM154	1.93E-04
EU154	1.28E-04
GD154	8.12E-05
EU155	3.09E-05
GD155	3.08E-05
GD156	2.00E-04
GD157	2.70E-07
GD158	3.75E-05
TB159	3.53E-06
GD160	1.37E-06
TB160	7.02E-14
DY160	3.30E-07
DY161	3.04E-07
DY162	2.31E-07
DY163	1.52E-07
DY164	2.94E-08
HO165	4.84E-08

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ADJ185G.OUT (continued) Results are in g/L and are normalized to Cs-137

HO166M	3.23E-10
ER166	1.15E-08
ER167	1.65E-09
ER168	2.19E-09
TM169	1.05E-11
ER170	3.00E-15
TM170	8.37E-17
YB170	2.02E-12
TM171	6.50E-15
YB171	7.31E-14

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Source Listing of Program CEXTRACT

```
      PROGRAM CEXTRACT

!-------- WRITTEN BY D.R. WENZEL

!            This program extracts the grams of each radionuclide
!            from file ADJ185G.OUT and sums the mass of radionuclides
!            that are listed more than once in the file.

      CHARACTER (LEN=1) :: DUMMY
      CHARACTER (LEN=7) :: DESC, NAME, NUCLIDE(600)

      INTEGER NUM(600)

      REAL :: DATA(600)

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER_E', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='ADJ185G.OUT', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='CEXTRACT.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'CEXTRACT.OUT -- g radionuclide/Ci Cs-137')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NUMBER
 1000 FORMAT(5X,A7, 5X, I6)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUM(LAST) = NUMBER
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,600
         DATA(l) = 0.
      END DO

!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ PAST THE FIRST 4 LINES OF INPUT

   35 DO  J=1,4
         READ(2,120) DUMMY
  120    FORMAT(A1)
      END DO

      WRITE(6,605)
  605 FORMAT(/,6X,'Number',3X,'g/g calcine  Nuclide')
```

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Source Listing of Program CEXTRACT (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,200,END=80) DESC, VALUE
  200  FORMAT(A7,5X,1PE10.3)

!-------- ADD MASS FROM MULTIPLE ENTRIES WHEN FOUND

       DO  J=1,LAST
          IF(DESC == NUCLIDE(J)) THEN
             DATA(J) = DATA(J) + VALUE
          END IF

       END DO

       GO TO 50

!-------- CHANGE CALCULATED MASS TO MEASURED MASS WHEN ANALYTICAL
!         MEASUREMENTS ARE AVAILABLE -- TAKEN FROM FILE 185DECAY.INP

   80  DO I=1,LAST
          IF(NUM(I) == 260550) DATA(I) = 6.31E-06          ! Fe 55
          IF(NUM(I) == 270600) DATA(I) = 1.34E-06          ! Co 60
          IF(NUM(I) == 380900) DATA(I) = 6.91E-03          ! Sr 90
          IF(NUM(I) == 390900) DATA(I) = 1.74E-06          !  Y 90
          IF(NUM(I) == 400950) DATA(I) = 2.01E-07          ! Zr 95
          IF(NUM(I) == 410950) DATA(I) = 1.25E-07          ! Nb 95
          IF(NUM(I) == 441060) DATA(I) = 3.38E-05          ! Ru106
          IF(NUM(I) == 451060) DATA(I) = 3.18E-11          ! Rh196
          IF(NUM(I) == 511250) DATA(I) = 3.21E-05          ! Sb125
          IF(NUM(I) == 551340) DATA(I) = 1.61E-04          ! Cs134
          IF(NUM(I) == 581440) DATA(I) = 3.26E-04          ! Ce144
          IF(NUM(I) == 591440) DATA(I) = 1.38E-08          ! Pr144
          IF(NUM(I) == 591441) DATA(I) = 1.31E-13          ! Pr144m
          IF(NUM(I) == 631540) DATA(I) = 5.63E-05          ! Eu154
          IF(NUM(I) == 922320) DATA(I) = 1.30E-11          !  U232
          IF(NUM(I) == 922330) DATA(I) = 5.75E-10          !  U233
          IF(NUM(I) == 922340) DATA(I) = 6.40E-04          !  U234
          IF(NUM(I) == 922350) DATA(I) = 1.24E-02          !  U235
          IF(NUM(I) == 922360) DATA(I) = 1.09E-03          !  U236
          IF(NUM(I) == 922380) DATA(I) = 3.93E-03          !  U238
          IF(NUM(I) == 932350) DATA(I) = 3.00E-15          ! Np235
          IF(NUM(I) == 932360) DATA(I) = 6.28E-12          ! Np236
          IF(NUM(I) == 932370) DATA(I) = 1.17E-05          ! Np237
          IF(NUM(I) == 932390) DATA(I) = 5.50E-16          ! Np239
          IF(NUM(I) == 942360) DATA(I) = 4.40E-09          ! Pu236
          IF(NUM(I) == 942380) DATA(I) = 3.64E-04          ! Pu238
          IF(NUM(I) == 942390) DATA(I) = 1.38E-03          ! Pu239
          IF(NUM(I) == 942400) DATA(I) = 3.39E-04          ! Pu240
          IF(NUM(I) == 942410) DATA(I) = 5.96E-05          ! Pu241
          IF(NUM(I) == 942420) DATA(I) = 4.78E-05          ! Pu242
          IF(NUM(I) == 942440) DATA(I) = 2.54E-10          ! Pu244
          IF(NUM(I) == 952410) DATA(I) = 2.61E-05          ! Am241
```

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Source Listing of Program CEXTRACT (continued)

```
         IF(NUM(I) == 952421) DATA(I) = 2.97E-08            ! Am242m
         IF(NUM(I) == 952420) DATA(I) = 3.57E-13            ! Am242
         IF(NUM(I) == 952430) DATA(I) = 9.93E-06            ! Am243
         IF(NUM(I) == 962420) DATA(I) = 3.74E-10            ! Cm242
         IF(NUM(I) == 962430) DATA(I) = 1.76E-09            ! Cm243
         IF(NUM(I) == 962440) DATA(I) = 8.45E-08            ! Cm244
         IF(NUM(I) == 962450) DATA(I) = 2.03E-09            ! Cm245
         IF(NUM(I) == 962460) DATA(I) = 9.02E-11            ! Cm246
         IF(NUM(I) == 962470) DATA(I) = 3.85E-13            ! Cm247
         IF(NUM(I) == 962480) DATA(I) = 1.02E-14            ! Cm248
         IF(NUM(I) == 962500) DATA(I) = 1.43E-23            ! Cm250
         IF(NUM(I) == 972490) DATA(I) = 1.31E-18            ! Bk249
         IF(NUM(I) == 982490) DATA(I) = 6.63E-17            ! Cf249
         IF(NUM(I) == 982500) DATA(I) = 2.25E-19            ! Cf250
         IF(NUM(I) == 982510) DATA(I) = 2.86E-18            ! Cf251
         IF(NUM(I) == 982520) DATA(I) = 2.25E-19            ! Cf252
      END DO

!-------- Normalize rusults to Cs-137 mass of 1.15E-02 g

      DO  J=1,LAST
         IF(DATA(J) /= 0.) THEN
            WRITE(6,620) NUM(J), DATA(J), NUCLIDE(J)
  620       FORMAT(6X,I6,2X,1PE10.3,4X,A7)
         ENDIF

      END DO

      GO TO 999

!-------- ERROR STATEMENTS

  900 WRITE(6,9000)
 9000 FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999 CONTINUE
      END PROGRAM CEXTRACT
```

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File MASTER_E

```
 H  1       10011
 H  2       10012
HE  3       20030
 B 10       50100
 B 11       50110
 C 12       60120
 C 13       60130
 N 14       70140
 N 15       70150
 O 16       80160
 O 17       80170
 O 18       80180
 F 19       90190
NE 20      100200
NE 21      100210
NE 22      100220
NA 23      110230
MG 24      120240
MG 25      120250
MG 26      120260
AL 27      130270
SI 28      140280
SI 29      140290
SI 30      140300
SI 32      140320
 P 31      150310
 P 32      150320
 S 34      160340
CL 37      170370
AR 38      180380
AR 39      180390
AR 40      180400
AR 42      180420
 K 41      190410
 K 42      190420
CA 42      200420
CA 43      200430
CA 44      200440
CA 45      200450
CA 46      200460
SC 45      210450
SC 46      210460
TI 46      220460
TI 47      220470
TI 48      220480
TI 49      220490
TI 50      220500
 V 50      230500
 V 51      230510
CR 50      240500
CR 51      240510
CR 52      240520
CR 53      240530
CR 54      240540
```

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File MASTER_E (continued)

```
MN 54      250540
MN 55      250550
FE 54      260540
FE 55      260550
FE 56      260560
FE 57      260570
FE 58      260580
CO 58      270580
CO 59      270590
CO 60      270600
NI 58      280580
NI 59      280590
NI 60      280600
NI 61      280610
NI 62      280620
NI 63      280630
NI 64      280640
CU 63      290630
CU 65      290650
ZN 64      300640
ZN 65      300650
MO 94      420940
RU 98      440980
IN113M     491131
IN114M     491141
SN112      501120
SN113      501130
YB173      701730
YB174      701740
LU175      711750
LU176      711760
LU177      711770
LU177M     711771
HF174      721740
HF175      721750
HF176      721760
HF177      721770
HF178      721780
HF179      721790
HF180      721800
HF181      721810
HF182      721820
TA181      731810
TA182      731820
 W182      741820
 W183      741830
 W184      741840
 W185      741850
 W186      741860
 W188      741880
RE185      751850
RE187      751870
RE188      751880
OS186      761860
```

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File MASTER_E (continued)

```
OS188      761880
OS189      761890
OS190      761900
HE  4       20040
TL206      812060
TL207      812070
TL208      812080
TL209      812090
PB206      822060
PB207      822070
PB208      822080
PB209      822090
PB210      822100
PB211      822110
PB212      822120
PB214      822140
BI208      832080
BI209      832090
BI210M     832101
BI210      832100
BI211      832110
BI212      832120
BI213      832130
BI214      832140
PO210      842100
PO211      842110
PO212      842120
PO213      842130
PO214      842140
PO215      842150
PO216      842160
PO218      842180
AT217      852170
RN219      862190
RN220      862200
RN222      862220
FR221      872210
FR223      872230
RA223      882230
RA224      882240
RA225      882250
RA226      882260
RA228      882280
AC225      892250
AC227      892270
AC228      892280
TH227      902270
TH228      902280
TH229      902290
TH230      902300
TH231      902310
TH232      902320
TH234      902340
PA231      912310
```

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File MASTER_E (continued)

```
PA233      912330
PA234M     912341
PA234      912340
 U232      922320
 U233      922330
 U234      922340
 U235      922350
 U236      922360
 U237      922370
 U238      922380
 U240      922400
NP235      932350
NP236      932360
NP237      932370
NP238      932380
NP239      932390
NP240M     932401
PU236      942360
PU238      942380
PU239      942390
PU240      942400
PU241      942410
PU242      942420
PU243      942430
PU244      942440
AM241      952410
AM242M     952421
AM242      952420
AM243      952430
AM245      952450
CM242      962420
CM243      962430
CM244      962440
CM245      962450
CM246      962460
CM247      962470
CM248      962480
CM250      962500
BK249      972490
CF249      982490
CF250      982500
CF251      982510
CF252      982520
 H  3       10030
LI  6       30060
LI  7       30070
BE  9       40090
BE 10       40100
 C 14       60140
ZN 66      300660
ZN 67      300670
ZN 68      300680
GA 69      310690
ZN 70      300700
```

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File MASTER_E (continued)

```
GE 70      320700
GA 71      310710
GE 72      320720
GE 73      320730
GE 74      320740
AS 75      330750
GE 76      320760
SE 76      340760
SE 77      340770
SE 78      340780
SE 79      340790
BR 79      350790
SE 80      340800
KR 80      360800
BR 81      350810
KR 81      360810
SE 82      340820
KR 82      360820
KR 83      360830
KR 84      360840
KR 85      360850
RB 85      370850
KR 86      360860
SR 86      380860
RB 87      370870
SR 87      380870
SR 88      380880
SR 89      380890
 Y 89      390890
SR 90      380900
 Y 90      390900
ZR 90      400900
 Y 91      390910
ZR 91      400910
ZR 92      400920
ZR 93      400930
NB 93      410930
NB 93M     410931
ZR 94      400940
NB 94      410940
ZR 95      400950
NB 95      410950
NB 95M     410951
MO 95      420950
ZR 96      400960
MO 96      420960
MO 97      420970
MO 98      420980
TC 98      430980
TC 99      430990
RU 99      440990
MO100      421000
RU100      441000
RU101      441010
```

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File MASTER_E (continued)

RU102	441020
RH102	451020
RU103	441030
RH103	451030
RH103M	451031
RU104	441040
PD104	461040
PD105	461050
RU106	441060
RH106	451060
PD106	461060
PD107	461070
AG107	471070
PD108	461080
AG108	471080
AG108M	471081
CD108	481080
AG109	471090
AG109M	471091
CD109	481090
PD110	461100
AG110	471100
AG110M	471101
CD110	481100
CD111	481110
CD112	481120
CD113	481130
CD113M	481131
IN113	491130
CD114	481140
IN114	491140
SN114	501140
IN115	491150
IN115M	491151
SN115	501150
CD116	481160
SN116	501160
SN117	501170
SN118	501180
SN119	501190
SN119M	501191
SN120	501200
SN121M	501211
SB121	511210
SN122	501220
TE122	521220
SN123	501230
SB123	511230
TE123	521230
TE123M	521231
SN124	501240
SB124	511240
TE124	521240
SB125	511250

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File MASTER_E (continued)

```
TE125      521250
TE125M     521251
SN126      501260
SB126      511260
SB126M     511261
TE126      521260
TE127      521270
TE127M     521271
 I127      531270
XE127      541270
TE128      521280
XE128      541280
TE129      521290
TE129M     521291
 I129      531290
XE129      541290
TE130      521300
XE130      541300
XE131      541310
XE132      541320
BA132      561320
CS133      551330
XE134      541340
CS134      551340
BA134      561340
CS135      551350
BA135      561350
XE136      541360
BA136      561360
CS137      551370
BA137      561370
BA137M     561371
BA138      561380
LA138      571380
LA139      571390
CE140      581400
CE141      581410
PR141      591410
CE142      581420
ND142      601420
ND143      601430
CE144      581440
PR144      591440
PR144M     591441
ND144      601440
ND145      601450
ND146      601460
PM146      611460
SM146      621460
PM147      611470
SM147      621470
ND148      601480
PM148      611480
PM148M     611481
```

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File MASTER_E (continued)

SM148	621480
SM149	621490
ND150	601500
SM150	621500
EU150	631500
SM151	621510
EU151	631510
SM152	621520
EU152	631520
GD152	641520
EU153	631530
GD153	641530
SM154	621540
EU154	631540
GD154	641540
EU155	631550
GD155	641550
GD156	641560
GD157	641570
GD158	641580
TB159	651590
GD160	641600
TB160	651600
DY160	661600
DY161	661610
DY162	661620
DY163	661630
DY164	661640
HO165	671650
HO166M	671661
ER166	681660
ER167	681670
ER168	681680
TM169	691690
ER170	681700
TM170	691700
YB170	701700
TM171	691710
YB171	701710
YB172	701720

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CEXTRACT.OUT -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
20030	1.410E-14	HE 3
50100	4.420E-16	B 10
50110	2.570E-07	B 11
60120	6.090E-04	C 12
60130	8.390E-06	C 13
70140	8.160E-04	N 14
70150	3.130E-06	N 15
80160	4.910E-02	O 16
80170	1.970E-05	O 17
80180	9.840E-05	O 18
90190	4.970E-11	F 19
100200	4.590E-16	NE 20
100210	3.580E-15	NE 21
100220	7.580E-18	NE 22
110230	6.950E-22	NA 23
120240	1.610E-09	MG 24
120250	3.790E-13	MG 25
120260	2.520E-16	MG 26
130270	8.210E-04	AL 27
140280	2.840E-07	SI 28
140290	3.360E-11	SI 29
140300	4.370E-15	SI 30
140320	7.930E-27	SI 32
150310	1.860E-19	P 31
150320	4.780E-31	P 32
160340	2.140E-25	S 34
170370	2.380E-19	CL 37
180380	3.780E-23	AR 38
180390	9.790E-24	AR 39
180400	9.120E-16	AR 40
180420	1.300E-24	AR 42
190410	2.920E-17	K 41
190420	5.570E-29	K 42
200420	5.080E-19	CA 42
200430	6.860E-11	CA 43
200440	5.230E-10	CA 44
200450	7.240E-16	CA 45
200460	6.220E-11	CA 46
210450	1.080E-11	SC 45
210460	2.840E-17	SC 46
220460	3.280E-05	TI 46
220470	2.990E-05	TI 47
220480	3.000E-04	TI 48
220490	2.570E-05	TI 49
220500	2.230E-05	TI 50
230500	1.440E-07	V 50
230510	3.860E-05	V 51
240500	1.740E-03	CR 50
240510	7.520E-27	CR 51
240520	3.430E-02	CR 52
240530	3.900E-03	CR 53
240540	1.070E-03	CR 54

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
250540	4.000E-09	MN 54
250550	1.030E-05	MN 55
260540	3.620E-03	FE 54
260550	6.310E-06	FE 55
260560	5.630E-02	FE 56
260570	1.500E-03	FE 57
260580	1.810E-04	FE 58
270580	3.360E-15	CO 58
270590	1.230E-06	CO 59
270600	1.340E-06	CO 60
280580	1.390E-02	NI 58
280590	7.450E-05	NI 59
280600	5.340E-03	NI 60
280610	2.520E-04	NI 61
280620	7.230E-04	NI 62
280630	1.330E-05	NI 63
280640	1.860E-04	NI 64
290630	7.450E-07	CU 63
290650	4.080E-07	CU 65
300640	2.330E-10	ZN 64
300650	2.510E-16	ZN 65
420940	6.410E-09	MO 94
440980	2.380E-20	RU 98
491131	5.000E-14	IN113M
491141	1.200E-18	IN114M
501120	6.120E-03	SN112
501130	8.320E-11	SN113
701730	1.400E-13	YB173
701740	6.390E-15	YB174
711750	5.280E-06	LU175
711760	1.290E-07	LU176
711770	4.200E-16	LU177
711771	4.220E-14	LU177M
721740	7.100E-06	HF174
721750	3.790E-15	HF175
721760	3.190E-04	HF176
721770	1.070E-04	HF177
721780	1.910E-03	HF178
721790	2.500E-03	HF179
721800	3.300E-03	HF180
721810	3.010E-19	HF181
721820	1.730E-07	HF182
731810	3.930E-04	TA181
731820	8.350E-11	TA182
741820	5.370E-05	W182
741830	5.580E-05	W183
741840	3.370E-06	W184
741850	6.040E-17	W185
741860	5.430E-11	W186
741880	7.620E-24	W188
751850	6.600E-09	RE185
751870	2.230E-12	RE187

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
751880	7.840E-26	RE188
761860	8.140E-10	OS186
761880	7.160E-14	OS188
761890	4.980E-16	OS189
761900	1.760E-17	OS190
20040	2.410E-06	HE 4
812060	1.460E-32	TL206
812070	1.020E-19	TL207
812080	1.030E-16	TL208
812090	2.900E-23	TL209
822060	1.400E-17	PB206
822070	2.660E-14	PB207
822080	1.070E-10	PB208
822090	1.210E-19	PB209
822100	2.540E-16	PB210
822110	7.870E-19	PB211
822120	6.090E-14	PB212
822140	1.120E-20	PB214
832080	7.930E-22	BI208
832090	1.600E-15	BI209
832101	5.640E-21	BI210M
832100	1.540E-19	BI210
832110	4.640E-20	BI211
832120	5.780E-15	BI212
832130	2.840E-20	BI213
832140	8.280E-21	BI214
842100	3.310E-18	PO210
842110	5.690E-25	PO211
842120	3.060E-25	PO212
842130	4.260E-29	PO213
842140	1.140E-27	PO214
842150	6.590E-25	PO215
842160	2.430E-19	PO216
842180	1.290E-21	PO218
852170	3.410E-25	AT217
862190	1.490E-21	RN219
862200	9.180E-17	RN220
862220	2.380E-18	RN222
872210	3.090E-21	FR221
872230	6.960E-21	FR223
882230	3.790E-16	RA223
882240	5.310E-13	RA224
882250	1.400E-17	RA225
882260	3.730E-13	RA226
882280	2.340E-18	RA228
892250	9.450E-18	AC225
892270	2.700E-13	AC227
892280	2.440E-22	AC228
902270	6.240E-16	TH227
902280	1.030E-10	TH228
902290	2.580E-12	TH229
902300	2.090E-08	TH230

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
902310	1.570E-12	TH231
902320	1.640E-08	TH232
902340	2.340E-13	TH234
912310	3.140E-09	PA231
912330	1.680E-10	PA233
912341	7.890E-18	PA234M
912340	3.530E-18	PA234
922320	1.300E-11	U232
922330	5.750E-10	U233
922340	6.400E-04	U234
922350	1.240E-02	U235
922360	1.090E-03	U236
922370	9.860E-13	U237
922380	3.930E-03	U238
922400	1.250E-21	U240
932350	3.000E-15	NP235
932360	6.280E-12	NP236
932370	1.170E-05	NP237
932380	1.440E-15	NP238
932390	5.500E-16	NP239
932401	1.100E-23	NP240M
942360	4.400E-09	PU236
942380	3.640E-04	PU238
942390	1.380E-03	PU239
942400	3.390E-04	PU240
942410	5.960E-05	PU241
942420	4.780E-05	PU242
942430	3.540E-24	PU243
942440	2.540E-10	PU244
952410	2.610E-05	AM241
952421	2.970E-08	AM242M
952420	3.570E-13	AM242
952430	9.930E-06	AM243
952450	1.300E-27	AM245
962420	3.740E-10	CM242
962430	1.760E-09	CM243
962440	8.450E-08	CM244
962450	2.030E-09	CM245
962460	9.020E-11	CM246
962470	3.850E-13	CM247
962480	1.020E-14	CM248
962500	1.430E-23	CM250
972490	1.310E-18	BK249
982490	6.630E-17	CF249
982500	2.250E-19	CF250
982510	2.860E-18	CF251
982520	2.250E-19	CF252
10030	3.610E-07	H 3
30060	2.690E-09	LI 6
30070	1.130E-10	LI 7
40090	2.720E-09	BE 9
40100	1.500E-09	BE 10

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
60140	2.180E-06	C 14
300660	7.110E-10	ZN 66
300670	3.350E-13	ZN 67
300680	3.860E-09	ZN 68
310690	5.960E-12	GA 69
300700	1.320E-08	ZN 70
320700	1.710E-14	GE 70
310710	7.430E-12	GA 71
320720	8.140E-08	GE 72
320730	2.850E-07	GE 73
320740	7.700E-07	GE 74
330750	1.850E-06	AS 75
320760	5.620E-06	GE 76
340760	3.270E-08	SE 76
340770	1.230E-05	SE 77
340780	2.640E-05	SE 78
340790	6.740E-05	SE 79
350790	5.010E-09	BR 79
340800	1.620E-04	SE 80
360800	8.280E-10	KR 80
350810	2.720E-04	BR 81
360810	2.960E-11	KR 81
340820	4.400E-04	SE 82
360820	6.600E-06	KR 82
360830	6.110E-04	KR 83
360840	1.500E-03	KR 84
360850	2.380E-04	KR 85
370850	1.510E-03	RB 85
360860	2.790E-03	KR 86
380860	3.400E-06	SR 86
370870	3.610E-03	RB 87
380870	2.520E-07	SR 87
380880	5.230E-03	SR 88
380890	6.600E-12	SR 89
390890	6.860E-03	Y 89
380900	6.910E-03	SR 90
390900	1.740E-06	Y 90
400900	2.070E+01	ZR 90
390910	1.080E-10	Y 91
400910	4.510E+00	ZR 91
400920	6.920E+00	ZR 92
400930	2.170E-02	ZR 93
410930	4.070E-03	NB 93
410931	5.540E-08	NB 93M
400940	7.000E+00	ZR 94
410940	2.590E-05	NB 94
400950	2.010E-07	ZR 95
410950	1.250E-07	NB 95
410951	2.060E-13	NB 95M
420950	1.160E-02	MO 95
400960	1.130E+00	ZR 96
420960	3.420E-04	MO 96

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
420970	1.240E-02	MO 97
420980	9.220E-03	MO 98
430980	3.300E-08	TC 98
430990	8.950E-03	TC 99
440990	2.040E-07	RU 99
421000	1.010E-02	MO100
441000	7.260E-04	RU100
441010	8.090E-03	RU101
441020	7.160E-03	RU102
451020	1.150E-09	RH102
441030	2.430E-14	RU103
451030	3.920E-03	RH103
451031	2.170E-17	RH103M
441040	3.180E-03	RU104
461040	1.330E-03	PD104
461050	1.660E-03	PD105
441060	3.380E-05	RU106
451060	3.180E-11	RH106
461060	8.230E-04	PD106
461070	3.300E-04	PD107
471070	2.440E-10	AG107
461080	1.600E-04	PD108
471080	6.810E-22	AG108
471081	2.160E-13	AG108M
481080	1.990E-10	CD108
471090	6.540E-05	AG109
471091	1.080E-20	AG109M
481090	1.090E-14	CD109
461100	5.840E-05	PD110
471100	7.110E-17	AG110
471101	4.690E-09	AG110M
481100	2.400E-05	CD110
481110	4.660E-05	CD111
481120	3.580E-05	CD112
481130	4.660E-07	CD113
481131	5.410E-07	CD113M
491130	6.330E-05	IN113
481140	6.480E-05	CD114
491140	1.930E-23	IN114
501140	4.150E-03	SN114
491150	1.040E-05	IN115
491151	6.070E-23	IN115M
501150	2.150E-03	SN115
481160	3.150E-05	CD116
501160	9.200E-02	SN116
501170	4.930E-02	SN117
501180	1.540E-01	SN118
501190	5.550E-02	SN119
501191	5.120E-07	SN119M
501200	2.080E-01	SN120
501211	9.620E-07	SN121M
511210	2.220E-04	SB121

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
501220	2.960E-02	SN122
521220	9.660E-06	TE122
501230	1.200E-09	SN123
511230	6.460E-05	SB123
521230	1.020E-07	TE123
521231	3.570E-13	TE123M
501240	3.680E-02	SN124
511240	2.160E-14	SB124
521240	1.760E-06	TE124
511250	3.210E-05	SB125
521250	2.500E-04	TE125
521251	7.690E-07	TE125M
501260	1.470E-04	SN126
511260	6.980E-12	SB126
511261	5.310E-14	SB126M
521260	4.940E-06	TE126
521270	3.900E-12	TE127
521271	1.110E-09	TE127M
531270	3.160E-04	I127
541270	6.100E-23	XE127
521280	8.240E-04	TE128
541280	1.190E-05	XE128
521290	1.620E-20	TE129
521291	1.730E-17	TE129M
531290	1.430E-03	I129
541290	6.080E-08	XE129
521300	3.170E-03	TE130
541300	5.920E-05	XE130
541310	4.800E-03	XE131
541320	1.050E-02	XE132
561320	9.040E-09	BA132
551330	1.320E-02	CS133
541340	1.660E-02	XE134
551340	1.610E-04	CS134
561340	1.070E-03	BA134
551350	6.260E-03	CS135
561350	1.820E-06	BA135
541360	2.210E-02	XE136
561360	1.630E-04	BA136
551370	1.150E-02	CS137
561370	2.020E-03	BA137
561371	1.760E-09	BA137M
561380	1.510E-02	BA138
571380	1.070E-07	LA138
571390	1.440E-02	LA139
581400	1.420E-02	CE140
581410	4.240E-16	CE141
591410	1.320E-02	PR141
581420	1.350E-02	CE142
601420	1.870E-04	ND142
601430	1.100E-02	ND143
581440	3.260E-04	CE144

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CEXTRACT.OUT (continued) -- g nuclide/0.0115 g Cs-137

Number	g/g calcine	Nuclide
591440	1.380E-08	PR144
591441	1.310E-13	PR144M
601440	1.510E-02	ND144
601450	8.510E-03	ND145
601460	7.660E-03	ND146
611460	2.070E-08	PM146
621460	6.060E-08	SM146
611470	6.000E-04	PM147
621470	2.660E-03	SM147
601480	4.030E-03	ND148
611480	1.030E-17	PM148
611481	1.410E-15	PM148M
621480	1.630E-03	SM148
621490	4.810E-05	SM149
601500	1.560E-03	ND150
621500	2.840E-03	SM150
631500	2.790E-12	EU150
621510	1.320E-04	SM151
631510	5.160E-06	EU151
621520	1.140E-03	SM152
631520	6.410E-07	EU152
641520	7.920E-07	GD152
631530	8.500E-04	EU153
641530	2.590E-10	GD153
621540	1.930E-04	SM154
631540	5.630E-05	EU154
641540	8.120E-05	GD154
631550	3.090E-05	EU155
641550	3.080E-05	GD155
641560	2.000E-04	GD156
641570	2.700E-07	GD157
641580	3.750E-05	GD158
651590	3.530E-06	TB159
641600	1.370E-06	GD160
651600	7.020E-14	TB160
661600	3.300E-07	DY160
661610	3.040E-07	DY161
661620	2.310E-07	DY162
661630	1.520E-07	DY163
661640	2.940E-08	DY164
671650	4.840E-08	HO165
671661	3.230E-10	HO166M
681660	1.150E-08	ER166
681670	1.650E-09	ER167
681680	2.190E-09	ER168
691690	1.050E-11	TM169
681700	3.000E-15	ER170
691700	8.370E-17	TM170
701700	2.020E-12	YB170
691710	6.500E-15	TM171
701710	7.310E-14	YB171
701720	2.240E-13	YB172

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File CO_RUN1.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     Coprocessing waste in WM-185
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     Final Activity in Ci/L rather than Ci
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  Ci/L
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      28.5   1   2   5   0
  DEC      31.    2   3   5   0
  DEC      32.    3   4   5   0
  DEC      39.    4   5   5   0
  DEC      41.    5   6   5   0
  DEC      45.    6   7   5   0
  DEC      51.    7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   20030 1.410E-14  50100 4.420E-16  50110 2.570E-07 0 0.
  1   60120 6.090E-04  60130 8.390E-06  70140 8.160E-04 0 0.
  1   70150 3.130E-06  80160 4.910E-02  80170 1.970E-05 0 0.
  1   80180 9.840E-05  90190 4.970E-11 100200 4.590E-16 0 0.
  1  100210 3.580E-15 100220 7.580E-18 110230 6.950E-22 0 0.
  1  120240 1.610E-09 120250 3.790E-13 120260 2.520E-16 0 0.
  1  130270 8.210E-04 140280 2.840E-07 140290 3.360E-11 0 0.
  1  140300 4.370E-15 140320 7.930E-27 150310 1.860E-19 0 0.
  1  150320 4.780E-31 160340 2.140E-25 170370 2.380E-19 0 0.
  1  180380 3.780E-23 180390 9.790E-24 180400 9.120E-16 0 0.
  1  180420 1.300E-24 190410 2.920E-17 190420 5.570E-29 0 0.
  1  200420 5.080E-19 200430 6.860E-11 200440 5.230E-10 0 0.
  1  200450 7.240E-16 200460 6.220E-11 210450 1.080E-11 0 0.
  1  210460 2.840E-17 220460 3.280E-05 220470 2.990E-05 0 0.
  1  220480 3.000E-04 220490 2.570E-05 220500 2.230E-05 0 0.
  1  230500 1.440E-07 230510 3.860E-05 240500 1.740E-03 0 0.
  1  240510 7.520E-27 240520 3.430E-02 240530 3.900E-03 0 0.
  1  240540 1.070E-03 250540 4.000E-09 250550 1.030E-05 0 0.
  1  260540 3.620E-03 260550 6.310E-06 260560 5.630E-02 0 0.
  1  260570 1.500E-03 260580 1.810E-04 270580 3.360E-15 0 0.
  1  270590 1.230E-06 270600 1.340E-06 280580 1.390E-02 0 0.
  1  280590 7.450E-05 280600 5.340E-03 280610 2.520E-04 0 0.
  1  280620 7.230E-04 280630 1.330E-05 280640 1.860E-04 0 0.
  1  290630 7.450E-07 290650 4.080E-07 300640 2.330E-10 0 0.
  1  300650 2.510E-16 420940 6.410E-09 440980 2.380E-20 0 0.
  1  491131 5.000E-14 491141 1.200E-18 501120 6.120E-03 0 0.
  1  501130 8.320E-11 701730 1.400E-13 701740 6.390E-15 0 0.
  1  711750 5.280E-06 711760 1.290E-07 711770 4.200E-16 0 0.
```

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File CO_RUN1.INP (continued)

```
1  711771 4.220E-14 721740 7.100E-06 721750 3.790E-15 0 0.
1  721760 3.190E-04 721770 1.070E-04 721780 1.910E-03 0 0.
1  721790 2.500E-03 721800 3.300E-03 721810 3.010E-19 0 0.
1  721820 1.730E-07 731810 3.930E-04 731820 8.350E-11 0 0.
1  741820 5.370E-05 741830 5.580E-05 741840 3.370E-06 0 0.
1  741850 6.040E-17 741860 5.430E-11 741880 7.620E-24 0 0.
1  751850 6.600E-09 751870 2.230E-12 751880 7.840E-26 0 0.
1  761860 8.140E-10 761880 7.160E-14 761890 4.980E-16 0 0.
1  761900 1.760E-17      0 0.             0 0.        0 0.
2   20040 1.400E-06 812060 1.460E-32 812070 1.020E-19 0 0.
2  812080 1.030E-16 812090 2.900E-23 822060 1.400E-17 0 0.
2  822070 2.660E-14 822080 1.070E-10 822090 1.210E-19 0 0.
2  822100 2.540E-16 822110 7.870E-19 822120 6.090E-14 0 0.
2  822140 1.120E-20 832080 7.930E-22 832090 1.600E-15 0 0.
2  832101 5.640E-21 832100 1.540E-19 832110 4.640E-20 0 0.
2  832120 5.780E-15 832130 2.840E-20 832140 8.280E-21 0 0.
2  842100 3.310E-18 842110 5.690E-25 842120 3.060E-25 0 0.
2  842130 4.260E-29 842140 1.140E-27 842150 6.590E-25 0 0.
2  842160 2.430E-19 842180 1.290E-21 852170 3.410E-25 0 0.
2  862190 1.490E-21 862200 9.180E-17 862220 2.380E-18 0 0.
2  872210 3.090E-21 872230 6.960E-21 882230 3.790E-16 0 0.
2  882240 5.310E-13 882250 1.400E-17 882260 3.730E-13 0 0.
2  882280 2.340E-18 892250 9.450E-18 892270 2.700E-13 0 0.
2  892280 2.440E-22 902270 6.240E-16 902280 1.030E-10 0 0.
2  902290 2.580E-12 902300 2.090E-08 902310 1.570E-12 0 0.
2  902320 1.640E-08 902340 2.340E-13 912310 3.140E-09 0 0.
2  912330 1.680E-10 912341 7.890E-18 912340 3.530E-18 0 0.
2  922320 1.300E-11 922330 5.750E-10 922340 6.400E-04 0 0.
2  922350 1.240E-02 922360 1.090E-03 922370 9.860E-13 0 0.
2  922380 3.930E-03 922400 1.250E-21 932350 3.000E-15 0 0.
2  932360 6.280E-12 932370 1.170E-05 932380 1.440E-15 0 0.
2  932390 5.500E-16 932401 1.100E-23 942360 4.400E-09 0 0.
2  942380 3.640E-04 942390 1.380E-03 942400 3.390E-04 0 0.
2  942410 5.960E-05 942420 4.780E-05 942430 3.540E-24 0 0.
2  942440 2.540E-10 952410 2.610E-05 952421 2.970E-08 0 0.
2  952420 3.570E-13 952430 9.930E-06 952450 1.300E-27 0 0.
2  962420 3.740E-10 962430 1.760E-09 962440 8.450E-08 0 0.
2  962450 2.030E-09 962460 9.020E-11 962470 3.850E-13 0 0.
2  962480 1.020E-14 962500 1.430E-23 972490 1.310E-18 0 0.
2  982490 6.630E-17 982500 7.370E-18 982510 2.860E-18 0 0.
2  982520 2.250E-19      0 0.             0 0.        0 0.
3   10030 3.610E-07  30060 2.690E-09  30070 1.130E-10 0 0.
3   40090 2.720E-09  40100 1.500E-09  60140 2.180E-06 0 0.
3  300660 7.110E-10 300670 3.350E-13 300680 3.860E-09 0 0.
3  310690 5.960E-12 300700 1.320E-08 320700 1.710E-14 0 0.
3  310710 7.430E-12 320720 8.140E-08 320730 2.850E-07 0 0.
3  320740 7.700E-07 330750 1.850E-06 320760 5.620E-06 0 0.
3  340760 3.270E-08 340770 1.230E-05 340780 2.640E-05 0 0.
3  340790 6.740E-05 350790 5.010E-09 340800 1.620E-04 0 0.
3  360800 8.280E-10 350810 2.720E-04 360810 2.960E-11 0 0.
3  340820 4.400E-04 360820 6.600E-06 360830 6.110E-04 0 0.
3  360840 1.500E-03 360850 2.380E-04 370850 1.510E-03 0 0.
3  360860 2.790E-03 380860 3.400E-06 370870 3.610E-03 0 0.
3  380870 3.810E-08 380880 5.210E-03 380890 6.600E-12 0 0.
```

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File CO_RUN1.INP (continued)

```
3  390890 6.860E-03 380900 6.910E-03 390900 1.740E-06 0 0.
3  400900 2.070E+00 390910 1.080E-10 400910 4.590E-01 0 0.
3  400920 7.000E-01 400930 1.080E-02 410930 4.070E-03 0 0.
3  410931 2.730E-08 400940 7.080E-01 410940 2.590E-05 0 0.
3  400950 2.010E-07 410950 1.250E-07 410951 2.060E-13 0 0.
3  420950 9.760E-03 400960 1.220E-01 420960 2.880E-04 0 0.
3  420970 9.490E-03 420980 9.200E-03 430980 3.300E-08 0 0.
3  430990 8.950E-03 440990 2.040E-07 421000 1.010E-02 0 0.
3  441000 7.260E-04 441010 8.090E-03 441020 7.160E-03 0 0.
3  451020 1.150E-09 441030 2.430E-14 451030 3.920E-03 0 0.
3  451031 2.170E-17 441040 3.180E-03 461040 1.330E-03 0 0.
3  461050 1.660E-03 441060 3.380E-05 451060 3.180E-11 0 0.
3  461060 8.230E-04 461070 3.300E-04 471070 2.440E-10 0 0.
3  461080 1.600E-04 471080 6.810E-22 471081 2.160E-13 0 0.
3  481080 1.990E-10 471090 6.540E-05 471091 1.080E-20 0 0.
3  481090 1.090E-14 461100 5.840E-05 471100 7.110E-17 0 0.
3  471101 4.690E-09 481100 2.400E-05 481110 4.660E-05 0 0.
3  481120 3.580E-05 481130 4.660E-07 481131 5.410E-07 0 0.
3  491130 6.330E-05 481140 6.480E-05 491140 1.930E-23 0 0.
3  501140 4.150E-03 491150 1.040E-05 491151 6.070E-23 0 0.
3  501150 2.150E-03 481160 3.150E-05 501160 9.200E-02 0 0.
3  501170 4.930E-02 501180 1.540E-01 501190 5.550E-02 0 0.
3  501191 5.120E-07 501200 2.080E-01 501211 9.620E-07 0 0.
3  511210 2.220E-04 501220 3.910E-05 521220 9.660E-06 0 0.
3  501230 1.070E-09 511230 4.530E-05 521230 1.020E-07 0 0.
3  521231 3.570E-13 501240 6.080E-05 511240 2.160E-14 0 0.
3  521240 1.350E-06 511250 3.210E-05 521250 6.410E-05 0 0.
3  521251 2.170E-07 501260 1.470E-04 511260 6.980E-12 0 0.
3  511261 5.310E-14 521260 3.500E-06 521270 3.900E-12 0 0.
3  521271 1.110E-09 531270 3.160E-04 541270 6.100E-23 0 0.
3  521280 8.240E-04 541280 1.190E-05 521290 1.620E-20 0 0.
3  521291 1.730E-17 531290 1.430E-03 541290 6.080E-08 0 0.
3  521300 3.170E-03 541300 5.920E-05 541310 4.800E-03 0 0.
3  541320 1.050E-02 561320 9.040E-09 551330 1.320E-02 0 0.
3  541340 1.660E-02 551340 1.610E-04 561340 1.070E-03 0 0.
3  551350 6.260E-03 561350 1.820E-06 541360 2.210E-02 0 0.
3  561360 1.630E-04 551370 1.150E-02 561370 2.020E-03 0 0.
3  561371 1.760E-09 561380 1.510E-02 571380 1.070E-07 0 0.
3  571390 1.440E-02 581400 1.420E-02 581410 4.240E-16 0 0.
3  591410 1.320E-02 581420 1.350E-02 601420 1.870E-04 0 0.
3  601430 1.100E-02 581440 3.260E-04 591440 1.380E-08 0 0.
3  591441 1.310E-13 601440 1.510E-02 601450 8.510E-03 0 0.
3  601460 7.660E-03 611460 2.070E-08 621460 6.060E-08 0 0.
3  611470 6.000E-04 621470 2.660E-03 601480 4.030E-03 0 0.
3  611480 1.030E-17 611481 1.410E-15 621480 1.630E-03 0 0.
3  621490 4.810E-05 601500 1.560E-03 621500 2.840E-03 0 0.
3  631500 2.790E-12 621510 1.320E-04 631510 5.160E-06 0 0.
3  621520 1.140E-03 631520 6.410E-07 641520 7.920E-07 0 0.
3  631530 8.500E-04 641530 2.590E-10 621540 1.930E-04 0 0.
3  631540 5.630E-05 641540 8.120E-05 631550 3.090E-05 0 0.
3  641550 3.080E-05 641560 2.000E-04 641570 2.700E-07 0 0.
3  641580 3.750E-05 651590 3.530E-06 641600 1.370E-06 0 0.
3  651600 7.020E-14 661600 3.300E-07 661610 3.040E-07 0 0.
3  661620 2.310E-07 661630 1.520E-07 661640 2.940E-08 0 0.
```

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File CO_RUN1.INP (continued)

```
3  671650 4.840E-08 671661 3.230E-10 681660 1.150E-08 0 0.
3  681670 1.650E-09 681680 2.190E-09 691690 1.050E-11 0 0.
3  681700 3.000E-15 691700 8.370E-17 701700 2.020E-12 0 0.
3  691710 6.500E-15 701710 7.310E-14 701720 2.240E-13 0 0.
0
```

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File CO_RUN1.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy co_run1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy co_run1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out co_run1.u6 >nul
copy tape13.out+tape11.out co_run1.u11 >nul
ren tape7.out co_run1.pch
ren tape15.out co_run1.dbg
ren tape16.out co_run1.vxs
ren tape50.out co_run1.ech
rem  cleanup files
del tape*.inp
del tape*.out
del co_run1.pch
del co_run1.dbg
del co_run1.vxs
del co_run1.ech
del co_run1.u11
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

Appendix B-5
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co_run1.ci
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	Ci/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
AR 39	3.338E-22	3.338E-22	3.338E-22	3.338E-22	3.338E-22	3.338E-22	3.338E-22	3.338E-22
AR 42	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22
K 42	0.000E+00	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22	3.355E-22
CA 45	1.290E-11	7.612E-31	7.612E-31	7.612E-31	1.441E-35	1.441E-35	1.441E-35	1.123E-39
V 50	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20
MN 54	3.096E-05	2.906E-15	3.834E-16	1.706E-16	6.053E-19	1.075E-19	0.000E+00	0.000E+00
FE 55	1.578E-02	7.914E-06	4.064E-06	3.113E-06	4.816E-07	2.826E-07	9.728E-08	1.965E-08
CO 60	1.516E-03	3.569E-05	2.569E-05	2.252E-05	8.969E-06	6.895E-06	4.074E-06	1.850E-06
NI 59	5.645E-06	5.644E-06	5.644E-06	5.644E-06	5.643E-06	5.643E-06	5.643E-06	5.643E-06
NI 63	8.207E-04	6.621E-04	6.497E-04	6.449E-04	6.117E-04	6.026E-04	5.847E-04	5.589E-04
ZN 65	2.069E-12	2.924E-25	2.924E-25	2.924E-25	2.041E-28	2.041E-28	2.041E-28	2.041E-28
LU176	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15
LU177	4.620E-11	2.805E-31	2.738E-31	2.738E-31	3.028E-36	0.000E+00	0.000E+00	0.000E+00
LU177M	2.009E-10	1.220E-30	1.220E-30	1.220E-30	1.320E-35	1.320E-35	1.320E-35	1.181E-39
HF182	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11
TA182	5.212E-07	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.778E-11	3.777E-11
RE187	8.530E-20	8.530E-20	8.530E-20	8.530E-20	8.530E-20	8.530E-20	8.530E-20	8.530E-20
TL206	0.000E+00	3.189E-24	3.189E-24	3.189E-24	3.189E-24	3.189E-24	3.189E-24	3.189E-24
TL207	1.943E-11	1.017E-10	1.067E-10	1.086E-10	1.205E-10	1.236E-10	1.295E-10	1.374E-10
TL208	3.034E-08	2.710E-08	2.652E-08	2.631E-08	2.453E-08	2.411E-08	2.317E-08	2.186E-08
TL209	1.186E-14	1.228E-14	1.232E-14	1.233E-14	1.245E-14	1.248E-14	1.255E-14	1.266E-14
PB209	5.500E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
PB210	1.940E-14	3.530E-12	4.232E-12	4.535E-12	7.007E-12	7.832E-12	9.646E-12	1.279E-11
PB211	1.944E-11	1.019E-10	1.070E-10	1.089E-10	1.208E-10	1.240E-10	1.298E-10	1.378E-10
PB212	8.465E-08	7.542E-08	7.380E-08	7.321E-08	6.826E-08	6.711E-08	6.450E-08	6.084E-08
PB214	3.673E-13	1.210E-11	1.377E-11	1.447E-11	1.986E-11	2.155E-11	2.515E-11	3.109E-11
BI208	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24
BI210M	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24
BI210	1.911E-14	3.530E-12	4.234E-12	4.537E-12	7.009E-12	7.836E-12	9.650E-12	1.280E-11
BI211	1.942E-11	1.019E-10	1.070E-10	1.089E-10	1.208E-10	1.240E-10	1.298E-10	1.378E-10
BI212	8.470E-08	7.542E-08	7.380E-08	7.321E-08	6.826E-08	6.711E-08	6.450E-08	6.084E-08
BI213	5.494E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
BI214	3.657E-13	1.210E-11	1.377E-11	1.447E-11	1.986E-11	2.155E-11	2.515E-11	3.109E-11
PO210	1.487E-14	3.530E-12	4.047E-12	4.320E-12	7.009E-12	7.546E-12	9.655E-12	1.280E-11
PO211	5.435E-14	2.854E-13	2.996E-13	3.048E-13	3.382E-13	3.471E-13	3.635E-13	3.859E-13
PO212	5.430E-08	4.832E-08	4.728E-08	4.691E-08	4.374E-08	4.300E-08	4.132E-08	3.898E-08
PO213	0.000E+00	5.561E-13	5.579E-13	5.586E-13	5.638E-13	5.654E-13	5.685E-13	5.733E-13
PO214	0.000E+00	1.210E-11	1.377E-11	1.447E-11	1.985E-11	2.155E-11	2.515E-11	3.108E-11
PO215	1.944E-11	1.019E-10	1.070E-10	1.089E-10	1.208E-10	1.240E-10	1.298E-10	1.378E-10
PO216	8.465E-08	7.542E-08	7.380E-08	7.321E-08	6.826E-08	6.711E-08	6.450E-08	6.084E-08
PO218	3.650E-13	1.210E-11	1.378E-11	1.448E-11	1.986E-11	2.155E-11	2.516E-11	3.109E-11
AT217	5.491E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
RN219	1.939E-11	1.019E-10	1.070E-10	1.089E-10	1.208E-10	1.240E-10	1.298E-10	1.378E-10
RN220	8.470E-08	7.542E-08	7.380E-08	7.321E-08	6.826E-08	6.711E-08	6.450E-08	6.084E-08
RN222	3.662E-13	1.210E-11	1.378E-11	1.448E-11	1.986E-11	2.155E-11	2.516E-11	3.109E-11
FR221	5.479E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
FR223	2.693E-13	1.407E-12	1.473E-12	1.499E-12	1.664E-12	1.707E-12	1.788E-12	1.899E-12
RA223	1.942E-11	1.019E-10	1.070E-10	1.089E-10	1.208E-10	1.240E-10	1.298E-10	1.378E-10
RA224	8.461E-08	7.542E-08	7.380E-08	7.321E-08	6.826E-08	6.711E-08	6.450E-08	6.084E-08
RA225	5.491E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
RA226	3.689E-13	1.210E-11	1.378E-11	1.448E-11	1.986E-11	2.155E-11	2.516E-11	3.109E-11
RA228	5.479E-16	1.801E-15	1.824E-15	1.833E-15	1.880E-15	1.891E-15	1.911E-15	1.937E-15
AC225	5.487E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
AC227	1.954E-11	1.019E-10	1.068E-10	1.086E-10	1.206E-10	1.237E-10	1.296E-10	1.376E-10
AC228	5.473E-16	1.801E-15	1.825E-15	1.833E-15	1.880E-15	1.891E-15	1.911E-15	1.937E-15
TH227	1.919E-11	1.005E-10	1.055E-10	1.074E-10	1.191E-10	1.223E-10	1.280E-10	1.359E-10
TH228	8.446E-08	7.542E-08	7.364E-08	7.294E-08	6.823E-08	6.694E-08	6.442E-08	6.080E-08
TH229	5.490E-13	5.684E-13	5.702E-13	5.709E-13	5.763E-13	5.778E-13	5.810E-13	5.859E-13
TH230	4.221E-10	1.508E-09	1.609E-09	1.649E-09	1.936E-09	2.018E-09	2.186E-09	2.440E-09
TH231	8.350E-07	2.682E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08
TH232	1.799E-15	1.899E-15	1.907E-15	1.911E-15	1.935E-15	1.942E-15	1.956E-15	1.977E-15
TH234	5.421E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09
PA231	1.484E-10	1.645E-10	1.659E-10	1.665E-10	1.704E-10	1.716E-10	1.738E-10	1.772E-10
PA233	3.488E-06	9.907E-09	1.010E-08	1.018E-08	1.073E-08	1.090E-08	1.123E-08	1.173E-08
PA234M	5.421E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09

Appendix B-5
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co_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	Ci/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
PA234	7.059E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12
U232	2.784E-10	7.341E-08	7.171E-08	7.103E-08	6.643E-08	6.517E-08	6.271E-08	5.919E-08
U233	5.568E-12	8.308E-12	8.422E-12	8.471E-12	8.791E-12	8.890E-12	9.084E-12	9.385E-12
U234	4.001E-06	4.451E-06	4.486E-06	4.500E-06	4.593E-06	4.619E-06	4.669E-06	4.742E-06
U235	2.681E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08	2.682E-08
U236	7.055E-08	7.061E-08	7.062E-08	7.062E-08	7.064E-08	7.064E-08	7.065E-08	7.066E-08
U237	8.051E-08	3.822E-08	3.388E-08	3.229E-08	2.305E-08	2.094E-08	1.727E-08	1.294E-08
U238	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09
U240	1.158E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15
NP235	4.210E-12	5.158E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	8.276E-14	8.275E-14	8.274E-14	8.274E-14	8.274E-14	8.274E-14	8.274E-14	8.273E-14
NP237	8.251E-09	9.907E-09	1.010E-08	1.018E-08	1.073E-08	1.090E-08	1.123E-08	1.173E-08
NP238	3.734E-10	1.268E-09	1.254E-09	1.248E-09	1.209E-09	1.198E-09	1.176E-09	1.144E-09
NP239	1.276E-10	1.975E-06	1.975E-06	1.974E-06	1.973E-06	1.973E-06	1.972E-06	1.971E-06
NP240M	1.165E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15
PU236	2.339E-06	2.289E-09	1.247E-09	9.776E-10	1.783E-10	1.096E-10	4.146E-11	9.646E-12
PU238	6.234E-03	4.977E-03	4.880E-03	4.842E-03	4.581E-03	4.509E-03	4.369E-03	4.167E-03
PU239	8.582E-05	8.575E-05	8.574E-05	8.574E-05	8.572E-05	8.572E-05	8.571E-05	8.569E-05
PU240	7.728E-05	7.706E-05	7.704E-05	7.703E-05	7.697E-05	7.696E-05	7.692E-05	7.688E-05
PU241	6.143E-03	1.558E-03	1.381E-03	1.316E-03	9.397E-04	8.535E-04	7.040E-04	5.274E-04
PU242	1.826E-07	1.826E-07	1.826E-07	1.826E-07	1.826E-07	1.826E-07	1.826E-07	1.826E-07
PU243	9.216E-18	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17
PU244	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15
PU246	0.000E+00	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25
AM241	8.961E-05	2.341E-04	2.391E-04	2.409E-04	2.506E-04	2.527E-04	2.561E-04	2.595E-04
AM242M	2.888E-07	2.536E-07	2.507E-07	2.496E-07	2.417E-07	2.395E-07	2.352E-07	2.288E-07
AM242	2.887E-07	2.523E-07	2.494E-07	2.483E-07	2.405E-07	2.383E-07	2.340E-07	2.277E-07
AM243	1.980E-06	1.975E-06	1.975E-06	1.974E-06	1.973E-06	1.973E-06	1.972E-06	1.971E-06
AM245	0.000E+00	5.030E-30	5.020E-30	5.020E-30	5.020E-30	5.020E-30	5.020E-30	5.020E-30
AM246	0.000E+00	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25
CM242	1.237E-06	2.087E-07	2.067E-07	2.057E-07	1.989E-07	1.974E-07	1.940E-07	1.883E-07
CM243	9.089E-08	4.545E-08	4.276E-08	4.174E-08	3.520E-08	3.353E-08	3.042E-08	2.629E-08
CM244	6.839E-06	2.298E-06	2.088E-06	2.010E-06	1.537E-06	1.424E-06	1.222E-06	9.711E-07
CM245	3.487E-10	3.479E-10	3.478E-10	3.478E-10	3.476E-10	3.475E-10	3.474E-10	3.472E-10
CM246	2.772E-11	2.760E-11	2.759E-11	2.759E-11	2.756E-11	2.755E-11	2.754E-11	2.751E-11
CM247	3.574E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17
CM248	4.338E-17	4.338E-17	4.338E-17	4.338E-17	4.338E-17	4.338E-17	4.338E-17	4.338E-17
CM250	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24
BK249	2.148E-15	3.468E-25	3.468E-25	3.468E-25	3.468E-25	3.468E-25	3.468E-25	3.468E-25
BK250	0.000E+00	1.646E-25	1.646E-25	1.646E-25	1.646E-25	1.646E-25	1.646E-25	1.646E-25
CF249	2.717E-16	2.619E-16	2.606E-16	2.601E-16	2.565E-16	2.555E-16	2.535E-16	2.505E-16
CF250	8.060E-16	1.780E-16	1.559E-16	1.479E-16	1.021E-16	9.179E-17	7.426E-17	5.404E-17
CF251	4.538E-18	4.439E-18	4.431E-18	4.427E-18	4.403E-18	4.397E-18	4.383E-18	4.363E-18
CF252	1.210E-16	6.773E-20	3.785E-20	3.785E-20	1.105E-20	1.105E-20	1.105E-20	7.363E-21
H 3	3.485E-03	7.038E-04	6.117E-04	5.783E-04	3.904E-04	3.489E-04	2.788E-04	1.991E-04
BE 10	3.353E-11	3.353E-11	3.353E-11	3.353E-11	3.353E-11	3.353E-11	3.353E-11	3.353E-11
C 14	9.721E-06	9.687E-06	9.684E-06	9.683E-06	9.675E-06	9.672E-06	9.668E-06	9.661E-06
SE 79	4.697E-06	4.696E-06	4.696E-06	4.696E-06	4.695E-06	4.695E-06	4.695E-06	4.695E-06
KR 81	6.227E-13	6.227E-13	6.227E-13	6.227E-13	6.227E-13	6.227E-13	6.227E-13	6.226E-13
KR 85	9.341E-02	1.479E-02	1.259E-02	1.180E-02	7.503E-03	6.593E-03	5.091E-03	3.454E-03
RB 87	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10
SR 90	9.429E-01	4.785E-01	4.508E-01	4.402E-01	3.727E-01	3.554E-01	3.231E-01	2.801E-01
Y 90	9.471E-01	4.786E-01	4.510E-01	4.404E-01	3.728E-01	3.554E-01	3.232E-01	2.802E-01
ZR 93	2.715E-05	2.715E-05	2.715E-05	2.715E-05	2.715E-05	2.715E-05	2.715E-05	2.715E-05
NB 93M	7.719E-06	2.156E-05	2.207E-05	2.225E-05	2.331E-05	2.355E-05	2.397E-05	2.445E-05
NB 94	4.855E-06	4.850E-06	4.849E-06	4.849E-06	4.848E-06	4.848E-06	4.847E-06	4.846E-06
TC 98	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11
TC 99	1.518E-04	1.518E-04	1.518E-04	1.518E-04	1.518E-04	1.518E-04	1.518E-04	1.518E-04
RH102	1.390E-06	1.542E-09	8.481E-10	6.678E-10	1.253E-10	7.770E-11	2.987E-11	7.119E-12
RU106	1.131E-01	3.486E-10	6.248E-11	3.141E-11	2.550E-13	6.446E-14	4.118E-15	6.652E-17
RH106	1.132E-01	3.486E-10	6.248E-11	3.141E-11	2.550E-13	6.446E-14	4.118E-15	6.652E-17
PD107	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07
AG108	5.005E-13	4.290E-13	4.232E-13	4.209E-13	4.051E-13	4.008E-13	3.921E-13	3.795E-13
AG108M	5.632E-12	4.821E-12	4.755E-12	4.730E-12	4.552E-12	4.503E-12	4.406E-12	4.264E-12
AG109M	2.824E-11	4.967E-18	1.277E-18	7.401E-19	1.615E-20	4.749E-21	4.749E-21	4.749E-21

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co_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	Ci/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
CD109	2.815E-11	4.967E-18	1.277E-18	7.358E-19	4.749E-21	4.749E-21	4.749E-21	4.749E-21
AG110	2.966E-07	8.545E-20	6.787E-21	2.389E-21	1.788E-24	1.788E-24	1.788E-24	1.788E-24
AG110M	2.229E-05	6.425E-18	4.947E-19	1.616E-19	1.344E-22	1.344E-22	1.344E-22	1.344E-22
CD113M	1.174E-04	3.030E-05	2.691E-05	2.566E-05	1.840E-05	1.673E-05	1.384E-05	1.040E-05
IN115	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17
SN119M	2.294E-03	3.728E-16	2.817E-17	9.984E-18	7.214E-21	7.214E-21	7.214E-21	7.214E-21
SN121M	5.690E-05	3.832E-05	3.701E-05	3.650E-05	3.313E-05	3.222E-05	3.048E-05	2.805E-05
TE123	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17
SB125	3.316E-02	2.650E-05	1.417E-05	1.104E-05	1.914E-06	1.161E-06	4.265E-07	9.503E-08
TE125M	3.910E-03	6.465E-06	3.458E-06	2.693E-06	4.671E-07	2.832E-07	1.041E-07	2.319E-08
SN126	4.172E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06
SB126	5.838E-07	5.840E-07	5.840E-07	5.840E-07	5.840E-07	5.839E-07	5.839E-07	5.839E-07
SB126M	4.172E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06	4.171E-06
I129	2.526E-07	2.526E-07	2.526E-07	2.526E-07	2.526E-07	2.526E-07	2.526E-07	2.526E-07
CS134	2.084E-01	1.439E-05	6.210E-06	4.437E-06	4.219E-07	2.154E-07	5.613E-08	7.469E-09
CS135	7.211E-06	7.211E-06	7.211E-06	7.211E-06	7.211E-06	7.211E-06	7.211E-06	7.211E-06
CS137	1.001E+00	5.180E-01	4.889E-01	4.778E-01	4.064E-01	3.881E-01	3.538E-01	3.080E-01
BA137M	9.471E-01	4.900E-01	4.625E-01	4.520E-01	3.845E-01	3.671E-01	3.347E-01	2.914E-01
LA138	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15
CE142	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10
CE144	1.040E+00	9.849E-12	1.063E-12	4.361E-13	8.533E-16	1.437E-16	4.094E-18	4.048E-20
PR144	1.043E+00	9.850E-12	1.063E-12	4.361E-13	8.551E-16	1.437E-16	4.094E-18	4.048E-20
PR144M	2.377E-05	1.182E-13	1.275E-14	5.234E-15	1.026E-17	1.725E-18	4.913E-20	4.857E-22
ND144	1.787E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14
PM146	9.220E-06	2.540E-07	1.854E-07	1.634E-07	6.763E-08	5.256E-08	3.175E-08	1.491E-08
SM146	2.121E-12	2.381E-12	2.383E-12	2.384E-12	2.387E-12	2.387E-12	2.388E-12	2.388E-12
PM147	5.564E-01	2.987E-04	1.543E-04	1.185E-04	1.864E-05	1.099E-05	3.818E-06	7.823E-07
SM147	6.048E-11	7.411E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11
SM148	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16
SM149	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17
EU150	1.848E-10	1.067E-10	1.017E-10	9.979E-11	8.721E-11	8.391E-11	7.769E-11	6.922E-11
SM151	3.474E-03	2.789E-03	2.736E-03	2.715E-03	2.573E-03	2.533E-03	2.456E-03	2.346E-03
EU152	1.109E-04	2.595E-05	2.284E-05	2.171E-05	1.519E-05	1.372E-05	1.119E-05	8.243E-06
GD152	1.726E-17	2.024E-17	2.035E-17	2.039E-17	2.061E-17	2.067E-17	2.075E-17	2.086E-17
GD153	9.137E-07	1.030E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EU154	1.520E-02	1.529E-03	1.250E-03	1.153E-03	6.559E-04	5.582E-04	4.044E-04	2.493E-04
EU155	1.438E-02	2.677E-04	1.888E-04	1.641E-04	6.170E-05	4.666E-05	2.668E-05	1.153E-05
HO166M	5.799E-10	5.704E-10	5.696E-10	5.693E-10	5.670E-10	5.663E-10	5.650E-10	5.631E-10
TM171	7.081E-12	2.408E-16	9.764E-17	6.806E-17	5.429E-18	2.645E-18	6.300E-19	6.613E-20

Appendix B-6
Page 1 of 6

Source Listing of Program ROUNDCO1

```
      PROGRAM ROUNDCO1

!-------- WRITTEN BY D.R. WENZEL

!            To format the data in input file CO_RUN1.CI
!            and write the output with 2 places of accuracy

      CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
      CHARACTER (LEN=10) :: BLANK, ZERO(7)
      CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(150)
      CHARACTER (LEN=24) :: NAME2, NUCLIDE2(150)
      CHARACTER (LEN=96) :: BUFFER2
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9)
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      EQUIVALENCE (BUFFER2, BUFFER3(1))
      EQUIVALENCE (ZERO(1), BUFFER3(27))

      REAL :: DATA(150,7), VALUE(7)

      DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='CO_RUN1.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='ROUNDCO1.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'ROUNDCO1.OUT  (Ci/L)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NAME2
 1000 FORMAT(A12, 5X, A24)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUCLIDE2(LAST) = NAME2
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,150
         DO K=1,7
            DATA(l,K) = 0.
         END DO

      END DO
```

Appendix B-6
Page 2 of 6

Source Listing of Program ROUNDCO1 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES
!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'1999Jul   2002Jan   ', &
              '2003Jan   2010Jan   2012Jan   2016Jan   2022Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,150
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7
                DATA(J,K) = VALUE(K)
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO

       GO TO 999
```

Appendix B-6
Page 3 of 6

Source Listing of Program ROUNDCO1 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')
!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDCO1
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

Appendix B-6
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ROUNDCO1.OUT (Ci/L)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.233E+01	yr	7.0E-04	6.1E-04	5.8E-04	3.9E-04	3.5E-04	2.8E-04	2.0E-04
Be-10	1.510E+06	yr	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11
C-14	5.730E+03	yr	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06
Fe-55	2.730E+00	yr	7.9E-06	4.1E-06	3.1E-06	4.8E-07	2.8E-07	9.7E-08	2.0E-08
Ni-59	7.600E+04	yr	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06
Co-60	5.271E+00	yr	3.6E-05	2.6E-05	2.3E-05	9.0E-06	6.9E-06	4.1E-06	1.8E-06
Ni-63	1.001E+02	yr	6.6E-04	6.5E-04	6.4E-04	6.1E-04	6.0E-04	5.8E-04	5.6E-04
Se-79	1.130E+06	yr	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
Rb-87	4.750E+10	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Sr-90	2.878E+01	yr	4.8E-01	4.5E-01	4.4E-01	3.7E-01	3.6E-01	3.2E-01	2.8E-01
Y-90	6.410E+01	h	4.8E-01	4.5E-01	4.4E-01	3.7E-01	3.6E-01	3.2E-01	2.8E-01
Zr-93	1.530E+06	yr	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05
Nb-93m	1.613E+01	yr	2.2E-05	2.2E-05	2.2E-05	2.3E-05	2.4E-05	2.4E-05	2.4E-05
Nb-94	2.030E+04	yr	4.9E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.8E-06
Tc-98	4.200E+06	yr	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11
Tc-99	2.111E+05	yr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Rh-102	2.070E+02	d	1.5E-09	8.5E-10	6.7E-10	1.3E-10	7.8E-11	3.0E-11	7.1E-12
Ru-106	3.736E+02	d	3.5E-10	6.2E-11	3.1E-11	2.5E-13	6.4E-14	4.1E-15	6.7E-17
Rh-106	2.980E+01	s	3.5E-10	6.2E-11	3.1E-11	2.5E-13	6.4E-14	4.1E-15	6.7E-17
Pd-107	6.500E+06	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Ag-108	2.370E+00	m	4.3E-13	4.2E-13	4.2E-13	4.1E-13	4.0E-13	3.9E-13	3.8E-13
Ag-108m	4.180E+02	yr	4.8E-12	4.8E-12	4.7E-12	4.6E-12	4.5E-12	4.4E-12	4.3E-12
Ag-109m	3.960E+01	s	5.0E-18	1.3E-18	7.4E-19	1.6E-20	4.7E-21	4.7E-21	4.7E-21
Cd-109	4.626E+02	d	5.0E-18	1.3E-18	7.4E-19	4.7E-21	4.7E-21	4.7E-21	4.7E-21
Ag-110	2.460E+01	s	8.5E-20	6.8E-21	2.4E-21	1.8E-24	1.8E-24	1.8E-24	1.8E-24
Ag-110m	2.498E+02	d	6.4E-18	4.9E-19	1.6E-19	1.3E-22	1.3E-22	1.3E-22	1.3E-22
Cd-113m	1.410E+01	yr	3.0E-05	2.7E-05	2.6E-05	1.8E-05	1.7E-05	1.4E-05	1.0E-05
In-115	4.410E+14	yr	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17
Sn-119m	2.931E+02	d	3.7E-16	2.8E-17	1.0E-17	7.2E-21	7.2E-21	7.2E-21	7.2E-21
Sn-121m	5.500E+01	yr	3.8E-05	3.7E-05	3.7E-05	3.3E-05	3.2E-05	3.0E-05	2.8E-05
Te-123	1.000E+13	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Sb-125	2.758E+00	yr	2.6E-05	1.4E-05	1.1E-05	1.9E-06	1.2E-06	4.3E-07	9.5E-08
Te-125m	5.740E+01	d	6.5E-06	3.5E-06	2.7E-06	4.7E-07	2.8E-07	1.0E-07	2.3E-08
Sn-126	1.000E+05	yr	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06
Sb-126	1.246E+01	d	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07
Sb-126m	1.915E+01	m	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.2E-06
I-129	1.570E+07	yr	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07
Cs-134	2.065E+00	yr	1.4E-05	6.2E-06	4.4E-06	4.2E-07	2.2E-07	5.6E-08	7.5E-09
Cs-135	2.300E+06	yr	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Cs-137	3.007E+01	yr	5.2E-01	4.9E-01	4.8E-01	4.1E-01	3.9E-01	3.5E-01	3.1E-01
Ba-137m	2.552E+00	m	4.9E-01	4.6E-01	4.5E-01	3.8E-01	3.7E-01	3.3E-01	2.9E-01
La-138	1.050E+11	yr	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15
Ce-142	5.000E+16	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Ce-144	2.849E+02	d	9.8E-12	1.1E-12	4.4E-13	8.5E-16	1.4E-16	4.1E-18	4.0E-20
Pr-144	1.728E+01	m	9.9E-12	1.1E-12	4.4E-13	8.6E-16	1.4E-16	4.1E-18	4.0E-20
Pr-144m	7.200E+00	m	1.2E-13	1.3E-14	5.2E-15	1.0E-17	1.7E-18	4.9E-20	4.9E-22
Nd-144	2.290E+15	yr	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14
Pm-146	5.530E+00	yr	2.5E-07	1.9E-07	1.6E-07	6.8E-08	5.3E-08	3.2E-08	1.5E-08
Sm-146	1.030E+08	yr	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12
Pm-147	2.623E+00	yr	3.0E-04	1.5E-04	1.2E-04	1.9E-05	1.1E-05	3.8E-06	7.8E-07
Sm-147	1.060E+11	yr	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11
Sm-148	7.000E+15	yr	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16
Sm-149	2.000E+15	yr	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17
Eu-150	3.690E+01	yr	1.1E-10	1.0E-10	1.0E-10	8.7E-11	8.4E-11	7.8E-11	6.9E-11
Sm-151	9.000E+01	yr	2.8E-03	2.7E-03	2.7E-03	2.6E-03	2.5E-03	2.5E-03	2.3E-03
Eu-152	1.354E+01	yr	2.6E-05	2.3E-05	2.2E-05	1.5E-05	1.4E-05	1.1E-05	8.2E-06
Gd-152	1.080E+14	yr	2.0E-17	2.0E-17	2.0E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17
Gd-153	2.416E+02	d	1.0E-19						
Eu-154	8.593E+00	yr	1.5E-03	1.2E-03	1.2E-03	6.6E-04	5.6E-04	4.0E-04	2.5E-04
Eu-155	4.761E+00	yr	2.7E-04	1.9E-04	1.6E-04	6.2E-05	4.7E-05	2.7E-05	1.2E-05
Ho-166m	1.200E+03	yr	5.7E-10	5.7E-10	5.7E-10	5.7E-10	5.7E-10	5.6E-10	5.6E-10
Tm-171	1.920E+00	yr	2.4E-16	9.8E-17	6.8E-17	5.4E-18	2.6E-18	6.3E-19	6.6E-20
Tl-207	4.770E+00	m	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Tl-208	3.053E+00	m	2.7E-08	2.7E-08	2.6E-08	2.5E-08	2.4E-08	2.3E-08	2.2E-08
Tl-209	2.200E+00	m	1.2E-14	1.2E-14	1.2E-14	1.2E-14	1.2E-14	1.3E-14	1.3E-14
Pb-209	3.253E+00	h	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13

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ROUNDCO1.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pb-210	2.230E+01	yr	3.5E-12	4.2E-12	4.5E-12	7.0E-12	7.8E-12	9.6E-12	1.3E-11
Pb-211	3.610E+01	m	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Pb-212	1.064E+01	h	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Pb-214	2.680E+01	m	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Bi-210m	3.040E+06	yr	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24
Bi-210	5.013E+00	d	3.5E-12	4.2E-12	4.5E-12	7.0E-12	7.8E-12	9.7E-12	1.3E-11
Bi-211	2.140E+00	m	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Bi-212	6.055E+01	m	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Bi-213	4.559E+01	m	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Bi-214	1.990E+01	m	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Po-210	1.384E+02	d	3.5E-12	4.0E-12	4.3E-12	7.0E-12	7.5E-12	9.7E-12	1.3E-11
Po-211	5.160E-01	s	2.9E-13	3.0E-13	3.0E-13	3.4E-13	3.5E-13	3.6E-13	3.9E-13
Po-212	2.990E-07	s	4.8E-08	4.7E-08	4.7E-08	4.4E-08	4.3E-08	4.1E-08	3.9E-08
Po-213	4.200E-06	s	5.6E-13	5.6E-13	5.6E-13	5.6E-13	5.7E-13	5.7E-13	5.7E-13
Po-214	1.643E-04	s	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Po-215	1.781E-03	s	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Po-216	1.450E-01	s	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Po-218	3.100E+00	m	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
At-217	3.230E-02	s	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Rn-219	3.960E+00	s	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Rn-220	5.560E+01	s	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Rn-222	3.823E+00	d	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Fr-221	4.900E+00	m	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Fr-223	2.180E+00	m	1.4E-12	1.5E-12	1.5E-12	1.7E-12	1.7E-12	1.8E-12	1.9E-12
Ra-223	1.144E+01	d	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Ra-224	3.660E+00	d	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.5E-08	6.1E-08
Ra-225	1.490E+01	d	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Ra-226	1.600E+03	yr	1.2E-11	1.4E-11	1.4E-11	2.0E-11	2.2E-11	2.5E-11	3.1E-11
Ra-228	5.750E+00	yr	1.8E-15	1.8E-15	1.8E-15	1.9E-15	1.9E-15	1.9E-15	1.9E-15
Ac-225	1.000E+01	d	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Ac-227	2.177E+01	yr	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Ac-228	6.150E+00	h	1.8E-15	1.8E-15	1.8E-15	1.9E-15	1.9E-15	1.9E-15	1.9E-15
Th-227	1.872E+01	d	1.0E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.4E-10
Th-228	1.912E+00	yr	7.5E-08	7.4E-08	7.3E-08	6.8E-08	6.7E-08	6.4E-08	6.1E-08
Th-229	7.340E+03	yr	5.7E-13	5.7E-13	5.7E-13	5.8E-13	5.8E-13	5.8E-13	5.9E-13
Th-230	7.538E+04	yr	1.5E-09	1.6E-09	1.6E-09	1.9E-09	2.0E-09	2.2E-09	2.4E-09
Th-231	2.552E+01	h	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08
Th-232	1.405E+10	yr	1.9E-15	1.9E-15	1.9E-15	1.9E-15	1.9E-15	2.0E-15	2.0E-15
Th-234	2.410E+01	d	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-231	3.276E+04	yr	1.6E-10	1.7E-10	1.7E-10	1.7E-10	1.7E-10	1.7E-10	1.8E-10
Pa-233	2.697E+01	d	9.9E-09	1.0E-08	1.0E-08	1.1E-08	1.1E-08	1.1E-08	1.2E-08
Pa-234m	1.170E+00	m	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-234	6.700E+00	h	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
U-232	6.890E+01	yr	7.3E-08	7.2E-08	7.1E-08	6.6E-08	6.5E-08	6.3E-08	5.9E-08
U-233	1.592E+05	yr	8.3E-12	8.4E-12	8.5E-12	8.8E-12	8.9E-12	9.1E-12	9.4E-12
U-234	2.455E+05	yr	4.5E-06	4.5E-06	4.5E-06	4.6E-06	4.6E-06	4.7E-06	4.7E-06
U-235	7.038E+08	yr	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08
U-236	2.342E+07	yr	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08
U-237	6.750E+00	d	3.8E-08	3.4E-08	3.2E-08	2.3E-08	2.1E-08	1.7E-08	1.3E-08
U-238	4.470E+09	yr	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
U-240	1.410E+01	h	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Np-235	3.961E+02	d	5.2E-20						
Np-236	1.540E+05	yr	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.3E-14
Np-237	2.144E+06	yr	9.9E-09	1.0E-08	1.0E-08	1.1E-08	1.1E-08	1.1E-08	1.2E-08
Np-238	2.117E+00	d	1.3E-09	1.3E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.1E-09
Np-239	2.356E+00	d	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06
Np-240m	7.220E+00	m	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Pu-236	2.858E+00	yr	2.3E-09	1.2E-09	9.8E-10	1.8E-10	1.1E-10	4.1E-11	9.6E-12
Pu-238	8.770E+01	yr	5.0E-03	4.9E-03	4.8E-03	4.6E-03	4.5E-03	4.4E-03	4.2E-03
Pu-239	2.411E+04	yr	8.6E-05	8.6E-05	8.6E-05	8.6E-05	8.6E-05	8.6E-05	8.6E-05
Pu-240	6.563E+03	yr	7.7E-05	7.7E-05	7.7E-05	7.7E-05	7.7E-05	7.7E-05	7.7E-05
Pu-241	1.435E+01	yr	1.6E-03	1.4E-03	1.3E-03	9.4E-04	8.5E-04	7.0E-04	5.3E-04
Pu-242	3.733E+05	yr	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Pu-243	4.956E+00	h	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Pu-244	8.080E+07	yr	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Am-241	4.322E+02	yr	2.3E-04	2.4E-04	2.4E-04	2.5E-04	2.5E-04	2.6E-04	2.6E-04

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ROUNDCO1.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Am-242m	1.410E+02	yr	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07
Am-242	1.602E+01	h	2.5E-07	2.5E-07	2.5E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07
Am-243	7.370E+03	yr	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06
Cm-242	1.628E+02	d	2.1E-07	2.1E-07	2.1E-07	2.0E-07	2.0E-07	1.9E-07	1.9E-07
Cm-243	2.910E+01	yr	4.5E-08	4.3E-08	4.2E-08	3.5E-08	3.4E-08	3.0E-08	2.6E-08
Cm-244	1.810E+01	yr	2.3E-06	2.1E-06	2.0E-06	1.5E-06	1.4E-06	1.2E-06	9.7E-07
Cm-245	8.500E+03	yr	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Cm-246	4.730E+03	yr	2.8E-11	2.8E-11	2.8E-11	2.8E-11	2.8E-11	2.8E-11	2.8E-11
Cm-247	1.560E+07	yr	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Cm-248	3.400E+05	yr	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17
Cf-249	3.510E+02	yr	2.6E-16	2.6E-16	2.6E-16	2.6E-16	2.6E-16	2.5E-16	2.5E-16
Cf-250	1.308E+01	yr	1.8E-16	1.6E-16	1.5E-16	1.0E-16	9.2E-17	7.4E-17	5.4E-17
Cf-251	8.980E+02	yr	4.4E-18	4.4E-18	4.4E-18	4.4E-18	4.4E-18	4.4E-18	4.4E-18
Cf-252	2.645E+00	yr	6.8E-20	3.8E-20	3.8E-20	1.1E-20	1.1E-20	1.1E-20	7.4E-21
Ca 45	1.626E+02	d	7.6E-31	7.6E-31	7.6E-31	1.4E-35	1.4E-35	1.4E-35	1.1E-39
V 50	1.400E+17	yr	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20
Mn 54	3.123E+02	d	2.9E-15	3.8E-16	1.7E-16	6.1E-19	1.1E-19		
Fe 55	2.730E+00	yr	7.9E-06	4.1E-06	3.1E-06	4.8E-07	2.8E-07	9.7E-08	2.0E-08
Zn 65	2.443E+02	d	2.9E-25	2.9E-25	2.9E-25	2.0E-28	2.0E-28	2.0E-28	2.0E-28
Lu176	3.780E+10	yr	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15
Lu177	6.734E+00	d	2.8E-31	2.7E-31	2.7E-31	3.0E-36			
Lu177m	1.604E+02	d	1.2E-30	1.2E-30	1.2E-30	1.3E-35	1.3E-35	1.3E-35	1.2E-39
Hf182	9.000E+06	yr	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Ta182	1.144E+02	d	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Re187	4.350E+10	yr	8.5E-20	8.5E-20	8.5E-20	8.5E-20	8.5E-20	8.5E-20	8.5E-20

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co_run1.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	g/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
HE 3	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14
B 10	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16
B 11	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07
C 12	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04
C 13	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06
N 14	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04
N 15	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06
O 16	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02
O 17	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05
O 18	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05
F 19	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11
NE 20	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16
NE 21	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15
NE 22	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18
NA 23	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22
MG 24	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09
MG 25	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13
MG 26	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16
AL 27	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04
SI 28	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07
SI 29	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11
SI 30	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15
P 31	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19
S 34	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25
CL 37	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19
AR 38	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23
AR 39	9.790E-24	9.790E-24	9.790E-24	9.790E-24	9.790E-24	9.790E-24	9.790E-24	9.790E-24
AR 40	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16
AR 42	1.300E-24	1.300E-24	1.300E-24	1.300E-24	1.300E-24	1.300E-24	1.300E-24	1.300E-24
K 41	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17
K 42	0.000E+00	5.555E-29	5.555E-29	5.555E-29	5.555E-29	5.555E-29	5.555E-29	5.555E-29
CA 42	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19
CA 43	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11
CA 44	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10
CA 45	7.240E-16	4.273E-35	4.273E-35	4.273E-35	8.089E-40	8.089E-40	8.089E-40	6.306E-44
CA 46	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11
SC 45	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11
TI 46	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05
TI 47	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05
TI 48	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04
TI 49	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05
TI 50	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05
V 50	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07
V 51	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05
CR 50	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03
CR 52	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02
CR 53	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03
CR 54	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03
MN 54	4.000E-09	3.754E-19	4.953E-20	2.203E-20	7.820E-23	1.388E-23	0.000E+00	0.000E+00
MN 55	1.030E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05
FE 54	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03
FE 55	6.310E-06	3.164E-09	1.625E-09	1.245E-09	1.926E-10	1.130E-10	3.890E-11	7.856E-12
FE 56	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02
FE 57	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03
FE 58	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04
CO 59	1.230E-06	1.248E-06	1.250E-06	1.251E-06	1.255E-06	1.256E-06	1.259E-06	1.263E-06
CO 60	1.340E-06	3.155E-08	2.271E-08	1.991E-08	7.930E-09	6.095E-09	3.602E-09	1.636E-09
NI 58	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02
NI 59	7.450E-05	7.448E-05	7.448E-05	7.448E-05	7.447E-05	7.447E-05	7.447E-05	7.447E-05
NI 60	5.340E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03
NI 61	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04
NI 62	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04
NI 63	1.330E-05	1.073E-05	1.053E-05	1.045E-05	9.914E-06	9.766E-06	9.476E-06	9.057E-06
NI 64	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04
CU 63	7.450E-07	3.315E-06	3.515E-06	3.594E-06	4.131E-06	4.279E-06	4.569E-06	4.988E-06
CU 65	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07

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co_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	g/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
ZN 64	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10
ZN 65	2.510E-16	3.548E-29	3.548E-29	3.548E-29	2.477E-32	2.477E-32	2.477E-32	2.477E-32
MO 94	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09
RU 98	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20
CD114	0.000E+00	9.035E-20	9.035E-20	9.035E-20	9.035E-20	9.035E-20	9.035E-20	9.035E-20
IN113	0.000E+00	8.325E-11	8.325E-11	8.325E-11	8.325E-11	8.325E-11	8.325E-11	8.325E-11
SN112	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03
SN114	0.000E+00	1.110E-18	1.110E-18	1.110E-18	1.110E-18	1.110E-18	1.110E-18	1.110E-18
YB173	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13
YB174	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15
LU175	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06
LU176	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07
LU177	4.200E-16	2.550E-36	2.489E-36	2.489E-36	2.753E-41	0.000E+00	0.000E+00	0.000E+00
LU177M	4.220E-14	2.561E-34	2.561E-34	2.561E-34	2.773E-39	2.773E-39	2.773E-39	2.480E-43
HF174	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06
HF176	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04
HF177	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04
HF178	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03
HF179	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03
HF180	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03
HF182	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07
TA181	3.930E-04	3.930E-04	3.930E-04	3.930E-04	3.930E-04	3.930E-04	3.930E-04	3.930E-04
TA182	8.350E-11	6.052E-15	6.052E-15	6.052E-15	6.052E-15	6.052E-15	6.053E-15	6.052E-15
W182	5.370E-05	5.370E-05	5.370E-05	5.370E-05	5.370E-05	5.370E-05	5.370E-05	5.370E-05
W183	5.580E-05	5.580E-05	5.580E-05	5.580E-05	5.580E-05	5.580E-05	5.580E-05	5.580E-05
W184	3.370E-06	3.370E-06	3.370E-06	3.370E-06	3.370E-06	3.370E-06	3.370E-06	3.370E-06
W186	5.430E-11	5.430E-11	5.430E-11	5.430E-11	5.430E-11	5.430E-11	5.430E-11	5.430E-11
RE185	6.600E-09	6.600E-09	6.600E-09	6.600E-09	6.600E-09	6.600E-09	6.600E-09	6.600E-09
RE187	2.230E-12	2.230E-12	2.230E-12	2.230E-12	2.230E-12	2.230E-12	2.230E-12	2.230E-12
OS186	8.140E-10	8.140E-10	8.140E-10	8.140E-10	8.140E-10	8.140E-10	8.140E-10	8.140E-10
OS187	0.000E+00	8.811E-22	9.583E-22	9.893E-22	1.206E-21	1.267E-21	1.391E-21	1.577E-21
OS188	7.160E-14	7.160E-14	7.160E-14	7.160E-14	7.160E-14	7.160E-14	7.160E-14	7.160E-14
OS189	4.980E-16	4.980E-16	4.980E-16	4.980E-16	4.980E-16	4.980E-16	4.980E-16	4.980E-16
OS190	1.760E-17	1.760E-17	1.760E-17	1.760E-17	1.760E-17	1.760E-17	1.760E-17	1.760E-17
HE 4	1.400E-06	2.712E-06	2.815E-06	2.856E-06	3.134E-06	3.211E-06	3.362E-06	3.580E-06
TL206	0.000E+00	1.463E-32	1.463E-32	1.463E-32	1.463E-32	1.463E-32	1.463E-32	1.463E-32
TL207	1.020E-19	5.336E-19	5.600E-19	5.699E-19	6.323E-19	6.489E-19	6.796E-19	7.214E-19
TL208	1.030E-16	9.199E-17	9.001E-17	8.930E-17	8.326E-17	8.186E-17	7.867E-17	7.421E-17
TL209	2.900E-23	3.001E-23	3.011E-23	3.014E-23	3.043E-23	3.051E-23	3.068E-23	3.093E-23
PB206	1.400E-17	1.309E-14	1.684E-14	1.854E-14	3.433E-14	4.014E-14	5.389E-14	8.052E-14
PB207	2.660E-14	7.766E-13	8.813E-13	9.245E-13	1.247E-12	1.345E-12	1.549E-12	1.871E-12
PB208	1.070E-10	1.088E-09	1.163E-09	1.193E-09	1.392E-09	1.447E-09	1.553E-09	1.705E-09
PB209	1.210E-19	1.250E-19	1.254E-19	1.256E-19	1.268E-19	1.271E-19	1.278E-19	1.289E-19
PB210	2.540E-16	4.621E-14	5.542E-14	5.937E-14	9.175E-14	1.025E-13	1.263E-13	1.675E-13
PB211	7.870E-19	4.128E-18	4.332E-18	4.409E-18	4.892E-18	5.020E-18	5.257E-18	5.581E-18
PB212	6.090E-14	5.426E-14	5.309E-14	5.267E-14	4.911E-14	4.828E-14	4.640E-14	4.377E-14
PB214	1.120E-20	3.689E-19	4.200E-19	4.413E-19	6.054E-19	6.570E-19	7.668E-19	9.478E-19
BI208	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22
BI209	1.600E-15	8.047E-15	8.623E-15	8.854E-15	1.048E-14	1.095E-14	1.189E-14	1.330E-14
BI210M	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21
BI210	1.540E-19	2.844E-17	3.411E-17	3.655E-17	5.647E-17	6.313E-17	7.775E-17	1.031E-16
BI211	4.640E-20	2.436E-19	2.556E-19	2.601E-19	2.886E-19	2.962E-19	3.102E-19	3.293E-19
BI212	5.780E-15	5.147E-15	5.036E-15	4.996E-15	4.658E-15	4.580E-15	4.401E-15	4.152E-15
BI213	2.840E-20	2.938E-20	2.947E-20	2.951E-20	2.979E-20	2.987E-20	3.003E-20	3.029E-20
BI214	8.280E-21	2.740E-19	3.118E-19	3.277E-19	4.495E-19	4.879E-19	5.694E-19	7.038E-19
PO210	3.310E-18	7.854E-16	9.006E-16	9.614E-16	1.560E-15	1.679E-15	2.149E-15	2.848E-15
PO211	5.690E-25	2.988E-24	3.136E-24	3.191E-24	3.541E-24	3.634E-24	3.806E-24	4.040E-24
PO212	3.060E-25	2.723E-25	2.664E-25	2.643E-25	2.465E-25	2.423E-25	2.329E-25	2.197E-25
PO213	0.000E+00	4.408E-29	4.422E-29	4.428E-29	4.469E-29	4.481E-29	4.506E-29	4.544E-29
PO214	0.000E+00	3.769E-26	4.290E-26	4.508E-26	6.184E-26	6.712E-26	7.833E-26	9.682E-26
PO215	6.590E-25	3.457E-24	3.628E-24	3.692E-24	4.096E-24	4.204E-24	4.402E-24	4.673E-24
PO216	2.430E-19	2.165E-19	2.119E-19	2.102E-19	1.960E-19	1.927E-19	1.852E-19	1.747E-19
PO218	1.290E-21	4.278E-20	4.870E-20	5.117E-20	7.019E-20	7.619E-20	8.892E-20	1.099E-19
AT217	3.410E-25	3.530E-25	3.541E-25	3.546E-25	3.579E-25	3.588E-25	3.608E-25	3.639E-25
RN219	1.490E-21	7.833E-21	8.221E-21	8.366E-21	9.282E-21	9.526E-21	9.976E-21	1.059E-20

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co_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	g/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
RN220	9.180E-17	8.174E-17	7.998E-17	7.935E-17	7.398E-17	7.274E-17	6.990E-17	6.594E-17
RN222	2.380E-18	7.866E-17	8.954E-17	9.408E-17	1.291E-16	1.401E-16	1.635E-16	2.021E-16
FR221	3.090E-21	3.205E-21	3.216E-21	3.220E-21	3.250E-21	3.259E-21	3.277E-21	3.304E-21
FR223	6.960E-21	3.635E-20	3.808E-20	3.874E-20	4.301E-20	4.412E-20	4.621E-20	4.906E-20
RA223	3.790E-16	1.990E-15	2.088E-15	2.125E-15	2.358E-15	2.420E-15	2.534E-15	2.690E-15
RA224	5.310E-13	4.733E-13	4.631E-13	4.594E-13	4.284E-13	4.212E-13	4.048E-13	3.818E-13
RA225	1.400E-17	1.449E-17	1.454E-17	1.456E-17	1.469E-17	1.473E-17	1.481E-17	1.494E-17
RA226	3.730E-13	1.224E-11	1.393E-11	1.464E-11	2.008E-11	2.179E-11	2.543E-11	3.144E-11
RA228	2.340E-18	7.693E-18	7.792E-18	7.828E-18	8.030E-18	8.077E-18	8.162E-18	8.274E-18
AC225	9.450E-18	9.789E-18	9.821E-18	9.834E-18	9.926E-18	9.953E-18	1.001E-17	1.009E-17
AC227	2.700E-13	1.409E-12	1.475E-12	1.501E-12	1.667E-12	1.710E-12	1.791E-12	1.901E-12
AC228	2.440E-22	8.030E-22	8.134E-22	8.172E-22	8.382E-22	8.431E-22	8.520E-22	8.637E-22
TH227	6.240E-16	3.270E-15	3.432E-15	3.492E-15	3.875E-15	3.976E-15	4.164E-15	4.420E-15
TH228	1.030E-10	9.198E-11	8.981E-11	8.896E-11	8.321E-11	8.164E-11	7.856E-11	7.415E-11
TH229	2.580E-12	2.671E-12	2.679E-12	2.683E-12	2.708E-12	2.715E-12	2.730E-12	2.753E-12
TH230	2.090E-08	7.468E-08	7.966E-08	8.166E-08	9.585E-08	9.995E-08	1.082E-07	1.208E-07
TH231	1.570E-12	5.042E-14	5.042E-14	5.042E-14	5.042E-14	5.043E-14	5.043E-14	5.043E-14
TH232	1.640E-08	1.730E-08	1.738E-08	1.742E-08	1.764E-08	1.770E-08	1.783E-08	1.802E-08
TH234	2.340E-13	5.705E-14	5.705E-14	5.706E-14	5.705E-14	5.705E-14	5.705E-14	5.705E-14
PA231	3.140E-09	3.482E-09	3.512E-09	3.524E-09	3.607E-09	3.631E-09	3.679E-09	3.750E-09
PA233	1.680E-10	4.772E-13	4.864E-13	4.902E-13	5.170E-13	5.249E-13	5.407E-13	5.649E-13
PA234M	7.890E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18
PA234	3.530E-18	8.593E-19	8.593E-19	8.593E-19	8.593E-19	8.593E-19	8.593E-19	8.593E-19
U232	1.300E-11	3.429E-09	3.349E-09	3.317E-09	3.102E-09	3.043E-09	2.929E-09	2.764E-09
U233	5.750E-10	8.579E-10	8.697E-10	8.748E-10	9.078E-10	9.180E-10	9.380E-10	9.691E-10
U234	6.400E-04	7.121E-04	7.177E-04	7.199E-04	7.348E-04	7.389E-04	7.470E-04	7.586E-04
U235	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02
U236	1.090E-03	1.091E-03	1.091E-03	1.091E-03	1.091E-03	1.091E-03	1.092E-03	1.092E-03
U237	9.860E-13	4.680E-13	4.149E-13	3.954E-13	2.823E-13	2.564E-13	2.115E-13	1.584E-13
U238	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03
U240	1.250E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21
NP235	3.000E-15	3.675E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	6.280E-12	6.279E-12	6.279E-12	6.279E-12	6.279E-12	6.278E-12	6.278E-12	6.278E-12
NP237	1.170E-05	1.405E-05	1.432E-05	1.443E-05	1.522E-05	1.545E-05	1.592E-05	1.663E-05
NP238	1.440E-15	4.890E-15	4.835E-15	4.813E-15	4.661E-15	4.619E-15	4.536E-15	4.413E-15
NP239	5.500E-16	8.511E-12	8.509E-12	8.508E-12	8.502E-12	8.501E-12	8.498E-12	8.493E-12
NP240M	1.100E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23
PU236	4.400E-09	4.307E-12	2.345E-12	1.839E-12	3.354E-13	2.062E-13	7.799E-14	1.815E-14
PU238	3.640E-04	2.906E-04	2.849E-04	2.827E-04	2.675E-04	2.633E-04	2.551E-04	2.433E-04
PU239	1.380E-03	1.379E-03	1.379E-03	1.379E-03	1.378E-03	1.378E-03	1.378E-03	1.378E-03
PU240	3.390E-04	3.380E-04	3.379E-04	3.379E-04	3.377E-04	3.376E-04	3.375E-04	3.372E-04
PU241	5.960E-05	1.512E-05	1.340E-05	1.277E-05	9.118E-06	8.281E-06	6.831E-06	5.117E-06
PU242	4.780E-05	4.780E-05	4.780E-05	4.780E-05	4.780E-05	4.780E-05	4.780E-05	4.780E-05
PU243	3.540E-24	1.373E-23	1.373E-23	1.373E-23	1.373E-23	1.373E-23	1.373E-23	1.373E-23
PU244	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10
PU246	0.000E+00	6.006E-30	6.006E-30	6.006E-30	6.006E-30	6.006E-30	6.006E-30	6.006E-30
AM241	2.610E-05	6.820E-05	6.963E-05	7.015E-05	7.300E-05	7.360E-05	7.458E-05	7.557E-05
AM242M	2.970E-08	2.608E-08	2.578E-08	2.567E-08	2.486E-08	2.464E-08	2.419E-08	2.354E-08
AM242	3.570E-13	3.120E-13	3.084E-13	3.070E-13	2.974E-13	2.947E-13	2.894E-13	2.816E-13
AM243	9.930E-06	9.903E-06	9.901E-06	9.900E-06	9.894E-06	9.892E-06	9.888E-06	9.883E-06
AM245	0.000E+00	8.137E-37	8.120E-37	8.120E-37	8.120E-37	8.120E-37	8.120E-37	8.120E-37
AM246	0.000E+00	9.610E-33	9.610E-33	9.610E-33	9.610E-33	9.610E-33	9.610E-33	9.610E-33
CM242	3.740E-10	6.308E-11	6.249E-11	6.218E-11	6.013E-11	5.969E-11	5.864E-11	5.694E-11
CM243	1.760E-09	8.800E-10	8.281E-10	8.082E-10	6.817E-10	6.493E-10	5.891E-10	5.091E-10
CM244	8.450E-08	2.839E-08	2.580E-08	2.483E-08	1.899E-08	1.759E-08	1.510E-08	1.200E-08
CM245	2.030E-09	2.025E-09	2.025E-09	2.025E-09	2.024E-09	2.023E-09	2.023E-09	2.022E-09
CM246	9.020E-11	8.982E-11	8.979E-11	8.978E-11	8.969E-11	8.966E-11	8.961E-11	8.953E-11
CM247	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13
CM248	1.020E-14	1.020E-14	1.020E-14	1.020E-14	1.020E-14	1.020E-14	1.020E-14	1.020E-14
CM250	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23
BK249	1.310E-18	2.116E-28	2.116E-28	2.116E-28	2.116E-28	2.116E-28	2.116E-28	2.116E-28
BK250	0.000E+00	4.229E-32	4.229E-32	4.229E-32	4.229E-32	4.229E-32	4.229E-32	4.229E-32
CF249	6.630E-17	6.391E-17	6.359E-17	6.347E-17	6.259E-17	6.235E-17	6.186E-17	6.113E-17
CF250	7.370E-18	1.628E-18	1.426E-18	1.352E-18	9.332E-19	8.393E-19	6.790E-19	4.941E-19
CF251	2.860E-18	2.798E-18	2.792E-18	2.790E-18	2.775E-18	2.771E-18	2.762E-18	2.750E-18
CF252	2.250E-19	1.259E-22	7.036E-23	7.036E-23	2.054E-23	2.054E-23	2.054E-23	1.369E-23

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co_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	g/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
SF250	0.000E+00	2.866E-13	3.071E-13	3.152E-13	3.691E-13	3.839E-13	4.126E-13	4.539E-13
H 3	3.610E-07	7.291E-08	6.336E-08	5.990E-08	4.044E-08	3.614E-08	2.888E-08	2.062E-08
LI 6	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09
LI 7	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10
BE 9	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09
BE 10	1.500E-09	1.500E-09	1.500E-09	1.500E-09	1.500E-09	1.500E-09	1.500E-09	1.500E-09
C 14	2.180E-06	2.172E-06	2.172E-06	2.172E-06	2.170E-06	2.169E-06	2.168E-06	2.167E-06
ZN 66	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10
ZN 67	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13
ZN 68	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09
GA 69	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12
ZN 70	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08
GE 70	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14
GA 71	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12
GE 72	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08
GE 73	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07
GE 74	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07
AS 75	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06
GE 76	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06
SE 76	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08
SE 77	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05
SE 78	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05
SE 79	6.740E-05	6.738E-05	6.738E-05	6.738E-05	6.737E-05	6.737E-05	6.737E-05	6.736E-05
BR 79	5.010E-09	2.550E-08	2.730E-08	2.802E-08	3.305E-08	3.449E-08	3.737E-08	4.168E-08
SE 80	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04
KR 80	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10
BR 81	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04
KR 81	2.960E-11	2.960E-11	2.960E-11	2.960E-11	2.960E-11	2.960E-11	2.960E-11	2.960E-11
SE 82	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04
KR 82	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06
KR 83	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04
KR 84	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03
KR 85	2.380E-04	3.769E-05	3.207E-05	3.006E-05	1.912E-05	1.680E-05	1.297E-05	8.799E-06
RB 85	1.510E-03	1.710E-03	1.716E-03	1.718E-03	1.729E-03	1.731E-03	1.735E-03	1.739E-03
KR 86	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03
SR 86	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06
RB 87	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03
SR 87	3.810E-08	3.810E-08	3.810E-08	3.810E-08	3.810E-08	3.810E-08	3.810E-08	3.810E-08
SR 88	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03
Y 89	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03
SR 90	6.910E-03	3.506E-03	3.304E-03	3.226E-03	2.731E-03	2.604E-03	2.368E-03	2.053E-03
Y 90	1.740E-06	8.793E-07	8.285E-07	8.090E-07	6.849E-07	6.530E-07	5.937E-07	5.147E-07
ZR 90	2.070E+00	2.073E+00	2.074E+00	2.074E+00	2.074E+00	2.074E+00	2.075E+00	2.075E+00
ZR 91	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01
ZR 92	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01
ZR 93	1.080E-02	1.080E-02	1.080E-02	1.080E-02	1.080E-02	1.080E-02	1.080E-02	1.080E-02
NB 93	4.070E-03	4.070E-03	4.070E-03	4.070E-03	4.070E-03	4.070E-03	4.070E-03	4.070E-03
NB 93M	2.730E-08	7.625E-08	7.804E-08	7.870E-08	8.245E-08	8.330E-08	8.476E-08	8.646E-08
ZR 94	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01
NB 94	2.590E-05	2.587E-05	2.587E-05	2.587E-05	2.587E-05	2.586E-05	2.586E-05	2.585E-05
MO 95	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03
ZR 96	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01
MO 96	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04
MO 97	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03
MO 98	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03
TC 98	3.300E-08	3.300E-08	3.300E-08	3.300E-08	3.300E-08	3.300E-08	3.300E-08	3.300E-08
TC 99	8.950E-03	8.949E-03	8.949E-03	8.949E-03	8.949E-03	8.949E-03	8.949E-03	8.949E-03
RU 99	2.040E-07	1.034E-06	1.107E-06	1.136E-06	1.340E-06	1.398E-06	1.514E-06	1.689E-06
MO100	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02
RU100	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04
RU101	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03
RU102	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03
RH102	1.150E-09	1.275E-12	7.015E-13	5.523E-13	1.037E-13	6.427E-14	2.470E-14	5.888E-15
RH103	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03
RU104	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03

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co_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	g/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
PD104	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03
PD105	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03
RU106	3.380E-05	1.041E-13	1.867E-14	9.384E-15	7.619E-17	1.926E-17	1.230E-18	1.987E-20
RH106	3.180E-11	9.789E-20	1.754E-20	8.821E-21	7.162E-23	1.810E-23	1.157E-24	1.868E-26
PD106	8.230E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04
PD107	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04
AG107	2.440E-10	1.248E-09	1.336E-09	1.371E-09	1.617E-09	1.688E-09	1.829E-09	2.040E-09
PD108	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04
AG108	6.810E-22	5.838E-22	5.759E-22	5.728E-22	5.513E-22	5.453E-22	5.335E-22	5.163E-22
AG108M	2.160E-13	1.849E-13	1.824E-13	1.814E-13	1.746E-13	1.727E-13	1.690E-13	1.635E-13
CD108	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10
AG109	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05
AG109M	1.080E-20	1.900E-27	4.884E-28	2.830E-28	6.175E-30	1.816E-30	1.816E-30	1.816E-30
CD109	1.090E-14	1.923E-21	4.945E-22	2.849E-22	1.839E-24	1.839E-24	1.839E-24	1.839E-24
PD110	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05
AG110	7.110E-17	2.049E-29	1.627E-30	5.727E-31	4.287E-34	4.287E-34	4.287E-34	4.287E-34
AG110M	4.690E-09	1.352E-21	1.041E-22	3.401E-23	2.829E-26	2.829E-26	2.829E-26	2.829E-26
CD110	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05
CD111	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05
CD112	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05
CD113	4.660E-07	4.664E-07	4.664E-07	4.664E-07	4.665E-07	4.665E-07	4.665E-07	4.665E-07
CD113M	5.410E-07	1.397E-07	1.240E-07	1.183E-07	8.482E-08	7.713E-08	6.378E-08	4.796E-08
IN113	6.330E-05	6.370E-05	6.372E-05	6.372E-05	6.376E-05	6.376E-05	6.378E-05	6.379E-05
CD114	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05
SN114	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03
IN115	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05
SN115	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03
CD116	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05
SN116	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02
SN117	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02
SN118	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01
SN119	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02
SN119M	5.120E-07	8.322E-20	6.289E-21	2.229E-21	1.610E-24	1.610E-24	1.610E-24	1.610E-24
SN120	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01
SN121M	9.620E-07	6.479E-07	6.258E-07	6.172E-07	5.601E-07	5.447E-07	5.153E-07	4.742E-07
SB121	2.220E-04	2.223E-04	2.223E-04	2.223E-04	2.224E-04	2.224E-04	2.224E-04	2.225E-04
SN122	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05
TE122	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06
SB123	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05
TE123	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07
SN124	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05
TE124	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06
SB125	3.210E-05	2.565E-08	1.372E-08	1.068E-08	1.853E-09	1.124E-09	4.129E-10	9.200E-11
TE125	6.410E-05	9.639E-05	9.640E-05	9.641E-05	9.642E-05	9.642E-05	9.642E-05	9.642E-05
TE125M	2.170E-07	3.588E-10	1.919E-10	1.494E-10	2.592E-11	1.572E-11	5.776E-12	1.287E-12
SN126	1.470E-04	1.470E-04	1.470E-04	1.470E-04	1.470E-04	1.470E-04	1.470E-04	1.469E-04
SB126	6.980E-12	6.983E-12	6.982E-12	6.982E-12	6.982E-12	6.982E-12	6.982E-12	6.981E-12
SB126M	5.310E-14	5.309E-14	5.309E-14	5.309E-14	5.308E-14	5.308E-14	5.308E-14	5.308E-14
TE126	3.500E-06	3.529E-06	3.532E-06	3.533E-06	3.540E-06	3.542E-06	3.546E-06	3.552E-06
I127	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04
TE128	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04
XE128	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05
I129	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03
XE129	6.080E-08	6.260E-08	6.276E-08	6.282E-08	6.326E-08	6.339E-08	6.364E-08	6.402E-08
TE130	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03
XE130	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05
XE131	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03
XE132	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02
BA132	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09
CS133	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02
XE134	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02
CS134	1.610E-04	1.112E-08	4.798E-09	3.428E-09	3.259E-10	1.664E-10	4.336E-11	5.770E-12
BA134	1.070E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03
CS135	6.260E-03	6.260E-03	6.260E-03	6.260E-03	6.260E-03	6.260E-03	6.260E-03	6.260E-03
BA135	1.820E-06	1.874E-06	1.878E-06	1.880E-06	1.894E-06	1.897E-06	1.905E-06	1.916E-06
XE136	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02

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co_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

	g/L	28.5YR	31.0YR	32.0YR	39.0YR	41.0YR	45.0YR	51.0YR
BA136	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04
CS137	1.150E-02	5.953E-03	5.619E-03	5.490E-03	4.670E-03	4.459E-03	4.066E-03	3.539E-03
BA137	2.020E-03	7.567E-03	7.901E-03	8.030E-03	8.850E-03	9.061E-03	9.454E-03	9.981E-03
BA137M	1.760E-09	9.107E-10	8.596E-10	8.399E-10	7.145E-10	6.822E-10	6.220E-10	5.415E-10
BA138	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02
LA138	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07
LA139	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02
CE140	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02
PR141	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02
CE142	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02
ND142	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04
ND143	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02
CE144	3.260E-04	3.086E-15	3.330E-16	1.367E-16	2.674E-19	4.503E-20	1.283E-21	1.268E-23
PR144	1.380E-08	1.303E-19	1.406E-20	5.771E-21	1.131E-23	1.902E-24	5.416E-26	5.355E-28
PR144M	1.310E-13	6.515E-22	7.029E-23	2.885E-23	5.656E-26	9.506E-27	2.708E-28	2.677E-30
ND144	1.510E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02
ND145	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03
ND146	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03
PM146	2.070E-08	5.703E-10	4.162E-10	3.669E-10	1.518E-10	1.180E-10	7.128E-11	3.347E-11
SM146	6.060E-08	6.805E-08	6.811E-08	6.812E-08	6.820E-08	6.822E-08	6.823E-08	6.825E-08
PM147	6.000E-04	3.220E-07	1.664E-07	1.277E-07	2.009E-08	1.185E-08	4.117E-09	8.436E-10
SM147	2.660E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03
ND148	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03
SM148	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03
SM149	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05
ND150	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03
SM150	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03
EU150	2.790E-12	1.612E-12	1.536E-12	1.507E-12	1.317E-12	1.267E-12	1.173E-12	1.045E-12
SM151	1.320E-04	1.060E-04	1.040E-04	1.032E-04	9.775E-05	9.626E-05	9.334E-05	8.912E-05
EU151	5.160E-06	3.118E-05	3.320E-05	3.399E-05	3.941E-05	4.090E-05	4.382E-05	4.804E-05
SM152	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03
EU152	6.410E-07	1.500E-07	1.320E-07	1.255E-07	8.783E-08	7.932E-08	6.469E-08	4.765E-08
GD152	7.920E-07	9.288E-07	9.338E-07	9.356E-07	9.461E-07	9.485E-07	9.526E-07	9.573E-07
EU153	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04
GD153	2.590E-10	2.919E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM154	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04
EU154	5.630E-05	5.661E-06	4.628E-06	4.270E-06	2.429E-06	2.067E-06	1.498E-06	9.233E-07
GD154	8.120E-05	1.318E-04	1.329E-04	1.332E-04	1.351E-04	1.354E-04	1.360E-04	1.366E-04
EU155	3.090E-05	5.754E-07	4.057E-07	3.528E-07	1.326E-07	1.003E-07	5.733E-08	2.478E-08
GD155	3.080E-05	6.112E-05	6.129E-05	6.135E-05	6.157E-05	6.160E-05	6.164E-05	6.168E-05
GD156	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04
GD157	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07
GD158	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05
TB159	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06
GD160	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06
DY160	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07
DY161	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07
DY162	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07
DY163	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07
DY164	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08
HO165	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08
HO166M	3.230E-10	3.177E-10	3.173E-10	3.171E-10	3.158E-10	3.154E-10	3.147E-10	3.136E-10
ER166	1.150E-08	1.151E-08	1.151E-08	1.151E-08	1.151E-08	1.151E-08	1.151E-08	1.151E-08
ER167	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09
ER168	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09
TM169	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11
ER170	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15
YB170	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12
TM171	6.500E-15	2.210E-19	8.963E-20	6.248E-20	4.984E-21	2.428E-21	5.783E-22	6.071E-23
YB171	7.310E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14
YB172	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13

Appendix B-8
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Source Listing of Program ELECO1

```
      PROGRAM ELECO1

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/18/02

!            To sum the g/L of coprocess waste and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='CO_RUN1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='CO_RUN1.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'CO_RUN1.ELE    g/L')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

Appendix B-8
Page 2 of 5

Source Listing of Program ELECO1 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'1999Jul   2002Jan   2003Jan   2010' &
            'Jan   2012Jan   2016Jan   2022Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J)
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999
```

Appendix B-8
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Source Listing of Program ELECO1 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELECO1
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

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CO_RUN1.ELE g/L
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	7.3E-08	6.3E-08	6.0E-08	4.0E-08	3.6E-08	2.9E-08	2.1E-08
He	2.7E-06	2.8E-06	2.9E-06	3.1E-06	3.2E-06	3.4E-06	3.6E-06
Li	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09
Be	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09
B	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07
C	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04
N	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04
O	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02
F	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Ne	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
Na	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22
Mg	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09
Si	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
P	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19
S	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25
Cl	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19
Ar	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16
K	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17
Ca	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10
Sc	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Ti	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
V	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05
Mn	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
Fe	3.2E-09	1.6E-09	1.2E-09	1.9E-10	1.1E-10	3.9E-11	7.9E-12
Co	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06	1.3E-06
Ni	8.5E-05	8.5E-05	8.5E-05	8.4E-05	8.4E-05	8.4E-05	8.4E-05
Cu	3.7E-06	3.9E-06	4.0E-06	4.5E-06	4.7E-06	5.0E-06	5.4E-06
Zn	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08
Ga	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
Ge	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06
As	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Se	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04
Br	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04
Kr	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03
Rb	5.3E-03	5.3E-03	5.3E-03	5.3E-03	5.3E-03	5.3E-03	5.3E-03
Sr	8.7E-03	8.5E-03	8.4E-03	7.9E-03	7.8E-03	7.6E-03	7.3E-03
Y	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
Zr	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Nb	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
Mo	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02
Tc	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03
Ru	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Rh	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03
Pd	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Ag	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05
Cd	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04
In	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05
Sn	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Sb	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04
Te	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
I	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
Xe	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02

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CO_RUN1.ELE g/L (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 17:48:57

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Cs	2.5E-02	2.5E-02	2.5E-02	2.4E-02	2.4E-02	2.4E-02	2.3E-02
Ba	2.4E-02	2.4E-02	2.5E-02	2.5E-02	2.6E-02	2.6E-02	2.6E-02
La	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02
Ce	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02
Pr	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02
Nd	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02
Pm	3.2E-07	1.7E-07	1.3E-07	2.0E-08	1.2E-08	4.2E-09	8.8E-10
Sm	9.2E-03	9.2E-03	9.2E-03	9.2E-03	9.2E-03	9.2E-03	9.2E-03
Eu	8.9E-04	8.9E-04	8.9E-04	8.9E-04	8.9E-04	9.0E-04	9.0E-04
Gd	4.3E-04	4.3E-04	4.3E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04
Tb	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Dy	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06
Ho	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08
Er	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08
Tm	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Yb	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Lu	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
Hf	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03
Ta	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04
W	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Re	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Os	8.1E-10	8.1E-10	8.1E-10	8.1E-10	8.1E-10	8.1E-10	8.1E-10
Tl	9.3E-17	9.1E-17	9.0E-17	8.4E-17	8.3E-17	7.9E-17	7.5E-17
Pb	1.1E-09	1.2E-09	1.2E-09	1.4E-09	1.4E-09	1.6E-09	1.7E-09
Bi	1.3E-14	1.4E-14	1.4E-14	1.5E-14	1.6E-14	1.6E-14	1.8E-14
Po	7.9E-16	9.0E-16	9.6E-16	1.6E-15	1.7E-15	2.1E-15	2.8E-15
At	3.5E-25	3.5E-25	3.5E-25	3.6E-25	3.6E-25	3.6E-25	3.6E-25
Rn	1.6E-16	1.7E-16	1.7E-16	2.0E-16	2.1E-16	2.3E-16	2.7E-16
Fr	4.0E-20	4.1E-20	4.2E-20	4.6E-20	4.7E-20	4.9E-20	5.2E-20
Ra	1.3E-11	1.4E-11	1.5E-11	2.1E-11	2.2E-11	2.6E-11	3.2E-11
Ac	1.4E-12	1.5E-12	1.5E-12	1.7E-12	1.7E-12	1.8E-12	1.9E-12
Th	9.2E-08	9.7E-08	9.9E-08	1.1E-07	1.2E-07	1.3E-07	1.4E-07
Pa	3.5E-09	3.5E-09	3.5E-09	3.6E-09	3.6E-09	3.7E-09	3.8E-09
U	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02
Np	1.4E-05	1.4E-05	1.4E-05	1.5E-05	1.5E-05	1.6E-05	1.7E-05
Pu	2.1E-03	2.1E-03	2.1E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Am	7.8E-05	8.0E-05	8.0E-05	8.3E-05	8.4E-05	8.4E-05	8.5E-05
Cm	3.1E-08	2.9E-08	2.8E-08	2.2E-08	2.0E-08	1.8E-08	1.5E-08
Bk	2.1E-28	2.1E-28	2.1E-28	2.1E-28	2.1E-28	2.1E-28	2.1E-28
Cf	6.8E-17	6.8E-17	6.8E-17	6.6E-17	6.6E-17	6.5E-17	6.4E-17
Total	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**

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File CO_RUN2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     Coprocessing waste in WM-185
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     Final Activity in Ci/L rather than Ci
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  Ci/L
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      61.    1   2   5   0
  DEC      71.    2   3   5   0
  DEC     145.    3   4   5   0
  DEC     429.    4   5   5   0
  DEC    1045.    5   6   5   0
  DEC    1139.    6   7   5   0
  DEC   10029.    7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   20030 1.410E-14  50100 4.420E-16  50110 2.570E-07 0 0.
  1   60120 6.090E-04  60130 8.390E-06  70140 8.160E-04 0 0.
  1   70150 3.130E-06  80160 4.910E-02  80170 1.970E-05 0 0.
  1   80180 9.840E-05  90190 4.970E-11 100200 4.590E-16 0 0.
  1  100210 3.580E-15 100220 7.580E-18 110230 6.950E-22 0 0.
  1  120240 1.610E-09 120250 3.790E-13 120260 2.520E-16 0 0.
  1  130270 8.210E-04 140280 2.840E-07 140290 3.360E-11 0 0.
  1  140300 4.370E-15 140320 7.930E-27 150310 1.860E-19 0 0.
  1  150320 4.780E-31 160340 2.140E-25 170370 2.380E-19 0 0.
  1  180380 3.780E-23 180390 9.790E-24 180400 9.120E-16 0 0.
  1  180420 1.300E-24 190410 2.920E-17 190420 5.570E-29 0 0.
  1  200420 5.080E-19 200430 6.860E-11 200440 5.230E-10 0 0.
  1  200450 7.240E-16 200460 6.220E-11 210450 1.080E-11 0 0.
  1  210460 2.840E-17 220460 3.280E-05 220470 2.990E-05 0 0.
  1  220480 3.000E-04 220490 2.570E-05 220500 2.230E-05 0 0.
  1  230500 1.440E-07 230510 3.860E-05 240500 1.740E-03 0 0.
  1  240510 7.520E-27 240520 3.430E-02 240530 3.900E-03 0 0.
  1  240540 1.070E-03 250540 4.000E-09 250550 1.030E-05 0 0.
  1  260540 3.620E-03 260550 6.310E-06 260560 5.630E-02 0 0.
  1  260570 1.500E-03 260580 1.810E-04 270580 3.360E-15 0 0.
  1  270590 1.230E-06 270600 1.340E-06 280580 1.390E-02 0 0.
  1  280590 7.450E-05 280600 5.340E-03 280610 2.520E-04 0 0.
  1  280620 7.230E-04 280630 1.330E-05 280640 1.860E-04 0 0.
  1  290630 7.450E-07 290650 4.080E-07 300640 2.330E-10 0 0.
  1  300650 2.510E-16 420940 6.410E-09 440980 2.380E-20 0 0.
  1  491131 5.000E-14 491141 1.200E-18 501120 6.120E-03 0 0.
  1  501130 8.320E-11 701730 1.400E-13 701740 6.390E-15 0 0.
  1  711750 5.280E-06 711760 1.290E-07 711770 4.200E-16 0 0.
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File CO_RUN2.INP (continued)

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1  711771 4.220E-14 721740 7.100E-06 721750 3.790E-15 0 0.
1  721760 3.190E-04 721770 1.070E-04 721780 1.910E-03 0 0.
1  721790 2.500E-03 721800 3.300E-03 721810 3.010E-19 0 0.
1  721820 1.730E-07 731810 3.930E-04 731820 8.350E-11 0 0.
1  741820 5.370E-05 741830 5.580E-05 741840 3.370E-06 0 0.
1  741850 6.040E-17 741860 5.430E-11 741880 7.620E-24 0 0.
1  751850 6.600E-09 751870 2.230E-12 751880 7.840E-26 0 0.
1  761860 8.140E-10 761880 7.160E-14 761890 4.980E-16 0 0.
1  761900 1.760E-17      0 0.             0 0.        0 0.
2   20040 1.400E-06 812060 1.460E-32 812070 1.020E-19 0 0.
2  812080 1.030E-16 812090 2.900E-23 822060 1.400E-17 0 0.
2  822070 2.660E-14 822080 1.070E-10 822090 1.210E-19 0 0.
2  822100 2.540E-16 822110 7.870E-19 822120 6.090E-14 0 0.
2  822140 1.120E-20 832080 7.930E-22 832090 1.600E-15 0 0.
2  832101 5.640E-21 832100 1.540E-19 832110 4.640E-20 0 0.
2  832120 5.780E-15 832130 2.840E-20 832140 8.280E-21 0 0.
2  842100 3.310E-18 842110 5.690E-25 842120 3.060E-25 0 0.
2  842130 4.260E-29 842140 1.140E-27 842150 6.590E-25 0 0.
2  842160 2.430E-19 842180 1.290E-21 852170 3.410E-25 0 0.
2  862190 1.490E-21 862200 9.180E-17 862220 2.380E-18 0 0.
2  872210 3.090E-21 872230 6.960E-21 882230 3.790E-16 0 0.
2  882240 5.310E-13 882250 1.400E-17 882260 3.730E-13 0 0.
2  882280 2.340E-18 892250 9.450E-18 892270 2.700E-13 0 0.
2  892280 2.440E-22 902270 6.240E-16 902280 1.030E-10 0 0.
2  902290 2.580E-12 902300 2.090E-08 902310 1.570E-12 0 0.
2  902320 1.640E-08 902340 2.340E-13 912310 3.140E-09 0 0.
2  912330 1.680E-10 912341 7.890E-18 912340 3.530E-18 0 0.
2  922320 1.300E-11 922330 5.750E-10 922340 6.400E-04 0 0.
2  922350 1.240E-02 922360 1.090E-03 922370 9.860E-13 0 0.
2  922380 3.930E-03 922400 1.250E-21 932350 3.000E-15 0 0.
2  932360 6.280E-12 932370 1.170E-05 932380 1.440E-15 0 0.
2  932390 5.500E-16 932401 1.100E-23 942360 4.400E-09 0 0.
2  942380 3.640E-04 942390 1.380E-03 942400 3.390E-04 0 0.
2  942410 5.960E-05 942420 4.780E-05 942430 3.540E-24 0 0.
2  942440 2.540E-10 952410 2.610E-05 952421 2.970E-08 0 0.
2  952420 3.570E-13 952430 9.930E-06 952450 1.300E-27 0 0.
2  962420 3.740E-10 962430 1.760E-09 962440 8.450E-08 0 0.
2  962450 2.030E-09 962460 9.020E-11 962470 3.850E-13 0 0.
2  962480 1.020E-14 962500 1.430E-23 972490 1.310E-18 0 0.
2  982490 6.630E-17 982500 7.370E-18 982510 2.860E-18 0 0.
2  982520 2.250E-19      0 0.             0 0.        0 0.
3   10030 3.610E-07  30060 2.690E-09  30070 1.130E-10 0 0.
3   40090 2.720E-09  40100 1.500E-09  60140 2.180E-06 0 0.
3  300660 7.110E-10 300670 3.350E-13 300680 3.860E-09 0 0.
3  310690 5.960E-12 300700 1.320E-08 320700 1.710E-14 0 0.
3  310710 7.430E-12 320720 8.140E-08 320730 2.850E-07 0 0.
3  320740 7.700E-07 330750 1.850E-06 320760 5.620E-06 0 0.
3  340760 3.270E-08 340770 1.230E-05 340780 2.640E-05 0 0.
3  340790 6.740E-05 350790 5.010E-09 340800 1.620E-04 0 0.
3  360800 8.280E-10 350810 2.720E-04 360810 2.960E-11 0 0.
3  340820 4.400E-04 360820 6.600E-06 360830 6.110E-04 0 0.
3  360840 1.500E-03 360850 2.380E-04 370850 1.510E-03 0 0.
3  360860 2.790E-03 380860 3.400E-06 370870 3.610E-03 0 0.
3  380870 3.810E-08 380880 5.210E-03 380890 6.600E-12 0 0.
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File CO_RUN2.INP (continued)

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3  390890 6.860E-03 380900 6.910E-03 390900 1.740E-06 0 0.
3  400900 2.070E+00 390910 1.080E-10 400910 4.590E-01 0 0.
3  400920 7.000E-01 400930 1.080E-02 410930 4.070E-03 0 0.
3  410931 2.730E-08 400940 7.080E-01 410940 2.590E-05 0 0.
3  400950 2.010E-07 410950 1.250E-07 410951 2.060E-13 0 0.
3  420950 9.760E-03 400960 1.220E-01 420960 2.880E-04 0 0.
3  420970 9.490E-03 420980 9.200E-03 430980 3.300E-08 0 0.
3  430990 8.950E-03 440990 2.040E-07 421000 1.010E-02 0 0.
3  441000 7.260E-04 441010 8.090E-03 441020 7.160E-03 0 0.
3  451020 1.150E-09 441030 2.430E-14 451030 3.920E-03 0 0.
3  451031 2.170E-17 441040 3.180E-03 461040 1.330E-03 0 0.
3  461050 1.660E-03 441060 3.380E-05 451060 3.180E-11 0 0.
3  461060 8.230E-04 461070 3.300E-04 471070 2.440E-10 0 0.
3  461080 1.600E-04 471080 6.810E-22 471081 2.160E-13 0 0.
3  481080 1.990E-10 471090 6.540E-05 471091 1.080E-20 0 0.
3  481090 1.090E-14 461100 5.840E-05 471100 7.110E-17 0 0.
3  471101 4.690E-09 481100 2.400E-05 481110 4.660E-05 0 0.
3  481120 3.580E-05 481130 4.660E-07 481131 5.410E-07 0 0.
3  491130 6.330E-05 481140 6.480E-05 491140 1.930E-23 0 0.
3  501140 4.150E-03 491150 1.040E-05 491151 6.070E-23 0 0.
3  501150 2.150E-03 481160 3.150E-05 501160 9.200E-02 0 0.
3  501170 4.930E-02 501180 1.540E-01 501190 5.550E-02 0 0.
3  501191 5.120E-07 501200 2.080E-01 501211 9.620E-07 0 0.
3  511210 2.220E-04 501220 3.910E-05 521220 9.660E-06 0 0.
3  501230 1.070E-09 511230 4.530E-05 521230 1.020E-07 0 0.
3  521231 3.570E-13 501240 6.080E-05 511240 2.160E-14 0 0.
3  521240 1.350E-06 511250 3.210E-05 521250 6.410E-05 0 0.
3  521251 2.170E-07 501260 1.470E-04 511260 6.980E-12 0 0.
3  511261 5.310E-14 521260 3.500E-06 521270 3.900E-12 0 0.
3  521271 1.110E-09 531270 3.160E-04 541270 6.100E-23 0 0.
3  521280 8.240E-04 541280 1.190E-05 521290 1.620E-20 0 0.
3  521291 1.730E-17 531290 1.430E-03 541290 6.080E-08 0 0.
3  521300 3.170E-03 541300 5.920E-05 541310 4.800E-03 0 0.
3  541320 1.050E-02 561320 9.040E-09 551330 1.320E-02 0 0.
3  541340 1.660E-02 551340 1.610E-04 561340 1.070E-03 0 0.
3  551350 6.260E-03 561350 1.820E-06 541360 2.210E-02 0 0.
3  561360 1.630E-04 551370 1.150E-02 561370 2.020E-03 0 0.
3  561371 1.760E-09 561380 1.510E-02 571380 1.070E-07 0 0.
3  571390 1.440E-02 581400 1.420E-02 581410 4.240E-16 0 0.
3  591410 1.320E-02 581420 1.350E-02 601420 1.870E-04 0 0.
3  601430 1.100E-02 581440 3.260E-04 591440 1.380E-08 0 0.
3  591441 1.310E-13 601440 1.510E-02 601450 8.510E-03 0 0.
3  601460 7.660E-03 611460 2.070E-08 621460 6.060E-08 0 0.
3  611470 6.000E-04 621470 2.660E-03 601480 4.030E-03 0 0.
3  611480 1.030E-17 611481 1.410E-15 621480 1.630E-03 0 0.
3  621490 4.810E-05 601500 1.560E-03 621500 2.840E-03 0 0.
3  631500 2.790E-12 621510 1.320E-04 631510 5.160E-06 0 0.
3  621520 1.140E-03 631520 6.410E-07 641520 7.920E-07 0 0.
3  631530 8.500E-04 641530 2.590E-10 621540 1.930E-04 0 0.
3  631540 5.630E-05 641540 8.120E-05 631550 3.090E-05 0 0.
3  641550 3.080E-05 641560 2.000E-04 641570 2.700E-07 0 0.
3  641580 3.750E-05 651590 3.530E-06 641600 1.370E-06 0 0.
3  651600 7.020E-14 661600 3.300E-07 661610 3.040E-07 0 0.
3  661620 2.310E-07 661630 1.520E-07 661640 2.940E-08 0 0.
```

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File CO_RUN2.INP (continued)

```
3  671650 4.840E-08 671661 3.230E-10 681660 1.150E-08 0 0.
3  681670 1.650E-09 681680 2.190E-09 691690 1.050E-11 0 0.
3  681700 3.000E-15 691700 8.370E-17 701700 2.020E-12 0 0.
3  691710 6.500E-15 701710 7.310E-14 701720 2.240E-13 0 0.
0
```

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File CO_RUN2.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy co_run2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy co_run2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out co_run2.u6 >nul
copy tape13.out+tape11.out co_run2.u11 >nul
ren tape7.out co_run2.pch
ren tape15.out co_run2.dbg
ren tape16.out co_run2.vxs
ren tape50.out co_run2.ech
rem  cleanup files
del tape*.inp
del tape*.out
del co_run2.pch
del co_run2.dbg
del co_run2.vxs
del co_run2.ech
del co_run2.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ************************************************************************
echo on
```

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co_run2.ci
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	Ci/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
AR 39	3.338E-22	3.338E-22	3.338E-22	3.338E-22	8.951E-23	0.000E+00	0.000E+00	0.000E+00
AR 42	3.355E-22	3.355E-22	3.355E-22	3.355E-22	4.555E-22	1.095E-27	1.095E-27	0.000E+00
K 42	0.000E+00	3.355E-22	3.355E-22	3.355E-22	4.555E-22	1.095E-27	1.095E-27	0.000E+00
V 50	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20	2.575E-20
MN 54	3.096E-05	1.068E-26	3.236E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 55	1.578E-02	1.366E-09	9.500E-11	2.570E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 60	1.516E-03	4.966E-07	1.333E-07	7.899E-12	4.723E-28	0.000E+00	0.000E+00	0.000E+00
NI 59	5.645E-06	5.642E-06	5.642E-06	5.638E-06	5.624E-06	5.594E-06	5.590E-06	5.175E-06
NI 63	8.207E-04	5.183E-04	4.807E-04	2.753E-04	3.239E-05	3.125E-07	1.539E-07	0.000E+00
LU176	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15	8.738E-15
HF182	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.774E-11
TA182	9.799E-08	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.777E-11	3.774E-11
RE187	2.471E-21	2.471E-21	2.471E-21	2.471E-21	2.471E-21	2.471E-21	2.471E-21	2.471E-21
TL206	0.000E+00	3.189E-24	3.189E-24	3.189E-24	3.189E-24	3.189E-24	3.189E-24	3.189E-24
TL207	1.943E-11	1.488E-10	1.590E-10	2.108E-10	3.886E-10	7.306E-10	7.659E-10	5.308E-09
TL208	3.034E-08	1.984E-08	1.802E-08	8.838E-09	5.740E-10	1.529E-12	6.214E-13	1.718E-14
TL209	1.186E-14	1.284E-14	1.304E-14	1.490E-14	3.281E-14	1.689E-13	2.042E-13	2.065E-11
PB209	5.500E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.455E-12	9.561E-10
PB210	1.940E-14	1.923E-11	2.723E-11	1.411E-10	1.860E-09	1.076E-08	1.204E-08	4.122E-07
PB211	1.944E-11	1.492E-10	1.594E-10	2.114E-10	3.897E-10	7.327E-10	7.680E-10	5.323E-09
PB212	8.465E-08	5.522E-08	5.016E-08	2.460E-08	1.597E-09	4.256E-12	1.730E-12	4.781E-14
PB214	3.673E-13	4.243E-11	5.561E-11	2.130E-10	1.860E-09	1.076E-08	1.268E-08	4.123E-07
BI208	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24	3.705E-24
BI210M	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24	3.202E-24
BI210	1.911E-14	1.923E-11	2.724E-11	1.411E-10	1.860E-09	1.076E-08	1.204E-08	4.122E-07
BI211	1.942E-11	1.492E-10	1.594E-10	2.114E-10	3.897E-10	7.327E-10	7.680E-10	5.323E-09
BI212	8.470E-08	5.522E-08	5.016E-08	2.460E-08	1.597E-09	4.256E-12	1.730E-12	4.781E-14
BI213	5.494E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.455E-12	9.561E-10
BI214	3.657E-13	4.243E-11	5.561E-11	2.130E-10	1.860E-09	1.076E-08	1.268E-08	4.123E-07
PO210	1.487E-14	1.923E-11	2.724E-11	1.411E-10	1.860E-09	1.076E-08	1.204E-08	4.122E-07
PO211	5.435E-14	4.177E-13	4.464E-13	5.919E-13	1.091E-12	2.052E-12	2.151E-12	1.490E-11
PO212	5.430E-08	3.538E-08	3.214E-08	1.576E-08	1.024E-09	2.727E-12	1.108E-12	3.063E-14
PO213	0.000E+00	5.816E-13	5.905E-13	6.748E-13	1.486E-12	7.649E-12	9.250E-12	9.354E-10
PO214	0.000E+00	4.242E-11	5.559E-11	2.129E-10	1.860E-09	1.076E-08	1.267E-08	4.122E-07
PO215	1.944E-11	1.492E-10	1.594E-10	2.114E-10	3.897E-10	7.327E-10	7.680E-10	5.323E-09
PO216	8.465E-08	5.522E-08	5.016E-08	2.460E-08	1.597E-09	4.256E-12	1.730E-12	4.781E-14
PO218	3.650E-13	4.244E-11	5.562E-11	2.130E-10	1.860E-09	1.076E-08	1.268E-08	4.124E-07
AT217	5.491E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.455E-12	9.561E-10
RN219	1.939E-11	1.492E-10	1.594E-10	2.114E-10	3.897E-10	7.327E-10	7.680E-10	5.323E-09
RN220	8.470E-08	5.522E-08	5.016E-08	2.460E-08	1.597E-09	4.256E-12	1.730E-12	4.781E-14
RN222	3.662E-13	4.244E-11	5.562E-11	2.130E-10	1.860E-09	1.076E-08	1.268E-08	4.124E-07
FR221	5.479E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.455E-12	9.561E-10
FR223	2.693E-13	2.059E-12	2.197E-12	2.917E-12	5.378E-12	1.011E-11	1.060E-11	7.345E-11
RA223	1.942E-11	1.492E-10	1.594E-10	2.114E-10	3.897E-10	7.327E-10	7.680E-10	5.323E-09
RA224	8.461E-08	5.522E-08	5.016E-08	2.460E-08	1.597E-09	4.256E-12	1.730E-12	4.781E-14
RA225	5.491E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.455E-12	9.561E-10
RA226	3.689E-13	4.244E-11	5.562E-11	2.130E-10	1.860E-09	1.076E-08	1.268E-08	4.124E-07
RA228	5.479E-16	1.976E-15	2.012E-15	2.306E-15	3.303E-15	5.496E-15	5.834E-15	4.080E-14
AC225	5.487E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.455E-12	9.561E-10
AC227	1.954E-11	1.492E-10	1.592E-10	2.114E-10	3.897E-10	7.327E-10	7.680E-10	5.323E-09
AC228	5.473E-16	1.976E-15	2.012E-15	2.306E-15	3.303E-15	5.496E-15	5.834E-15	4.080E-14
TH227	1.919E-11	1.471E-10	1.572E-10	2.085E-10	3.843E-10	7.226E-10	7.574E-10	5.249E-09
TH228	8.446E-08	5.522E-08	5.016E-08	2.460E-08	1.597E-09	4.256E-12	1.730E-12	4.781E-14
TH229	5.490E-13	5.944E-13	6.035E-13	6.897E-13	1.519E-12	7.817E-12	9.454E-12	9.561E-10
TH230	4.221E-10	2.871E-09	3.313E-09	6.820E-09	2.199E-08	5.621E-08	6.143E-08	5.289E-07
TH231	8.350E-07	2.682E-08	2.682E-08	2.683E-08	2.685E-08	2.690E-08	2.691E-08	2.755E-08
TH232	1.799E-15	2.012E-15	2.047E-15	2.305E-15	3.303E-15	5.496E-15	5.834E-15	4.080E-14
TH234	5.421E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09
PA231	1.484E-10	1.828E-10	1.885E-10	2.301E-10	3.895E-10	7.324E-10	7.844E-10	5.322E-09
PA233	3.488E-06	1.257E-08	1.342E-08	1.945E-08	3.710E-08	5.628E-08	5.787E-08	6.748E-08
PA234M	5.421E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09
PA234	7.059E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12	1.718E-12	1.719E-12
U232	2.784E-10	5.376E-08	4.882E-08	2.394E-08	1.555E-09	4.137E-12	1.678E-12	7.012E-15
U233	5.568E-12	9.901E-12	1.047E-11	1.580E-11	5.170E-11	1.814E-10	2.047E-10	2.774E-09
U234	4.001E-06	4.855E-06	4.960E-06	5.524E-06	6.156E-06	6.220E-06	6.218E-06	6.064E-06

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co_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

Ci/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
U235	2.681E-08	2.682E-08	2.682E-08	2.683E-08	2.685E-08	2.690E-08	2.691E-08	2.755E-08
U236	7.055E-08	7.069E-08	7.071E-08	7.088E-08	7.151E-08	7.281E-08	7.300E-08	8.465E-08
U237	8.051E-08	7.995E-09	4.940E-09	1.402E-10	8.425E-15	7.858E-15	7.798E-15	3.777E-15
U238	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09	1.322E-09
U240	1.158E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15
NP235	4.210E-12	4.900E-29	4.900E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	8.276E-14	8.273E-14	8.272E-14	8.269E-14	8.255E-14	8.224E-14	8.219E-14	7.791E-14
NP237	8.251E-09	1.257E-08	1.342E-08	1.945E-08	3.710E-08	5.628E-08	5.787E-08	6.748E-08
NP238	3.734E-10	1.093E-09	1.045E-09	7.454E-10	2.041E-10	1.230E-11	8.015E-12	1.988E-29
NP239	1.276E-10	1.969E-06	1.967E-06	1.954E-06	1.902E-06	1.795E-06	1.779E-06	7.721E-07
NP240M	1.165E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15	4.501E-15
PU236	2.339E-06	8.549E-13	8.196E-14	7.442E-15	7.429E-15	7.402E-15	7.398E-15	7.012E-15
PU238	6.234E-03	3.850E-03	3.558E-03	1.983E-03	2.104E-04	1.625E-06	7.742E-07	7.810E-27
PU239	8.582E-05	8.567E-05	8.565E-05	8.547E-05	8.479E-05	8.333E-05	8.311E-05	6.460E-05
PU240	7.728E-05	7.680E-05	7.671E-05	7.612E-05	7.386E-05	6.919E-05	6.850E-05	2.669E-05
PU241	6.143E-03	3.259E-04	2.014E-04	5.714E-06	3.439E-10	3.207E-10	3.183E-10	1.541E-10
PU242	1.826E-07	1.826E-07	1.826E-07	1.825E-07	1.825E-07	1.823E-07	1.822E-07	1.793E-07
PU243	9.216E-18	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.572E-17
PU244	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.507E-15	4.506E-15
PU246	0.000E+00	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25
AM241	8.961E-05	2.620E-04	2.619E-04	2.386E-04	1.514E-04	5.639E-05	4.850E-05	1.853E-10
AM242M	2.888E-07	2.186E-07	2.089E-07	1.491E-07	4.083E-08	2.461E-09	1.603E-09	3.977E-27
AM242	2.887E-07	2.175E-07	2.079E-07	1.483E-07	4.062E-08	2.448E-09	1.595E-09	3.957E-27
AM243	1.980E-06	1.969E-06	1.967E-06	1.954E-06	1.902E-06	1.795E-06	1.779E-06	7.721E-07
AM246	0.000E+00	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25	2.939E-25
CM242	1.237E-06	1.799E-07	1.719E-07	1.227E-07	3.360E-08	2.025E-09	1.319E-09	3.282E-27
CM243	9.089E-08	2.062E-08	1.617E-08	2.673E-09	2.668E-12	8.314E-19	8.378E-20	0.000E+00
CM244	6.839E-06	6.623E-07	4.517E-07	2.659E-08	5.058E-13	2.914E-23	2.914E-23	0.000E+00
CM245	3.487E-10	3.470E-10	3.467E-10	3.446E-10	3.367E-10	3.202E-10	3.178E-10	1.539E-10
CM246	2.772E-11	2.747E-11	2.743E-11	2.714E-11	2.603E-11	2.378E-11	2.346E-11	6.377E-12
CM247	3.574E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.573E-17	3.572E-17
CM248	4.338E-17	4.338E-17	4.338E-17	4.337E-17	4.335E-17	4.329E-17	4.328E-17	4.250E-17
CM250	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24	1.176E-24
BK249	2.148E-15	2.366E-36	1.144E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BK250	0.000E+00	1.646E-25	1.646E-25	1.646E-25	1.646E-25	1.646E-25	1.646E-25	1.646E-25
CF249	2.717E-16	2.456E-16	2.408E-16	2.080E-16	1.186E-16	3.508E-17	2.913E-17	6.736E-25
CF250	8.060E-16	3.181E-17	1.872E-17	3.716E-19	2.728E-25	1.646E-25	1.646E-25	1.646E-25
CF251	4.538E-18	4.329E-18	4.296E-18	4.057E-18	3.259E-18	2.026E-18	1.884E-18	1.953E-21
CF252	1.210E-16	1.325E-23	1.325E-23	4.763E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H 3	3.485E-03	1.136E-04	6.478E-05	1.017E-06	1.215E-13	1.170E-28	1.170E-28	0.000E+00
BE 10	3.353E-11	3.353E-11	3.353E-11	3.353E-11	3.352E-11	3.352E-11	3.351E-11	3.339E-11
C 14	9.721E-06	9.649E-06	9.637E-06	9.551E-06	9.229E-06	8.566E-06	8.469E-06	2.889E-06
SE 79	4.697E-06	4.694E-06	4.694E-06	4.690E-06	4.676E-06	4.645E-06	4.640E-06	4.221E-06
KR 81	6.227E-13	6.226E-13	6.226E-13	6.224E-13	6.219E-13	6.206E-13	6.204E-13	6.025E-13
KR 85	9.341E-02	1.809E-03	9.477E-04	7.920E-06	8.389E-14	4.225E-31	4.225E-31	0.000E+00
RB 87	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10	3.160E-10
SR 90	9.429E-01	2.208E-01	1.740E-01	2.990E-02	3.469E-05	1.488E-11	1.588E-12	0.000E+00
Y 90	9.471E-01	2.208E-01	1.740E-01	2.990E-02	3.470E-05	1.488E-11	1.589E-12	0.000E+00
ZR 93	2.715E-05	2.715E-05	2.715E-05	2.715E-05	2.714E-05	2.713E-05	2.713E-05	2.702E-05
NB 93M	7.719E-06	2.498E-05	2.531E-05	2.578E-05	2.579E-05	2.578E-05	2.578E-05	2.567E-05
NB 94	4.855E-06	4.844E-06	4.843E-06	4.831E-06	4.784E-06	4.684E-06	4.669E-06	3.447E-06
TC 98	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.868E-11	2.864E-11
TC 99	1.518E-04	1.518E-04	1.518E-04	1.517E-04	1.516E-04	1.513E-04	1.512E-04	1.469E-04
RH102	1.390E-06	6.474E-13	5.931E-14	1.235E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU106	1.131E-01	6.862E-20	2.396E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	1.132E-01	6.862E-20	2.396E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.698E-07	1.696E-07
AG108	5.005E-13	3.593E-13	3.402E-13	2.272E-13	4.822E-14	1.672E-15	1.001E-15	0.000E+00
AG108M	5.632E-12	4.037E-12	3.823E-12	2.553E-12	5.418E-13	1.878E-14	1.125E-14	9.547E-36
AG109M	2.824E-11	9.883E-26	9.883E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	2.815E-11	9.883E-26	9.883E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD113M	1.174E-04	6.470E-06	4.023E-06	1.196E-07	1.651E-13	3.216E-26	3.216E-26	0.000E+00
IN115	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17	6.472E-17
SN121M	5.690E-05	2.441E-05	2.125E-05	7.615E-06	1.482E-07	2.885E-11	7.831E-12	0.000E+00
TE123	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17	2.966E-17

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co_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	Ci/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
SB125	3.316E-02	7.782E-09	6.372E-10	5.779E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125M	3.910E-03	1.899E-09	1.555E-10	1.410E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	4.172E-06	4.170E-06	4.170E-06	4.168E-06	4.160E-06	4.142E-06	4.139E-06	3.892E-06
SB126	5.838E-07	5.839E-07	5.838E-07	5.835E-07	5.824E-07	5.799E-07	5.795E-07	5.449E-07
SB126M	4.172E-06	4.170E-06	4.170E-06	4.168E-06	4.160E-06	4.142E-06	4.139E-06	3.892E-06
I129	2.526E-07	2.526E-07	2.526E-07	2.525E-07	2.525E-07	2.525E-07	2.525E-07	2.524E-07
CS134	2.084E-01	2.590E-10	8.982E-12	1.412E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS135	7.211E-06	7.211E-06	7.211E-06	7.210E-06	7.210E-06	7.209E-06	7.208E-06	7.189E-06
CS137	1.001E+00	2.445E-01	1.940E-01	3.510E-02	4.957E-05	3.265E-11	3.721E-12	0.000E+00
BA137M	9.471E-01	2.313E-01	1.836E-01	3.320E-02	4.692E-05	3.089E-11	3.520E-12	0.000E+00
LA138	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15	2.054E-15
CE142	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10	3.241E-10
ND144	1.787E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14	1.826E-14
PM146	9.220E-06	4.227E-09	1.199E-09	1.068E-13	3.050E-29	0.000E+00	0.000E+00	0.000E+00
SM146	2.121E-12	2.389E-12	2.389E-12	2.389E-12	2.389E-12	2.389E-12	2.389E-12	2.388E-12
PM147	5.564E-01	5.571E-08	3.967E-09	1.280E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	6.048E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11	7.412E-11
SM148	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16	4.923E-16
SM149	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17	1.155E-17
EU150	1.848E-10	5.709E-11	4.709E-11	1.133E-11	4.777E-14	3.375E-19	5.443E-20	0.000E+00
SM151	3.474E-03	2.172E-03	2.011E-03	1.137E-03	1.276E-04	1.110E-06	5.381E-07	0.000E+00
EU152	1.109E-04	4.952E-06	2.975E-06	6.848E-08	3.545E-14	8.226E-28	8.226E-28	0.000E+00
GD152	1.726E-17	2.097E-17	2.104E-17	2.114E-17	2.115E-17	2.115E-17	2.115E-17	2.115E-17
EU154	1.520E-02	1.114E-04	4.974E-05	1.278E-07	1.465E-17	4.021E-39	0.000E+00	0.000E+00
EU155	1.438E-02	2.850E-06	7.045E-07	2.270E-11	1.308E-28	0.000E+00	0.000E+00	0.000E+00
HO166M	5.799E-10	5.598E-10	5.566E-10	5.333E-10	4.526E-10	3.171E-10	3.004E-10	1.769E-12
TM171	7.081E-12	1.932E-21	1.932E-21	4.827E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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Source Listing of Program ROUNDCO2

```
      PROGRAM ROUNDCO2

!-------- WRITTEN BY D.R. WENZEL

!            To format the data in input file CO_RUN2.CI
!            and write the output with 2 places of accuracy

      CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
      CHARACTER (LEN=10) :: BLANK, ZERO(7)
      CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
      CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
      CHARACTER (LEN=96) :: BUFFER2
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9)
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      EQUIVALENCE (BUFFER2, BUFFER3(1))
      EQUIVALENCE (ZERO(1), BUFFER3(27))

      REAL :: DATA(175,7), VALUE(7)

      DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='CO_RUN2.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='ROUNDCO2.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'ROUNDCO2.OUT  (Ci/L)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NAME2
 1000 FORMAT(A12, 5X, A24)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUCLIDE2(LAST) = NAME2
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,175
         DO K=1,7
            DATA(l,K) = 0.
         END DO
```

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Source Listing of Program ROUNDCO2 (continued)

```
      END DO

!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35 DO  J=1,3
         READ(2,120) ORGLINE
  120    FORMAT(A111)

         IF(J == 2) THEN
            WRITE(6,120) ORGLINE
         END IF

      END DO

      WRITE(6,605)
  605 FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'2032Jan   2042Jan   ', &
            '2116Jan   2400Jan   3016Jan   3110Jan   12000Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50 READ(2,120,END=80) ORGLINE
      WRITE(BUFFER,120) ORGLINE
      READ(BUFFER,400) DESC, VALUE
  400 FORMAT(A12,9X,7(E10.4))
      DO  J=1,175
         IF(DESC == NUCLIDE(J)) THEN
            DO 60 K=1,7
               DATA(J,K) = VALUE(K)
   60       CONTINUE

         END IF

      END DO

      GO TO 50

   80 DO  J=1,LAST
         WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620    FORMAT(2X,A24,7(1PE10.1))
         DO K=1,7
            IF(DATA(J,K) == 0.) THEN
               ZERO(K) = BLANK
            ENDIF

         END DO

         WRITE(6,625) BUFFER2
  625    FORMAT(A96)

      END DO
```

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Source Listing of Program ROUNDCO2 (continued)

```
      GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDCO2
```

See Appendix A-2, pages 4-5, for a listing of file MASTER.

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ROUNDCO2.OUT (Ci/L)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.233E+01	yr	1.1E-04	6.5E-05	1.0E-06	1.2E-13	1.2E-28	1.2E-28	
Be-10	1.510E+06	yr	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.4E-11	3.3E-11
C-14	5.730E+03	yr	9.6E-06	9.6E-06	9.6E-06	9.2E-06	8.6E-06	8.5E-06	2.9E-06
Fe-55	2.730E+00	yr	1.4E-09	9.5E-11	2.6E-19				
Ni-59	7.600E+04	yr	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.6E-06	5.2E-06
Co-60	5.271E+00	yr	5.0E-07	1.3E-07	7.9E-12	4.7E-28			
Ni-63	1.001E+02	yr	5.2E-04	4.8E-04	2.8E-04	3.2E-05	3.1E-07	1.5E-07	
Se-79	1.130E+06	yr	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.6E-06	4.6E-06	4.2E-06
Rb-87	4.750E+10	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Sr-90	2.878E+01	yr	2.2E-01	1.7E-01	3.0E-02	3.5E-05	1.5E-11	1.6E-12	
Y-90	6.410E+01	h	2.2E-01	1.7E-01	3.0E-02	3.5E-05	1.5E-11	1.6E-12	
Zr-93	1.530E+06	yr	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05	2.7E-05
Nb-93m	1.613E+01	yr	2.5E-05	2.5E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Nb-94	2.030E+04	yr	4.8E-06	4.8E-06	4.8E-06	4.8E-06	4.7E-06	4.7E-06	3.4E-06
Tc-98	4.200E+06	yr	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11	2.9E-11
Tc-99	2.111E+05	yr	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04
Rh-102	2.070E+02	d	6.5E-13	5.9E-14	1.2E-21				
Ru-106	3.736E+02	d							
Rh-106	2.980E+01	s							
Pd-107	6.500E+06	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Ag-108	2.370E+00	m	3.6E-13	3.4E-13					
Ag-108m	4.180E+02	yr	4.0E-12	3.8E-12	2.6E-12	5.4E-13	1.9E-14	1.1E-14	9.5E-36
Ag-109m	3.960E+01	s							
Cd-109	4.626E+02	d							
Ag-110	2.460E+01	s							
Ag-110m	2.498E+02	d							
Cd-113m	1.410E+01	yr	6.5E-06	4.0E-06	1.2E-07	1.7E-13	3.2E-26	3.2E-26	
In-115	4.410E+14	yr	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17	6.5E-17
Sn-119m	2.931E+02	d							
Sn-121m	5.500E+01	yr	2.4E-05	2.1E-05	7.6E-06	1.5E-07	2.9E-11	7.8E-12	
Te-123	1.000E+13	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Sb-125	2.758E+00	yr	7.8E-09	6.4E-10	5.8E-18				
Te-125m	5.740E+01	d	1.9E-09	1.6E-10	1.4E-18				
Sn-126	1.000E+05	yr	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.1E-06	4.1E-06	3.9E-06
Sb-126	1.246E+01	d	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.8E-07	5.4E-07
Sb-126m	1.915E+01	m	4.2E-06	4.2E-06	4.2E-06	4.2E-06	4.1E-06	4.1E-06	3.9E-06
I-129	1.570E+07	yr	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07	2.5E-07
Cs-134	2.065E+00	yr	2.6E-10	9.0E-12	1.4E-22				
Cs-135	2.300E+06	yr	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06	7.2E-06
Cs-137	3.007E+01	yr	2.4E-01	1.9E-01	3.5E-02	5.0E-05	3.3E-11	3.7E-12	
Ba-137m	2.552E+00	m	2.3E-01	1.8E-01	3.3E-02	4.7E-05	3.1E-11	3.5E-12	
La-138	1.050E+11	yr	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15	2.1E-15
Ce-142	5.000E+16	yr	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Ce-144	2.849E+02	d							
Pr-144	1.728E+01	m							
Pr-144m	7.200E+00	m							
Nd-144	2.290E+15	yr	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14	1.8E-14
Pm-146	5.530E+00	yr	4.2E-09	1.2E-09	1.1E-13	3.0E-29			
Sm-146	1.030E+08	yr	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12
Pm-147	2.623E+00	yr	5.6E-08	4.0E-09	1.3E-17				
Sm-147	1.060E+11	yr	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11	7.4E-11
Sm-148	7.000E+15	yr	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16	4.9E-16
Sm-149	2.000E+15	yr	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17	1.2E-17
Eu-150	3.690E+01	yr	5.7E-11	4.7E-11	1.1E-11	4.8E-14	3.4E-19	5.4E-20	
Sm-151	9.000E+01	yr	2.2E-03	2.0E-03	1.1E-03	1.3E-04	1.1E-06	5.4E-07	
Eu-152	1.354E+01	yr	5.0E-06	3.0E-06	6.8E-08	3.5E-14	8.2E-28	8.2E-28	
Gd-152	1.080E+14	yr	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17
Gd-153	2.416E+02	d							
Eu-154	8.593E+00	yr	1.1E-04	5.0E-05	1.3E-07	1.5E-17	4.0E-39		
Eu-155	4.761E+00	yr	2.9E-06	7.0E-07	2.3E-11	1.3E-28			
Ho-166m	1.200E+03	yr	5.6E-10	5.6E-10	5.3E-10	4.5E-10	3.2E-10	3.0E-10	1.8E-12
Tm-171	1.920E+00	yr	1.9E-21	1.9E-21	4.8E-33				
Tl-207	4.770E+00	m	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Tl-208	3.053E+00	m	2.0E-08	1.8E-08	8.8E-09	5.7E-10	1.5E-12	6.2E-13	1.7E-14
Tl-209	2.200E+00	m	1.3E-14	1.3E-14	1.5E-14	3.3E-14	1.7E-13	2.0E-13	2.1E-11

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ROUNDCO2.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.253E+00	h	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Pb-210	2.230E+01	yr	1.9E-11	2.7E-11	1.4E-10	1.9E-09	1.1E-08	1.2E-08	4.1E-07
Pb-211	3.610E+01	m	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Pb-212	1.064E+01	h	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Pb-214	2.680E+01	m	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Bi-210m	3.040E+06	yr	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24	3.2E-24
Bi-210	5.013E+00	d	1.9E-11	2.7E-11	1.4E-10	1.9E-09	1.1E-08	1.2E-08	4.1E-07
Bi-211	2.140E+00	m	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Bi-212	6.055E+01	m	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Bi-213	4.559E+01	m	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Bi-214	1.990E+01	m	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Po-210	1.384E+02	d	1.9E-11	2.7E-11	1.4E-10	1.9E-09	1.1E-08	1.2E-08	4.1E-07
Po-211	5.160E-01	s	4.2E-13	4.5E-13	5.9E-13	1.1E-12	2.1E-12	2.2E-12	1.5E-11
Po-212	2.990E-07	s	3.5E-08	3.2E-08	1.6E-08	1.0E-09	2.7E-12	1.1E-12	3.1E-14
Po-213	4.200E-06	s	5.8E-13	5.9E-13	6.7E-13	1.5E-12	7.6E-12	9.3E-12	9.4E-10
Po-214	1.643E-04	s	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Po-215	1.781E-03	s	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Po-216	1.450E-01	s	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Po-218	3.100E+00	m	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
At-217	3.230E-02	s	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Rn-219	3.960E+00	s	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Rn-220	5.560E+01	s	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Rn-222	3.823E+00	d	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Fr-221	4.900E+00	m	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Fr-223	2.180E+00	m	2.1E-12	2.2E-12	2.9E-12	5.4E-12	1.0E-11	1.1E-11	7.3E-11
Ra-223	1.144E+01	d	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Ra-224	3.660E+00	d	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Ra-225	1.490E+01	d	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Ra-226	1.600E+03	yr	4.2E-11	5.6E-11	2.1E-10	1.9E-09	1.1E-08	1.3E-08	4.1E-07
Ra-228	5.750E+00	yr	2.0E-15	2.0E-15	2.3E-15	3.3E-15	5.5E-15	5.8E-15	4.1E-14
Ac-225	1.000E+01	d	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Ac-227	2.177E+01	yr	1.5E-10	1.6E-10	2.1E-10	3.9E-10	7.3E-10	7.7E-10	5.3E-09
Ac-228	6.150E+00	h	2.0E-15	2.0E-15	2.3E-15	3.3E-15	5.5E-15	5.8E-15	4.1E-14
Th-227	1.872E+01	d	1.5E-10	1.6E-10	2.1E-10	3.8E-10	7.2E-10	7.6E-10	5.2E-09
Th-228	1.912E+00	yr	5.5E-08	5.0E-08	2.5E-08	1.6E-09	4.3E-12	1.7E-12	4.8E-14
Th-229	7.340E+03	yr	5.9E-13	6.0E-13	6.9E-13	1.5E-12	7.8E-12	9.5E-12	9.6E-10
Th-230	7.538E+04	yr	2.9E-09	3.3E-09	6.8E-09	2.2E-08	5.6E-08	6.1E-08	5.3E-07
Th-231	2.552E+01	h	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.8E-08
Th-232	1.405E+10	yr	2.0E-15	2.0E-15	2.3E-15	3.3E-15	5.5E-15	5.8E-15	4.1E-14
Th-234	2.410E+01	d	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-231	3.276E+04	yr	1.8E-10	1.9E-10	2.3E-10	3.9E-10	7.3E-10	7.8E-10	5.3E-09
Pa-233	2.697E+01	d	1.3E-08	1.3E-08	1.9E-08	3.7E-08	5.6E-08	5.8E-08	6.7E-08
Pa-234m	1.170E+00	m	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Pa-234	6.700E+00	h	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
U-232	6.890E+01	yr	5.4E-08	4.9E-08	2.4E-08	1.6E-09	4.1E-12	1.7E-12	7.0E-15
U-233	1.592E+05	yr	9.9E-12	1.0E-11	1.6E-11	5.2E-11	1.8E-10	2.0E-10	2.8E-09
U-234	2.455E+05	yr	4.9E-06	5.0E-06	5.5E-06	6.2E-06	6.2E-06	6.2E-06	6.1E-06
U-235	7.038E+08	yr	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.7E-08	2.8E-08
U-236	2.342E+07	yr	7.1E-08	7.1E-08	7.1E-08	7.2E-08	7.3E-08	7.3E-08	8.5E-08
U-237	6.750E+00	d	8.0E-09	4.9E-09	1.4E-10	8.4E-15	7.9E-15	7.8E-15	3.8E-15
U-238	4.470E+09	yr	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
U-240	1.410E+01	h	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Np-236	1.540E+05	yr	8.3E-14	8.3E-14	8.3E-14	8.3E-14	8.2E-14	8.2E-14	7.8E-14
Np-237	2.144E+06	yr	1.3E-08	1.3E-08	1.9E-08	3.7E-08	5.6E-08	5.8E-08	6.7E-08
Np-238	2.117E+00	d	1.1E-09	1.0E-09	7.5E-10	2.0E-10	1.2E-11	8.0E-12	2.0E-29
Np-239	2.356E+00	d	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06	7.7E-07
Np-240m	7.220E+00	m	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Pu-236	2.858E+00	yr	8.5E-13	8.2E-14	7.4E-15	7.4E-15	7.4E-15	7.4E-15	7.0E-15
Pu-238	8.770E+01	yr	3.8E-03	3.6E-03	2.0E-03	2.1E-04	1.6E-06	7.7E-07	7.8E-27
Pu-239	2.411E+04	yr	8.6E-05	8.6E-05	8.5E-05	8.5E-05	8.3E-05	8.3E-05	6.5E-05
Pu-240	6.563E+03	yr	7.7E-05	7.7E-05	7.6E-05	7.4E-05	6.9E-05	6.8E-05	2.7E-05
Pu-241	1.435E+01	yr	3.3E-04	2.0E-04	5.7E-06	3.4E-10	3.2E-10	3.2E-10	1.5E-10
Pu-242	3.733E+05	yr	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Pu-243	4.956E+00	h	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17

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ROUNDCO2.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pu-244	8.080E+07	yr	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15	4.5E-15
Am-241	4.322E+02	yr	2.6E-04	2.6E-04	2.4E-04	1.5E-04	5.6E-05	4.8E-05	1.9E-10
Am-242m	1.410E+02	yr	2.2E-07	2.1E-07	1.5E-07	4.1E-08	2.5E-09	1.6E-09	4.0E-27
Am-242	1.602E+01	h	2.2E-07	2.1E-07	1.5E-07	4.1E-08	2.4E-09	1.6E-09	4.0E-27
Am-243	7.370E+03	yr	2.0E-06	2.0E-06	2.0E-06	1.9E-06	1.8E-06	1.8E-06	7.7E-07
Cm-242	1.628E+02	d	1.8E-07	1.7E-07	1.2E-07	3.4E-08	2.0E-09	1.3E-09	3.3E-27
Cm-243	2.910E+01	yr	2.1E-08	1.6E-08	2.7E-09	2.7E-12	8.3E-19	8.4E-20	
Cm-244	1.810E+01	yr	6.6E-07	4.5E-07	2.7E-08	5.1E-13	2.9E-23	2.9E-23	
Cm-245	8.500E+03	yr	3.5E-10	3.5E-10	3.4E-10	3.4E-10	3.2E-10	3.2E-10	1.5E-10
Cm-246	4.730E+03	yr	2.7E-11	2.7E-11	2.7E-11	2.6E-11	2.4E-11	2.3E-11	6.4E-12
Cm-247	1.560E+07	yr	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17	3.6E-17
Cm-248	3.400E+05	yr	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17	4.3E-17
Cf-249	3.510E+02	yr	2.5E-16	2.4E-16	2.1E-16	1.2E-16	3.5E-17	2.9E-17	6.7E-25
Cf-250	1.308E+01	yr	3.2E-17	1.9E-17	3.7E-19	2.7E-25	1.6E-25	1.6E-25	1.6E-25
Cf-251	8.980E+02	yr	4.3E-18	4.3E-18	4.1E-18	3.3E-18	2.0E-18	1.9E-18	2.0E-21
Cf-252	2.645E+00	yr	1.3E-23	1.3E-23	4.8E-32				
Ca 45	1.626E+02	d							
V 50	1.400E+17	yr	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20	2.6E-20
Mn 54	3.123E+02	d	1.1E-26	3.2E-30					
Fe 55	2.730E+00	yr	1.4E-09	9.5E-11	2.6E-19				
Zn 65	2.443E+02	d							
Lu176	3.780E+10	yr	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15	8.7E-15
Lu177	6.734E+00	d							
Lu177m	1.604E+02	d							
Hf182	9.000E+06	yr	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Ta182	1.144E+02	d	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11	3.8E-11
Re187	4.350E+10	yr	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21	2.5E-21

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co_run2.g
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	g/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
HE 3	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14	1.410E-14
B 10	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16	4.420E-16
B 11	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07	2.570E-07
C 12	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04	6.090E-04
C 13	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06	8.390E-06
N 14	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04	8.160E-04
N 15	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06	3.130E-06
O 16	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02	4.910E-02
O 17	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05	1.970E-05
O 18	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05	9.840E-05
F 19	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11	4.970E-11
NE 20	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16	4.590E-16
NE 21	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15	3.580E-15
NE 22	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18	7.580E-18
NA 23	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22	6.950E-22
MG 24	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09	1.610E-09
MG 25	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13	3.790E-13
MG 26	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16	2.520E-16
AL 27	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04	8.210E-04
SI 28	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07	2.840E-07
SI 29	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11	3.360E-11
SI 30	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15	4.370E-15
P 31	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19	1.860E-19
S 34	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25	2.140E-25
CL 37	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19	2.380E-19
AR 38	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23	3.780E-23
AR 39	9.790E-24	9.790E-24	9.790E-24	9.790E-24	2.626E-24	0.000E+00	0.000E+00	0.000E+00
AR 40	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16	9.120E-16
AR 42	1.300E-24	1.300E-24	1.300E-24	1.300E-24	1.765E-24	4.242E-30	4.242E-30	0.000E+00
K 41	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17	2.920E-17
K 42	0.000E+00	5.555E-29	5.555E-29	5.555E-29	7.542E-29	1.813E-34	1.813E-34	0.000E+00
CA 42	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19	5.080E-19
CA 43	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11	6.860E-11
CA 44	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10	5.230E-10
CA 46	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11	6.220E-11
SC 45	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11	1.080E-11
TI 46	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05	3.280E-05
TI 47	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05	2.990E-05
TI 48	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04	3.000E-04
TI 49	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05	2.570E-05
TI 50	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05	2.230E-05
V 50	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07	1.440E-07
V 51	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05	3.860E-05
CR 50	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03	1.740E-03
CR 52	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02	3.430E-02
CR 53	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03	3.900E-03
CR 54	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03	1.070E-03
MN 54	4.000E-09	1.379E-30	4.180E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MN 55	1.030E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05	1.661E-05
FE 54	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03
FE 55	6.310E-06	5.463E-13	3.798E-14	1.028E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 56	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02	5.630E-02
FE 57	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03
FE 58	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04	1.810E-04
CO 59	1.230E-06	1.269E-06	1.276E-06	1.324E-06	1.506E-06	1.901E-06	1.962E-06	7.430E-06
CO 60	1.340E-06	4.391E-10	1.178E-10	6.983E-15	4.176E-31	0.000E+00	0.000E+00	0.000E+00
NI 58	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02	1.390E-02
NI 59	7.450E-05	7.446E-05	7.445E-05	7.441E-05	7.422E-05	7.383E-05	7.377E-05	6.830E-05
NI 60	5.340E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03	5.341E-03
NI 61	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04	2.520E-04
NI 62	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04	7.230E-04
NI 63	1.330E-05	8.400E-06	7.790E-06	4.461E-06	5.250E-07	5.064E-09	2.494E-09	0.000E+00
NI 64	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04	1.860E-04
CU 63	7.450E-07	5.645E-06	6.255E-06	9.584E-06	1.352E-05	1.404E-05	1.404E-05	1.405E-05
CU 65	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07	4.080E-07
ZN 64	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10	2.330E-10

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co_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	g/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
MO 94	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09	6.410E-09
RU 98	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20	2.380E-20
CD114	0.000E+00	9.035E-20	9.035E-20	9.035E-20	9.035E-20	9.035E-20	9.035E-20	9.035E-20
IN113	0.000E+00	8.325E-11	8.325E-11	8.325E-11	8.325E-11	8.325E-11	8.325E-11	8.325E-11
SN112	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03	6.120E-03
SN114	0.000E+00	1.110E-18	1.110E-18	1.110E-18	1.110E-18	1.110E-18	1.110E-18	1.110E-18
YB173	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13	1.400E-13
YB174	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15	6.390E-15
LU175	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06	5.280E-06
LU176	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07
HF174	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06	7.100E-06
HF176	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04	3.190E-04
HF177	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04	1.070E-04
HF178	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03	1.910E-03
HF179	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03	2.500E-03
HF180	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03	3.300E-03
HF182	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.730E-07	1.729E-07
TA181	8.220E-05	8.220E-05	8.220E-05	8.220E-05	8.220E-05	8.220E-05	8.220E-05	8.220E-05
TA182	1.570E-11	6.052E-15	6.052E-15	6.052E-15	6.052E-15	6.052E-15	6.052E-15	6.047E-15
W182	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06
W183	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.400E-06
W184	2.170E-07	2.170E-07	2.170E-07	2.170E-07	2.170E-07	2.170E-07	2.170E-07	2.170E-07
W186	1.940E-12	1.940E-12	1.940E-12	1.940E-12	1.940E-12	1.940E-12	1.940E-12	1.940E-12
RE185	3.240E-10	3.240E-10	3.240E-10	3.240E-10	3.240E-10	3.240E-10	3.240E-10	3.240E-10
RE187	6.460E-14	6.460E-14	6.460E-14	6.460E-14	6.460E-14	6.460E-14	6.460E-14	6.460E-14
OS186	2.880E-11	2.880E-11	2.880E-11	2.880E-11	2.880E-11	2.880E-11	2.880E-11	2.880E-11
OS187	0.000E+00	5.463E-23	5.463E-23	1.209E-22	3.752E-22	9.269E-22	1.011E-21	8.972E-21
OS188	1.750E-15	1.750E-15	1.750E-15	1.750E-15	1.750E-15	1.750E-15	1.750E-15	1.750E-15
OS189	1.040E-17	1.040E-17	1.040E-17	1.040E-17	1.040E-17	1.040E-17	1.040E-17	1.040E-17
OS190	3.210E-10	3.210E-10	3.210E-10	3.210E-10	3.210E-10	3.210E-10	3.210E-10	3.210E-10
HE 4	1.400E-06	3.925E-06	4.245E-06	6.033E-06	8.565E-06	1.001E-05	1.017E-05	1.915E-05
TL206	0.000E+00	1.463E-32	1.463E-32	1.463E-32	1.463E-32	1.463E-32	1.463E-32	1.463E-32
TL207	1.020E-19	7.809E-19	8.345E-19	1.107E-18	2.040E-18	3.835E-18	4.020E-18	2.786E-17
TL208	1.030E-16	6.736E-17	6.118E-17	3.000E-17	1.948E-18	5.190E-21	2.110E-21	5.832E-23
TL209	2.900E-23	3.138E-23	3.186E-23	3.641E-23	8.019E-23	4.127E-22	4.992E-22	5.048E-20
PB206	1.400E-17	1.445E-13	2.365E-13	2.478E-12	9.486E-11	1.466E-09	1.890E-09	6.956E-07
PB207	2.660E-14	2.446E-12	3.066E-12	8.627E-12	4.270E-11	1.793E-10	2.075E-10	1.129E-08
PB208	1.070E-10	1.938E-09	2.151E-09	3.221E-09	4.184E-09	4.251E-09	4.251E-09	4.251E-09
PB209	1.210E-19	1.308E-19	1.328E-19	1.517E-19	3.341E-19	1.720E-18	2.080E-18	2.103E-16
PB210	2.540E-16	2.518E-13	3.565E-13	1.847E-12	2.435E-11	1.408E-10	1.577E-10	5.397E-09
PB211	7.870E-19	6.041E-18	6.455E-18	8.560E-18	1.578E-17	2.967E-17	3.110E-17	2.155E-16
PB212	6.090E-14	3.973E-14	3.609E-14	1.770E-14	1.149E-15	3.061E-18	1.244E-18	3.440E-20
PB214	1.120E-20	1.294E-18	1.695E-18	6.494E-18	5.671E-17	3.280E-16	3.865E-16	1.257E-14
BI208	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22	7.930E-22
BI209	1.600E-15	1.569E-14	1.812E-14	3.741E-14	1.554E-13	1.170E-12	1.498E-12	1.336E-09
BI210M	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21	5.640E-21
BI210	1.540E-19	1.549E-16	2.195E-16	1.137E-15	1.498E-14	8.666E-14	9.702E-14	3.321E-12
BI211	4.640E-20	3.564E-19	3.809E-19	5.051E-19	9.311E-19	1.751E-18	1.835E-18	1.272E-17
BI212	5.780E-15	3.769E-15	3.423E-15	1.679E-15	1.090E-16	2.904E-19	1.180E-19	3.263E-21
BI213	2.840E-20	3.073E-20	3.119E-20	3.565E-20	7.851E-20	4.041E-19	4.887E-19	4.942E-17
BI214	8.280E-21	9.605E-19	1.259E-18	4.822E-18	4.211E-17	2.436E-16	2.870E-16	9.334E-15
PO210	3.310E-18	4.279E-15	6.062E-15	3.139E-14	4.138E-13	2.394E-12	2.680E-12	9.173E-11
PO211	5.690E-25	4.373E-24	4.673E-24	6.197E-24	1.142E-23	2.148E-23	2.251E-23	1.560E-22
PO212	3.060E-25	1.994E-25	1.811E-25	8.881E-26	5.768E-27	1.536E-29	6.244E-30	1.726E-31
PO213	0.000E+00	4.610E-29	4.680E-29	5.348E-29	1.178E-28	6.062E-28	7.332E-28	7.415E-26
PO214	0.000E+00	1.321E-25	1.732E-25	6.634E-25	5.793E-24	3.351E-23	3.948E-23	1.284E-21
PO215	6.590E-25	5.059E-24	5.406E-24	7.168E-24	1.321E-23	2.484E-23	2.604E-23	1.805E-22
PO216	2.430E-19	1.585E-19	1.440E-19	7.061E-20	4.586E-21	1.222E-23	4.965E-24	1.373E-25
PO218	1.290E-21	1.500E-19	1.966E-19	7.530E-19	6.576E-18	3.804E-17	4.482E-17	1.458E-15
AT217	3.410E-25	3.692E-25	3.748E-25	4.283E-25	9.432E-25	4.855E-24	5.871E-24	5.938E-22
RN219	1.490E-21	1.146E-20	1.225E-20	1.624E-20	2.994E-20	5.630E-20	5.902E-20	4.090E-19
RN220	9.180E-17	5.985E-17	5.437E-17	2.666E-17	1.731E-18	4.612E-21	1.874E-21	5.182E-23
RN222	2.380E-18	2.758E-16	3.614E-16	1.384E-15	1.209E-14	6.993E-14	8.240E-14	2.680E-12
FR221	3.090E-21	3.352E-21	3.403E-21	3.889E-21	8.565E-21	4.408E-20	5.332E-20	5.392E-18
FR223	6.960E-21	5.321E-20	5.677E-20	7.538E-20	1.390E-19	2.613E-19	2.739E-19	1.898E-18

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co_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	g/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
RA223	3.790E-16	2.912E-15	3.112E-15	4.126E-15	7.607E-15	1.430E-14	1.499E-14	1.039E-13
RA224	5.310E-13	3.466E-13	3.148E-13	1.544E-13	1.003E-14	2.671E-17	1.085E-17	3.001E-19
RA225	1.400E-17	1.516E-17	1.539E-17	1.758E-17	3.873E-17	1.993E-16	2.411E-16	2.438E-14
RA226	3.730E-13	4.290E-11	5.623E-11	2.154E-10	1.881E-09	1.088E-08	1.282E-08	4.169E-07
RA228	2.340E-18	8.440E-18	8.595E-18	9.850E-18	1.411E-17	2.347E-17	2.492E-17	1.743E-16
AC225	9.450E-18	1.024E-17	1.039E-17	1.188E-17	2.616E-17	1.346E-16	1.628E-16	1.647E-14
AC227	2.700E-13	2.062E-12	2.200E-12	2.921E-12	5.385E-12	1.013E-11	1.061E-11	7.356E-11
AC228	2.440E-22	8.810E-22	8.972E-22	1.028E-21	1.472E-21	2.450E-21	2.601E-21	1.819E-20
TH227	6.240E-16	4.785E-15	5.113E-15	6.780E-15	1.250E-14	2.350E-14	2.463E-14	1.707E-13
TH228	1.030E-10	6.735E-11	6.117E-11	3.000E-11	1.948E-12	5.190E-15	2.109E-15	5.831E-17
TH229	2.580E-12	2.793E-12	2.836E-12	3.241E-12	7.137E-12	3.673E-11	4.443E-11	4.493E-09
TH230	2.090E-08	1.422E-07	1.641E-07	3.377E-07	1.089E-06	2.784E-06	3.042E-06	2.619E-05
TH231	1.570E-12	5.043E-14	5.043E-14	5.044E-14	5.049E-14	5.058E-14	5.060E-14	5.181E-14
TH232	1.640E-08	1.834E-08	1.865E-08	2.101E-08	3.010E-08	5.009E-08	5.317E-08	3.719E-07
TH234	2.340E-13	5.705E-14	5.706E-14	5.706E-14	5.706E-14	5.706E-14	5.706E-14	5.707E-14
PA231	3.140E-09	3.869E-09	3.989E-09	4.870E-09	8.243E-09	1.550E-08	1.660E-08	1.126E-07
PA233	1.680E-10	6.056E-13	6.465E-13	9.370E-13	1.787E-12	2.711E-12	2.787E-12	3.250E-12
PA234M	7.890E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18	1.924E-18
PA234	3.530E-18	8.593E-19	8.593E-19	8.593E-19	8.593E-19	8.593E-19	8.593E-19	8.595E-19
U232	1.300E-11	2.511E-09	2.280E-09	1.118E-09	7.262E-11	1.932E-13	7.837E-14	3.275E-16
U233	5.750E-10	1.022E-09	1.081E-09	1.631E-09	5.339E-09	1.873E-08	2.114E-08	2.864E-07
U234	6.400E-04	7.767E-04	7.935E-04	8.837E-04	9.847E-04	9.950E-04	9.948E-04	9.701E-04
U235	1.240E-02	1.240E-02	1.240E-02	1.241E-02	1.242E-02	1.244E-02	1.244E-02	1.274E-02
U236	1.090E-03	1.092E-03	1.092E-03	1.095E-03	1.105E-03	1.125E-03	1.128E-03	1.308E-03
U237	9.860E-13	9.790E-14	6.050E-14	1.717E-15	1.032E-19	9.623E-20	9.550E-20	4.625E-20
U238	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.930E-03	3.931E-03
U240	1.250E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21	4.858E-21
NP235	3.000E-15	3.491E-32	3.491E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	6.280E-12	6.278E-12	6.277E-12	6.275E-12	6.264E-12	6.241E-12	6.237E-12	5.912E-12
NP237	1.170E-05	1.783E-05	1.903E-05	2.759E-05	5.260E-05	7.981E-05	8.207E-05	9.569E-05
NP238	1.440E-15	4.216E-15	4.028E-15	2.875E-15	7.874E-16	4.745E-17	3.091E-17	7.669E-35
NP239	5.500E-16	8.485E-12	8.477E-12	8.418E-12	8.197E-12	7.736E-12	7.668E-12	3.327E-12
NP240M	1.100E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23	4.249E-23
PU236	4.400E-09	1.608E-15	1.542E-16	1.400E-17	1.398E-17	1.392E-17	1.392E-17	1.319E-17
PU238	3.640E-04	2.248E-04	2.077E-04	1.158E-04	1.229E-05	9.489E-08	4.521E-08	4.560E-28
PU239	1.380E-03	1.378E-03	1.377E-03	1.374E-03	1.363E-03	1.340E-03	1.336E-03	1.039E-03
PU240	3.390E-04	3.369E-04	3.365E-04	3.339E-04	3.240E-04	3.035E-04	3.005E-04	1.171E-04
PU241	5.960E-05	3.162E-06	1.954E-06	5.545E-08	3.336E-12	3.112E-12	3.088E-12	1.496E-12
PU242	4.780E-05	4.780E-05	4.780E-05	4.779E-05	4.777E-05	4.772E-05	4.771E-05	4.695E-05
PU243	3.540E-24	1.373E-23	1.373E-23	1.373E-23	1.373E-23	1.373E-23	1.373E-23	1.372E-23
PU244	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10	2.540E-10
PU246	0.000E+00	6.006E-30	6.006E-30	6.006E-30	6.006E-30	6.006E-30	6.006E-30	6.006E-30
AM241	2.610E-05	7.630E-05	7.629E-05	6.949E-05	4.410E-05	1.642E-05	1.412E-05	5.398E-11
AM242M	2.970E-08	2.249E-08	2.149E-08	1.533E-08	4.199E-09	2.531E-10	1.649E-10	4.090E-28
AM242	3.570E-13	2.690E-13	2.570E-13	1.834E-13	5.023E-14	3.028E-15	1.972E-15	4.893E-33
AM243	9.930E-06	9.873E-06	9.864E-06	9.796E-06	9.538E-06	9.002E-06	8.923E-06	3.871E-06
AM246	0.000E+00	9.610E-33	9.610E-33	9.610E-33	9.610E-33	9.610E-33	9.610E-33	9.610E-33
CM242	3.740E-10	5.439E-11	5.197E-11	3.708E-11	1.016E-11	6.122E-13	3.988E-13	9.922E-31
CM243	1.760E-09	3.992E-10	3.130E-10	5.176E-11	5.167E-14	1.610E-20	1.622E-21	0.000E+00
CM244	8.450E-08	8.182E-09	5.580E-09	3.285E-10	6.249E-15	3.600E-25	3.600E-25	0.000E+00
CM245	2.030E-09	2.020E-09	2.018E-09	2.006E-09	1.960E-09	1.864E-09	1.850E-09	8.959E-10
CM246	9.020E-11	8.940E-11	8.927E-11	8.830E-11	8.471E-11	7.740E-11	7.634E-11	2.075E-11
CM247	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.850E-13	3.848E-13
CM248	1.020E-14	1.020E-14	1.020E-14	1.020E-14	1.019E-14	1.018E-14	1.018E-14	9.993E-15
CM250	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23	1.430E-23
BK249	1.310E-18	1.443E-39	6.978E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BK250	0.000E+00	4.229E-32	4.229E-32	4.229E-32	4.229E-32	4.229E-32	4.229E-32	4.229E-32
CF249	6.630E-17	5.993E-17	5.876E-17	5.076E-17	2.894E-17	8.560E-18	7.107E-18	1.644E-25
CF250	7.370E-18	2.909E-19	1.712E-19	3.398E-21	2.495E-27	1.505E-27	1.505E-27	1.505E-27
CF251	2.860E-18	2.728E-18	2.707E-18	2.557E-18	2.054E-18	1.277E-18	1.187E-18	1.231E-21
CF252	2.250E-19	2.463E-26	2.463E-26	8.854E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	0.000E+00	5.184E-13	5.785E-13	9.372E-13	1.794E-12	3.189E-12	3.393E-12	1.729E-11
H 3	3.610E-07	1.176E-08	6.710E-09	1.054E-10	1.258E-17	1.212E-32	1.212E-32	0.000E+00
LI 6	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09	2.690E-09
LI 7	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10	1.130E-10

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co_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	g/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
BE 9	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09	2.720E-09
BE 10	1.500E-09	1.500E-09	1.500E-09	1.500E-09	1.500E-09	1.499E-09	1.499E-09	1.493E-09
C 14	2.180E-06	2.164E-06	2.161E-06	2.142E-06	2.070E-06	1.921E-06	1.899E-06	6.479E-07
ZN 66	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10	7.110E-10
ZN 67	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13	3.350E-13
ZN 68	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09	3.860E-09
GA 69	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12	5.960E-12
ZN 70	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08	1.320E-08
GE 70	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14	1.710E-14
GA 71	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12	7.430E-12
GE 72	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08	8.140E-08
GE 73	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07	2.850E-07
GE 74	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07	7.700E-07
AS 75	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06	1.850E-06
GE 76	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06	5.620E-06
SE 76	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08	3.270E-08
SE 77	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05
SE 78	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05	2.640E-05
SE 79	6.740E-05	6.736E-05	6.735E-05	6.730E-05	6.709E-05	6.665E-05	6.659E-05	6.056E-05
BR 79	5.010E-09	4.887E-08	5.605E-08	1.092E-07	3.128E-07	7.524E-07	8.192E-07	6.845E-06
SE 80	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04	1.620E-04
KR 80	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10	8.280E-10
BR 81	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04	2.720E-04
KR 81	2.960E-11	2.959E-11	2.959E-11	2.959E-11	2.956E-11	2.950E-11	2.949E-11	2.864E-11
SE 82	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04	4.400E-04
KR 82	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06	6.600E-06
KR 83	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04	6.110E-04
KR 84	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03	1.500E-03
KR 85	2.380E-04	4.609E-06	2.415E-06	2.018E-08	2.137E-16	1.077E-33	1.077E-33	0.000E+00
RB 85	1.510E-03	1.743E-03	1.746E-03	1.748E-03	1.748E-03	1.748E-03	1.748E-03	1.748E-03
KR 86	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03	2.790E-03
SR 86	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06	3.400E-06
RB 87	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03	3.610E-03
SR 87	3.810E-08	3.810E-08	3.810E-08	3.811E-08	3.812E-08	3.816E-08	3.816E-08	3.863E-08
SR 88	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03	5.210E-03
Y 89	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03	6.860E-03
SR 90	6.910E-03	1.618E-03	1.275E-03	2.191E-04	2.542E-07	1.090E-13	1.164E-14	0.000E+00
Y 90	1.740E-06	4.057E-07	3.198E-07	5.494E-08	6.375E-11	2.734E-17	2.919E-18	0.000E+00
ZR 90	2.070E+00	2.075E+00	2.076E+00	2.077E+00	2.077E+00	2.077E+00	2.077E+00	2.077E+00
ZR 91	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01	4.590E-01
ZR 92	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01	7.000E-01
ZR 93	1.080E-02	1.080E-02	1.080E-02	1.080E-02	1.080E-02	1.079E-02	1.079E-02	1.075E-02
NB 93	4.070E-03	4.070E-03	4.070E-03	4.071E-03	4.072E-03	4.075E-03	4.076E-03	4.119E-03
NB 93M	2.730E-08	8.835E-08	8.949E-08	9.116E-08	9.119E-08	9.117E-08	9.116E-08	9.080E-08
ZR 94	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01	7.080E-01
NB 94	2.590E-05	2.585E-05	2.584E-05	2.577E-05	2.552E-05	2.499E-05	2.491E-05	1.839E-05
MO 95	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03	9.760E-03
ZR 96	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01	1.220E-01
MO 96	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04	2.880E-04
MO 97	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03	9.490E-03
MO 98	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03	9.200E-03
TC 98	3.300E-08	3.300E-08	3.300E-08	3.300E-08	3.300E-08	3.299E-08	3.299E-08	3.295E-08
TC 99	8.950E-03	8.948E-03	8.948E-03	8.946E-03	8.938E-03	8.920E-03	8.917E-03	8.663E-03
RU 99	2.040E-07	1.980E-06	2.272E-06	4.426E-06	1.269E-05	3.059E-05	3.332E-05	2.876E-04
MO100	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02	1.010E-02
RU100	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04	7.260E-04
RU101	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03	8.090E-03
RU102	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03	7.160E-03
RH102	1.150E-09	5.354E-16	4.905E-17	1.021E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03	3.920E-03
RU104	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03	3.180E-03
PD104	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03	1.330E-03
PD105	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03	1.660E-03
RU106	3.380E-05	2.050E-23	7.159E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	3.180E-11	1.927E-29	6.729E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD106	8.230E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04	8.568E-04

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co_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	g/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
PD107	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.300E-04	3.296E-04
AG107	2.440E-10	2.392E-09	2.744E-09	5.350E-09	1.535E-08	3.704E-08	4.035E-08	3.532E-07
PD108	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04	1.600E-04
AG108	6.810E-22	4.889E-22	4.629E-22	3.091E-22	6.561E-23	2.275E-24	1.362E-24	0.000E+00
AG108M	2.160E-13	1.548E-13	1.466E-13	9.790E-14	2.078E-14	7.204E-16	4.313E-16	3.662E-37
CD108	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10	1.990E-10
AG109	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05	6.540E-05
AG109M	1.080E-20	3.780E-35	3.780E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	1.090E-14	3.826E-29	3.826E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD110	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05	5.840E-05
CD110	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05	2.400E-05
CD111	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05	4.660E-05
CD112	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05	3.580E-05
CD113	4.660E-07	4.665E-07	4.665E-07	4.665E-07	4.665E-07	4.665E-07	4.665E-07	4.665E-07
CD113M	5.410E-07	2.982E-08	1.854E-08	5.512E-10	7.609E-16	1.482E-28	1.482E-28	0.000E+00
IN113	6.330E-05	6.381E-05	6.382E-05	6.384E-05	6.384E-05	6.384E-05	6.384E-05	6.384E-05
CD114	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05	6.480E-05
SN114	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03	4.150E-03
IN115	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05	1.040E-05
SN115	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03	2.150E-03
CD116	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05	3.150E-05
SN116	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02	9.200E-02
SN117	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02	4.930E-02
SN118	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01	1.540E-01
SN119	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02	5.550E-02
SN120	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01	2.080E-01
SN121M	9.620E-07	4.128E-07	3.593E-07	1.287E-07	2.505E-09	4.877E-13	1.324E-13	0.000E+00
SB121	2.220E-04	2.225E-04	2.226E-04	2.228E-04	2.230E-04	2.230E-04	2.230E-04	2.230E-04
SN122	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05	3.910E-05
TE122	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06	9.660E-06
SB123	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05	4.530E-05
TE123	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07	1.020E-07
SN124	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05	6.080E-05
TE124	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06	1.350E-06
SB125	3.210E-05	7.533E-12	6.168E-13	5.595E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125	6.410E-05	9.642E-05	9.642E-05	9.642E-05	9.642E-05	9.642E-05	9.642E-05	9.642E-05
TE125M	2.170E-07	1.054E-13	8.628E-15	7.826E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	1.470E-04	1.469E-04	1.469E-04	1.469E-04	1.466E-04	1.459E-04	1.458E-04	1.371E-04
SB126	6.980E-12	6.981E-12	6.980E-12	6.977E-12	6.963E-12	6.933E-12	6.929E-12	6.515E-12
SB126M	5.310E-14	5.308E-14	5.307E-14	5.305E-14	5.294E-14	5.272E-14	5.268E-14	4.953E-14
TE126	3.500E-06	3.562E-06	3.572E-06	3.648E-06	3.936E-06	4.561E-06	4.656E-06	1.337E-05
I127	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04	3.160E-04
TE128	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04	8.240E-04
XE128	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05	1.190E-05
I129	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.430E-03	1.429E-03
XE129	6.080E-08	6.465E-08	6.528E-08	6.996E-08	8.789E-08	1.268E-07	1.327E-07	6.939E-07
TE130	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03	3.170E-03
XE130	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05	5.920E-05
XE131	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03	4.800E-03
XE132	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02	1.050E-02
BA132	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09	9.040E-09
CS133	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02
XE134	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02	1.660E-02
CS134	1.610E-04	2.001E-13	6.939E-15	1.091E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA134	1.070E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03	1.231E-03
CS135	6.260E-03	6.260E-03	6.260E-03	6.260E-03	6.259E-03	6.258E-03	6.258E-03	6.241E-03
BA135	1.820E-06	1.935E-06	1.954E-06	2.094E-06	2.629E-06	3.791E-06	3.969E-06	2.071E-05
XE136	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02	2.210E-02
BA136	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04	1.630E-04
CS137	1.150E-02	2.809E-03	2.230E-03	4.033E-04	5.697E-07	3.752E-13	4.276E-14	0.000E+00
BA137	2.020E-03	1.071E-02	1.129E-02	1.312E-02	1.352E-02	1.352E-02	1.352E-02	1.352E-02
BA137M	1.760E-09	4.298E-10	3.411E-10	6.171E-11	8.720E-14	5.740E-20	6.542E-21	0.000E+00
BA138	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02	1.510E-02
LA138	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07	1.070E-07
LA139	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02	1.440E-02
CE140	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02	1.420E-02

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co_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

	g/L	61.0YR	71.0YR	145.0YR	429.0YR	1045.0YR	1139.0YR	1.0E+04YR
PR141	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02	1.320E-02
CE142	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02	1.350E-02
ND142	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04	1.870E-04
ND143	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02	1.100E-02
ND144	1.510E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02	1.543E-02
ND145	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03	8.510E-03
ND146	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03	7.660E-03
PM146	2.070E-08	9.490E-12	2.691E-12	2.397E-16	6.849E-32	0.000E+00	0.000E+00	0.000E+00
SM146	6.060E-08	6.826E-08	6.826E-08	6.826E-08	6.826E-08	6.826E-08	6.826E-08	6.825E-08
PM147	6.000E-04	6.007E-11	4.278E-12	1.381E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	2.660E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03	3.260E-03
ND148	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03	4.030E-03
SM148	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03	1.630E-03
SM149	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05	4.810E-05
ND150	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03	1.560E-03
SM150	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03	2.840E-03
EU150	2.790E-12	8.620E-13	7.111E-13	1.710E-13	7.213E-16	5.095E-21	8.219E-22	0.000E+00
SM151	1.320E-04	8.251E-05	7.640E-05	4.321E-05	4.848E-06	4.217E-08	2.045E-08	0.000E+00
EU151	5.160E-06	5.465E-05	6.076E-05	9.395E-05	1.323E-04	1.371E-04	1.371E-04	1.372E-04
SM152	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03	1.140E-03
EU152	6.410E-07	2.862E-08	1.719E-08	3.958E-10	2.049E-16	4.755E-30	4.755E-30	0.000E+00
GD152	7.920E-07	9.626E-07	9.658E-07	9.705E-07	9.706E-07	9.706E-07	9.706E-07	9.706E-07
EU153	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04	8.500E-04
SM154	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04	1.930E-04
EU154	5.630E-05	4.124E-07	1.842E-07	4.733E-10	5.424E-20	1.489E-41	0.000E+00	0.000E+00
GD154	8.120E-05	1.371E-04	1.373E-04	1.375E-04	1.375E-04	1.375E-04	1.375E-04	1.375E-04
EU155	3.090E-05	6.126E-09	1.514E-09	4.878E-14	2.812E-31	0.000E+00	0.000E+00	0.000E+00
GD155	3.080E-05	6.169E-05	6.170E-05	6.170E-05	6.170E-05	6.170E-05	6.170E-05	6.170E-05
GD156	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04	2.000E-04
GD157	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07	2.700E-07
GD158	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05	3.750E-05
TB159	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06	3.530E-06
GD160	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06	1.370E-06
DY160	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07	3.300E-07
DY161	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07	3.040E-07
DY162	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07	2.310E-07
DY163	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07	1.520E-07
DY164	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08	2.940E-08
HO165	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08	4.840E-08
HO166M	3.230E-10	3.118E-10	3.100E-10	2.970E-10	2.521E-10	1.766E-10	1.673E-10	9.851E-13
ER166	1.150E-08	1.151E-08	1.151E-08	1.153E-08	1.157E-08	1.165E-08	1.166E-08	1.182E-08
ER167	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09	1.650E-09
ER168	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09	2.190E-09
TM169	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11	1.050E-11
ER170	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15	3.000E-15
YB170	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12	2.020E-12
TM171	6.500E-15	1.774E-24	1.774E-24	4.431E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB171	7.310E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14	7.960E-14
YB172	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13	2.240E-13

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Source Listing of Program ELECO2

```
      PROGRAM ELECO1

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/18/02

!            To sum the g/L of coprocess waste and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='CO_RUN1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='CO_RUN1.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'CO_RUN1.ELE    g/L')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Page 2 of 5

Source Listing of Program ELECO2 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610  FORMAT(A85,/,'Element',5X,'1999Jul   2002Jan   2003Jan   2010' &
             'Jan   2012Jan   2016Jan   2022Jan')

!--------- Skip the next 2 lines of data

       READ(3,300) TITLE
       READ(3,300) TITLE
       FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60  READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310  FORMAT(1X,A6,14X,7(1PE10.3))
       IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

       DO K=1,29
          IF(NAME == NUCLIDE(K)) GO TO 60
       END DO

       FOUND = .TRUE.
       DO J=1,7
          TOTAL(J) = TOTAL(J) + OLD(J)
       END DO

       GO TO 60

!--------- Write element total when element found

   80  REWIND(3)
       IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

       IF(TOTAL(1) > 0.) THEN
          WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620     FORMAT(1X,a2,6X,7(1PE10.1))
       ENDIF

!--------- Keep a sum of the total for all elements

       DO J=1,7
          SIGMA(J) = SIGMA(J) + TOTAL(J)
       END DO

       GO TO 10
  100  WRITE(6,630) (SIGMA(J),J=1,7)
  630  FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
       GO TO 999
```

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Source Listing of Program ELECO2 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELECO1
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

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CO_RUN2.ELE g/L
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	1.2E-08	6.7E-09	1.1E-10	1.3E-17	1.2E-32	1.2E-32	0.0E+00
He	3.9E-06	4.2E-06	6.0E-06	8.6E-06	1.0E-05	1.0E-05	1.9E-05
Li	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09	2.8E-09
Be	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09	4.2E-09
B	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07	2.6E-07
C	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04	6.2E-04
N	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04	8.2E-04
O	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02	4.9E-02
F	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Ne	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
Na	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22	6.9E-22
Mg	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09	1.6E-09
Si	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07	2.8E-07
P	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19	1.9E-19
S	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25	2.1E-25
Cl	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19	2.4E-19
Ar	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16	9.1E-16
K	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17
Ca	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10	6.5E-10
Sc	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Ti	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
V	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05	3.9E-05
Mn	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05	1.7E-05
Fe	5.5E-13	3.8E-14	1.0E-22	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	1.3E-06	1.3E-06	1.3E-06	1.5E-06	1.9E-06	2.0E-06	7.4E-06
Ni	8.3E-05	8.2E-05	7.9E-05	7.5E-05	7.4E-05	7.4E-05	6.8E-05
Cu	6.1E-06	6.7E-06	1.0E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05
Zn	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08	1.8E-08
Ga	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
Ge	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06	6.8E-06
As	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06	1.8E-06
Se	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.1E-04	7.0E-04
Br	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.8E-04
Kr	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03	4.9E-03
Rb	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03
Sr	6.8E-03	6.5E-03	5.4E-03	5.2E-03	5.2E-03	5.2E-03	5.2E-03
Y	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03	6.9E-03
Zr	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Nb	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
Mo	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02	3.9E-02
Tc	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.9E-03	8.7E-03
Ru	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Rh	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03	3.9E-03
Pd	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Ag	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.5E-05	6.6E-05
Cd	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04	2.0E-04
In	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05	7.4E-05
Sn	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.5E-04	1.4E-04
Sb	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04	2.7E-04
Te	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03	4.1E-03
I	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03	1.7E-03
Xe	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02	5.4E-02

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CO_RUN2.ELE g/L (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/05/02 at 14:23:55

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Cs	2.2E-02	2.2E-02	2.0E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Ba	2.7E-02	2.8E-02	3.0E-02	3.0E-02	3.0E-02	3.0E-02	3.0E-02
La	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02	1.4E-02
Ce	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02	2.8E-02
Pr	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02
Nd	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02	4.8E-02
Pm	7.0E-11	7.0E-12	2.4E-16	6.8E-32	0.0E+00	0.0E+00	0.0E+00
Sm	9.2E-03	9.2E-03	9.2E-03	9.1E-03	9.1E-03	9.1E-03	9.1E-03
Eu	9.1E-04	9.1E-04	9.4E-04	9.8E-04	9.9E-04	9.9E-04	9.9E-04
Gd	4.4E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04	4.4E-04
Tb	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Dy	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06
Ho	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.9E-08	4.8E-08
Er	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.5E-08	1.6E-08	1.6E-08
Tm	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11	1.1E-11
Yb	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Lu	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
Hf	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03	8.1E-03
Ta	8.2E-05	8.2E-05	8.2E-05	8.2E-05	8.2E-05	8.2E-05	8.2E-05
W	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Re	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10	3.2E-10
Os	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Tl	6.8E-17	6.2E-17	3.1E-17	4.0E-18	3.8E-18	4.0E-18	2.8E-17
Pb	1.9E-09	2.2E-09	3.2E-09	4.3E-09	6.0E-09	6.5E-09	7.2E-07
Bi	2.0E-14	2.2E-14	4.0E-14	1.7E-13	1.3E-12	1.6E-12	1.3E-09
Po	4.3E-15	6.1E-15	3.1E-14	4.1E-13	2.4E-12	2.7E-12	9.2E-11
At	3.7E-25	3.7E-25	4.3E-25	9.4E-25	4.9E-24	5.9E-24	5.9E-22
Rn	3.4E-16	4.2E-16	1.4E-15	1.2E-14	7.0E-14	8.2E-14	2.7E-12
Fr	5.7E-20	6.0E-20	7.9E-20	1.5E-19	3.1E-19	3.3E-19	7.3E-18
Ra	4.3E-11	5.7E-11	2.2E-10	1.9E-09	1.1E-08	1.3E-08	4.2E-07
Ac	2.1E-12	2.2E-12	2.9E-12	5.4E-12	1.0E-11	1.1E-11	7.4E-11
Th	1.6E-07	1.8E-07	3.6E-07	1.1E-06	2.8E-06	3.1E-06	2.7E-05
Pa	3.9E-09	4.0E-09	4.9E-09	8.2E-09	1.6E-08	1.7E-08	1.1E-07
U	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.8E-02	1.9E-02
Np	1.8E-05	1.9E-05	2.8E-05	5.3E-05	8.0E-05	8.2E-05	9.6E-05
Pu	2.0E-03	2.0E-03	1.9E-03	1.7E-03	1.7E-03	1.7E-03	1.2E-03
Am	8.6E-05	8.6E-05	7.9E-05	5.4E-05	2.5E-05	2.3E-05	3.9E-06
Cm	1.1E-08	8.1E-09	2.5E-09	2.1E-09	1.9E-09	1.9E-09	9.2E-10
Bk	4.2E-32	4.2E-32	4.2E-32	4.2E-32	4.2E-32	4.2E-32	4.2E-32
Cf	6.3E-17	6.2E-17	5.3E-17	3.1E-17	9.8E-18	8.3E-18	1.2E-21
Total	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**	**4.2E-01**

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File SS_RUN1.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     Electrolytic IAR first campaign waste
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     Final Activity in Ci/L rather than Ci
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  Ci/L
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      26.5   1   2   5   0
  DEC      29.    2   3   5   0
  DEC      30.    3   4   5   0
  DEC      37.    4   5   5   0
  DEC      39.    5   6   5   0
  DEC      43.    6   7   5   0
  DEC      49.    7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   20030 1.028E-15  20040 7.450E-08  50100 4.008E-15 0 0.
  1   50110 6.663E-18  60120 5.042E-02  60130 5.614E-04 0 0.
  1   70140 5.876E-15  70150 1.427E-22  80160 1.689E-35 0 0.
  1   80170 2.046E-24 100200 2.707E-19 100210 1.312E-21 0 0.
  1  100220 1.018E-11 110220 7.345E-22 110230 7.397E-13 0 0.
  1  120240 1.679E-15 120250 7.607E-07 120260 3.116E-07 0 0.
  1  130270 3.247E-09 140280 6.453E-01 140290 3.043E-02 0 0.
  1  140300 2.020E-02 140320 2.209E-15 150310 2.880E-02 0 0.
  1  150320 1.306E-13 150330 1.521E-18 160320 2.544E-02 0 0.
  1  160330 1.453E-05 160340 8.132E-04 160350 5.215E-12 0 0.
  1  160360 3.856E-06 170350 1.201E-09 170360 7.292E-14 0 0.
  1  170370 3.578E-12 180360 7.240E-19 180370 6.191E-28 0 0.
  1  180380 7.607E-18 180390 1.380E-23 180420 7.502E-32 0 0.
  1  190410 4.638E-20 190420 3.211E-36 200420 2.057E-25 0 0.
  1  200430 1.600E-22 200440 2.387E-12 200450 1.941E-19 0 0.
  1  200460 7.660E-13 200470 1.417E-32 210450 5.928E-18 0 0.
  1  210460 4.076E-25 210470 4.019E-32 220460 5.509E-23 0 0.
  1  220470 5.194E-07 220480 6.505E-12 220490 1.128E-06 0 0.
  1  220500 1.249E-05 230500 2.151E-05 230510 5.928E-05 0 0.
  1  240500 4.753E-01 240510 1.070E-09 240520 9.129E+00 0 0.
  1  240530 2.466E+00 240540 2.586E-01 250540 1.140E-05 0 0.
  1  250550 2.854E-05 260540 2.476E+00 260550 1.540E-05 0 0.
  1  260560 3.856E+01 260570 8.814E-01 260580 1.186E-01 0 0.
  1  260590 5.771E-10 270580 2.790E-06 270590 2.235E-05 0 0.
  1  270600 4.180E-06 280580 5.246E+00 280590 1.490E-04 0 0.
  1  280600 2.020E-01 280610 8.709E-02 280620 2.775E-01 0 0.
  1  280630 2.700E-05 280640 7.030E-02 290630 8.709E-07 0 0.
  1  290650 1.049E-06 300640 9.968E-13 300650 3.494E-19 0 0.
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File SS_RUN1.INP (continued)

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1  400890 4.580E-32 420920 3.017E-01 420930 2.130E-06 0 0.
1  420940 1.868E-01 430970 1.663E-06 430971 5.928E-12 0 0.
1  440960 1.868E-02 440970 1.144E-32 440980 6.296E-03 0 0.
2  812060 6.086E-35 812070 8.761E-19 812080 9.181E-17 0 0.
2  812090 1.243E-22 822060 1.306E-15 822070 1.527E-13 0 0.
2  822080 1.023E-10 822090 5.183E-19 822100 2.700E-14 0 0.
2  822110 6.800E-18 822120 5.400E-14 822140 9.601E-19 0 0.
2  832080 7.345E-23 832090 3.148E-15 832101 2.350E-23 0 0.
2  832100 1.660E-17 832110 4.008E-19 832120 5.131E-15 0 0.
2  832130 1.217E-19 832140 7.135E-19 842100 3.850E-16 0 0.
2  842110 4.921E-24 842120 2.712E-25 842130 1.826E-28 0 0.
2  842140 9.811E-26 842150 5.666E-24 842160 2.156E-19 0 0.
2  842180 1.117E-19 852170 1.464E-24 862180 1.243E-29 0 0.
2  862190 1.291E-20 862200 8.132E-17 862220 2.050E-16 0 0.
2  872210 1.327E-20 872230 6.191E-20 882220 1.375E-26 0 0.
2  882230 3.280E-15 882240 4.710E-13 882250 6.080E-17 0 0.
2  882260 3.180E-11 882280 8.551E-19 892250 4.050E-17 0 0.
2  892270 2.400E-12 892280 8.919E-23 902260 6.820E-25 0 0.
2  902270 5.460E-15 902280 9.140E-11 902290 1.120E-11 0 0.
2  902300 1.180E-06 902310 3.400E-11 902320 7.560E-09 0 0.
2  902340 1.110E-10 912310 4.150E-08 912330 1.280E-11 0 0.
2  912341 3.730E-15 912340 1.670E-15 922300 6.715E-22 0 0.
2  922310 7.974E-33 922320 1.462E-13 922330 1.230E-11 0 0.
2  922340 1.850E-09 922350 2.529E-03 922360 1.720E-06 0 0.
2  922370 1.889E-15 922380 2.390E-04 922400 3.363E-30 0 0.
2  932350 7.083E-13 932360 2.620E-10 932370 3.780E-04 0 0.
2  932380 8.814E-20 932390 4.740E-20 932401 2.943E-32 0 0.
2  942360 1.410E-10 942370 7.397E-14 942380 2.030E-06 0 0.
2  942390 2.300E-02 942400 4.670E-05 942410 5.830E-08 0 0.
2  942420 6.770E-11 942440 1.720E-19 942460 4.276E-31 0 0.
2  952410 1.330E-08 952421 4.360E-13 952420 5.650E-18 0 0.
2  952430 5.510E-14 952460 6.820E-34 962410 2.256E-23 0 0.
2  962420 5.760E-14 962430 5.000E-16 962440 6.670E-17 0 0.
2  962450 7.980E-20 962460 2.634E-23      0 0.000E+00 0 0.
3   10030 3.070E-07  30060 1.962E-09  30070 4.591E-11 0 0.
3   40090 8.866E-13  40100 5.928E-10  60140 1.190E-10 0 0.
3  300660 3.908E-12 300670 1.647E-13 300680 2.235E-17 0 0.
3  310690 3.331E-22 320700 9.811E-30 310710 4.412E-11 0 0.
3  320720 2.754E-07 320730 7.292E-07 320740 1.437E-06 0 0.
3  330750 2.481E-06 320760 5.823E-06 340760 3.825E-09 0 0.
3  340770 1.175E-05 340780 2.356E-05 340790 6.090E-04 0 0.
3  350790 1.726E-09 340800 7.712E-05 360800 1.390E-10 0 0.
3  350810 1.238E-04 360810 1.049E-12 340820 1.758E-04 0 0.
3  360820 3.221E-07 360830 3.090E-04 360840 5.771E-04 0 0.
3  360850 1.128E-04 370850 5.981E-04 360860 1.096E-03 0 0.
3  370860 7.502E-13 380860 5.614E-07 370870 1.420E-03 0 0.
3  380870 1.506E-08 380880 2.062E-03 380890 1.327E-06 0 0.
3  390890 2.607E-03 380900 2.800E-03 390900 7.100E-07 0 0.
3  400900 3.552E-04 390910 3.195E-06 400910 3.295E-03 0 0.
3  400920 3.447E-03 410920 5.928E-26 400930 3.780E-03 0 0.
3  410930 1.375E-09 410931 7.760E-09 400940 3.651E-03 0 0.
3  410940 4.180E-10 400950 5.170E-06 410950 2.800E-06 0 0.
3  410951 2.256E-09 420950 3.882E-03 400960 3.830E-03 0 0.
3  420960 3.379E-06 420970 3.714E-03 420980 3.756E-03 0 0.
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File SS_RUN1.INP (continued)

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3  430980 6.320E-09 420990 1.354E-30 430990 3.620E-03 0 0.
3  430991 1.191E-31 440990 5.509E-08 421000 4.055E-03 0 0.
3  441000 6.978E-06 441010 3.531E-03 441020 3.053E-03 0 0.
3  451020 8.320E-11 441030 3.337E-07 451030 2.245E-03 0 0.
3  451031 2.980E-10 441040 1.595E-03 461040 5.509E-06 0 0.
3  461050 8.656E-04 441060 5.340E-05 451060 4.930E-11 0 0.
3  461060 4.218E-04 471060 1.107E-27 461070 3.130E-04 0 0.
3  471070 1.537E-10 461080 1.952E-04 471080 1.039E-22 0 0.
3  471081 1.080E-13 481080 1.941E-10 471090 1.380E-04 0 0.
3  471091 1.899E-20 481090 1.920E-14 461100 1.049E-04 0 0.
3  471100 6.296E-17 471101 4.160E-09 481100 3.421E-07 0 0.
3  471110 1.207E-16 481110 8.656E-05 481120 7.765E-05 0 0.
3  481130 7.607E-05 481131 9.890E-07 491130 2.434E-07 0 0.
3  481140 7.397E-05 491140 3.557E-19 491141 2.214E-14 0 0.
3  501140 6.978E-11 481150 4.884E-38 481151 1.894E-09 0 0.
3  491150 6.240E-05 491151 5.351E-16 501150 2.513E-06 0 0.
3  481160 7.450E-05 501160 1.327E-06 501170 7.345E-05 0 0.
3  501171 6.453E-18 501180 7.660E-05 501190 7.607E-05 0 0.
3  501191 5.876E-08 501200 7.869E-05 501211 3.610E-08 0 0.
3  511210 7.765E-05 501220 8.499E-05 511220 4.071E-35 0 0.
3  521220 1.532E-07 501230 2.445E-07 511230 9.129E-05 0 0.
3  521230 1.670E-10 521231 3.588E-13 501240 1.091E-04 0 0.
3  511240 2.544E-10 521240 1.952E-07 501250 7.135E-15 0 0.
3  511250 1.100E-05 521250 8.184E-05 521251 6.540E-07 0 0.
3  501260 1.890E-04 511260 9.010E-12 511261 6.880E-14 0 0.
3  521260 5.351E-06 511270 1.285E-24 521270 1.432E-09 0 0.
3  521271 4.092E-07 531270 3.447E-04 541270 1.317E-16 0 0.
3  521280 6.400E-04 541280 6.400E-07 521290 7.765E-12 0 0.
3  521291 8.289E-09 531290 9.510E-04 541290 4.428E-09 0 0.
3  541291 1.249E-22 521300 1.674E-03 541300 1.936E-06 0 0.
3  521311 0.000E+00 531310 1.878E-14 541310 2.791E-03 0 0.
3  541311 4.360E-13 521320 9.496E-27 531320 2.875E-28 0 0.
3  541320 3.998E-03 551320 1.306E-21 561320 2.424E-10 0 0.
3  541330 1.222E-18 541331 5.981E-38 551330 5.614E-03 0 0.
3  541340 6.610E-03 551340 3.470E-06 561340 8.551E-06 0 0.
3  551350 5.530E-03 561350 1.128E-08 541360 5.614E-03 0 0.
3  551360 4.270E-13 561360 2.492E-05 561361 1.915E-20 0 0.
3  551370 4.830E-03 561370 5.351E-04 561371 7.360E-10 0 0.
3  561380 5.823E-03 571380 1.880E-08 571390 5.666E-03 0 0.
3  561400 6.400E-11 571400 9.653E-12 581400 5.614E-03 0 0.
3  581410 2.739E-07 591410 5.404E-03 581420 5.077E-03 0 0.
3  601420 2.670E-06 591430 1.406E-10 601430 5.236E-03 0 0.
3  581440 9.610E-04 591440 1.430E-08 591441 7.135E-11 0 0.
3  601440 4.940E-03 601450 3.536E-03 601460 2.765E-03 0 0.
3  611460 9.010E-09 621460 7.190E-09 601470 3.552E-12 0 0.
3  611470 7.770E-04 621470 1.420E-03 601480 1.626E-03 0 0.
3  611480 3.069E-11 611481 4.187E-09 621480 2.000E-05 0 0.
3  611490 4.743E-37 621490 2.120E-04 601500 6.715E-04 0 0.
3  621500 6.505E-06 631500 3.230E-12 621510 4.180E-04 0 0.
3  631510 1.506E-05 621520 3.011E-04 631520 1.250E-08 0 0.
3  641520 6.790E-09 621530 7.006E-42 631530 2.009E-04 0 0.
3  641530 4.160E-12 621540 9.286E-05 631540 1.280E-06 0 0.
3  641540 5.246E-07 631550 2.250E-05 641550 2.644E-05 0 0.
3  631560 2.728E-12 641560 2.964E-05 641570 1.789E-05 0 0.
```

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File SS_RUN1.INP (continued)

```
  3  641580 1.002E-05 651590 3.961E-06 641600 1.967E-06 0 0.
  3  651600 7.083E-11 661600 2.224E-08 651610 2.319E-19 0 0.
  3  661610 8.551E-07 661620 5.351E-07 661630 2.161E-07 0 0.
  3  661640 1.201E-07 671650 6.243E-08 661660 5.666E-31 0 0.
  3  671660 2.775E-31 671661 6.520E-11 681660 3.363E-08 0 0.
  3  681670 2.099E-08 681680 1.149E-10 681690 6.138E-24 0 0.
  3  691690 1.878E-14 681700 1.369E-19 691700 1.967E-18 0 0.
  3  701700 9.391E-17 691710 2.518E-20 701710 8.289E-20 0 0.
  3  701720 3.924E-23      0 0.000E+00      0 0.000E+00 0 0.
  0
```

File SS_RUN1.BAT

```
echo off
echo **                                                                  **
echo **                            O R I G E N 2                         **
echo **                                                                  **
copy ss_run1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy ss_run1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out ss_run1.u6 >nul
copy tape13.out+tape11.out ss_run1.u11 >nul
ren tape7.out ss_run1.pch
ren tape15.out ss_run1.dbg
ren tape16.out ss_run1.vxs
ren tape50.out ss_run1.ech
rem  cleanup files
del tape*.inp
del tape*.out
del ss_run1.pch
del ss_run1.vxs
del ss_run1.dbg
del ss_run1.ech
del ss_run1.u11
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed **************************
echo ***********************************************************************
echo on
```

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ss_run1.ci
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	Ci/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
NA 22	4.589E-18	3.943E-21	3.943E-21	3.943E-21	3.943E-21	3.943E-21	3.943E-21	3.943E-21
SI 32	3.798E-14	3.692E-14	3.683E-14	3.679E-14	3.651E-14	3.644E-14	3.628E-14	3.605E-14
P 32	3.728E-08	3.693E-14	3.683E-14	3.679E-14	3.652E-14	3.644E-14	3.628E-14	3.605E-14
CL 36	2.407E-15	2.407E-15	2.407E-15	2.407E-15	2.407E-15	2.407E-15	2.406E-15	2.406E-15
AR 39	4.705E-22	4.705E-22	4.705E-22	4.705E-22	4.705E-22	4.705E-22	4.705E-22	4.705E-22
CA 45	3.458E-15	4.563E-33	4.563E-33	4.563E-33	8.649E-38	8.649E-38	8.649E-38	0.000E+00
V 50	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18
MN 54	8.825E-02	4.186E-11	5.524E-12	2.457E-12	8.459E-15	1.674E-15	6.550E-17	4.884E-19
FE 55	3.852E-02	3.292E-05	1.690E-05	1.295E-05	2.003E-06	1.175E-06	4.046E-07	8.173E-08
CO 60	4.728E-03	1.448E-04	1.043E-04	9.140E-05	3.640E-05	2.798E-05	1.653E-05	7.509E-06
NI 59	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05
NI 63	1.666E-03	1.365E-03	1.339E-03	1.329E-03	1.261E-03	1.242E-03	1.205E-03	1.152E-03
ZN 65	2.879E-15	3.246E-27	3.246E-27	3.246E-27	2.266E-30	2.266E-30	2.266E-30	2.266E-30
MO 93	2.341E-06	2.329E-06	2.328E-06	2.328E-06	2.324E-06	2.323E-06	2.322E-06	2.319E-06
TC 97	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09
TL206	0.000E+00	1.329E-26	1.329E-26	1.329E-26	1.329E-26	1.329E-26	1.329E-26	1.329E-26
TL207	1.669E-10	1.191E-09	1.252E-09	1.274E-09	1.411E-09	1.446E-09	1.508E-09	1.587E-09
TL208	2.705E-08	8.613E-10	8.553E-10	8.512E-10	7.992E-10	7.860E-10	7.556E-10	7.129E-10
TL209	5.085E-14	5.220E-14	5.235E-14	5.242E-14	5.295E-14	5.312E-14	5.349E-14	5.413E-14
PB209	2.356E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
PB210	2.062E-12	1.052E-10	1.209E-10	1.274E-10	1.759E-10	1.906E-10	2.210E-10	2.687E-10
PB211	1.679E-10	1.194E-09	1.255E-09	1.278E-09	1.415E-09	1.450E-09	1.512E-09	1.591E-09
PB212	7.506E-08	2.397E-09	2.380E-09	2.369E-09	2.224E-09	2.188E-09	2.103E-09	1.984E-09
PB214	3.149E-11	3.030E-10	3.285E-10	3.386E-10	4.097E-10	4.300E-10	4.705E-10	5.311E-10
BI208	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25
BI210M	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26
BI210	2.060E-12	1.052E-10	1.210E-10	1.275E-10	1.759E-10	1.907E-10	2.211E-10	2.688E-10
BI211	1.678E-10	1.194E-09	1.255E-09	1.278E-09	1.415E-09	1.450E-09	1.512E-09	1.591E-09
BI212	7.519E-08	2.397E-09	2.380E-09	2.369E-09	2.224E-09	2.188E-09	2.103E-09	1.984E-09
BI213	2.354E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
BI214	3.152E-11	3.030E-10	3.285E-10	3.386E-10	4.097E-10	4.300E-10	4.705E-10	5.311E-10
PO210	1.730E-12	1.052E-10	1.166E-10	1.225E-10	1.759E-10	1.851E-10	2.212E-10	2.688E-10
PO211	4.700E-13	3.343E-12	3.515E-12	3.578E-12	3.963E-12	4.060E-12	4.233E-12	4.456E-12
PO212	4.813E-08	1.536E-09	1.525E-09	1.518E-09	1.425E-09	1.402E-09	1.347E-09	1.271E-09
PO213	0.000E+00	2.364E-12	2.371E-12	2.374E-12	2.398E-12	2.406E-12	2.423E-12	2.452E-12
PO214	0.000E+00	3.030E-10	3.284E-10	3.386E-10	4.097E-10	4.299E-10	4.704E-10	5.310E-10
PO215	1.671E-10	1.194E-09	1.255E-09	1.278E-09	1.415E-09	1.450E-09	1.512E-09	1.591E-09
PO216	7.510E-08	2.397E-09	2.380E-09	2.369E-09	2.224E-09	2.188E-09	2.103E-09	1.984E-09
PO218	3.160E-11	3.031E-10	3.285E-10	3.387E-10	4.098E-10	4.301E-10	4.706E-10	5.312E-10
AT217	2.357E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
RN219	1.680E-10	1.194E-09	1.255E-09	1.278E-09	1.415E-09	1.450E-09	1.512E-09	1.591E-09
RN220	7.503E-08	2.397E-09	2.380E-09	2.369E-09	2.224E-09	2.188E-09	2.103E-09	1.984E-09
RN222	3.154E-11	3.031E-10	3.285E-10	3.387E-10	4.098E-10	4.301E-10	4.706E-10	5.312E-10
FR221	2.353E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
FR223	2.396E-12	1.647E-11	1.729E-11	1.760E-11	1.950E-11	1.997E-11	2.082E-11	2.192E-11
RA223	1.680E-10	1.194E-09	1.255E-09	1.278E-09	1.415E-09	1.450E-09	1.512E-09	1.591E-09
RA224	7.505E-08	2.397E-09	2.380E-09	2.369E-09	2.224E-09	2.188E-09	2.103E-09	1.984E-09
RA225	2.385E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
RA226	3.145E-11	3.031E-10	3.285E-10	3.387E-10	4.098E-10	4.301E-10	4.706E-10	5.312E-10
RA228	2.002E-16	7.890E-16	7.983E-16	8.013E-16	8.159E-16	8.185E-16	8.223E-16	8.257E-16
AC225	2.351E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
AC227	1.737E-10	1.194E-09	1.253E-09	1.275E-09	1.413E-09	1.447E-09	1.509E-09	1.588E-09
AC228	2.001E-16	7.890E-16	7.983E-16	8.014E-16	8.160E-16	8.186E-16	8.224E-16	8.258E-16
TH227	1.679E-10	1.177E-09	1.238E-09	1.260E-09	1.396E-09	1.430E-09	1.491E-09	1.569E-09
TH228	7.495E-08	2.397E-09	2.375E-09	2.360E-09	2.223E-09	2.182E-09	2.100E-09	1.983E-09
TH229	2.383E-12	2.417E-12	2.424E-12	2.427E-12	2.451E-12	2.459E-12	2.477E-12	2.506E-12
TH230	2.383E-08	2.382E-08	2.382E-08	2.382E-08	2.382E-08	2.382E-08	2.382E-08	2.382E-08
TH231	1.808E-05	5.506E-09	5.510E-09	5.511E-09	5.521E-09	5.524E-09	5.529E-09	5.538E-09
TH232	8.295E-16	8.296E-16	8.296E-16	8.296E-16	8.297E-16	8.297E-16	8.297E-16	8.298E-16
TH234	2.571E-06	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11
PA231	1.961E-09	1.965E-09	1.965E-09	1.965E-09	1.965E-09	1.966E-09	1.966E-09	1.966E-09
PA233	2.658E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07
PA234M	2.563E-06	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11
PA234	3.340E-09	1.045E-13	1.045E-13	1.045E-13	1.045E-13	1.045E-13	1.045E-13	1.045E-13
U232	3.130E-12	2.392E-09	2.337E-09	2.315E-09	2.166E-09	2.125E-09	2.045E-09	1.930E-09

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ss_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	Ci/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
U233	1.191E-13	3.101E-11	3.405E-11	3.534E-11	4.350E-11	4.595E-11	5.061E-11	5.761E-11
U234	1.156E-11	2.369E-09	2.567E-09	2.645E-09	3.174E-09	3.320E-09	3.605E-09	4.016E-09
U235	5.469E-09	5.506E-09	5.510E-09	5.511E-09	5.521E-09	5.524E-09	5.529E-09	5.538E-09
U236	1.113E-10	1.197E-10	1.204E-10	1.208E-10	1.230E-10	1.236E-10	1.248E-10	1.267E-10
U237	1.543E-10	4.116E-11	3.649E-11	3.478E-11	2.483E-11	2.255E-11	1.860E-11	1.393E-11
U238	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11
U240	0.000E+00	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24
NP235	9.941E-10	4.373E-17	8.853E-18	4.679E-18	6.941E-20	3.739E-20	0.000E+00	0.000E+00
NP236	3.453E-12	3.452E-12	3.452E-12	3.452E-12	3.452E-12	3.452E-12	3.452E-12	3.452E-12
NP237	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07
NP238	2.285E-14	1.878E-14	1.857E-14	1.849E-14	1.791E-14	1.774E-14	1.742E-14	1.695E-14
NP239	1.100E-14	1.096E-14	1.096E-14	1.096E-14	1.095E-14	1.095E-14	1.094E-14	1.094E-14
NP240M	0.000E+00	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24
PU236	7.495E-08	1.199E-10	6.545E-11	5.139E-11	9.625E-12	6.038E-12	2.476E-12	8.143E-13
PU238	3.477E-05	2.820E-05	2.765E-05	2.743E-05	2.595E-05	2.555E-05	2.475E-05	2.361E-05
PU239	1.430E-03	1.429E-03	1.429E-03	1.429E-03	1.429E-03	1.429E-03	1.429E-03	1.428E-03
PU240	1.065E-05	1.062E-05	1.061E-05	1.061E-05	1.060E-05	1.060E-05	1.060E-05	1.059E-05
PU241	6.009E-06	1.678E-06	1.488E-06	1.418E-06	1.012E-06	9.192E-07	7.582E-07	5.680E-07
PU242	2.586E-13	2.586E-13	2.586E-13	2.586E-13	2.586E-13	2.586E-13	2.586E-13	2.586E-13
PU244	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24
AM241	4.566E-08	1.844E-07	1.900E-07	1.920E-07	2.033E-07	2.057E-07	2.098E-07	2.141E-07
AM242M	4.239E-12	3.756E-12	3.714E-12	3.697E-12	3.581E-12	3.548E-12	3.484E-12	3.390E-12
AM242	4.569E-12	3.738E-12	3.695E-12	3.679E-12	3.563E-12	3.531E-12	3.467E-12	3.373E-12
AM243	1.099E-14	1.096E-14	1.096E-14	1.096E-14	1.095E-14	1.095E-14	1.094E-14	1.094E-14
CM242	1.905E-10	3.091E-12	3.062E-12	3.047E-12	2.947E-12	2.925E-12	2.874E-12	2.790E-12
CM243	2.582E-14	1.355E-14	1.275E-14	1.245E-14	1.050E-14	1.000E-14	9.074E-15	7.842E-15
CM244	5.399E-15	1.958E-15	1.779E-15	1.712E-15	1.310E-15	1.213E-15	1.041E-15	8.275E-16
CM245	1.371E-20	1.368E-20	1.368E-20	1.368E-20	1.367E-20	1.367E-20	1.366E-20	1.366E-20
CM246	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24
H 3	2.964E-03	6.697E-04	5.820E-04	5.502E-04	3.714E-04	3.320E-04	2.652E-04	1.894E-04
BE 10	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.325E-11
C 14	5.306E-10	5.289E-10	5.288E-10	5.287E-10	5.282E-10	5.281E-10	5.279E-10	5.275E-10
SE 79	4.244E-05	4.243E-05	4.243E-05	4.243E-05	4.243E-05	4.242E-05	4.242E-05	4.242E-05
KR 81	2.207E-14	2.207E-14	2.207E-14	2.207E-14	2.207E-14	2.207E-14	2.207E-14	2.207E-14
KR 85	4.427E-02	7.980E-03	6.789E-03	6.364E-03	4.047E-03	3.556E-03	2.746E-03	1.863E-03
RB 87	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
SR 90	3.821E-01	2.033E-01	1.916E-01	1.871E-01	1.584E-01	1.510E-01	1.373E-01	1.190E-01
Y 90	3.864E-01	2.034E-01	1.916E-01	1.871E-01	1.584E-01	1.511E-01	1.373E-01	1.191E-01
ZR 93	9.502E-06	9.502E-06	9.502E-06	9.502E-06	9.502E-06	9.502E-06	9.502E-06	9.501E-06
NB 93M	2.194E-06	7.256E-06	7.468E-06	7.546E-06	7.990E-06	8.090E-06	8.263E-06	8.464E-06
NB 94	7.835E-11	7.828E-11	7.827E-11	7.827E-11	7.825E-11	7.824E-11	7.823E-11	7.822E-11
TC 98	5.493E-12	5.493E-12	5.493E-12	5.493E-12	5.493E-12	5.493E-12	5.493E-12	5.493E-12
TC 99	6.140E-05	6.139E-05	6.139E-05	6.139E-05	6.139E-05	6.139E-05	6.139E-05	6.139E-05
RH102	1.006E-07	1.792E-10	9.857E-11	7.762E-11	1.457E-11	9.031E-12	3.471E-12	8.273E-13
RU106	1.787E-01	2.179E-09	3.905E-10	1.963E-10	1.594E-12	4.029E-13	2.574E-14	4.157E-16
RH106	1.756E-01	2.179E-09	3.905E-10	1.963E-10	1.594E-12	4.029E-13	2.574E-14	4.157E-16
PD107	1.611E-07	1.611E-07	1.611E-07	1.611E-07	1.611E-07	1.611E-07	1.611E-07	1.611E-07
AG108	7.636E-14	2.169E-13	2.139E-13	2.128E-13	2.048E-13	2.026E-13	1.982E-13	1.918E-13
AG108M	2.816E-12	2.437E-12	2.404E-12	2.391E-12	2.301E-12	2.276E-12	2.227E-12	2.155E-12
AG109M	4.966E-11	2.606E-17	6.661E-18	3.856E-18	1.019E-19	5.136E-20	2.115E-20	1.268E-20
CD109	4.959E-11	2.606E-17	6.654E-18	3.834E-18	1.019E-19	5.136E-20	2.115E-20	1.268E-20
AG110	2.626E-07	5.750E-19	4.599E-20	1.705E-20	1.418E-23	1.418E-23	1.418E-23	1.418E-23
AG110M	1.977E-05	4.323E-17	3.458E-18	1.282E-18	1.066E-21	1.066E-21	1.066E-21	1.066E-21
CD113M	2.146E-04	6.092E-05	5.410E-05	5.159E-05	3.699E-05	3.364E-05	2.782E-05	2.092E-05
IN115	3.883E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16
SN119M	2.633E-04	3.379E-16	2.554E-17	9.049E-18	6.538E-21	6.538E-21	6.538E-21	6.538E-21
SN121M	2.135E-06	1.478E-06	1.428E-06	1.408E-06	1.278E-06	1.243E-06	1.176E-06	1.082E-06
TE123	4.856E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20
SB125	1.136E-02	1.504E-05	8.044E-06	6.263E-06	1.087E-06	6.587E-07	2.421E-07	5.394E-08
TE125M	1.178E-02	3.668E-06	1.963E-06	1.528E-06	2.651E-07	1.608E-07	5.907E-08	1.316E-08
SN126	5.364E-06	5.363E-06	5.363E-06	5.363E-06	5.363E-06	5.363E-06	5.363E-06	5.362E-06
SB126	7.536E-07	7.509E-07	7.509E-07	7.508E-07	7.508E-07	7.508E-07	7.508E-07	7.507E-07
SB126M	5.406E-06	5.363E-06	5.363E-06	5.363E-06	5.363E-06	5.363E-06	5.363E-06	5.362E-06
I129	1.680E-07	1.680E-07	1.680E-07	1.680E-07	1.680E-07	1.680E-07	1.680E-07	1.680E-07
CS134	4.492E-03	6.075E-07	2.622E-07	1.873E-07	1.781E-08	9.092E-09	2.370E-09	3.153E-10

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ss_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	Ci/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
CS135	6.370E-06	6.370E-06	6.370E-06	6.370E-06	6.370E-06	6.370E-06	6.370E-06	6.370E-06
CS137	4.203E-01	2.279E-01	2.151E-01	2.102E-01	1.788E-01	1.707E-01	1.556E-01	1.355E-01
BA137M	3.960E-01	2.155E-01	2.035E-01	1.988E-01	1.691E-01	1.615E-01	1.472E-01	1.282E-01
LA138	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16
CE142	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10
CE144	3.067E+00	1.724E-10	1.860E-11	7.633E-12	1.494E-14	2.517E-15	7.140E-17	3.723E-19
PR144	1.081E+00	1.724E-10	1.860E-11	7.634E-12	1.497E-14	2.517E-15	7.141E-17	3.723E-19
PR144M	1.295E-02	2.069E-12	2.232E-13	9.160E-14	1.796E-16	3.020E-17	8.569E-19	4.468E-21
ND144	5.846E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15
PM146	4.013E-06	1.422E-07	1.038E-07	9.151E-08	3.788E-08	2.944E-08	1.778E-08	8.348E-09
SM146	2.516E-13	3.641E-13	3.653E-13	3.656E-13	3.672E-13	3.674E-13	3.678E-13	3.680E-13
PM147	7.206E-01	6.560E-04	3.389E-04	2.602E-04	4.094E-05	2.413E-05	8.387E-06	1.719E-06
SM147	3.228E-11	4.993E-11	4.994E-11	4.994E-11	4.995E-11	4.995E-11	4.995E-11	4.995E-11
SM148	6.040E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18
SM149	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17
EU150	2.139E-10	1.284E-10	1.224E-10	1.201E-10	1.049E-10	1.010E-10	9.348E-11	8.328E-11
SM151	1.100E-02	8.970E-03	8.799E-03	8.732E-03	8.273E-03	8.147E-03	7.900E-03	7.543E-03
EU152	2.163E-06	5.603E-07	4.933E-07	4.688E-07	3.281E-07	2.963E-07	2.417E-07	1.780E-07
GD152	1.479E-19	2.042E-19	2.065E-19	2.074E-19	2.123E-19	2.134E-19	2.153E-19	2.176E-19
GD153	1.468E-08	1.340E-20	1.340E-20	1.340E-20	8.850E-24	8.850E-24	8.850E-24	8.850E-24
EU154	3.457E-04	4.084E-05	3.339E-05	3.080E-05	1.752E-05	1.491E-05	1.080E-05	6.660E-06
EU155	1.047E-02	2.578E-04	1.818E-04	1.581E-04	5.942E-05	4.493E-05	2.569E-05	1.110E-05
HO166M	1.171E-10	1.153E-10	1.151E-10	1.150E-10	1.146E-10	1.145E-10	1.142E-10	1.138E-10
TM171	2.743E-17	1.920E-21	1.920E-21	1.920E-21	1.920E-21	1.920E-21	1.920E-21	1.920E-21

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Source Listing of Program ROUNDSS1

```
PROGRAM ROUNDSS1

!-------- WRITTEN BY D.R. WENZEL

!            To format of the output of an ORIGEN2 run for stainless
!            steel fuel and convert the output to 2 places of accuracy

       CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
       CHARACTER (LEN=10) :: BLANK, ZERO(7)
       CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
       CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
       CHARACTER (LEN=96) :: BUFFER2
       CHARACTER (LEN=111) :: BUFFER, ORGLINE

       COMMON /AMT/ AMOUNT(9)
       EQUIVALENCE (ORGLINE, BUFFER1(1))
       EQUIVALENCE (BUFFER2, BUFFER3(1))
       EQUIVALENCE (ZERO(1), BUFFER3(27))

       REAL :: DATA(175,7), VALUE(7)

       DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

       OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(2,FILE ='SS_RUN1.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(6,FILE ='ROUNDSS1.OUT', STATUS='UNKNOWN', ERR = 900)

       WRITE(6,600)
  600  FORMAT(1X,'ROUNDSS1.OUT (Ci/l)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

       LAST = 0
   10  READ(1,1000,END=20) NAME, NAME2
 1000  FORMAT(A12, 5X, A24)
       LAST = LAST + 1
       NUCLIDE(LAST) = NAME
       NUCLIDE2(LAST) = NAME2
       GO TO 10

!-------- ZERO MEMORY

   20  DO  l=1,175
          DO K=1,7
             DATA(l,K) = 0.
          END DO

       END DO
```

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Page 2 of 6

Source Listing of Program ROUNDSS1 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'1999Jul   2002Jan   ', &
              '2003Jan   2010Jan   2012Jan   2016Jan   2022Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,175
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7
                DATA(J,K) = VALUE(K)
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO

       GO TO 999

!-------- ERROR STATEMENTS
```

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Page 3 of 6

Source Listing of Program ROUNDSS1 (continued)

```
  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDSS1
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

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ROUNDSS1.OUT (Ci/l)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	6.7E-04	5.8E-04	5.5E-04	3.7E-04	3.3E-04	2.7E-04	1.9E-04
Be-10	1.600E+06	yr	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
C-14	5.729E+03	yr	5.3E-10	5.3E-10	5.3E-10	5.3E-10	5.3E-10	5.3E-10	5.3E-10
Fe-55	2.600E+00	yr	3.3E-05	1.7E-05	1.3E-05	2.0E-06	1.2E-06	4.0E-07	8.2E-08
Ni-59	8.000E+04	yr	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Co-60	5.270E+00	yr	1.4E-04	1.0E-04	9.1E-05	3.6E-05	2.8E-05	1.7E-05	7.5E-06
Ni-63	9.200E+01	yr	1.4E-03	1.3E-03	1.3E-03	1.3E-03	1.2E-03	1.2E-03	1.2E-03
Se-79	6.496E+04	yr	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05
Rb-87	4.696E+10	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Sr-90	2.912E+01	yr	2.0E-01	1.9E-01	1.9E-01	1.6E-01	1.5E-01	1.4E-01	1.2E-01
Y-90	6.400E+01	h	2.0E-01	1.9E-01	1.9E-01	1.6E-01	1.5E-01	1.4E-01	1.2E-01
Zr-93	1.530E+06	yr	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06
Nb-93m	1.360E+01	yr	7.3E-06	7.5E-06	7.5E-06	8.0E-06	8.1E-06	8.3E-06	8.5E-06
Nb-94	2.030E+04	yr	7.8E-11	7.8E-11	7.8E-11	7.8E-11	7.8E-11	7.8E-11	7.8E-11
Tc-98	4.199E+06	yr	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12
Tc-99	2.130E+05	yr	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05
Rh-102	1.059E+03	d	1.8E-10	9.9E-11	7.8E-11	1.5E-11	9.0E-12	3.5E-12	8.3E-13
Ru-106	3.682E+02	d	2.2E-09	3.9E-10	2.0E-10	1.6E-12	4.0E-13	2.6E-14	4.2E-16
Rh-106	2.990E+01	s	2.2E-09	3.9E-10	2.0E-10	1.6E-12	4.0E-13	2.6E-14	4.2E-16
Pd-107	6.496E+06	yr	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Ag-108	2.370E+00	m	2.2E-13	2.1E-13	2.1E-13	2.0E-13	2.0E-13	2.0E-13	1.9E-13
Ag-108m	1.270E+02	yr	2.4E-12	2.4E-12	2.4E-12	2.3E-12	2.3E-12	2.2E-12	2.2E-12
Ag-109m	3.960E+01	s	2.6E-17	6.7E-18	3.9E-18	1.0E-19	5.1E-20	2.1E-20	1.3E-20
Cd-109	4.640E+02	d	2.6E-17	6.7E-18	3.8E-18	1.0E-19	5.1E-20	2.1E-20	1.3E-20
Ag-110	2.460E+01	s	5.8E-19	4.6E-20	1.7E-20	1.4E-23	1.4E-23	1.4E-23	1.4E-23
Ag-110m	2.499E+02	d	4.3E-17	3.5E-18	1.3E-18	1.1E-21	1.1E-21	1.1E-21	1.1E-21
Cd-113m	1.459E+01	yr	6.1E-05	5.4E-05	5.2E-05	3.7E-05	3.4E-05	2.8E-05	2.1E-05
In-115	4.997E+14	yr	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16
Sn-119m	2.450E+02	d	3.4E-16	2.6E-17	9.0E-18	6.5E-21	6.5E-21	6.5E-21	6.5E-21
Sn-121m	4.997E+01	yr	1.5E-06	1.4E-06	1.4E-06	1.3E-06	1.2E-06	1.2E-06	1.1E-06
Te-123	1.000E+13	yr	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20
Sb-125	2.770E+00	yr	1.5E-05	8.0E-06	6.3E-06	1.1E-06	6.6E-07	2.4E-07	5.4E-08
Te-125m	5.800E+01	d	3.7E-06	2.0E-06	1.5E-06	2.7E-07	1.6E-07	5.9E-08	1.3E-08
Sn-126	1.000E+05	yr	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
Sb-126	1.240E+01	d	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07
Sb-126m	1.900E+01	m	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06	5.4E-06
I-129	1.570E+07	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Cs-134	2.062E+00	yr	6.1E-07	2.6E-07	1.9E-07	1.8E-08	9.1E-09	2.4E-09	3.2E-10
Cs-135	2.300E+06	yr	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06
Cs-137	3.000E+01	yr	2.3E-01	2.2E-01	2.1E-01	1.8E-01	1.7E-01	1.6E-01	1.4E-01
Ba-137m	2.552E+00	m	2.2E-01	2.0E-01	2.0E-01	1.7E-01	1.6E-01	1.5E-01	1.3E-01
La-138	1.350E+11	yr	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16
Ce-142	1.049E+11	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Ce-144	2.843E+02	d	1.7E-10	1.9E-11	7.6E-12	1.5E-14	2.5E-15	7.1E-17	3.7E-19
Pr-144	1.728E+01	m	1.7E-10	1.9E-11	7.6E-12	1.5E-14	2.5E-15	7.1E-17	3.7E-19
Pr-144m	7.200E+00	m	2.1E-12	2.2E-13	9.2E-14	1.8E-16	3.0E-17	8.6E-19	4.5E-21
Nd-144	2.099E+15	yr	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15
Pm-146	5.500E+00	yr	1.4E-07	1.0E-07	9.2E-08	3.8E-08	2.9E-08	1.8E-08	8.3E-09
Sm-146	7.000E+07	yr	3.6E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
Pm-147	2.623E+00	yr	6.6E-04	3.4E-04	2.6E-04	4.1E-05	2.4E-05	8.4E-06	1.7E-06
Sm-147	1.070E+11	yr	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Sm-148	8.001E+15	yr	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18
Sm-149	9.994E+15	yr	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17
Eu-150	3.600E+01	yr	1.3E-10	1.2E-10	1.2E-10	1.0E-10	1.0E-10	9.3E-11	8.3E-11
Sm-151	8.999E+01	yr	9.0E-03	8.8E-03	8.7E-03	8.3E-03	8.1E-03	7.9E-03	7.5E-03
Eu-152	1.360E+01	yr	5.6E-07	4.9E-07	4.7E-07	3.3E-07	3.0E-07	2.4E-07	1.8E-07
Gd-152	1.080E+14	yr	2.0E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.2E-19	2.2E-19
Gd-153	2.420E+02	d	1.3E-20	1.3E-20	1.3E-20	8.9E-24	8.9E-24	8.9E-24	8.9E-24
Eu-154	8.600E+00	yr	4.1E-05	3.3E-05	3.1E-05	1.8E-05	1.5E-05	1.1E-05	6.7E-06
Eu-155	4.959E+00	yr	2.6E-04	1.8E-04	1.6E-04	5.9E-05	4.5E-05	2.6E-05	1.1E-05
Ho-166m	1.200E+03	yr	1.2E-10	1.2E-10	1.2E-10	1.1E-10	1.1E-10	1.1E-10	1.1E-10
Tm-171	1.920E+00	yr	1.9E-21	1.9E-21	1.9E-21	1.9E-21	1.9E-21	1.9E-21	1.9E-21
Tl-207	4.770E+00	m	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.4E-09	1.5E-09	1.6E-09
Tl-208	3.070E+00	m	8.6E-10	8.6E-10	8.5E-10	8.0E-10	7.9E-10	7.6E-10	7.1E-10

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ROUNDSS1.OUT (Ci/l) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Tl-209	2.200E+00	m	5.2E-14	5.2E-14	5.2E-14	5.3E-14	5.3E-14	5.3E-14	5.4E-14
Pb-209	3.300E+00	h	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Pb-210	2.230E+01	yr	1.1E-10	1.2E-10	1.3E-10	1.8E-10	1.9E-10	2.2E-10	2.7E-10
Pb-211	3.610E+01	m	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Pb-212	1.064E+01	h	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Pb-214	2.680E+01	m	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Bi-210m	3.000E+06	yr	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26
Bi-210	5.012E+00	d	1.1E-10	1.2E-10	1.3E-10	1.8E-10	1.9E-10	2.2E-10	2.7E-10
Bi-211	2.130E+00	m	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Bi-212	6.055E+01	m	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Bi-213	4.565E+01	m	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Bi-214	1.990E+01	m	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Po-210	1.384E+02	d	1.1E-10	1.2E-10	1.2E-10	1.8E-10	1.9E-10	2.2E-10	2.7E-10
Po-211	5.600E-01	s	3.3E-12	3.5E-12	3.6E-12	4.0E-12	4.1E-12	4.2E-12	4.5E-12
Po-212	3.000E-07	s	1.5E-09	1.5E-09	1.5E-09	1.4E-09	1.4E-09	1.3E-09	1.3E-09
Po-213	4.200E-06	s	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.4E-12	2.5E-12
Po-214	1.643E-04	s	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Po-215	1.780E-03	s	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Po-216	1.500E-01	s	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Po-218	3.050E+00	m	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
At-217	3.230E-02	s	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Rn-219	3.960E+00	s	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Rn-220	5.560E+01	s	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Rn-222	3.824E+00	d	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Fr-221	4.800E+00	m	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Fr-223	2.180E+01	m	1.6E-11	1.7E-11	1.8E-11	2.0E-11	2.0E-11	2.1E-11	2.2E-11
Ra-223	1.143E+01	d	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.5E-09	1.5E-09	1.6E-09
Ra-224	3.660E+00	d	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Ra-225	1.480E+01	d	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Ra-226	1.600E+03	yr	3.0E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.7E-10	5.3E-10
Ra-228	6.700E+00	yr	7.9E-16	8.0E-16	8.0E-16	8.2E-16	8.2E-16	8.2E-16	8.3E-16
Ac-225	1.000E+01	d	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Ac-227	2.177E+01	yr	1.2E-09	1.3E-09	1.3E-09	1.4E-09	1.4E-09	1.5E-09	1.6E-09
Ac-228	6.131E+00	h	7.9E-16	8.0E-16	8.0E-16	8.2E-16	8.2E-16	8.2E-16	8.3E-16
Th-227	1.872E+01	d	1.2E-09	1.2E-09	1.3E-09	1.4E-09	1.4E-09	1.5E-09	1.6E-09
Th-228	1.913E+00	yr	2.4E-09	2.4E-09	2.4E-09	2.2E-09	2.2E-09	2.1E-09	2.0E-09
Th-229	7.339E+03	yr	2.4E-12	2.4E-12	2.4E-12	2.5E-12	2.5E-12	2.5E-12	2.5E-12
Th-230	7.700E+04	yr	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08
Th-231	2.552E+01	h	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09
Th-232	1.405E+10	yr	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.3E-16
Th-234	2.410E+01	d	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-231	3.277E+04	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Pa-233	2.700E+01	d	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Pa-234m	1.170E+00	m	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-234	6.700E+00	h	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13
U-232	7.200E+01	yr	2.4E-09	2.3E-09	2.3E-09	2.2E-09	2.1E-09	2.0E-09	1.9E-09
U-233	1.585E+05	yr	3.1E-11	3.4E-11	3.5E-11	4.3E-11	4.6E-11	5.1E-11	5.8E-11
U-234	2.445E+05	yr	2.4E-09	2.6E-09	2.6E-09	3.2E-09	3.3E-09	3.6E-09	4.0E-09
U-235	7.038E+08	yr	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09
U-236	2.341E+07	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.3E-10
U-237	6.750E+00	d	4.1E-11	3.6E-11	3.5E-11	2.5E-11	2.3E-11	1.9E-11	1.4E-11
U-238	4.468E+09	yr	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
U-240	1.410E+01	h	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Np-235	3.961E+02	d	4.4E-17	8.9E-18	4.7E-18	6.9E-20	3.7E-20		
Np-236	1.150E+05	yr	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12	3.5E-12
Np-237	2.140E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Np-238	2.117E+00	d	1.9E-14	1.9E-14	1.8E-14	1.8E-14	1.8E-14	1.7E-14	1.7E-14
Np-239	2.355E+00	d	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14
Np-240m	7.400E+00	m	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Pu-236	2.851E+00	yr	1.2E-10	6.5E-11	5.1E-11	9.6E-12	6.0E-12	2.5E-12	8.1E-13
Pu-238	8.774E+01	yr	2.8E-05	2.8E-05	2.7E-05	2.6E-05	2.6E-05	2.5E-05	2.4E-05
Pu-239	2.406E+04	yr	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03
Pu-240	6.537E+03	yr	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05
Pu-241	1.440E+01	yr	1.7E-06	1.5E-06	1.4E-06	1.0E-06	9.2E-07	7.6E-07	5.7E-07
Pu-242	3.869E+05	yr	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13

Appendix C-2
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ROUNDSS1.OUT (Ci/l) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pu-243	4.956E+00	h							
Pu-244	8.261E+07	yr	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24
Am-241	4.322E+02	yr	1.8E-07	1.9E-07	1.9E-07	2.0E-07	2.1E-07	2.1E-07	2.1E-07
Am-242m	1.520E+02	yr	3.8E-12	3.7E-12	3.7E-12	3.6E-12	3.5E-12	3.5E-12	3.4E-12
Am-242	1.602E+01	h	3.7E-12	3.7E-12	3.7E-12	3.6E-12	3.5E-12	3.5E-12	3.4E-12
Am-243	7.380E+03	yr	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.1E-14
Cm-242	1.632E+02	d	3.1E-12	3.1E-12	3.0E-12	2.9E-12	2.9E-12	2.9E-12	2.8E-12
Cm-243	2.850E+01	yr	1.4E-14	1.3E-14	1.2E-14	1.0E-14	1.0E-14	9.1E-15	7.8E-15
Cm-244	1.811E+01	yr	2.0E-15	1.8E-15	1.7E-15	1.3E-15	1.2E-15	1.0E-15	8.3E-16
Cm-245	8.499E+03	yr	1.4E-20	1.4E-20	1.4E-20	1.4E-20	1.4E-20	1.4E-20	1.4E-20
Cm-246	4.731E+03	yr	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24
Cm-247	1.560E+07	yr							
Cm-248	3.391E+05	yr							
Cf-249	3.505E+02	yr							
Cf-250	1.308E+01	yr							
Cf-251	8.980E+02	yr							
Cf-252	2.638E+00	yr							
Ca-45	1.630E+02	d	4.6E-33	4.6E-33	4.6E-33	8.6E-38	8.6E-38	8.6E-38	
V-50	4.000E+16	yr	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18
Mn-54	3.125E+02	d	4.2E-11	5.5E-12	2.5E-12	8.5E-15	1.7E-15	6.5E-17	4.9E-19
Fe-55	2.600E+00	yr	3.3E-05	1.7E-05	1.3E-05	2.0E-06	1.2E-06	4.0E-07	8.2E-08
Lu-176	3.000E+10	yr							
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr							
Ta-182	1.150E+02	d							
Re-187	5.000E+10	yr							

Appendix C-3
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ss_run1.g
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	g/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
HE 3	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15
HE 4	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08
B 10	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15
B 11	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18
C 12	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02
C 13	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04
N 14	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15
N 15	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22
O 17	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24
NE 20	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19
NE 21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21
NE 22	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11
NA 22	7.345E-22	6.310E-25	6.310E-25	6.310E-25	6.310E-25	6.310E-25	6.310E-25	6.310E-25
NA 23	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13
MG 24	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15
MG 25	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07
MG 26	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07
AL 27	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09
SI 28	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01
SI 29	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02
SI 30	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02
SI 32	2.209E-15	2.147E-15	2.142E-15	2.139E-15	2.124E-15	2.119E-15	2.110E-15	2.097E-15
P 31	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02
P 32	1.306E-13	1.294E-19	1.290E-19	1.289E-19	1.279E-19	1.276E-19	1.271E-19	1.263E-19
S 32	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02
S 33	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05
S 34	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04
S 36	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06
CL 35	1.201E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09
CL 36	7.292E-14	7.292E-14	7.292E-14	7.291E-14	7.291E-14	7.291E-14	7.291E-14	7.291E-14
CL 37	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12
AR 36	7.240E-19	5.089E-18	5.501E-18	5.666E-18	6.819E-18	7.148E-18	7.807E-18	8.795E-18
AR 38	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18
AR 39	1.380E-23	1.380E-23	1.380E-23	1.380E-23	1.380E-23	1.380E-23	1.380E-23	1.380E-23
K 41	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20
CA 42	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25
CA 43	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22
CA 44	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12
CA 45	1.941E-19	2.561E-37	2.561E-37	2.561E-37	4.855E-42	4.855E-42	4.855E-42	0.000E+00
CA 46	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13
SC 45	5.928E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18
TI 46	5.509E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23
TI 47	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07
TI 48	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12
TI 49	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06
TI 50	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05
V 50	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05
V 51	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05
CR 50	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01
CR 52	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00
CR 53	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00
CR 54	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01
MN 54	1.140E-05	5.408E-15	7.136E-16	3.174E-16	1.093E-18	2.162E-19	8.461E-21	6.309E-23
MN 55	2.854E-05	4.393E-05	4.393E-05	4.393E-05	4.394E-05	4.394E-05	4.394E-05	4.394E-05
FE 54	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00
FE 55	1.540E-05	1.316E-08	6.759E-09	5.177E-09	8.010E-10	4.700E-10	1.618E-10	3.268E-11
FE 56	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01
FE 57	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01
FE 58	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01
CO 59	2.235E-05	2.238E-05	2.239E-05	2.239E-05	2.240E-05	2.240E-05	2.241E-05	2.241E-05
CO 60	4.180E-06	1.281E-07	9.217E-08	8.081E-08	3.218E-08	2.474E-08	1.462E-08	6.639E-09
NI 58	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00
NI 59	1.490E-04	1.490E-04	1.490E-04	1.490E-04	1.490E-04	1.489E-04	1.489E-04	1.489E-04
NI 60	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01
NI 61	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02
NI 62	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01

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ss_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	g/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
NI 63	2.700E-05	2.211E-05	2.170E-05	2.154E-05	2.043E-05	2.013E-05	1.953E-05	1.867E-05
NI 64	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02
CU 63	8.709E-07	5.758E-06	6.170E-06	6.333E-06	7.440E-06	7.745E-06	8.343E-06	9.206E-06
CU 65	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06
ZN 64	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13
ZN 65	3.494E-19	3.938E-31	3.938E-31	3.938E-31	2.749E-34	2.749E-34	2.749E-34	2.749E-34
NB 93	0.000E+00	1.115E-08	1.220E-08	1.262E-08	1.556E-08	1.640E-08	1.807E-08	2.058E-08
MO 92	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01
MO 93	2.130E-06	2.119E-06	2.118E-06	2.117E-06	2.114E-06	2.114E-06	2.112E-06	2.109E-06
MO 94	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01
MO 97	0.000E+00	1.175E-11	1.286E-11	1.330E-11	1.640E-11	1.729E-11	1.906E-11	2.172E-11
TC 97	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06
RU 96	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02
RU 98	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03
HE 4	0.000E+00	3.024E-07	3.309E-07	3.423E-07	4.219E-07	4.446E-07	4.900E-07	5.581E-07
TL206	0.000E+00	6.097E-35	6.097E-35	6.097E-35	6.097E-35	6.097E-35	6.097E-35	6.097E-35
TL207	8.761E-19	6.249E-18	6.571E-18	6.689E-18	7.408E-18	7.590E-18	7.914E-18	8.330E-18
TL208	9.181E-17	2.924E-18	2.903E-18	2.889E-18	2.713E-18	2.668E-18	2.565E-18	2.420E-18
TL209	1.243E-22	1.276E-22	1.280E-22	1.281E-22	1.294E-22	1.298E-22	1.308E-22	1.323E-22
PB206	1.306E-15	4.420E-13	5.523E-13	6.007E-13	1.020E-12	1.165E-12	1.491E-12	2.076E-12
PB207	1.527E-13	8.159E-12	9.387E-12	9.894E-12	1.368E-11	1.483E-11	1.720E-11	2.094E-11
PB208	1.023E-10	2.080E-10	2.104E-10	2.113E-10	2.178E-10	2.196E-10	2.230E-10	2.280E-10
PB209	5.183E-19	5.316E-19	5.332E-19	5.339E-19	5.392E-19	5.410E-19	5.448E-19	5.513E-19
PB210	2.700E-14	1.377E-12	1.583E-12	1.668E-12	2.303E-12	2.495E-12	2.893E-12	3.518E-12
PB211	6.800E-18	4.835E-17	5.083E-17	5.174E-17	5.731E-17	5.872E-17	6.122E-17	6.444E-17
PB212	5.400E-14	1.725E-15	1.712E-15	1.704E-15	1.600E-15	1.574E-15	1.513E-15	1.427E-15
PB214	9.601E-19	9.239E-18	1.001E-17	1.032E-17	1.249E-17	1.311E-17	1.435E-17	1.619E-17
BI208	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23
BI209	3.148E-15	2.884E-14	3.129E-14	3.227E-14	3.919E-14	4.118E-14	4.517E-14	5.123E-14
BI210M	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23
BI210	1.660E-17	8.473E-16	9.746E-16	1.027E-15	1.418E-15	1.536E-15	1.781E-15	2.166E-15
BI211	4.008E-19	2.853E-18	2.999E-18	3.053E-18	3.381E-18	3.464E-18	3.612E-18	3.802E-18
BI212	5.131E-15	1.636E-16	1.624E-16	1.617E-16	1.518E-16	1.493E-16	1.435E-16	1.354E-16
BI213	1.217E-19	1.249E-19	1.253E-19	1.254E-19	1.267E-19	1.271E-19	1.280E-19	1.295E-19
BI214	7.135E-19	6.860E-18	7.436E-18	7.667E-18	9.276E-18	9.735E-18	1.065E-17	1.202E-17
PO210	3.850E-16	2.340E-14	2.596E-14	2.725E-14	3.915E-14	4.119E-14	4.922E-14	5.982E-14
PO211	4.921E-24	3.500E-23	3.680E-23	3.746E-23	4.149E-23	4.251E-23	4.432E-23	4.665E-23
PO212	2.712E-25	8.655E-27	8.594E-27	8.553E-27	8.031E-27	7.898E-27	7.593E-27	7.163E-27
PO213	0.000E+00	1.874E-28	1.880E-28	1.882E-28	1.901E-28	1.907E-28	1.921E-28	1.943E-28
PO214	0.000E+00	9.438E-25	1.023E-24	1.055E-24	1.276E-24	1.339E-24	1.465E-24	1.654E-24
PO215	5.666E-24	4.048E-23	4.256E-23	4.333E-23	4.799E-23	4.917E-23	5.127E-23	5.396E-23
PO216	2.156E-19	6.881E-21	6.833E-21	6.800E-21	6.385E-21	6.280E-21	6.037E-21	5.695E-21
PO218	1.117E-19	1.071E-18	1.161E-18	1.197E-18	1.449E-18	1.520E-18	1.663E-18	1.878E-18
AT217	1.464E-24	1.501E-24	1.505E-24	1.507E-24	1.522E-24	1.527E-24	1.538E-24	1.556E-24
RN219	1.291E-20	9.174E-20	9.645E-20	9.819E-20	1.087E-19	1.114E-19	1.162E-19	1.223E-19
RN220	8.132E-17	2.598E-18	2.580E-18	2.567E-18	2.411E-18	2.371E-18	2.279E-18	2.150E-18
RN222	2.050E-16	1.970E-15	2.135E-15	2.201E-15	2.663E-15	2.795E-15	3.058E-15	3.452E-15
FR221	1.327E-20	1.363E-20	1.367E-20	1.369E-20	1.382E-20	1.387E-20	1.397E-20	1.413E-20
FR223	6.191E-20	4.257E-19	4.468E-19	4.547E-19	5.039E-19	5.161E-19	5.382E-19	5.665E-19
RA223	3.280E-15	2.330E-14	2.450E-14	2.494E-14	2.762E-14	2.830E-14	2.951E-14	3.106E-14
RA224	4.710E-13	1.504E-14	1.494E-14	1.487E-14	1.396E-14	1.373E-14	1.320E-14	1.245E-14
RA225	6.080E-17	6.162E-17	6.180E-17	6.188E-17	6.250E-17	6.270E-17	6.315E-17	6.389E-17
RA226	3.180E-11	3.064E-10	3.322E-10	3.424E-10	4.143E-10	4.348E-10	4.758E-10	5.371E-10
RA228	8.551E-19	3.370E-18	3.410E-18	3.423E-18	3.485E-18	3.496E-18	3.512E-18	3.527E-18
AC225	4.050E-17	4.162E-17	4.175E-17	4.180E-17	4.222E-17	4.236E-17	4.266E-17	4.316E-17
AC227	2.400E-12	1.650E-11	1.731E-11	1.762E-11	1.953E-11	2.000E-11	2.085E-11	2.195E-11
AC228	8.919E-23	3.518E-22	3.559E-22	3.573E-22	3.638E-22	3.650E-22	3.666E-22	3.682E-22
TH227	5.460E-15	3.829E-14	4.026E-14	4.099E-14	4.539E-14	4.651E-14	4.849E-14	5.104E-14
TH228	9.140E-11	2.923E-12	2.897E-12	2.878E-12	2.711E-12	2.661E-12	2.561E-12	2.418E-12
TH229	1.120E-11	1.136E-11	1.139E-11	1.140E-11	1.152E-11	1.156E-11	1.164E-11	1.178E-11
TH230	1.180E-06	1.180E-06	1.180E-06	1.180E-06	1.180E-06	1.180E-06	1.180E-06	1.180E-06
TH231	3.400E-11	1.035E-14	1.036E-14	1.036E-14	1.038E-14	1.039E-14	1.040E-14	1.041E-14
TH232	7.560E-09	7.561E-09	7.562E-09	7.562E-09	7.562E-09	7.562E-09	7.562E-09	7.563E-09
TH234	1.110E-10	3.470E-15	3.470E-15	3.470E-15	3.470E-15	3.470E-15	3.470E-15	3.470E-15
PA231	4.150E-08	4.158E-08	4.158E-08	4.158E-08	4.159E-08	4.160E-08	4.160E-08	4.161E-08

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ss_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	g/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
PA233	1.280E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11
PA234M	3.730E-15	1.170E-19	1.170E-19	1.170E-19	1.170E-19	1.170E-19	1.170E-19	1.170E-19
PA234	1.670E-15	5.226E-20	5.226E-20	5.226E-20	5.226E-20	5.226E-20	5.226E-20	5.226E-20
U232	1.462E-13	1.117E-10	1.092E-10	1.081E-10	1.012E-10	9.924E-11	9.550E-11	9.014E-11
U233	1.230E-11	3.202E-09	3.516E-09	3.649E-09	4.491E-09	4.745E-09	5.226E-09	5.949E-09
U234	1.850E-09	3.789E-07	4.106E-07	4.231E-07	5.078E-07	5.311E-07	5.767E-07	6.425E-07
U235	2.529E-03	2.546E-03	2.548E-03	2.549E-03	2.553E-03	2.554E-03	2.557E-03	2.561E-03
U236	1.720E-06	1.849E-06	1.861E-06	1.866E-06	1.900E-06	1.910E-06	1.929E-06	1.958E-06
U237	1.889E-15	5.041E-16	4.469E-16	4.259E-16	3.041E-16	2.762E-16	2.278E-16	1.706E-16
U238	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04
U240	0.000E+00	3.290E-30	3.290E-30	3.290E-30	3.290E-30	3.290E-30	3.290E-30	3.290E-30
NP235	7.083E-13	3.116E-20	6.308E-21	3.334E-21	4.945E-23	2.664E-23	0.000E+00	0.000E+00
NP236	2.620E-10	2.620E-10	2.620E-10	2.620E-10	2.619E-10	2.619E-10	2.619E-10	2.619E-10
NP237	3.780E-04	3.780E-04	3.780E-04	3.780E-04	3.780E-04	3.780E-04	3.780E-04	3.780E-04
NP238	8.814E-20	7.244E-20	7.162E-20	7.130E-20	6.906E-20	6.843E-20	6.719E-20	6.538E-20
NP239	4.740E-20	4.723E-20	4.722E-20	4.722E-20	4.719E-20	4.718E-20	4.716E-20	4.713E-20
NP240M	0.000E+00	2.878E-32	2.878E-32	2.878E-32	2.878E-32	2.878E-32	2.878E-32	2.878E-32
PU236	1.410E-10	2.256E-13	1.231E-13	9.668E-14	1.811E-14	1.136E-14	4.659E-15	1.532E-15
PU238	2.030E-06	1.647E-06	1.614E-06	1.602E-06	1.516E-06	1.492E-06	1.445E-06	1.378E-06
PU239	2.300E-02	2.298E-02	2.298E-02	2.298E-02	2.298E-02	2.297E-02	2.297E-02	2.297E-02
PU240	4.670E-05	4.657E-05	4.656E-05	4.655E-05	4.652E-05	4.651E-05	4.649E-05	4.646E-05
PU241	5.830E-08	1.628E-08	1.443E-08	1.376E-08	9.821E-09	8.919E-09	7.357E-09	5.511E-09
PU242	6.770E-11	6.771E-11	6.771E-11	6.771E-11	6.771E-11	6.771E-11	6.771E-11	6.771E-11
PU244	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19
AM241	1.330E-08	5.370E-08	5.533E-08	5.592E-08	5.921E-08	5.992E-08	6.109E-08	6.234E-08
AM242M	4.360E-13	3.864E-13	3.820E-13	3.803E-13	3.683E-13	3.650E-13	3.584E-13	3.487E-13
AM242	5.650E-18	4.622E-18	4.569E-18	4.549E-18	4.406E-18	4.366E-18	4.287E-18	4.171E-18
AM243	5.510E-14	5.496E-14	5.495E-14	5.494E-14	5.491E-14	5.490E-14	5.488E-14	5.485E-14
CM242	5.760E-14	9.345E-16	9.257E-16	9.211E-16	8.909E-16	8.843E-16	8.688E-16	8.435E-16
CM243	5.000E-16	2.625E-16	2.470E-16	2.410E-16	2.033E-16	1.937E-16	1.757E-16	1.518E-16
CM244	6.670E-17	2.419E-17	2.198E-17	2.116E-17	1.618E-17	1.499E-17	1.286E-17	1.022E-17
CM245	7.980E-20	7.963E-20	7.963E-20	7.963E-20	7.958E-20	7.958E-20	7.956E-20	7.952E-20
CM246	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23
SF250	0.000E+00	7.647E-15	8.360E-15	8.645E-15	1.063E-14	1.120E-14	1.233E-14	1.401E-14
H 3	3.070E-07	6.937E-08	6.028E-08	5.699E-08	3.848E-08	3.439E-08	2.747E-08	1.962E-08
LI 6	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09
LI 7	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11
BE 9	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13
BE 10	5.928E-10	5.928E-10	5.928E-10	5.928E-10	5.928E-10	5.928E-10	5.928E-10	5.928E-10
C 14	1.190E-10	1.186E-10	1.186E-10	1.186E-10	1.185E-10	1.184E-10	1.184E-10	1.183E-10
ZN 66	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12
ZN 67	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13
ZN 68	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17
GA 69	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22
GA 71	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11
GE 72	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07
GE 73	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07
GE 74	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06
AS 75	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06
GE 76	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06
SE 76	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09
SE 77	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05
SE 78	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05
SE 79	6.090E-04	6.088E-04	6.088E-04	6.088E-04	6.088E-04	6.087E-04	6.087E-04	6.087E-04
BR 79	1.726E-09	1.739E-07	1.901E-07	1.966E-07	2.421E-07	2.551E-07	2.811E-07	3.201E-07
SE 80	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05
KR 80	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10
BR 81	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04
KR 81	1.049E-12	1.049E-12	1.049E-12	1.049E-12	1.049E-12	1.049E-12	1.049E-12	1.049E-12
SE 82	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04
KR 82	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07
KR 83	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04
KR 84	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04
KR 85	1.128E-04	2.033E-05	1.730E-05	1.621E-05	1.031E-05	9.061E-06	6.996E-06	4.746E-06
RB 85	5.981E-04	6.906E-04	6.936E-04	6.947E-04	7.006E-04	7.018E-04	7.039E-04	7.062E-04

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ss_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	g/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
KR 86	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03
SR 86	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07
RB 87	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03
SR 87	1.506E-08	1.506E-08	1.506E-08	1.506E-08	1.506E-08	1.506E-08	1.506E-08	1.506E-08
SR 88	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03
Y 89	2.607E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03
SR 90	2.800E-03	1.490E-03	1.404E-03	1.371E-03	1.161E-03	1.107E-03	1.006E-03	8.722E-04
Y 90	7.100E-07	3.737E-07	3.521E-07	3.438E-07	2.910E-07	2.775E-07	2.523E-07	2.187E-07
ZR 90	3.552E-04	1.665E-03	1.752E-03	1.785E-03	1.995E-03	2.049E-03	2.150E-03	2.283E-03
ZR 91	3.295E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03
ZR 92	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03
ZR 93	3.780E-03	3.780E-03	3.780E-03	3.780E-03	3.780E-03	3.780E-03	3.780E-03	3.780E-03
NB 93	1.375E-09	2.886E-08	3.239E-08	3.383E-08	4.424E-08	4.731E-08	5.355E-08	6.312E-08
NB 93M	7.760E-09	2.566E-08	2.641E-08	2.669E-08	2.826E-08	2.861E-08	2.922E-08	2.993E-08
ZR 94	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03
NB 94	4.180E-10	4.176E-10	4.176E-10	4.176E-10	4.175E-10	4.174E-10	4.174E-10	4.173E-10
MO 95	3.882E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03
ZR 96	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03
MO 96	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06
MO 97	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03
MO 98	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03
TC 98	6.320E-09	6.320E-09	6.320E-09	6.320E-09	6.320E-09	6.320E-09	6.320E-09	6.320E-09
TC 99	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.620E-03	3.619E-03	3.619E-03
RU 99	5.509E-08	3.672E-07	3.967E-07	4.085E-07	4.909E-07	5.145E-07	5.616E-07	6.323E-07
MO100	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03
RU100	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06
RU101	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03
RU102	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03
RH102	8.320E-11	1.482E-13	8.153E-14	6.419E-14	1.205E-14	7.469E-15	2.871E-15	6.843E-16
RH103	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03
RU104	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03
PD104	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06
PD105	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04
RU106	5.340E-05	6.509E-13	1.167E-13	5.865E-14	4.762E-16	1.204E-16	7.690E-18	1.242E-19
RH106	4.930E-11	6.119E-19	1.097E-19	5.513E-20	4.476E-22	1.131E-22	7.229E-24	1.167E-25
PD106	4.218E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04
PD107	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04
AG107	1.537E-10	1.039E-09	1.122E-09	1.156E-09	1.389E-09	1.456E-09	1.590E-09	1.790E-09
PD108	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04
AG108	1.039E-22	2.951E-22	2.911E-22	2.895E-22	2.787E-22	2.756E-22	2.697E-22	2.610E-22
AG108M	1.080E-13	9.346E-14	9.219E-14	9.169E-14	8.825E-14	8.729E-14	8.541E-14	8.266E-14
CD108	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10
AG109	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04
AG109M	1.899E-20	9.965E-27	2.547E-27	1.475E-27	3.896E-29	1.964E-29	8.090E-30	4.849E-30
CD109	1.920E-14	1.009E-20	2.576E-21	1.484E-21	3.944E-23	1.988E-23	8.190E-24	4.909E-24
PD110	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04
AG110	6.296E-17	1.378E-28	1.103E-29	4.087E-30	3.399E-33	3.399E-33	3.399E-33	3.399E-33
AG110M	4.160E-09	9.096E-21	7.277E-22	2.697E-22	2.243E-25	2.243E-25	2.243E-25	2.243E-25
CD110	3.421E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07
CD111	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05
CD112	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05
CD113	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05
CD113M	9.890E-07	2.808E-07	2.494E-07	2.378E-07	1.705E-07	1.551E-07	1.282E-07	9.641E-08
IN113	2.434E-07	9.509E-07	9.823E-07	9.939E-07	1.061E-06	1.077E-06	1.103E-06	1.135E-06
CD114	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05
SN114	6.978E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11
IN115	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05
SN115	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06
CD116	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05
SN116	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06
SN117	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05
SN118	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05
SN119	7.607E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05
SN119M	5.876E-08	7.543E-20	5.700E-21	2.020E-21	1.459E-24	1.459E-24	1.459E-24	1.459E-24
SN120	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05
SN121M	3.610E-08	2.500E-08	2.414E-08	2.381E-08	2.161E-08	2.102E-08	1.988E-08	1.830E-08

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ss_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	g/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
SB121	7.765E-05	7.766E-05	7.766E-05	7.766E-05	7.766E-05	7.767E-05	7.767E-05	7.767E-05
SN122	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05
TE122	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07
SB123	9.129E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05
TE123	1.670E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10
SN124	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04
TE124	1.952E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07
SB125	1.100E-05	1.456E-08	7.788E-09	6.064E-09	1.052E-09	6.377E-10	2.344E-10	5.221E-11
TE125	8.184E-05	9.348E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05
TE125M	6.540E-07	2.036E-10	1.089E-10	8.481E-11	1.471E-11	8.922E-12	3.278E-12	7.303E-13
SN126	1.890E-04	1.890E-04	1.890E-04	1.890E-04	1.890E-04	1.889E-04	1.889E-04	1.889E-04
SB126	9.010E-12	8.978E-12	8.977E-12	8.977E-12	8.977E-12	8.977E-12	8.977E-12	8.976E-12
SB126M	6.880E-14	6.826E-14	6.826E-14	6.826E-14	6.825E-14	6.825E-14	6.825E-14	6.825E-14
TE126	5.351E-06	5.386E-06	5.389E-06	5.390E-06	5.399E-06	5.402E-06	5.407E-06	5.415E-06
I127	3.447E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04
TE128	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04
XE128	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07
I129	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04
XE129	4.428E-09	5.541E-09	5.646E-09	5.688E-09	5.982E-09	6.066E-09	6.234E-09	6.486E-09
TE130	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03
XE130	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06
XE131	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03
XE132	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03
BA132	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10
CS133	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03
XE134	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03
CS134	3.470E-06	4.694E-10	2.025E-10	1.447E-10	1.376E-11	7.024E-12	1.831E-12	2.436E-13
BA134	8.551E-06	1.202E-05	1.202E-05	1.202E-05	1.202E-05	1.202E-05	1.202E-05	1.202E-05
CS135	5.530E-03	5.530E-03	5.530E-03	5.530E-03	5.530E-03	5.530E-03	5.530E-03	5.530E-03
BA135	1.128E-08	5.545E-08	5.961E-08	6.128E-08	7.294E-08	7.628E-08	8.294E-08	9.294E-08
XE136	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03
BA136	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05
CS137	4.830E-03	2.618E-03	2.471E-03	2.415E-03	2.054E-03	1.962E-03	1.788E-03	1.557E-03
BA137	5.351E-04	2.747E-03	2.894E-03	2.950E-03	3.311E-03	3.404E-03	3.577E-03	3.808E-03
BA137M	7.360E-10	4.006E-10	3.781E-10	3.695E-10	3.143E-10	3.001E-10	2.736E-10	2.382E-10
BA138	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03
LA138	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08
LA139	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03
CE140	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03
PR141	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03
CE142	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03
ND142	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06
ND143	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03
CE144	9.610E-04	5.402E-14	5.828E-15	2.392E-15	4.682E-18	7.886E-19	2.237E-20	1.167E-22
PR144	1.430E-08	2.281E-18	2.461E-19	1.010E-19	1.980E-22	3.330E-23	9.448E-25	4.926E-27
PR144M	7.135E-11	1.140E-20	1.230E-21	5.049E-22	9.899E-25	1.665E-25	4.723E-27	2.462E-29
ND144	4.940E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03
ND145	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03
ND146	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03
PM146	9.010E-09	3.194E-10	2.331E-10	2.055E-10	8.504E-11	6.609E-11	3.992E-11	1.874E-11
SM146	7.190E-09	1.041E-08	1.044E-08	1.045E-08	1.049E-08	1.050E-08	1.051E-08	1.052E-08
PM147	7.770E-04	7.074E-07	3.654E-07	2.806E-07	4.414E-08	2.602E-08	9.044E-09	1.853E-09
SM147	1.420E-03	2.196E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03
ND148	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03
SM148	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05
SM149	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04
ND150	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04
SM150	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06
EU150	3.230E-12	1.939E-12	1.848E-12	1.813E-12	1.584E-12	1.524E-12	1.411E-12	1.257E-12
SM151	4.180E-04	3.408E-04	3.343E-04	3.318E-04	3.143E-04	3.095E-04	3.002E-04	2.866E-04
EU151	1.506E-05	9.223E-05	9.873E-05	1.013E-04	1.187E-04	1.235E-04	1.329E-04	1.465E-04
SM152	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04
EU152	1.250E-08	3.239E-09	2.851E-09	2.710E-09	1.897E-09	1.713E-09	1.397E-09	1.029E-09
GD152	6.790E-09	9.370E-09	9.478E-09	9.518E-09	9.744E-09	9.795E-09	9.883E-09	9.986E-09
EU153	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04
GD153	4.160E-12	3.799E-24	3.799E-24	3.799E-24	2.509E-27	2.509E-27	2.509E-27	2.509E-27

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ss_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

	g/L	26.5YR	29.0YR	30.0YR	37.0YR	39.0YR	43.0YR	49.0YR
SM154	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05
EU154	1.280E-06	1.512E-07	1.236E-07	1.141E-07	6.488E-08	5.522E-08	4.000E-08	2.466E-08
GD154	5.246E-07	1.653E-06	1.681E-06	1.691E-06	1.740E-06	1.749E-06	1.765E-06	1.780E-06
EU155	2.250E-05	5.541E-07	3.907E-07	3.397E-07	1.277E-07	9.656E-08	5.521E-08	2.387E-08
GD155	2.644E-05	4.839E-05	4.855E-05	4.860E-05	4.881E-05	4.884E-05	4.888E-05	4.892E-05
GD156	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05
GD157	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05
GD158	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05
TB159	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06
GD160	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06
DY160	2.224E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08
DY161	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07
DY162	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07
DY163	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07
DY164	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07
HO165	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08
HO166M	6.520E-11	6.421E-11	6.412E-11	6.408E-11	6.382E-11	6.375E-11	6.360E-11	6.338E-11
ER166	3.363E-08	3.363E-08	3.363E-08	3.363E-08	3.363E-08	3.363E-08	3.363E-08	3.363E-08
ER167	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08
ER168	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
TM169	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14
ER170	1.369E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19
YB170	9.391E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17
TM171	2.518E-20	1.763E-24	1.763E-24	1.763E-24	1.763E-24	1.763E-24	1.763E-24	1.763E-24
YB171	8.289E-20	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19
YB172	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23

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Source Listing of Program ELESS1

```
      PROGRAM ELESS1

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/18/02

!            To sum the g/L electrolytic wastes and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='SS_RUN1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='SS_RUN1.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'SS_RUN1.ELE    g/L')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Page 2 of 5

Source Listing of Program ELESS1 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'1999Jul   2002Jan   2003Jan   2010' &
            'Jan   2012Jan   2016Jan   2022Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J)
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999
```

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Source Listing of Program ELESS1 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELESS1
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

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SS_RUN1.ELE g/L
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	6.9E-08	6.0E-08	5.7E-08	3.8E-08	3.4E-08	2.7E-08	2.0E-08
He	3.8E-07	4.1E-07	4.2E-07	5.0E-07	5.2E-07	5.6E-07	6.3E-07
Li	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Be	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10
B	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
C	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02
N	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15
O	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24
Ne	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
Na	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13
Mg	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Si	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01
P	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02
S	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02
Cl	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09
Ar	1.3E-17	1.3E-17	1.3E-17	1.4E-17	1.5E-17	1.5E-17	1.6E-17
K	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20
Ca	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Sc	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18
Ti	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05
V	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05
Mn	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Fe	1.3E-08	6.8E-09	5.2E-09	8.0E-10	4.7E-10	1.6E-10	3.3E-11
Co	2.3E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05	2.2E-05
Ni	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04
Cu	6.8E-06	7.2E-06	7.4E-06	8.5E-06	8.8E-06	9.4E-06	1.0E-05
Zn	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12
Ga	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11
Ge	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06
As	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06
Se	9.0E-04	9.0E-04	9.0E-04	9.0E-04	9.0E-04	9.0E-04	9.0E-04
Br	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04	1.2E-04
Kr	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Rb	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03
Sr	3.6E-03	3.5E-03	3.4E-03	3.2E-03	3.2E-03	3.1E-03	2.9E-03
Y	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03
Zr	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03
Nb	6.6E-08	7.1E-08	7.4E-08	8.8E-08	9.3E-08	1.0E-07	1.1E-07
Mo	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01
Tc	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03
Ru	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02
Rh	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Pd	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Ag	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04
Cd	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04
In	6.3E-05	6.3E-05	6.3E-05	6.3E-05	6.3E-05	6.4E-05	6.4E-05
Sn	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04
Sb	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04
Te	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03
I	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Xe	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Cs	1.4E-02	1.4E-02	1.4E-02	1.3E-02	1.3E-02	1.3E-02	1.3E-02

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SS_RUN1.ELE g/L (continued)
ORIGEN2 V2.1 (8-1-91), Run on 06/04/02 at 15:22:13

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Ba	8.6E-03	8.8E-03	8.8E-03	9.2E-03	9.3E-03	9.4E-03	9.7E-03
La	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03
Ce	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Pr	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03
Nd	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02
Pm	7.1E-07	3.7E-07	2.8E-07	4.4E-08	2.6E-08	9.1E-09	1.9E-09
Sm	3.2E-03	3.2E-03	3.2E-03	3.1E-03	3.1E-03	3.1E-03	3.1E-03
Eu	2.9E-04	3.0E-04	3.0E-04	3.2E-04	3.2E-04	3.3E-04	3.5E-04
Gd	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Tb	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06
Dy	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06
Ho	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08
Er	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08
Tm	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14
Yb	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17
Tl	9.2E-18	9.5E-18	9.6E-18	1.0E-17	1.0E-17	1.0E-17	1.1E-17
Pb	2.2E-10	2.2E-10	2.2E-10	2.3E-10	2.4E-10	2.4E-10	2.5E-10
Bi	3.0E-14	3.2E-14	3.3E-14	4.1E-14	4.3E-14	4.7E-14	5.4E-14
Po	2.3E-14	2.6E-14	2.7E-14	3.9E-14	4.1E-14	4.9E-14	6.0E-14
At	1.5E-24	1.5E-24	1.5E-24	1.5E-24	1.5E-24	1.5E-24	1.6E-24
Rn	2.0E-15	2.1E-15	2.2E-15	2.7E-15	2.8E-15	3.1E-15	3.5E-15
Fr	4.4E-19	4.6E-19	4.7E-19	5.2E-19	5.3E-19	5.5E-19	5.8E-19
Ra	3.1E-10	3.3E-10	3.4E-10	4.1E-10	4.3E-10	4.8E-10	5.4E-10
Ac	1.7E-11	1.7E-11	1.8E-11	2.0E-11	2.0E-11	2.1E-11	2.2E-11
Th	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
Pa	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.2E-08
U	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
Np	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04
Pu	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.3E-02
Am	5.4E-08	5.5E-08	5.6E-08	5.9E-08	6.0E-08	6.1E-08	6.2E-08
Cm	1.2E-15	1.2E-15	1.2E-15	1.1E-15	1.1E-15	1.1E-15	1.0E-15
Total	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**

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File SS_RUN2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     Electrolytic IAR first campaign waste
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     Final Activity in Ci/L rather than Ci
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  Ci/L
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      59.    1   2   5   0
  DEC      69.    2   3   5   0
  DEC     143.    3   4   5   0
  DEC     427.    4   5   5   0
  DEC    1043.    5   6   5   0
  DEC    1137.    6   7   5   0
  DEC   10027.    7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   20030 1.028E-15  20040 7.450E-08  50100 4.008E-15 0 0.
  1   50110 6.663E-18  60120 5.042E-02  60130 5.614E-04 0 0.
  1   70140 5.876E-15  70150 1.427E-22  80160 1.689E-35 0 0.
  1   80170 2.046E-24 100200 2.707E-19 100210 1.312E-21 0 0.
  1  100220 1.018E-11 110220 7.345E-22 110230 7.397E-13 0 0.
  1  120240 1.679E-15 120250 7.607E-07 120260 3.116E-07 0 0.
  1  130270 3.247E-09 140280 6.453E-01 140290 3.043E-02 0 0.
  1  140300 2.020E-02 140320 2.209E-15 150310 2.880E-02 0 0.
  1  150320 1.306E-13 150330 1.521E-18 160320 2.544E-02 0 0.
  1  160330 1.453E-05 160340 8.132E-04 160350 5.215E-12 0 0.
  1  160360 3.856E-06 170350 1.201E-09 170360 7.292E-14 0 0.
  1  170370 3.578E-12 180360 7.240E-19 180370 6.191E-28 0 0.
  1  180380 7.607E-18 180390 1.380E-23 180420 7.502E-32 0 0.
  1  190410 4.638E-20 190420 3.211E-36 200420 2.057E-25 0 0.
  1  200430 1.600E-22 200440 2.387E-12 200450 1.941E-19 0 0.
  1  200460 7.660E-13 200470 1.417E-32 210450 5.928E-18 0 0.
  1  210460 4.076E-25 210470 4.019E-32 220460 5.509E-23 0 0.
  1  220470 5.194E-07 220480 6.505E-12 220490 1.128E-06 0 0.
  1  220500 1.249E-05 230500 2.151E-05 230510 5.928E-05 0 0.
  1  240500 4.753E-01 240510 1.070E-09 240520 9.129E+00 0 0.
  1  240530 2.466E+00 240540 2.586E-01 250540 1.140E-05 0 0.
  1  250550 2.854E-05 260540 2.476E+00 260550 1.540E-05 0 0.
  1  260560 3.856E+01 260570 8.814E-01 260580 1.186E-01 0 0.
  1  260590 5.771E-10 270580 2.790E-06 270590 2.235E-05 0 0.
  1  270600 4.180E-06 280580 5.246E+00 280590 1.490E-04 0 0.
  1  280600 2.020E-01 280610 8.709E-02 280620 2.775E-01 0 0.
  1  280630 2.700E-05 280640 7.030E-02 290630 8.709E-07 0 0.
  1  290650 1.049E-06 300640 9.968E-13 300650 3.494E-19 0 0.
  1  400890 4.580E-32 420920 3.017E-01 420930 2.130E-06 0 0.
```

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File SS_RUN2.INP (continued)

```
1  420940 1.868E-01 430970 1.663E-06 430971 5.928E-12 0 0.
1  440960 1.868E-02 440970 1.144E-32 440980 6.296E-03 0 0.
2  812060 6.086E-35 812070 8.761E-19 812080 9.181E-17 0 0.
2  812090 1.243E-22 822060 1.306E-15 822070 1.527E-13 0 0.
2  822080 1.023E-10 822090 5.183E-19 822100 2.700E-14 0 0.
2  822110 6.800E-18 822120 5.400E-14 822140 9.601E-19 0 0.
2  832080 7.345E-23 832090 3.148E-15 832101 2.350E-23 0 0.
2  832100 1.660E-17 832110 4.008E-19 832120 5.131E-15 0 0.
2  832130 1.217E-19 832140 7.135E-19 842100 3.850E-16 0 0.
2  842110 4.921E-24 842120 2.712E-25 842130 1.826E-28 0 0.
2  842140 9.811E-26 842150 5.666E-24 842160 2.156E-19 0 0.
2  842180 1.117E-19 852170 1.464E-24 862180 1.243E-29 0 0.
2  862190 1.291E-20 862200 8.132E-17 862220 2.050E-16 0 0.
2  872210 1.327E-20 872230 6.191E-20 882220 1.375E-26 0 0.
2  882230 3.280E-15 882240 4.710E-13 882250 6.080E-17 0 0.
2  882260 3.180E-11 882280 8.551E-19 892250 4.050E-17 0 0.
2  892270 2.400E-12 892280 8.919E-23 902260 6.820E-25 0 0.
2  902270 5.460E-15 902280 9.140E-11 902290 1.120E-11 0 0.
2  902300 1.180E-06 902310 3.400E-11 902320 7.560E-09 0 0.
2  902340 1.110E-10 912310 4.150E-08 912330 1.280E-11 0 0.
2  912341 3.730E-15 912340 1.670E-15 922300 6.715E-22 0 0.
2  922310 7.974E-33 922320 1.462E-13 922330 1.230E-11 0 0.
2  922340 1.850E-09 922350 2.529E-03 922360 1.720E-06 0 0.
2  922370 1.889E-15 922380 2.390E-04 922400 3.363E-30 0 0.
2  932350 7.083E-13 932360 2.620E-10 932370 3.780E-04 0 0.
2  932380 8.814E-20 932390 4.740E-20 932401 2.943E-32 0 0.
2  942360 1.410E-10 942370 7.397E-14 942380 2.030E-06 0 0.
2  942390 2.300E-02 942400 4.670E-05 942410 5.830E-08 0 0.
2  942420 6.770E-11 942440 1.720E-19 942460 4.276E-31 0 0.
2  952410 1.330E-08 952421 4.360E-13 952420 5.650E-18 0 0.
2  952430 5.510E-14 952460 6.820E-34 962410 2.256E-23 0 0.
2  962420 5.760E-14 962430 5.000E-16 962440 6.670E-17 0 0.
2  962450 7.980E-20 962460 2.634E-23      0 0.000E+00 0 0.
3   10030 3.070E-07  30060 1.962E-09  30070 4.591E-11 0 0.
3   40090 8.866E-13  40100 5.928E-10  60140 1.190E-10 0 0.
3  300660 3.908E-12 300670 1.647E-13 300680 2.235E-17 0 0.
3  310690 3.331E-22 320700 9.811E-30 310710 4.412E-11 0 0.
3  320720 2.754E-07 320730 7.292E-07 320740 1.437E-06 0 0.
3  330750 2.481E-06 320760 5.823E-06 340760 3.825E-09 0 0.
3  340770 1.175E-05 340780 2.356E-05 340790 6.090E-04 0 0.
3  350790 1.726E-09 340800 7.712E-05 360800 1.390E-10 0 0.
3  350810 1.238E-04 360810 1.049E-12 340820 1.758E-04 0 0.
3  360820 3.221E-07 360830 3.090E-04 360840 5.771E-04 0 0.
3  360850 1.128E-04 370850 5.981E-04 360860 1.096E-03 0 0.
3  370860 7.502E-13 380860 5.614E-07 370870 1.420E-03 0 0.
3  380870 1.506E-08 380880 2.062E-03 380890 1.327E-06 0 0.
3  390890 2.607E-03 380900 2.800E-03 390900 7.100E-07 0 0.
3  400900 3.552E-04 390910 3.195E-06 400910 3.295E-03 0 0.
3  400920 3.447E-03 410920 5.928E-26 400930 3.780E-03 0 0.
3  410930 1.375E-09 410931 7.760E-09 400940 3.651E-03 0 0.
3  410940 4.180E-10 400950 5.170E-06 410950 2.800E-06 0 0.
3  410951 2.256E-09 420950 3.882E-03 400960 3.830E-03 0 0.
3  420960 3.379E-06 420970 3.714E-03 420980 3.756E-03 0 0.
3  430980 6.320E-09 420990 1.354E-30 430990 3.620E-03 0 0.
3  430991 1.191E-31 440990 5.509E-08 421000 4.055E-03 0 0.
```

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File SS_RUN2.INP (continued)

```
3  441000 6.978E-06 441010 3.531E-03 441020 3.053E-03 0 0.
3  451020 8.320E-11 441030 3.337E-07 451030 2.245E-03 0 0.
3  451031 2.980E-10 441040 1.595E-03 461040 5.509E-06 0 0.
3  461050 8.656E-04 441060 5.340E-05 451060 4.930E-11 0 0.
3  461060 4.218E-04 471060 1.107E-27 461070 3.130E-04 0 0.
3  471070 1.537E-10 461080 1.952E-04 471080 1.039E-22 0 0.
3  471081 1.080E-13 481080 1.941E-10 471090 1.380E-04 0 0.
3  471091 1.899E-20 481090 1.920E-14 461100 1.049E-04 0 0.
3  471100 6.296E-17 471101 4.160E-09 481100 3.421E-07 0 0.
3  471110 1.207E-16 481110 8.656E-05 481120 7.765E-05 0 0.
3  481130 7.607E-05 481131 9.890E-07 491130 2.434E-07 0 0.
3  481140 7.397E-05 491140 3.557E-19 491141 2.214E-14 0 0.
3  501140 6.978E-11 481150 4.884E-38 481151 1.894E-09 0 0.
3  491150 6.240E-05 491151 5.351E-16 501150 2.513E-06 0 0.
3  481160 7.450E-05 501160 1.327E-06 501170 7.345E-05 0 0.
3  501171 6.453E-18 501180 7.660E-05 501190 7.607E-05 0 0.
3  501191 5.876E-08 501200 7.869E-05 501211 3.610E-08 0 0.
3  511210 7.765E-05 501220 8.499E-05 511220 4.071E-35 0 0.
3  521220 1.532E-07 501230 2.445E-07 511230 9.129E-05 0 0.
3  521230 1.670E-10 521231 3.588E-13 501240 1.091E-04 0 0.
3  511240 2.544E-10 521240 1.952E-07 501250 7.135E-15 0 0.
3  511250 1.100E-05 521250 8.184E-05 521251 6.540E-07 0 0.
3  501260 1.890E-04 511260 9.010E-12 511261 6.880E-14 0 0.
3  521260 5.351E-06 511270 1.285E-24 521270 1.432E-09 0 0.
3  521271 4.092E-07 531270 3.447E-04 541270 1.317E-16 0 0.
3  521280 6.400E-04 541280 6.400E-07 521290 7.765E-12 0 0.
3  521291 8.289E-09 531290 9.510E-04 541290 4.428E-09 0 0.
3  541291 1.249E-22 521300 1.674E-03 541300 1.936E-06 0 0.
3  521311 0.000E+00 531310 1.878E-14 541310 2.791E-03 0 0.
3  541311 4.360E-13 521320 9.496E-27 531320 2.875E-28 0 0.
3  541320 3.998E-03 551320 1.306E-21 561320 2.424E-10 0 0.
3  541330 1.222E-18 541331 5.981E-38 551330 5.614E-03 0 0.
3  541340 6.610E-03 551340 3.470E-06 561340 8.551E-06 0 0.
3  551350 5.530E-03 561350 1.128E-08 541360 5.614E-03 0 0.
3  551360 4.270E-13 561360 2.492E-05 561361 1.915E-20 0 0.
3  551370 4.830E-03 561370 5.351E-04 561371 7.360E-10 0 0.
3  561380 5.823E-03 571380 1.880E-08 571390 5.666E-03 0 0.
3  561400 6.400E-11 571400 9.653E-12 581400 5.614E-03 0 0.
3  581410 2.739E-07 591410 5.404E-03 581420 5.077E-03 0 0.
3  601420 2.670E-06 591430 1.406E-10 601430 5.236E-03 0 0.
3  581440 9.610E-04 591440 1.430E-08 591441 7.135E-11 0 0.
3  601440 4.940E-03 601450 3.536E-03 601460 2.765E-03 0 0.
3  611460 9.010E-09 621460 7.190E-09 601470 3.552E-12 0 0.
3  611470 7.770E-04 621470 1.420E-03 601480 1.626E-03 0 0.
3  611480 3.069E-11 611481 4.187E-09 621480 2.000E-05 0 0.
3  611490 4.743E-37 621490 2.120E-04 601500 6.715E-04 0 0.
3  621500 6.505E-06 631500 3.230E-12 621510 4.180E-04 0 0.
3  631510 1.506E-05 621520 3.011E-04 631520 1.250E-08 0 0.
3  641520 6.790E-09 621530 7.006E-42 631530 2.009E-04 0 0.
3  641530 4.160E-12 621540 9.286E-05 631540 1.280E-06 0 0.
3  641540 5.246E-07 631550 2.250E-05 641550 2.644E-05 0 0.
3  631560 2.728E-12 641560 2.964E-05 641570 1.789E-05 0 0.
3  641580 1.002E-05 651590 3.961E-06 641600 1.967E-06 0 0.
3  651600 7.083E-11 661600 2.224E-08 651610 2.319E-19 0 0.
```

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File SS_RUN2.INP (continued)

```
  3  661610 8.551E-07 661620 5.351E-07 661630 2.161E-07 0 0.
  3  661640 1.201E-07 671650 6.243E-08 661660 5.666E-31 0 0.
  3  671660 2.775E-31 671661 6.520E-11 681660 3.363E-08 0 0.
  3  681670 2.099E-08 681680 1.149E-10 681690 6.138E-24 0 0.
  3  691690 1.878E-14 681700 1.369E-19 691700 1.967E-18 0 0.
  3  701700 9.391E-17 691710 2.518E-20 701710 8.289E-20 0 0.
  3  701720 3.924E-23      0 0.000E+00      0 0.000E+00 0 0.
  0
```

File SS_RUN2.BAT

```
echo off
echo **                                                                  **
echo **                            O R I G E N 2                         **
echo **                                                                  **
copy ss_run2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy ss_run2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out ss_run2.u6 >nul
copy tape13.out+tape11.out ss_run2.u11 >nul
ren tape7.out ss_run2.pch
ren tape15.out ss_run2.dbg
ren tape16.out ss_run2.vxs
ren tape50.out ss_run2.ech
rem  cleanup files
del tape*.inp
del tape*.out
del ss_run2.pch
del ss_run2.vxs
del ss_run2.dbg
del ss_run2.ech
del ss_run2.u11
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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ss_run2.ci
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	Ci/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
NA 22	4.589E-18	6.850E-25	6.850E-25	1.880E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SI 32	3.798E-14	3.567E-14	3.529E-14	3.261E-14	2.409E-14	1.249E-14	1.130E-14	8.627E-19
P 32	3.728E-08	3.567E-14	3.529E-14	3.261E-14	2.409E-14	1.249E-14	1.130E-14	8.627E-19
CL 36	2.407E-15	2.406E-15	2.406E-15	2.406E-15	2.404E-15	2.401E-15	2.400E-15	2.352E-15
AR 39	4.705E-22	4.705E-22	4.705E-22	4.705E-22	1.262E-22	8.485E-23	8.485E-23	9.552E-33
V 50	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18	3.847E-18
MN 54	8.825E-02	1.538E-22	4.661E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 55	3.852E-02	5.683E-09	3.952E-10	1.069E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 60	4.728E-03	2.015E-06	5.409E-07	3.206E-11	1.917E-27	0.000E+00	0.000E+00	0.000E+00
NI 59	1.129E-05	1.128E-05	1.128E-05	1.128E-05	1.125E-05	1.119E-05	1.118E-05	1.035E-05
NI 63	1.666E-03	1.068E-03	9.906E-04	5.673E-04	6.676E-05	6.441E-07	3.172E-07	0.000E+00
MO 93	2.341E-06	2.314E-06	2.310E-06	2.276E-06	2.152E-06	1.904E-06	1.869E-06	3.211E-07
TC 97	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.358E-09	2.352E-09
TL206	0.000E+00	1.329E-26	1.329E-26	1.329E-26	1.329E-26	1.329E-26	1.329E-26	1.329E-26
TL207	1.669E-10	1.687E-09	1.765E-09	1.947E-09	1.993E-09	2.051E-09	2.056E-09	3.893E-09
TL208	2.705E-08	6.470E-10	5.878E-10	2.883E-10	1.882E-11	1.603E-13	1.313E-13	1.056E-13
TL209	5.085E-14	5.535E-14	5.682E-14	7.505E-14	2.634E-13	1.297E-12	1.528E-12	8.784E-11
PB209	2.356E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
PB210	2.062E-12	3.529E-10	4.414E-10	1.147E-09	4.044E-09	8.654E-09	9.061E-09	2.273E-08
PB211	1.679E-10	1.692E-09	1.770E-09	1.953E-09	1.998E-09	2.056E-09	2.062E-09	3.904E-09
PB212	7.506E-08	1.801E-09	1.636E-09	8.023E-10	5.239E-11	4.461E-13	3.654E-13	2.940E-13
PB214	3.149E-11	6.318E-10	7.320E-10	1.460E-09	4.044E-09	8.656E-09	9.257E-09	2.273E-08
BI208	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25	3.432E-25
BI210M	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26	1.334E-26
BI210	2.060E-12	3.529E-10	4.416E-10	1.147E-09	4.044E-09	8.654E-09	9.061E-09	2.273E-08
BI211	1.678E-10	1.692E-09	1.770E-09	1.953E-09	1.998E-09	2.056E-09	2.062E-09	3.904E-09
BI212	7.519E-08	1.801E-09	1.636E-09	8.023E-10	5.239E-11	4.461E-13	3.654E-13	2.940E-13
BI213	2.354E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
BI214	3.152E-11	6.318E-10	7.320E-10	1.460E-09	4.044E-09	8.656E-09	9.257E-09	2.273E-08
PO210	1.730E-12	3.529E-10	4.416E-10	1.147E-09	4.044E-09	8.654E-09	9.061E-09	2.273E-08
PO211	4.700E-13	4.737E-12	4.955E-12	5.467E-12	5.595E-12	5.758E-12	5.774E-12	1.093E-11
PO212	4.813E-08	1.154E-09	1.048E-09	5.140E-10	3.357E-11	2.858E-13	2.341E-13	1.884E-13
PO213	0.000E+00	2.507E-12	2.574E-12	3.399E-12	1.193E-11	5.875E-11	6.920E-11	3.979E-09
PO214	0.000E+00	6.316E-10	7.318E-10	1.460E-09	4.043E-09	8.654E-09	9.255E-09	2.273E-08
PO215	1.671E-10	1.692E-09	1.770E-09	1.953E-09	1.998E-09	2.056E-09	2.062E-09	3.904E-09
PO216	7.510E-08	1.801E-09	1.636E-09	8.023E-10	5.239E-11	4.461E-13	3.654E-13	2.940E-13
PO218	3.160E-11	6.319E-10	7.321E-10	1.460E-09	4.045E-09	8.658E-09	9.258E-09	2.274E-08
AT217	2.357E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
RN219	1.680E-10	1.692E-09	1.770E-09	1.953E-09	1.998E-09	2.056E-09	2.062E-09	3.904E-09
RN220	7.503E-08	1.801E-09	1.636E-09	8.023E-10	5.239E-11	4.461E-13	3.654E-13	2.940E-13
RN222	3.154E-11	6.319E-10	7.321E-10	1.460E-09	4.045E-09	8.658E-09	9.258E-09	2.274E-08
FR221	2.353E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
FR223	2.396E-12	2.334E-11	2.438E-11	2.694E-11	2.758E-11	2.838E-11	2.845E-11	5.387E-11
RA223	1.680E-10	1.692E-09	1.770E-09	1.953E-09	1.998E-09	2.056E-09	2.062E-09	3.904E-09
RA224	7.505E-08	1.801E-09	1.636E-09	8.023E-10	5.239E-11	4.461E-13	3.654E-13	2.940E-13
RA225	2.385E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
RA226	3.145E-11	6.319E-10	7.321E-10	1.460E-09	4.045E-09	8.658E-09	9.258E-09	2.274E-08
RA228	2.002E-16	8.283E-16	8.293E-16	8.308E-16	8.332E-16	8.433E-16	8.454E-16	1.449E-15
AC225	2.351E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
AC227	1.737E-10	1.692E-09	1.767E-09	1.952E-09	1.998E-09	2.056E-09	2.062E-09	3.904E-09
AC228	2.001E-16	8.283E-16	8.294E-16	8.308E-16	8.332E-16	8.433E-16	8.454E-16	1.449E-15
TH227	1.679E-10	1.668E-09	1.745E-09	1.926E-09	1.971E-09	2.028E-09	2.034E-09	3.850E-09
TH228	7.495E-08	1.801E-09	1.636E-09	8.023E-10	5.239E-11	4.461E-13	3.654E-13	2.940E-13
TH229	2.383E-12	2.562E-12	2.631E-12	3.474E-12	1.219E-11	6.005E-11	7.073E-11	4.067E-09
TH230	2.383E-08	2.382E-08	2.382E-08	2.380E-08	2.377E-08	2.371E-08	2.370E-08	2.282E-08
TH231	1.808E-05	5.552E-09	5.566E-09	5.670E-09	6.067E-09	6.916E-09	7.044E-09	1.774E-08
TH232	8.295E-16	8.298E-16	8.299E-16	8.304E-16	8.332E-16	8.433E-16	8.454E-16	1.449E-15
TH234	2.571E-06	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11
PA231	1.961E-09	1.967E-09	1.968E-09	1.973E-09	1.997E-09	2.055E-09	2.065E-09	3.903E-09
PA233	2.658E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.665E-07	2.665E-07	2.658E-07
PA234M	2.563E-06	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11
PA234	3.340E-09	1.045E-13	1.045E-13	1.045E-13	1.045E-13	1.045E-13	1.045E-13	1.045E-13
U232	3.130E-12	1.753E-09	1.592E-09	7.810E-10	5.101E-11	4.416E-13	3.596E-13	2.925E-13
U233	1.191E-13	6.889E-11	8.054E-11	1.668E-10	4.974E-10	1.213E-09	1.322E-09	1.142E-08
U234	1.156E-11	4.660E-09	5.254E-09	8.455E-09	1.205E-08	1.245E-08	1.245E-08	1.215E-08

Appendix C-5
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ss_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	Ci/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
U235	5.469E-09	5.552E-09	5.566E-09	5.670E-09	6.067E-09	6.916E-09	7.044E-09	1.774E-08
U236	1.113E-10	1.299E-10	1.330E-10	1.560E-10	2.429E-10	4.225E-10	4.489E-10	2.057E-09
U237	1.543E-10	8.611E-12	5.321E-12	1.510E-13	1.744E-19	3.089E-25	3.089E-25	1.484E-25
U238	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11	8.038E-11
U240	0.000E+00	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24
NP235	9.941E-10	4.154E-26	4.154E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	3.453E-12	3.451E-12	3.451E-12	3.450E-12	3.444E-12	3.431E-12	3.429E-12	3.250E-12
NP237	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.666E-07	2.665E-07	2.665E-07	2.658E-07
NP238	2.285E-14	1.620E-14	1.547E-14	1.104E-14	3.024E-15	1.823E-16	1.187E-16	2.945E-34
NP239	1.100E-14	1.093E-14	1.092E-14	1.084E-14	1.056E-14	9.963E-15	9.875E-15	4.285E-15
NP240M	0.000E+00	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24	3.048E-24
PU236	7.495E-08	3.548E-13	3.145E-13	3.105E-13	3.100E-13	3.088E-13	3.086E-13	2.925E-13
PU238	3.477E-05	2.181E-05	2.016E-05	1.123E-05	1.192E-06	9.181E-09	4.369E-09	1.157E-31
PU239	1.430E-03	1.428E-03	1.427E-03	1.424E-03	1.413E-03	1.388E-03	1.384E-03	1.071E-03
PU240	1.065E-05	1.058E-05	1.057E-05	1.049E-05	1.017E-05	9.531E-06	9.436E-06	3.677E-06
PU241	6.009E-06	3.510E-07	2.169E-07	6.154E-09	7.109E-15	1.261E-20	1.261E-20	6.059E-21
PU242	2.586E-13	2.586E-13	2.586E-13	2.587E-13	2.586E-13	2.584E-13	2.584E-13	2.543E-13
PU244	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24	3.052E-24
AM241	4.566E-08	2.178E-07	2.188E-07	2.007E-07	1.274E-07	4.745E-08	4.081E-08	2.625E-14
AM242M	4.239E-12	3.239E-12	3.095E-12	2.208E-12	6.049E-13	3.645E-14	2.375E-14	5.891E-32
AM242	4.569E-12	3.223E-12	3.079E-12	2.197E-12	6.018E-13	3.627E-14	2.363E-14	5.862E-32
AM243	1.099E-14	1.093E-14	1.092E-14	1.084E-14	1.056E-14	9.963E-15	9.875E-15	4.285E-15
CM242	1.905E-10	2.665E-12	2.547E-12	1.817E-12	4.977E-13	3.000E-14	1.954E-14	4.862E-32
CM243	2.582E-14	6.149E-15	4.821E-15	7.972E-16	7.883E-19	2.456E-25	2.456E-25	0.000E+00
CM244	5.399E-15	5.644E-16	3.849E-16	2.266E-17	4.310E-22	2.483E-32	2.483E-32	0.000E+00
CM245	1.371E-20	1.364E-20	1.363E-20	1.355E-20	1.323E-20	1.259E-20	1.249E-20	6.046E-21
CM246	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24	8.094E-24	0.000E+00
H 3	2.964E-03	1.080E-04	6.163E-05	9.681E-07	1.156E-13	1.113E-28	1.113E-28	0.000E+00
BE 10	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.325E-11	1.324E-11	1.319E-11
C 14	5.306E-10	5.268E-10	5.262E-10	5.215E-10	5.039E-10	4.677E-10	4.624E-10	1.577E-10
SE 79	4.244E-05	4.242E-05	4.241E-05	4.238E-05	4.225E-05	4.197E-05	4.193E-05	3.814E-05
KR 81	2.207E-14	2.207E-14	2.206E-14	2.206E-14	2.204E-14	2.199E-14	2.199E-14	2.135E-14
KR 85	4.427E-02	9.758E-04	5.112E-04	4.272E-06	4.525E-14	2.279E-31	2.279E-31	0.000E+00
RB 87	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
SR 90	3.821E-01	9.381E-02	7.394E-02	1.270E-02	1.467E-05	6.292E-12	6.716E-13	0.000E+00
Y 90	3.864E-01	9.384E-02	7.396E-02	1.271E-02	1.473E-05	6.294E-12	6.718E-13	0.000E+00
ZR 93	9.502E-06	9.501E-06	9.501E-06	9.501E-06	9.500E-06	9.497E-06	9.497E-06	9.459E-06
NB 93M	2.194E-06	8.689E-06	8.823E-06	9.021E-06	9.025E-06	9.022E-06	9.022E-06	8.986E-06
NB 94	7.835E-11	7.819E-11	7.816E-11	7.797E-11	7.721E-11	7.561E-11	7.536E-11	5.563E-11
TC 98	5.493E-12	5.493E-12	5.493E-12	5.493E-12	5.493E-12	5.492E-12	5.492E-12	5.484E-12
TC 99	6.140E-05	6.138E-05	6.138E-05	6.137E-05	6.131E-05	6.119E-05	6.117E-05	5.942E-05
RH102	1.006E-07	7.554E-14	6.921E-15	1.441E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU106	1.787E-01	4.289E-19	2.169E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	1.756E-01	4.289E-19	2.169E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	1.611E-07	1.611E-07	1.611E-07	1.610E-07	1.610E-07	1.610E-07	1.610E-07	1.609E-07
AG108	7.636E-14	1.816E-13	1.720E-13	1.148E-13	2.437E-14	8.451E-16	5.059E-16	0.000E+00
AG108M	2.816E-12	2.041E-12	1.932E-12	1.290E-12	2.739E-13	9.495E-15	5.685E-15	4.826E-36
AG109M	4.966E-11	5.184E-25	5.184E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	4.959E-11	5.184E-25	5.184E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD113M	2.146E-04	1.301E-05	8.087E-06	2.404E-07	3.318E-13	6.465E-26	6.465E-26	0.000E+00
IN115	3.883E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16	3.884E-16
SN121M	2.135E-06	9.420E-07	8.200E-07	2.938E-07	5.718E-09	1.113E-12	3.021E-13	0.000E+00
TE123	4.856E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20	4.866E-20
SB125	1.136E-02	4.399E-09	3.602E-10	3.267E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125M	1.178E-02	1.073E-09	8.788E-11	7.971E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	5.364E-06	5.362E-06	5.362E-06	5.359E-06	5.348E-06	5.326E-06	5.322E-06	5.004E-06
SB126	7.536E-07	7.507E-07	7.506E-07	7.503E-07	7.488E-07	7.456E-07	7.451E-07	7.006E-07
SB126M	5.406E-06	5.362E-06	5.362E-06	5.359E-06	5.348E-06	5.326E-06	5.322E-06	5.004E-06
I129	1.680E-07	1.680E-07	1.680E-07	1.680E-07	1.680E-07	1.679E-07	1.679E-07	1.679E-07
CS134	4.492E-03	1.093E-11	3.792E-13	5.962E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS135	6.370E-06	6.370E-06	6.370E-06	6.370E-06	6.369E-06	6.368E-06	6.368E-06	6.351E-06
CS137	4.203E-01	1.075E-01	8.535E-02	1.544E-02	2.185E-05	1.440E-11	1.640E-12	0.000E+00
BA137M	3.960E-01	1.017E-01	8.074E-02	1.461E-02	2.067E-05	1.362E-11	1.552E-12	0.000E+00
LA138	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16	3.609E-16
CE142	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10	1.219E-10

Appendix C-5
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ss_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	Ci/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
ND144	5.846E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15	6.983E-15
PM146	4.013E-06	2.367E-09	6.713E-10	5.980E-14	1.708E-29	0.000E+00	0.000E+00	0.000E+00
SM146	2.516E-13	3.682E-13	3.683E-13	3.683E-13	3.683E-13	3.683E-13	3.683E-13	3.682E-13
PM147	7.206E-01	1.224E-07	8.714E-09	2.812E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	3.228E-11	4.995E-11	4.995E-11	4.995E-11	4.995E-11	4.995E-11	4.995E-11	4.995E-11
SM148	6.040E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18	6.042E-18
SM149	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17	5.092E-17
EU150	2.139E-10	6.869E-11	5.666E-11	1.363E-11	5.749E-14	4.061E-19	6.667E-20	0.000E+00
SM151	1.100E-02	6.984E-03	6.466E-03	3.657E-03	4.103E-04	3.569E-06	1.731E-06	0.000E+00
EU152	2.163E-06	1.069E-07	6.423E-08	1.479E-09	7.654E-16	1.776E-29	1.776E-29	0.000E+00
GD152	1.479E-19	2.201E-19	2.216E-19	2.238E-19	2.238E-19	2.238E-19	2.238E-19	2.238E-19
EU154	3.457E-04	2.975E-06	1.329E-06	3.406E-09	3.904E-19	1.166E-40	0.000E+00	0.000E+00
EU155	1.047E-02	2.745E-06	6.784E-07	2.186E-11	1.260E-28	0.000E+00	0.000E+00	0.000E+00
HO166M	1.171E-10	1.131E-10	1.125E-10	1.078E-10	9.147E-11	6.409E-11	6.070E-11	3.574E-13
TM171	2.743E-17	1.541E-26	1.541E-26	3.837E-38	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix C-6
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Source Listing of Program ROUNDSS2

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PROGRAM ROUNDSS2

!-------- WRITTEN BY D.R. WENZEL

!            To format of the output of an ORIGEN2 run for stainless
!            steel fuel and convert the output to 2 places of accuracy

       CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
       CHARACTER (LEN=10) :: BLANK, ZERO(7)
       CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
       CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
       CHARACTER (LEN=96) :: BUFFER2
       CHARACTER (LEN=111) :: BUFFER, ORGLINE

       COMMON /AMT/ AMOUNT(9)
       EQUIVALENCE (ORGLINE, BUFFER1(1))
       EQUIVALENCE (BUFFER2, BUFFER3(1))
       EQUIVALENCE (ZERO(1), BUFFER3(27))

       REAL :: DATA(175,7), VALUE(7)

       DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

       OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(2,FILE ='SS_RUN2.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

       OPEN(6,FILE ='ROUNDSS2.OUT', STATUS='UNKNOWN', ERR = 900)

       WRITE(6,600)
  600  FORMAT(1X,'ROUNDSS2.OUT (Ci/l)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

       LAST = 0
   10  READ(1,1000,END=20) NAME, NAME2
 1000  FORMAT(A12, 5X, A24)
       LAST = LAST + 1
       NUCLIDE(LAST) = NAME
       NUCLIDE2(LAST) = NAME2
       GO TO 10

!-------- ZERO MEMORY

   20  DO  l=1,175
          DO K=1,7
             DATA(l,K) = 0.
          END DO

       END DO
```

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Source Listing of Program ROUNDSS2 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',5X,'2032Jan   2042Jan   ', &
              '2116Jan   2400Jan   3016Jan   3110Jan   12000Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,175
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7
                DATA(J,K) = VALUE(K)
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO

       GO TO 999

!-------- ERROR STATEMENTS
```

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Source Listing of Program ROUNDSS2 (continued)

```
  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDSS2
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

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ROUNDSS2.OUT (Ci/l)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	1.1E-04	6.2E-05	9.7E-07	1.2E-13	1.1E-28	1.1E-28	
Be-10	1.600E+06	yr	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11	1.3E-11
C-14	5.729E+03	yr	5.3E-10	5.3E-10	5.2E-10	5.0E-10	4.7E-10	4.6E-10	1.6E-10
Fe-55	2.600E+00	yr	5.7E-09	4.0E-10	1.1E-18				
Ni-59	8.000E+04	yr	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.1E-05	1.0E-05
Co-60	5.270E+00	yr	2.0E-06	5.4E-07	3.2E-11	1.9E-27			
Ni-63	9.200E+01	yr	1.1E-03	9.9E-04	5.7E-04	6.7E-05	6.4E-07	3.2E-07	
Se-79	6.496E+04	yr	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	4.2E-05	3.8E-05
Rb-87	4.696E+10	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Sr-90	2.912E+01	yr	9.4E-02	7.4E-02	1.3E-02	1.5E-05	6.3E-12	6.7E-13	
Y-90	6.400E+01	h	9.4E-02	7.4E-02	1.3E-02	1.5E-05	6.3E-12	6.7E-13	
Zr-93	1.530E+06	yr	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06	9.5E-06
Nb-93m	1.360E+01	yr	8.7E-06	8.8E-06	9.0E-06	9.0E-06	9.0E-06	9.0E-06	9.0E-06
Nb-94	2.030E+04	yr	7.8E-11	7.8E-11	7.8E-11	7.7E-11	7.6E-11	7.5E-11	5.6E-11
Tc-98	4.199E+06	yr	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12	5.5E-12
Tc-99	2.130E+05	yr	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	6.1E-05	5.9E-05
Rh-102	1.059E+03	d	7.6E-14	6.9E-15	1.4E-22				
Ru-106	3.682E+02	d							
Rh-106	2.990E+01	s							
Pd-107	6.496E+06	yr	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Ag-108	2.370E+00	m	1.8E-13	1.7E-13	1.1E-13	2.4E-14	8.5E-16	5.1E-16	
Ag-108m	1.270E+02	yr	2.0E-12	1.9E-12	1.3E-12	2.7E-13	9.5E-15	5.7E-15	4.8E-36
Ag-109m	3.960E+01	s							
Cd-109	4.640E+02	d							
Ag-110	2.460E+01	s							
Ag-110m	2.499E+02	d							
Cd-113m	1.459E+01	yr	1.3E-05	8.1E-06	2.4E-07	3.3E-13	6.5E-26	6.5E-26	
In-115	4.997E+14	yr	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16	3.9E-16
Sn-119m	2.450E+02	d							
Sn-121m	4.997E+01	yr	9.4E-07	8.2E-07	2.9E-07	5.7E-09	1.1E-12	3.0E-13	
Te-123	1.000E+13	yr	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20	4.9E-20
Sb-125	2.770E+00	yr	4.4E-09	3.6E-10	3.3E-18				
Te-125m	5.800E+01	d	1.1E-09	8.8E-11	8.0E-19				
Sn-126	1.000E+05	yr	5.4E-06	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.0E-06
Sb-126	1.240E+01	d	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.5E-07	7.0E-07
Sb-126m	1.900E+01	m	5.4E-06	5.4E-06	5.4E-06	5.3E-06	5.3E-06	5.3E-06	5.0E-06
I-129	1.570E+07	yr	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07	1.7E-07
Cs-134	2.062E+00	yr	1.1E-11	3.8E-13	6.0E-24				
Cs-135	2.300E+06	yr	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06	6.4E-06
Cs-137	3.000E+01	yr	1.1E-01	8.5E-02	1.5E-02	2.2E-05	1.4E-11	1.6E-12	
Ba-137m	2.552E+00	m	1.0E-01	8.1E-02	1.5E-02	2.1E-05	1.4E-11	1.6E-12	
La-138	1.350E+11	yr	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16	3.6E-16
Ce-142	1.049E+11	yr	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10	1.2E-10
Ce-144	2.843E+02	d							
Pr-144	1.728E+01	m							
Pr-144m	7.200E+00	m							
Nd-144	2.099E+15	yr	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15	7.0E-15
Pm-146	5.500E+00	yr	2.4E-09	6.7E-10	6.0E-14	1.7E-29			
Sm-146	7.000E+07	yr	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13	3.7E-13
Pm-147	2.623E+00	yr	1.2E-07	8.7E-09	2.8E-17				
Sm-147	1.070E+11	yr	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11	5.0E-11
Sm-148	8.001E+15	yr	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18	6.0E-18
Sm-149	9.994E+15	yr	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17	5.1E-17
Eu-150	3.600E+01	yr	6.9E-11	5.7E-11	1.4E-11	5.7E-14	4.1E-19	6.7E-20	
Sm-151	8.999E+01	yr	7.0E-03	6.5E-03	3.7E-03	4.1E-04	3.6E-06	1.7E-06	
Eu-152	1.360E+01	yr	1.1E-07	6.4E-08	1.5E-09	7.7E-16	1.8E-29	1.8E-29	
Gd-152	1.080E+14	yr	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19	2.2E-19
Gd-153	2.420E+02	d							
Eu-154	8.600E+00	yr	3.0E-06	1.3E-06	3.4E-09	3.9E-19	1.2E-40		
Eu-155	4.959E+00	yr	2.7E-06	6.8E-07	2.2E-11	1.3E-28			
Ho-166m	1.200E+03	yr	1.1E-10	1.1E-10	1.1E-10	9.1E-11	6.4E-11	6.1E-11	3.6E-13
Tm-171	1.920E+00	yr	1.5E-26	1.5E-26	3.8E-38				
Tl-207	4.770E+00	m	1.7E-09	1.8E-09	1.9E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Tl-208	3.070E+00	m	6.5E-10	5.9E-10	2.9E-10	1.9E-11	1.6E-13	1.3E-13	1.1E-13
Tl-209	2.200E+00	m	5.5E-14	5.7E-14	7.5E-14	2.6E-13	1.3E-12	1.5E-12	8.8E-11

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ROUNDSS2.OUT (Ci/l) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.300E+00	h	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Pb-210	2.230E+01	yr	3.5E-10	4.4E-10	1.1E-09	4.0E-09	8.7E-09	9.1E-09	2.3E-08
Pb-211	3.610E+01	m	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Pb-212	1.064E+01	h	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Pb-214	2.680E+01	m	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Bi-210m	3.000E+06	yr	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26	1.3E-26
Bi-210	5.012E+00	d	3.5E-10	4.4E-10	1.1E-09	4.0E-09	8.7E-09	9.1E-09	2.3E-08
Bi-211	2.130E+00	m	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Bi-212	6.055E+01	m	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Bi-213	4.565E+01	m	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Bi-214	1.990E+01	m	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Po-210	1.384E+02	d	3.5E-10	4.4E-10	1.1E-09	4.0E-09	8.7E-09	9.1E-09	2.3E-08
Po-211	5.600E-01	s	4.7E-12	5.0E-12	5.5E-12	5.6E-12	5.8E-12	5.8E-12	1.1E-11
Po-212	3.000E-07	s	1.2E-09	1.0E-09	5.1E-10	3.4E-11	2.9E-13	2.3E-13	1.9E-13
Po-213	4.200E-06	s	2.5E-12	2.6E-12	3.4E-12	1.2E-11	5.9E-11	6.9E-11	4.0E-09
Po-214	1.643E-04	s	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Po-215	1.780E-03	s	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Po-216	1.500E-01	s	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Po-218	3.050E+00	m	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
At-217	3.230E-02	s	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Rn-219	3.960E+00	s	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Rn-220	5.560E+01	s	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Rn-222	3.824E+00	d	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Fr-221	4.800E+00	m	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Fr-223	2.180E+01	m	2.3E-11	2.4E-11	2.7E-11	2.8E-11	2.8E-11	2.8E-11	5.4E-11
Ra-223	1.143E+01	d	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Ra-224	3.660E+00	d	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Ra-225	1.480E+01	d	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Ra-226	1.600E+03	yr	6.3E-10	7.3E-10	1.5E-09	4.0E-09	8.7E-09	9.3E-09	2.3E-08
Ra-228	6.700E+00	yr	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.4E-16	8.5E-16	1.4E-15
Ac-225	1.000E+01	d	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Ac-227	2.177E+01	yr	1.7E-09	1.8E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Ac-228	6.131E+00	h	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.4E-16	8.5E-16	1.4E-15
Th-227	1.872E+01	d	1.7E-09	1.7E-09	1.9E-09	2.0E-09	2.0E-09	2.0E-09	3.8E-09
Th-228	1.913E+00	yr	1.8E-09	1.6E-09	8.0E-10	5.2E-11	4.5E-13	3.7E-13	2.9E-13
Th-229	7.339E+03	yr	2.6E-12	2.6E-12	3.5E-12	1.2E-11	6.0E-11	7.1E-11	4.1E-09
Th-230	7.700E+04	yr	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.4E-08	2.3E-08
Th-231	2.552E+01	h	5.6E-09	5.6E-09	5.7E-09	6.1E-09	6.9E-09	7.0E-09	1.8E-08
Th-232	1.405E+10	yr	8.3E-16	8.3E-16	8.3E-16	8.3E-16	8.4E-16	8.5E-16	1.4E-15
Th-234	2.410E+01	d	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-231	3.277E+04	yr	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.1E-09	2.1E-09	3.9E-09
Pa-233	2.700E+01	d	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Pa-234m	1.170E+00	m	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
Pa-234	6.700E+00	h	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13	1.0E-13
U-232	7.200E+01	yr	1.8E-09	1.6E-09	7.8E-10	5.1E-11	4.4E-13	3.6E-13	2.9E-13
U-233	1.585E+05	yr	6.9E-11	8.1E-11	1.7E-10	5.0E-10	1.2E-09	1.3E-09	1.1E-08
U-234	2.445E+05	yr	4.7E-09	5.3E-09	8.5E-09	1.2E-08	1.2E-08	1.2E-08	1.2E-08
U-235	7.038E+08	yr	5.6E-09	5.6E-09	5.7E-09	6.1E-09	6.9E-09	7.0E-09	1.8E-08
U-236	2.341E+07	yr	1.3E-10	1.3E-10	1.6E-10	2.4E-10	4.2E-10	4.5E-10	2.1E-09
U-237	6.750E+00	d	8.6E-12	5.3E-12	1.5E-13	1.7E-19	3.1E-25	3.1E-25	1.5E-25
U-238	4.468E+09	yr	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11	8.0E-11
U-240	1.410E+01	h	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Np-236	1.150E+05	yr	3.5E-12	3.5E-12	3.5E-12	3.4E-12	3.4E-12	3.4E-12	3.3E-12
Np-237	2.140E+06	yr	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07	2.7E-07
Np-238	2.117E+00	d	1.6E-14	1.5E-14	1.1E-14	3.0E-15	1.8E-16	1.2E-16	2.9E-34
Np-239	2.355E+00	d	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.0E-14	9.9E-15	4.3E-15
Np-240m	7.400E+00	m	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24	3.0E-24
Pu-236	2.851E+00	yr	3.5E-13	3.1E-13	3.1E-13	3.1E-13	3.1E-13	3.1E-13	2.9E-13
Pu-238	8.774E+01	yr	2.2E-05	2.0E-05	1.1E-05	1.2E-06	9.2E-09	4.4E-09	1.2E-31
Pu-239	2.406E+04	yr	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.4E-03	1.1E-03
Pu-240	6.537E+03	yr	1.1E-05	1.1E-05	1.0E-05	1.0E-05	9.5E-06	9.4E-06	3.7E-06
Pu-241	1.440E+01	yr	3.5E-07	2.2E-07	6.2E-09	7.1E-15	1.3E-20	1.3E-20	6.1E-21
Pu-242	3.869E+05	yr	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.6E-13	2.5E-13
Pu-243	4.956E+00	h							

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ROUNDSS2.OUT (Ci/l) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pu-244	8.261E+07	yr	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24	3.1E-24
Am-241	4.322E+02	yr	2.2E-07	2.2E-07	2.0E-07	1.3E-07	4.7E-08	4.1E-08	2.6E-14
Am-242m	1.520E+02	yr	3.2E-12	3.1E-12	2.2E-12	6.0E-13	3.6E-14	2.4E-14	5.9E-32
Am-242	1.602E+01	h	3.2E-12	3.1E-12	2.2E-12	6.0E-13	3.6E-14	2.4E-14	5.9E-32
Am-243	7.380E+03	yr	1.1E-14	1.1E-14	1.1E-14	1.1E-14	1.0E-14	9.9E-15	4.3E-15
Cm-242	1.632E+02	d	2.7E-12	2.5E-12	1.8E-12	5.0E-13	3.0E-14	2.0E-14	4.9E-32
Cm-243	2.850E+01	yr	6.1E-15	4.8E-15	8.0E-16	7.9E-19	2.5E-25	2.5E-25	
Cm-244	1.811E+01	yr	5.6E-16	3.8E-16	2.3E-17	4.3E-22	2.5E-32	2.5E-32	
Cm-245	8.499E+03	yr	1.4E-20	1.4E-20	1.4E-20	1.3E-20	1.3E-20	1.2E-20	6.0E-21
Cm-246	4.731E+03	yr	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24	8.1E-24	
Cm-247	1.560E+07	yr							
Cm-248	3.391E+05	yr							
Cf-249	3.505E+02	yr							
Cf-250	1.308E+01	yr							
Cf-251	8.980E+02	yr							
Cf-252	2.638E+00	yr							
Ca-45	1.630E+02	d							
V-50	4.000E+16	yr	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18	3.8E-18
Mn-54	3.125E+02	d	1.5E-22	4.7E-26					
Fe-55	2.600E+00	yr	5.7E-09	4.0E-10	1.1E-18				
Lu-176	3.000E+10	yr							
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr							
Ta-182	1.150E+02	d							
Re-187	5.000E+10	yr							

Appendix C-7
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ss_run2.g
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	g/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
HE 3	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15	1.028E-15
HE 4	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08	7.450E-08
B 10	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15	4.008E-15
B 11	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18	6.663E-18
C 12	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02	5.042E-02
C 13	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04	5.614E-04
N 14	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15	5.876E-15
N 15	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22	1.427E-22
O 17	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24	2.046E-24
NE 20	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19	2.707E-19
NE 21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21	1.312E-21
NE 22	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11	1.018E-11
NA 22	7.345E-22	1.096E-28	1.096E-28	3.009E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NA 23	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13
MG 24	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15	1.679E-15
MG 25	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07	7.607E-07
MG 26	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07	3.116E-07
AL 27	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09	3.247E-09
SI 28	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01	6.453E-01
SI 29	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02	3.043E-02
SI 30	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02	2.020E-02
SI 32	2.209E-15	2.074E-15	2.052E-15	1.897E-15	1.401E-15	7.264E-16	6.571E-16	5.017E-20
P 31	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02	2.880E-02
P 32	1.306E-13	1.249E-19	1.236E-19	1.142E-19	8.439E-20	4.375E-20	3.958E-20	3.022E-24
S 32	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02	2.544E-02
S 33	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05	1.453E-05
S 34	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04	8.132E-04
S 36	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06	3.856E-06
CL 35	1.201E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09	1.206E-09
CL 36	7.292E-14	7.291E-14	7.291E-14	7.290E-14	7.285E-14	7.275E-14	7.273E-14	7.126E-14
CL 37	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12	3.578E-12
AR 36	7.240E-19	1.044E-17	1.209E-17	2.428E-17	7.103E-17	1.723E-16	1.878E-16	1.634E-15
AR 38	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18	7.607E-18
AR 39	1.380E-23	1.380E-23	1.380E-23	1.380E-23	3.701E-24	2.489E-24	2.489E-24	2.802E-34
K 41	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20	4.638E-20
CA 42	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25	2.057E-25
CA 43	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22	1.600E-22
CA 44	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12	2.387E-12
CA 46	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13	7.660E-13
SC 45	5.928E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18	6.122E-18
TI 46	5.509E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23	5.550E-23
TI 47	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07	5.194E-07
TI 48	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12	6.505E-12
TI 49	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06	1.128E-06
TI 50	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05	1.249E-05
V 50	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05	2.151E-05
V 51	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05	5.928E-05
CR 50	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01	4.753E-01
CR 52	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00	9.129E+00
CR 53	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00	2.466E+00
CR 54	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01	2.586E-01
MN 54	1.140E-05	1.987E-26	6.021E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MN 55	2.854E-05	4.394E-05	4.394E-05	4.394E-05	4.394E-05	4.394E-05	4.394E-05	4.394E-05
FE 54	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00	2.476E+00
FE 55	1.540E-05	2.272E-12	1.580E-13	4.274E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 56	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01	3.856E+01
FE 57	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01	8.814E-01
FE 58	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01	1.186E-01
CO 59	2.235E-05	2.243E-05	2.244E-05	2.254E-05	2.290E-05	2.369E-05	2.381E-05	3.475E-05
CO 60	4.180E-06	1.782E-09	4.782E-10	2.834E-14	1.695E-30	0.000E+00	0.000E+00	0.000E+00
NI 58	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00	5.246E+00
NI 59	1.490E-04	1.489E-04	1.489E-04	1.488E-04	1.484E-04	1.477E-04	1.475E-04	1.366E-04
NI 60	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01	2.020E-01
NI 61	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02	8.709E-02
NI 62	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01	2.775E-01
NI 63	2.700E-05	1.731E-05	1.605E-05	9.193E-06	1.082E-06	1.044E-08	5.141E-09	0.000E+00

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ss_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	g/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
NI 64	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02	7.030E-02
CU 63	8.709E-07	1.056E-05	1.182E-05	1.868E-05	2.679E-05	2.786E-05	2.787E-05	2.787E-05
CU 65	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06	1.049E-06
ZN 64	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13	9.968E-13
NB 93	0.000E+00	2.475E-08	2.892E-08	5.950E-08	1.728E-07	3.977E-07	4.296E-07	1.838E-06
MO 92	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01	3.017E-01
MO 93	2.130E-06	2.105E-06	2.101E-06	2.070E-06	1.957E-06	1.732E-06	1.700E-06	2.921E-07
MO 94	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01	1.868E-01
MO 97	0.000E+00	2.616E-11	3.059E-11	6.340E-11	1.893E-10	4.623E-10	5.040E-10	4.440E-09
TC 97	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.663E-06	1.659E-06
RU 96	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02	1.868E-02
RU 98	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03	6.296E-03
HE 4	0.000E+00	6.714E-07	7.846E-07	1.618E-06	4.775E-06	1.151E-05	1.253E-05	9.714E-05
TL206	0.000E+00	6.097E-35	6.097E-35	6.097E-35	6.097E-35	6.097E-35	6.097E-35	6.097E-35
TL207	8.761E-19	8.855E-18	9.263E-18	1.022E-17	1.046E-17	1.076E-17	1.079E-17	2.043E-17
TL208	9.181E-17	2.196E-18	1.995E-18	9.786E-19	6.390E-20	5.441E-22	4.457E-22	3.586E-22
TL209	1.243E-22	1.353E-22	1.389E-22	1.834E-22	6.438E-22	3.171E-21	3.734E-21	2.147E-19
PB206	1.306E-15	3.322E-12	4.909E-12	2.832E-11	3.237E-10	1.889E-09	2.221E-09	7.242E-08
PB207	1.527E-13	2.752E-11	3.448E-11	9.070E-11	3.165E-10	8.168E-10	8.945E-10	1.104E-08
PB208	1.023E-10	2.403E-10	2.472E-10	2.821E-10	3.136E-10	3.158E-10	3.158E-10	3.169E-10
PB209	5.183E-19	5.637E-19	5.787E-19	7.643E-19	2.682E-18	1.321E-17	1.556E-17	8.946E-16
PB210	2.700E-14	4.621E-12	5.779E-12	1.502E-11	5.294E-11	1.133E-10	1.186E-10	2.976E-10
PB211	6.800E-18	6.850E-17	7.166E-17	7.907E-17	8.092E-17	8.327E-17	8.350E-17	1.581E-16
PB212	5.400E-14	1.296E-15	1.177E-15	5.772E-16	3.769E-17	3.209E-19	2.629E-19	2.115E-19
PB214	9.601E-19	1.926E-17	2.232E-17	4.451E-17	1.233E-16	2.639E-16	2.822E-16	6.930E-16
BI208	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23	7.345E-23
BI209	3.148E-15	6.148E-14	7.200E-14	1.620E-13	9.803E-13	9.185E-12	1.167E-11	5.943E-09
BI210M	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23	2.350E-23
BI210	1.660E-17	2.843E-15	3.557E-15	9.243E-15	3.258E-14	6.972E-14	7.300E-14	1.831E-13
BI211	4.008E-19	4.042E-18	4.228E-18	4.665E-18	4.774E-18	4.913E-18	4.927E-18	9.327E-18
BI212	5.131E-15	1.229E-16	1.116E-16	5.475E-17	3.575E-18	3.044E-20	2.494E-20	2.006E-20
BI213	1.217E-19	1.325E-19	1.360E-19	1.796E-19	6.303E-19	3.104E-18	3.656E-18	2.102E-16
BI214	7.135E-19	1.430E-17	1.657E-17	3.305E-17	9.156E-17	1.960E-16	2.096E-16	5.146E-16
PO210	3.850E-16	7.853E-14	9.826E-14	2.553E-13	8.998E-13	1.926E-12	2.016E-12	5.057E-12
PO211	4.921E-24	4.959E-23	5.187E-23	5.724E-23	5.858E-23	6.028E-23	6.044E-23	1.144E-22
PO212	2.712E-25	6.502E-27	5.906E-27	2.897E-27	1.892E-28	1.611E-30	1.319E-30	1.061E-30
PO213	0.000E+00	1.987E-28	2.040E-28	2.694E-28	9.456E-28	4.657E-27	5.485E-27	3.154E-25
PO214	0.000E+00	1.968E-24	2.280E-24	4.547E-24	1.260E-23	2.696E-23	2.883E-23	7.080E-23
PO215	5.666E-24	5.736E-23	6.000E-23	6.621E-23	6.776E-23	6.973E-23	6.992E-23	1.324E-22
PO216	2.156E-19	5.170E-21	4.696E-21	2.303E-21	1.504E-22	1.281E-24	1.049E-24	8.439E-25
PO218	1.117E-19	2.234E-18	2.588E-18	5.162E-18	1.430E-17	3.060E-17	3.273E-17	8.036E-17
AT217	1.464E-24	1.591E-24	1.634E-24	2.158E-24	7.572E-24	3.729E-23	4.392E-23	2.525E-21
RN219	1.291E-20	1.300E-19	1.360E-19	1.500E-19	1.536E-19	1.580E-19	1.584E-19	3.000E-19
RN220	8.132E-17	1.952E-18	1.773E-18	8.695E-19	5.678E-20	4.835E-22	3.960E-22	3.186E-22
RN222	2.050E-16	4.107E-15	4.758E-15	9.490E-15	2.629E-14	5.627E-14	6.017E-14	1.478E-13
FR221	1.327E-20	1.445E-20	1.483E-20	1.959E-20	6.876E-20	3.387E-19	3.989E-19	2.293E-17
FR223	6.191E-20	6.033E-19	6.301E-19	6.962E-19	7.127E-19	7.334E-19	7.353E-19	1.392E-18
RA223	3.280E-15	3.302E-14	3.454E-14	3.811E-14	3.901E-14	4.014E-14	4.025E-14	7.620E-14
RA224	4.710E-13	1.130E-14	1.027E-14	5.035E-15	3.288E-16	2.800E-18	2.293E-18	1.845E-18
RA225	6.080E-17	6.534E-17	6.707E-17	8.859E-17	3.109E-16	1.531E-15	1.803E-15	1.037E-13
RA226	3.180E-11	6.388E-10	7.402E-10	1.476E-09	4.090E-09	8.753E-09	9.360E-09	2.299E-08
RA228	8.551E-19	3.538E-18	3.542E-18	3.549E-18	3.559E-18	3.602E-18	3.611E-18	6.191E-18
AC225	4.050E-17	4.414E-17	4.531E-17	5.984E-17	2.100E-16	1.034E-15	1.218E-15	7.004E-14
AC227	2.400E-12	2.338E-11	2.442E-11	2.698E-11	2.762E-11	2.842E-11	2.849E-11	5.395E-11
AC228	8.919E-23	3.693E-22	3.698E-22	3.704E-22	3.715E-22	3.760E-22	3.769E-22	6.462E-22
TH227	5.460E-15	5.426E-14	5.676E-14	6.263E-14	6.409E-14	6.595E-14	6.614E-14	1.252E-13
TH228	9.140E-11	2.196E-12	1.995E-12	9.785E-13	6.389E-14	5.441E-16	4.457E-16	3.585E-16
TH229	1.120E-11	1.204E-11	1.236E-11	1.633E-11	5.730E-11	2.822E-10	3.324E-10	1.911E-08
TH230	1.180E-06	1.179E-06	1.179E-06	1.179E-06	1.177E-06	1.174E-06	1.174E-06	1.130E-06
TH231	3.400E-11	1.044E-14	1.047E-14	1.066E-14	1.141E-14	1.300E-14	1.325E-14	3.335E-14
TH232	7.560E-09	7.563E-09	7.564E-09	7.569E-09	7.594E-09	7.687E-09	7.705E-09	1.321E-08
TH234	1.110E-10	3.470E-15	3.470E-15	3.470E-15	3.470E-15	3.470E-15	3.470E-15	3.470E-15
PA231	4.150E-08	4.163E-08	4.164E-08	4.176E-08	4.226E-08	4.349E-08	4.370E-08	8.259E-08
PA233	1.280E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11	1.284E-11	1.280E-11
PA234M	3.730E-15	1.170E-19	1.170E-19	1.170E-19	1.170E-19	1.170E-19	1.170E-19	1.170E-19

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ss_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	g/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
PA234	1.670E-15	5.226E-20	5.226E-20	5.226E-20	5.226E-20	5.226E-20	5.226E-20	5.226E-20
U232	1.462E-13	8.187E-11	7.436E-11	3.647E-11	2.382E-12	2.062E-14	1.679E-14	1.366E-14
U233	1.230E-11	7.113E-09	8.317E-09	1.722E-08	5.136E-08	1.253E-07	1.365E-07	1.179E-06
U234	1.850E-09	7.454E-07	8.405E-07	1.353E-06	1.928E-06	1.992E-06	1.992E-06	1.943E-06
U235	2.529E-03	2.567E-03	2.574E-03	2.622E-03	2.805E-03	3.198E-03	3.258E-03	8.202E-03
U236	1.720E-06	2.006E-06	2.055E-06	2.411E-06	3.753E-06	6.528E-06	6.935E-06	3.178E-05
U237	1.889E-15	1.054E-16	6.516E-17	1.849E-18	2.136E-24	3.783E-30	3.783E-30	1.818E-30
U238	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04	2.390E-04
U240	0.000E+00	3.290E-30	3.290E-30	3.290E-30	3.290E-30	3.290E-30	3.290E-30	3.290E-30
NP235	7.083E-13	2.960E-29	2.960E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	2.620E-10	2.619E-10	2.619E-10	2.618E-10	2.613E-10	2.604E-10	2.602E-10	2.466E-10
NP237	3.780E-04	3.780E-04	3.780E-04	3.780E-04	3.780E-04	3.779E-04	3.779E-04	3.768E-04
NP238	8.814E-20	6.247E-20	5.968E-20	4.259E-20	1.166E-20	7.030E-22	4.579E-22	1.136E-39
NP239	4.740E-20	4.709E-20	4.705E-20	4.672E-20	4.549E-20	4.293E-20	4.256E-20	1.846E-20
NP240M	0.000E+00	2.878E-32	2.878E-32	2.878E-32	2.878E-32	2.878E-32	2.878E-32	2.878E-32
PU236	1.410E-10	6.675E-16	5.917E-16	5.841E-16	5.831E-16	5.809E-16	5.806E-16	5.503E-16
PU238	2.030E-06	1.274E-06	1.177E-06	6.560E-07	6.959E-08	5.361E-10	2.551E-10	6.756E-33
PU239	2.300E-02	2.296E-02	2.295E-02	2.291E-02	2.272E-02	2.232E-02	2.226E-02	1.723E-02
PU240	4.670E-05	4.641E-05	4.636E-05	4.600E-05	4.463E-05	4.181E-05	4.140E-05	1.613E-05
PU241	5.830E-08	3.406E-09	2.104E-09	5.971E-11	6.898E-17	1.223E-22	1.223E-22	5.879E-23
PU242	6.770E-11	6.771E-11	6.771E-11	6.772E-11	6.771E-11	6.765E-11	6.764E-11	6.657E-11
PU244	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19	1.720E-19
AM241	1.330E-08	6.344E-08	6.372E-08	5.846E-08	3.711E-08	1.382E-08	1.189E-08	7.647E-15
AM242M	4.360E-13	3.332E-13	3.183E-13	2.271E-13	6.221E-14	3.749E-15	2.442E-15	6.059E-33
AM242	5.650E-18	3.985E-18	3.808E-18	2.717E-18	7.442E-19	4.485E-20	2.922E-20	7.248E-38
AM243	5.510E-14	5.480E-14	5.474E-14	5.436E-14	5.293E-14	4.996E-14	4.952E-14	2.149E-14
CM242	5.760E-14	8.058E-16	7.699E-16	5.494E-16	1.505E-16	9.069E-18	5.907E-18	1.470E-35
CM243	5.000E-16	1.191E-16	9.336E-17	1.544E-17	1.526E-20	4.756E-27	4.756E-27	0.000E+00
CM244	6.670E-17	6.973E-18	4.755E-18	2.800E-19	5.325E-24	3.068E-34	3.068E-34	0.000E+00
CM245	7.980E-20	7.942E-20	7.935E-20	7.887E-20	7.705E-20	7.327E-20	7.271E-20	3.520E-20
CM246	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23	2.634E-23	0.000E+00
SF250	0.000E+00	1.681E-14	1.959E-14	3.970E-14	1.128E-13	2.617E-13	2.836E-13	1.623E-12
H 3	3.070E-07	1.119E-08	6.384E-09	1.003E-10	1.197E-17	1.153E-32	1.153E-32	0.000E+00
LI 6	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09	1.962E-09
LI 7	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11	4.591E-11
BE 9	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13	8.866E-13
BE 10	5.928E-10	5.928E-10	5.928E-10	5.928E-10	5.927E-10	5.925E-10	5.925E-10	5.902E-10
C 14	1.190E-10	1.182E-10	1.180E-10	1.170E-10	1.130E-10	1.049E-10	1.037E-10	3.538E-11
ZN 66	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12	3.908E-12
ZN 67	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13	1.647E-13
ZN 68	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17	2.235E-17
GA 69	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22	3.331E-22
GA 71	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11	4.412E-11
GE 72	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07	2.754E-07
GE 73	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07	7.292E-07
GE 74	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06	1.437E-06
AS 75	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06	2.481E-06
GE 76	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06	5.823E-06
SE 76	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09	3.825E-09
SE 77	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05	1.175E-05
SE 78	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05	2.356E-05
SE 79	6.090E-04	6.086E-04	6.086E-04	6.081E-04	6.062E-04	6.023E-04	6.017E-04	5.472E-04
BR 79	1.726E-09	3.850E-07	4.499E-07	9.303E-07	2.770E-06	6.742E-06	7.346E-06	6.179E-05
SE 80	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05	7.712E-05
KR 80	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10	1.390E-10
BR 81	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04	1.238E-04
KR 81	1.049E-12	1.049E-12	1.049E-12	1.049E-12	1.048E-12	1.045E-12	1.045E-12	1.015E-12
SE 82	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04	1.758E-04
KR 82	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07	3.221E-07
KR 83	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04	3.090E-04
KR 84	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04	5.771E-04
KR 85	1.128E-04	2.486E-06	1.302E-06	1.088E-08	1.153E-16	5.807E-34	5.807E-34	0.000E+00
RB 85	5.981E-04	7.084E-04	7.096E-04	7.109E-04	7.109E-04	7.109E-04	7.109E-04	7.109E-04
KR 86	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03	1.096E-03
SR 86	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07	5.614E-07

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ss_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

	g/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
RB 87	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03	1.420E-03
SR 87	1.506E-08	1.506E-08	1.506E-08	1.506E-08	1.507E-08	1.508E-08	1.508E-08	1.527E-08
SR 88	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03	2.062E-03
Y 89	2.607E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03	2.608E-03
SR 90	2.800E-03	6.875E-04	5.419E-04	9.310E-05	1.075E-07	4.611E-14	4.922E-15	0.000E+00
Y 90	7.100E-07	1.724E-07	1.359E-07	2.335E-08	2.707E-11	1.156E-17	1.234E-18	0.000E+00
ZR 90	3.552E-04	2.468E-03	2.614E-03	3.063E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03
ZR 91	3.295E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03	3.298E-03
ZR 92	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03	3.447E-03
ZR 93	3.780E-03	3.780E-03	3.780E-03	3.780E-03	3.779E-03	3.778E-03	3.778E-03	3.763E-03
NB 93	1.375E-09	7.945E-08	9.610E-08	2.221E-07	7.084E-07	1.763E-06	1.924E-06	1.711E-05
NB 93M	7.760E-09	3.073E-08	3.120E-08	3.190E-08	3.192E-08	3.191E-08	3.191E-08	3.178E-08
ZR 94	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03	3.651E-03
NB 94	4.180E-10	4.172E-10	4.170E-10	4.160E-10	4.119E-10	4.034E-10	4.021E-10	2.968E-10
MO 95	3.882E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03	3.890E-03
ZR 96	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03	3.830E-03
MO 96	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06	3.379E-06
MO 97	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03	3.714E-03
MO 98	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03	3.756E-03
TC 98	6.320E-09	6.320E-09	6.320E-09	6.320E-09	6.320E-09	6.319E-09	6.319E-09	6.310E-09
TC 99	3.620E-03	3.619E-03	3.619E-03	3.618E-03	3.615E-03	3.608E-03	3.607E-03	3.504E-03
RU 99	5.509E-08	7.500E-07	8.678E-07	1.739E-06	5.082E-06	1.232E-05	1.342E-05	1.163E-04
MO100	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03	4.055E-03
RU100	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06	6.978E-06
RU101	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03	3.531E-03
RU102	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03	3.053E-03
RH102	8.320E-11	6.248E-17	5.724E-18	1.192E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03	2.245E-03
RU104	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03	1.595E-03
PD104	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06	5.509E-06
PD105	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04	8.656E-04
RU106	5.340E-05	1.281E-22	6.481E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	4.930E-11	1.204E-28	6.092E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD106	4.218E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04	4.752E-04
PD107	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.130E-04	3.127E-04
AG107	1.537E-10	2.124E-09	2.458E-09	4.930E-09	1.441E-08	3.499E-08	3.812E-08	3.349E-07
PD108	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04	1.952E-04
AG108	1.039E-22	2.471E-22	2.340E-22	1.563E-22	3.317E-23	1.150E-24	6.884E-25	0.000E+00
AG108M	1.080E-13	7.827E-14	7.411E-14	4.949E-14	1.050E-14	3.642E-16	2.180E-16	1.851E-37
CD108	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10	1.941E-10
AG109	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04	1.380E-04
AG109M	1.899E-20	1.983E-34	1.983E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	1.920E-14	2.007E-28	2.007E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD110	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04	1.049E-04
CD110	3.421E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07	3.463E-07
CD111	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05	8.656E-05
CD112	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05	7.765E-05
CD113	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05	7.607E-05
CD113M	9.890E-07	5.995E-08	3.728E-08	1.108E-09	1.530E-15	2.980E-28	2.980E-28	0.000E+00
IN113	2.434E-07	1.172E-06	1.194E-06	1.230E-06	1.231E-06	1.231E-06	1.231E-06	1.231E-06
CD114	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05	7.397E-05
SN114	6.978E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11	6.980E-11
IN115	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05	6.240E-05
SN115	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06	2.513E-06
CD116	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05	7.450E-05
SN116	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06	1.327E-06
SN117	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05	7.345E-05
SN118	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05	7.660E-05
SN119	7.607E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05	7.613E-05
SN120	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05	7.869E-05
SN121M	3.610E-08	1.593E-08	1.386E-08	4.967E-09	9.667E-11	1.882E-14	5.108E-15	0.000E+00
SB121	7.765E-05	7.767E-05	7.767E-05	7.768E-05	7.769E-05	7.769E-05	7.769E-05	7.769E-05
SN122	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05	8.499E-05
TE122	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07	1.532E-07
SB123	9.129E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05	9.153E-05
TE123	1.670E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10	1.674E-10

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ss_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

g/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
SN124	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04	1.091E-04
TE124	1.952E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07	1.955E-07
SB125	1.100E-05	4.258E-12	3.487E-13	3.163E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125	8.184E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05	9.349E-05
TE125M	6.540E-07	5.956E-14	4.877E-15	4.424E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	1.890E-04	1.889E-04	1.889E-04	1.888E-04	1.884E-04	1.876E-04	1.875E-04	1.763E-04
SB126	9.010E-12	8.976E-12	8.975E-12	8.970E-12	8.953E-12	8.915E-12	8.909E-12	8.376E-12
SB126M	6.880E-14	6.824E-14	6.824E-14	6.820E-14	6.807E-14	6.778E-14	6.773E-14	6.369E-14
TE126	5.351E-06	5.428E-06	5.441E-06	5.538E-06	5.910E-06	6.712E-06	6.835E-06	1.804E-05
I127	3.447E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04	3.451E-04
TE128	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04	6.400E-04
XE128	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07	6.400E-07
I129	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.510E-04	9.506E-04
XE129	4.428E-09	6.905E-09	7.325E-09	1.043E-08	2.236E-08	4.822E-08	5.217E-08	4.254E-07
TE130	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03	1.674E-03
XE130	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06	1.936E-06
XE131	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03	2.791E-03
XE132	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03	3.998E-03
BA132	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10	2.424E-10
CS133	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03
XE134	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03	6.610E-03
CS134	3.470E-06	8.447E-15	2.929E-16	4.606E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA134	8.551E-06	1.202E-05	1.202E-05	1.202E-05	1.202E-05	1.202E-05	1.202E-05	1.202E-05
CS135	5.530E-03	5.530E-03	5.530E-03	5.530E-03	5.529E-03	5.528E-03	5.528E-03	5.513E-03
BA135	1.128E-08	1.096E-07	1.263E-07	2.496E-07	7.229E-07	1.749E-06	1.906E-06	1.670E-05
XE136	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03
BA136	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05	2.492E-05
CS137	4.830E-03	1.236E-03	9.807E-04	1.774E-04	2.511E-07	1.654E-13	1.885E-14	0.000E+00
BA137	5.351E-04	4.129E-03	4.384E-03	5.188E-03	5.365E-03	5.365E-03	5.365E-03	5.365E-03
BA137M	7.360E-10	1.890E-10	1.500E-10	2.714E-11	3.842E-14	2.531E-20	2.884E-21	0.000E+00
BA138	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03	5.823E-03
LA138	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08	1.880E-08
LA139	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03	5.666E-03
CE140	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03	5.614E-03
PR141	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03	5.404E-03
CE142	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03	5.077E-03
ND142	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06	2.670E-06
ND143	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03	5.236E-03
ND144	4.940E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03	5.901E-03
ND145	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03	3.536E-03
ND146	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03	2.765E-03
PM146	9.010E-09	5.315E-12	1.507E-12	1.343E-16	3.836E-32	0.000E+00	0.000E+00	0.000E+00
SM146	7.190E-09	1.052E-08	1.052E-08	1.052E-08	1.052E-08	1.052E-08	1.052E-08	1.052E-08
PM147	7.770E-04	1.320E-10	9.397E-12	3.033E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	1.420E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03
ND148	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03	1.626E-03
SM148	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05	2.000E-05
SM149	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04	2.120E-04
ND150	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04	6.715E-04
SM150	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06	6.505E-06
EU150	3.230E-12	1.037E-12	8.555E-13	2.058E-13	8.680E-16	6.132E-21	1.007E-21	0.000E+00
SM151	4.180E-04	2.654E-04	2.457E-04	1.389E-04	1.559E-05	1.356E-07	6.575E-08	0.000E+00
EU151	1.506E-05	1.677E-04	1.874E-04	2.941E-04	4.175E-04	4.329E-04	4.330E-04	4.331E-04
SM152	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04	3.011E-04
EU152	1.250E-08	6.180E-10	3.713E-10	8.547E-12	4.424E-18	1.027E-31	1.027E-31	0.000E+00
GD152	6.790E-09	1.010E-08	1.017E-08	1.027E-08	1.027E-08	1.027E-08	1.027E-08	1.027E-08
EU153	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04	2.009E-04
SM154	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05	9.286E-05
EU154	1.280E-06	1.102E-08	4.920E-09	1.261E-11	1.446E-21	4.316E-43	0.000E+00	0.000E+00
GD154	5.246E-07	1.794E-06	1.800E-06	1.805E-06	1.805E-06	1.805E-06	1.805E-06	1.805E-06
EU155	2.250E-05	5.899E-09	1.458E-09	4.698E-14	2.708E-31	0.000E+00	0.000E+00	0.000E+00
GD155	2.644E-05	4.893E-05	4.894E-05	4.894E-05	4.894E-05	4.894E-05	4.894E-05	4.894E-05
GD156	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05	2.964E-05
GD157	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05	1.789E-05
GD158	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05	1.002E-05
TB159	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06	3.961E-06

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ss_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

g/L	59.0YR	69.0YR	143.0YR	427.0YR	1043.0YR	1137.0YR	1.0E+04YR
GD160	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06	1.967E-06
DY160	2.224E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08	2.231E-08
DY161	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07	8.551E-07
DY162	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07	5.351E-07
DY163	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07	2.161E-07
DY164	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07	1.201E-07
HO165	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08	6.243E-08
HO166M	6.520E-11	6.302E-11	6.265E-11	6.003E-11	5.095E-11	3.570E-11	3.381E-11	1.991E-13
ER166	3.363E-08	3.363E-08	3.363E-08	3.364E-08	3.364E-08	3.366E-08	3.366E-08	3.369E-08
ER167	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08	2.099E-08
ER168	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
TM169	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14	1.878E-14
ER170	1.369E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19	1.398E-19
YB170	9.391E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17	9.587E-17
TM171	2.518E-20	1.414E-29	1.414E-29	3.522E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB171	8.289E-20	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19
YB172	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23	3.924E-23

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Source Listing of Program ELESS2

```
      PROGRAM ELESS2

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/18/02

!            To sum the g/L electrolytic wastes and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='SS_RUN2.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='SS_RUN2.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'SS_RUN2.ELE    g/L')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Source Listing of Program ELESS2 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'2032Jan   2042Jan   2116Jan   2400' &
            'Jan   3016Jan   3110Jan   12000Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J)
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999
```

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Source Listing of Program ELESS2 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELESS2
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

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Page 4 of 5

SS_RUN2.ELE g/L
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	1.1E-08	6.4E-09	1.0E-10	1.2E-17	1.2E-32	1.2E-32	0.0E+00
He	7.5E-07	8.6E-07	1.7E-06	4.8E-06	1.2E-05	1.3E-05	9.7E-05
Li	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09	2.0E-09
Be	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10	5.9E-10
B	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15	4.0E-15
C	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02	5.1E-02
N	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15	5.9E-15
O	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24	2.0E-24
Ne	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11	1.0E-11
Na	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13	7.4E-13
Mg	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Si	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01	7.0E-01
P	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02	2.9E-02
S	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02	2.6E-02
Cl	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09	1.2E-09
Ar	1.8E-17	2.0E-17	3.2E-17	7.9E-17	1.8E-16	2.0E-16	1.6E-15
K	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20	4.6E-20
Ca	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Sc	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18	6.1E-18
Ti	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05	1.4E-05
V	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05
Mn	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Fe	2.3E-12	1.6E-13	4.3E-22	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	2.2E-05	2.2E-05	2.3E-05	2.3E-05	2.4E-05	2.4E-05	3.5E-05
Ni	1.7E-04	1.6E-04	1.6E-04	1.5E-04	1.5E-04	1.5E-04	1.4E-04
Cu	1.2E-05	1.3E-05	2.0E-05	2.8E-05	2.9E-05	2.9E-05	2.9E-05
Zn	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12	5.1E-12
Ga	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11	4.4E-11
Ge	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06	8.3E-06
As	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06	2.5E-06
Se	9.0E-04	9.0E-04	9.0E-04	8.9E-04	8.9E-04	8.9E-04	8.4E-04
Br	1.2E-04	1.2E-04	1.2E-04	1.3E-04	1.3E-04	1.3E-04	1.9E-04
Kr	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Rb	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03
Sr	2.8E-03	2.6E-03	2.2E-03	2.1E-03	2.1E-03	2.1E-03	2.1E-03
Y	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03	2.6E-03
Zr	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03	3.8E-03
Nb	1.4E-07	1.6E-07	3.1E-07	9.1E-07	2.2E-06	2.4E-06	1.9E-05
Mo	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01	5.0E-01
Tc	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.6E-03	3.5E-03
Ru	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02	3.3E-02
Rh	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Pd	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03	2.0E-03
Ag	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04	1.4E-04
Cd	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04	3.9E-04
In	6.4E-05	6.4E-05	6.4E-05	6.4E-05	6.4E-05	6.4E-05	6.4E-05
Sn	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.9E-04	1.8E-04
Sb	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04	1.7E-04
Te	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03
I	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03	1.3E-03
Xe	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02	1.9E-02
Cs	1.2E-02	1.2E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02

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SS_RUN2.ELE g/L (continued)
ORIGEN2 V2.1 (8-1-91), Run on 05/30/02 at 20:44:11

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Ba	1.0E-02	1.0E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
La	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03	5.7E-03
Ce	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02	1.1E-02
Pr	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03	5.4E-03
Nd	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02	2.0E-02
Pm	1.4E-10	1.1E-11	1.3E-16	3.8E-32	0.0E+00	0.0E+00	0.0E+00
Sm	3.1E-03	3.1E-03	3.0E-03	2.8E-03	2.8E-03	2.8E-03	2.8E-03
Eu	3.7E-04	3.9E-04	4.9E-04	6.2E-04	6.3E-04	6.3E-04	6.3E-04
Gd	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Tb	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06	4.0E-06
Dy	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06	1.7E-06
Ho	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08	6.2E-08
Er	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08	5.5E-08
Tm	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14	1.9E-14
Yb	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17	9.6E-17
Tl	1.1E-17	1.1E-17	1.1E-17	1.1E-17	1.1E-17	1.1E-17	2.1E-17
Pb	2.8E-10	2.9E-10	4.2E-10	1.0E-09	3.1E-09	3.5E-09	8.4E-08
Bi	6.4E-14	7.6E-14	1.7E-13	1.0E-12	9.3E-12	1.2E-11	5.9E-09
Po	7.9E-14	9.8E-14	2.6E-13	9.0E-13	1.9E-12	2.0E-12	5.1E-12
At	1.6E-24	1.6E-24	2.2E-24	7.6E-24	3.7E-23	4.4E-23	2.5E-21
Rn	4.1E-15	4.8E-15	9.5E-15	2.6E-14	5.6E-14	6.0E-14	1.5E-13
Fr	6.2E-19	6.4E-19	7.2E-19	7.8E-19	1.1E-18	1.1E-18	2.4E-17
Ra	6.4E-10	7.4E-10	1.5E-09	4.1E-09	8.8E-09	9.4E-09	2.3E-08
Ac	2.3E-11	2.4E-11	2.7E-11	2.8E-11	2.8E-11	2.8E-11	5.4E-11
Th	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
Pa	4.2E-08	4.2E-08	4.2E-08	4.2E-08	4.4E-08	4.4E-08	8.3E-08
U	2.8E-03	2.8E-03	2.9E-03	3.0E-03	3.4E-03	3.5E-03	8.5E-03
Np	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04	3.8E-04
Pu	2.3E-02	2.3E-02	2.3E-02	2.3E-02	2.2E-02	2.2E-02	1.7E-02
Am	6.3E-08	6.4E-08	5.8E-08	3.7E-08	1.4E-08	1.2E-08	2.9E-14
Cm	9.3E-16	8.7E-16	5.7E-16	1.5E-16	9.1E-18	6.0E-18	3.5E-20
Total	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**	**1.5E+00**

Appendix D-1

Source Listing of Program REDUCESB

```
      PROGRAM REDUCESB


!-------- WRITTEN BY D.R. WENZEL

!            To calculate nuclide mass for sodium bearing
!            waste (SBW)

      CHARACTER (LEN=12) :: CS137, DESC, NAME, NUCLIDE(750)
      CHARACTER (LEN=111) :: BUFFER, ORGLINE
      REAL * 4  GUEOL(3)

      COMMON /AMT/ AMOUNT(9),FLAG
      LOGICAL :: FLAG

      REAL * 4 DATA(750), MASS, VALUE(9)

      DATA CS137/' CS137      '/


!-------- OPEN OUTPUT FILE

      OPEN(6,FILE ='REDUCESB.OUT', STATUS='UNKNOWN', ERR = 900)

!-------- Normalize to

      GUEOL(1) = 154.5
      GUEOL(2) = 515.5
      GUEOL(3) = 59.55
      CORFACT = 1. / GUEOL(1)
      WRITE(6,600)
  600 FORMAT(1X,'reducesb.out',//,13X,'Calculated  Normalized',/,  &
             1X,'Nuclide',7X,' g/L      to Cs-137')

!-------- READ MASTER LIST OF RADIONUCLIDES

      OPEN(1,FILE ='MASTER_A', STATUS='OLD',FORM='FORMATTED', ERR=900)
   10 READ(1,100,END=20) NAME
  100 FORMAT(A12)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      IF(NAME == CS137) NUMCS137 = LAST
      GO TO 10

!-------- ZERO MEMORY

   20 DO  I=1,750
         DATA(I) = 0.
      END DO

!-------- READ RADIONUCLIDE INVENTORIES, NORMALIZE ACTIVITIES,
!         AND ADD RESULTS TO DATA

      DO  I=1,13
```

Appendix D-1
Page 2 of 7

Source Listing of Program REDUCESB (continued)

```
          IF(I == 5) CORFACT = 1. / GUEOL(2)
          IF(I == 10) CORFACT = 1. / GUEOL(3)
          CALL FILEOPN(i)
          IF(FLAG) GO TO 900

!-------- READ PAST FIRST 4 LINES

   35     DO  J=1,4
             READ(1,120) ORGLINE
  120        FORMAT(A111)
          END DO

!-------- READ RADIONUCLIDE INVENTORIES, NORMALIZE ACTIVITIES,
!         AND ADD RESULTS TO DATA

   50     READ(1,120,END=80) ORGLINE
          WRITE(BUFFER,120) ORGLINE
          READ(BUFFER,400) DESC, (VALUE(J),J=1,9)
  400     FORMAT(A12,9X,9(1X,E9.4))
          DO  J=1,750
             IF(DESC == NUCLIDE(J)) THEN
                DO  K=1,7
                   IF(AMOUNT(K) /= 0.) THEN
                      DATA(J) = DATA(J) + VALUE(K+2) * AMOUNT(K)       &
                                * CORFACT

                   END IF

                END DO

             END IF

          END DO

          GO TO 50

   80  END DO

!------- Normalize mass/L of nuclides to measured Cs-137 concentration
!        of 8.0018E-1 g/L (69.6 mCi/L)

       CSNORM = 8.0018E-1 / DATA(NUMCS137)
       DO  I=1,LAST
          MASS = DATA(I) * CSNORM
          RATIO = MASS / 8.001E-1
          IF(MASS == 0.) GO TO 90
          WRITE(6,610) NUCLIDE(I), MASS, RATIO
  610     FORMAT(A12,1PE10.3,2X,1PE10.2)
   90  END DO

       GO TO 999


!-------- ERROR STATEMENTS
```

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Page 3 of 7

Source Listing of Program REDUCESB (continued)

```
  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM REDUCESB

       SUBROUTINE FILEOPN(I)

!------- THIS SUBROUTINE LOADS THE DESIRED FILE


       INTEGER, INTENT(IN OUT) :: I
       COMMON /AMT/ AMOUNT(9),FLAG
       LOGICAL :: FLAG

!--------The following table indicate the age of fuel in the
!        different fuel groups.  Group 1 is not used.

!       Column number  1     2     3     4     5     6     7
!       Fuel Group    ---------  Age of fuel (yr) ----------
!           2         13    14    15    16    17    18    19
!           3         20    21    22    23    24    25    26
!           4         27    28    29    30    31    32    33
!           5         34    35    36    37    38    39    40
!           6         41    42    43    44    45    46    47


       FLAG = .FALSE.
       CLOSE(1)
       SELECT CASE ( i )
          CASE (    1)
             GO TO 1
          CASE (    2)
             GO TO 2
          CASE (    3)
             GO TO 3
          CASE (    4)
             GO TO 4
          CASE (    5)
             GO TO 5
          CASE (    6)
             GO TO 6
          CASE (    7)
             GO TO 7
          CASE (    8)
             GO TO 8
          CASE (    9)
             GO TO 9
          CASE (   10)
             GO TO 10
          CASE (   11)
```

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Source Listing of Program REDUCESB (continued)

```
            GO TO 11
         CASE (   12)
            GO TO 12
      END SELECT

!-------- OPEN DESIRED INPUT FILE

    1  OPEN(1,FILE ='SBWAL2.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Al fuel in Fuel Group 2

      AMOUNT(1) = 0.
      AMOUNT(2) = 0.
      AMOUNT(3) = 0.
      AMOUNT(4) = 0.
      AMOUNT(5) = 0.
      AMOUNT(6) = 296.
      AMOUNT(7) = 0.
      RETURN

    2  OPEN(1,FILE ='SBWAL4.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Al fuel in Fuel Group 4

      AMOUNT(1) = 150.
      AMOUNT(2) = 4.
      AMOUNT(3) = 1309.
      AMOUNT(4) = 0.
      AMOUNT(5) = 670.
      AMOUNT(6) = 41.
      AMOUNT(7) = 366.
      RETURN

    3  OPEN(1,FILE ='SBWAL5.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Al fuel in Fuel Group 5

      AMOUNT(1) = 0.
      AMOUNT(2) = 505.
      AMOUNT(3) = 795.
      AMOUNT(4) = 0.
      AMOUNT(5) = 45.
      AMOUNT(6) = 345.
      AMOUNT(7) = 91.
      RETURN

    4  OPEN(1,FILE ='SBWAL6.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Al fuel in Fuel Group 6

      AMOUNT(1) = 277.
      AMOUNT(2) = 727.
      AMOUNT(3) = 712.
      AMOUNT(4) = 443.
```

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Source Listing of Program REDUCESB (continued)

```
      AMOUNT(5) = 620.
      AMOUNT(6) = 341.
      AMOUNT(7) = 0.
      RETURN

    5 OPEN(1,FILE ='SBWZR2.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Zr fuel in Fuel Group 2

      AMOUNT(1) = 30
      AMOUNT(2) = 641.
      AMOUNT(3) = 0.
      AMOUNT(4) = 810.
      AMOUNT(5) = 723.
      AMOUNT(6) = 408.
      AMOUNT(7) = 706.
      RETURN

    6 OPEN(1,FILE ='SBWZR3.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Zr fuel in Fuel Group 3

      AMOUNT(1) = 342.
      AMOUNT(2) = 0.
      AMOUNT(3) = 0.
      AMOUNT(4) = 600.
      AMOUNT(5) = 0.
      AMOUNT(6) = 0.
      AMOUNT(7) = 0.
      RETURN

    7 OPEN(1,FILE ='SBWZR4.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Zr fuel in Fuel Group 4

      AMOUNT(1) = 206.
      AMOUNT(2) = 800.
      AMOUNT(3) = 1478.
      AMOUNT(4) = 0.
      AMOUNT(5) = 17.
      AMOUNT(6) = 0.
      AMOUNT(7) = 0.
      RETURN

    8 OPEN(1,FILE ='SBWZR5.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Zr fuel in Fuel Group 5

      AMOUNT(1) = 4.
      AMOUNT(2) = 0.
      AMOUNT(3) = 0.
      AMOUNT(4) = 0.
      AMOUNT(5) = 0.
      AMOUNT(6) = 0.
```

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Source Listing of Program REDUCESB (continued)

```
      AMOUNT(7) = 0.
      RETURN

    9 OPEN(1,FILE ='SBWZR6.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- Zr fuel in Fuel Group 6

      AMOUNT(1) = 15.
      AMOUNT(2) = 0.
      AMOUNT(3) = 0.
      AMOUNT(4) = 0.
      AMOUNT(5) = 0.
      AMOUNT(6) = 0.
      AMOUNT(7) = 0.
      RETURN

   10 OPEN(1,FILE ='SBWSS2.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- SS fuel in Fuel Group 2

      AMOUNT(1) = 0.
      AMOUNT(2) = 0.
      AMOUNT(3) = 0.
      AMOUNT(4) = 0.
      AMOUNT(5) = 0.
      AMOUNT(6) = 826.
      AMOUNT(7) = 0.
      RETURN

   11 OPEN(1,FILE ='SBWSS3.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- SS fuel in Fuel Group 3

      AMOUNT(1) = 0.
      AMOUNT(2) = 0.
      AMOUNT(3) = 371.
      AMOUNT(4) = 0.
      AMOUNT(5) = 3140.
      AMOUNT(6) = 0.
      AMOUNT(7) = 1544.
      RETURN

   12 OPEN(1,FILE ='SBWSS5.G', STATUS='OLD',FORM='FORMATTED', ERR=900)

!-------- SS fuel in Fuel Group 5

      AMOUNT(1) = 69.
      AMOUNT(2) = 0.
      AMOUNT(3) = 0.
      AMOUNT(4) = 0.
      AMOUNT(5) = 0.
      AMOUNT(6) = 75.
      AMOUNT(7) = 0.
      RETURN
```

Appendix D-1

Source Listing of Program REDUCESB (continued)

```
  900  FLAG = .TRUE.
       RETURN
       END SUBROUTINE FILEOPN
```

See Appendix B-3, page 5, for a listing of file MASTER_A.

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File SBWAL2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) MTR
  BAS     ONE MTR ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE MTR ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP     400.0   .4065  1   2   3 2
  IRP     800.0   .4065  2   3   3 0
  IRP    1600.0   .4065  3   4   3 0
  IRP    2000.0   .4065  4   5   3 0
  IRP    3100.0   .4065  5   6   3 0
  IRP    3336.0   .4065  6   7   3 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC      1.0    1   2   5   4
  DEC     13.0    2   3   5   0
  DEC     14.0    3   4   5   0
  DEC     15.0    4   5   5   0
  DEC     16.0    5   6   5   0
  DEC     17.0    6   7   5   0
  DEC     18.0    7   8   5   0
  DEC     19.0    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340  2.317 922350   200. 922360  .4343  922380  11.53 FUEL 93.3%
  0
```

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File SBWAL2.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwal2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwal2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out sbwal2.u6 >nul
copy tape13.out+tape11.out sbwal2.u11 >nul
ren tape7.out sbwal2.pch
ren tape15.out sbwal2.dbg
ren tape16.out sbwal2.vxs
ren tape50.out sbwal2.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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sbwal2.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:17

	3336.0HR	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
HE 4	5.756E-07	6.753E-06	7.736E-05	8.315E-05	8.892E-05	9.467E-05	1.004E-04	1.061E-04	1.118E-04
TL206	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32
TL207	1.122E-19	2.492E-18	9.197E-17	1.041E-16	1.167E-16	1.298E-16	1.435E-16	1.578E-16	1.725E-16
TL208	2.197E-16	1.654E-15	6.869E-15	6.915E-15	6.918E-15	6.906E-15	6.883E-15	6.851E-15	6.812E-15
TL209	2.473E-21	1.203E-21	6.981E-21	7.518E-21	8.065E-21	8.621E-21	9.186E-21	9.761E-21	1.034E-20
PB206	1.059E-18	1.243E-16	6.806E-13	8.987E-13	1.155E-12	1.465E-12	1.835E-12	2.275E-12	2.791E-12
PB207	7.884E-16	8.919E-14	3.508E-11	4.254E-11	5.094E-11	6.032E-11	7.073E-11	8.220E-11	9.478E-11
PB208	8.944E-12	3.252E-10	2.189E-08	2.417E-08	2.646E-08	2.874E-08	3.102E-08	3.328E-08	3.554E-08
PB209	1.031E-17	5.011E-18	2.909E-17	3.133E-17	3.360E-17	3.592E-17	3.827E-17	4.067E-17	4.310E-17
PB210	3.456E-15	1.336E-14	6.794E-12	8.371E-12	1.017E-11	1.219E-11	1.445E-11	1.697E-11	1.975E-11
PB211	8.682E-19	1.928E-17	7.115E-16	8.054E-16	9.026E-16	1.004E-15	1.110E-15	1.220E-15	1.335E-15
PB212	1.296E-13	9.757E-13	4.052E-12	4.079E-12	4.080E-12	4.073E-12	4.060E-12	4.041E-12	4.018E-12
PB214	1.019E-19	1.354E-18	1.263E-16	1.458E-16	1.668E-16	1.892E-16	2.129E-16	2.381E-16	2.647E-16
BI208	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21
BI209	1.851E-15	1.092E-14	3.762E-13	4.316E-13	4.912E-13	5.550E-13	6.231E-13	6.955E-13	7.724E-13
BI210M	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20
BI210	1.842E-18	8.224E-18	4.180E-15	5.153E-15	6.258E-15	7.504E-15	8.899E-15	1.045E-14	1.216E-14
BI211	5.122E-20	1.137E-18	4.198E-17	4.752E-17	5.326E-17	5.925E-17	6.551E-17	7.201E-17	7.874E-17
BI212	1.229E-14	9.256E-14	3.843E-13	3.869E-13	3.871E-13	3.864E-13	3.851E-13	3.833E-13	3.811E-13
BI213	2.421E-18	1.177E-18	6.835E-18	7.361E-18	7.896E-18	8.440E-18	8.993E-18	9.556E-18	1.013E-17
BI214	7.566E-20	1.005E-18	9.376E-17	1.083E-16	1.239E-16	1.405E-16	1.581E-16	1.768E-16	1.966E-16
PO210	7.703E-18	1.312E-16	1.155E-13	1.284E-13	1.546E-13	1.862E-13	2.220E-13	2.620E-13	3.062E-13
PO211	6.285E-25	1.395E-23	5.151E-22	5.831E-22	6.534E-22	7.270E-22	8.037E-22	8.834E-22	9.661E-22
PO212	6.504E-25	4.897E-24	2.033E-23	2.047E-23	2.048E-23	2.044E-23	2.037E-23	2.028E-23	2.016E-23
PO213	3.633E-27	1.766E-27	1.025E-26	1.104E-26	1.185E-26	1.266E-26	1.349E-26	1.434E-26	1.519E-26
PO214	2.030E-25	1.383E-25	1.290E-23	1.490E-23	1.704E-23	1.932E-23	2.175E-23	2.433E-23	2.704E-23
PO215	7.266E-25	1.614E-23	5.958E-22	6.744E-22	7.558E-22	8.409E-22	9.297E-22	1.022E-21	1.118E-21
PO216	5.172E-19	3.894E-18	1.617E-17	1.628E-17	1.628E-17	1.625E-17	1.620E-17	1.612E-17	1.603E-17
PO218	1.182E-20	1.570E-19	1.464E-17	1.691E-17	1.934E-17	2.194E-17	2.469E-17	2.761E-17	3.070E-17
AT217	2.909E-23	1.415E-23	8.211E-23	8.843E-23	9.486E-23	1.014E-22	1.080E-22	1.148E-22	1.217E-22
RN218	4.180E-23	2.164E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.647E-21	3.658E-20	1.350E-18	1.528E-18	1.713E-18	1.906E-18	2.107E-18	2.316E-18	2.532E-18
RN220	1.952E-16	1.470E-15	6.104E-15	6.145E-15	6.147E-15	6.137E-15	6.116E-15	6.088E-15	6.053E-15
RN222	2.172E-17	2.887E-16	2.692E-14	3.109E-14	3.556E-14	4.033E-14	4.540E-14	5.077E-14	5.644E-14
FR221	2.642E-19	1.285E-19	7.456E-19	8.030E-19	8.614E-19	9.208E-19	9.811E-19	1.043E-18	1.105E-18
FR223	1.599E-20	1.697E-19	6.266E-18	7.080E-18	7.934E-18	8.827E-18	9.758E-18	1.073E-17	1.173E-17
RA222	4.621E-20	2.392E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	4.183E-16	9.292E-15	3.430E-13	3.882E-13	4.351E-13	4.841E-13	5.352E-13	5.883E-13	6.433E-13
RA224	1.131E-12	8.512E-12	3.534E-11	3.558E-11	3.559E-11	3.553E-11	3.541E-11	3.525E-11	3.505E-11
RA225	1.576E-15	5.808E-16	3.371E-15	3.631E-15	3.895E-15	4.163E-15	4.436E-15	4.714E-15	4.996E-15
RA226	3.592E-12	4.491E-11	4.188E-09	4.837E-09	5.532E-09	6.274E-09	7.063E-09	7.898E-09	8.780E-09
RA228	4.739E-19	1.274E-17	1.062E-15	1.196E-15	1.334E-15	1.476E-15	1.622E-15	1.770E-15	1.922E-15
AC225	8.067E-16	3.923E-16	2.277E-15	2.453E-15	2.631E-15	2.812E-15	2.997E-15	3.184E-15	3.375E-15
AC227	6.195E-13	6.577E-12	2.428E-10	2.743E-10	3.074E-10	3.420E-10	3.781E-10	4.156E-10	4.545E-10
AC228	7.721E-16	1.329E-21	1.108E-19	1.248E-19	1.393E-19	1.541E-19	1.693E-19	1.848E-19	2.006E-19
TH226	2.303E-18	1.192E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	9.385E-16	1.527E-14	5.635E-13	6.380E-13	7.149E-13	7.954E-13	8.794E-13	9.666E-13	1.057E-12
TH228	2.352E-10	1.653E-09	6.868E-09	6.889E-09	6.892E-09	6.880E-09	6.857E-09	6.825E-09	6.786E-09
TH229	6.913E-11	1.070E-10	6.213E-10	6.691E-10	7.178E-10	7.672E-10	8.176E-10	8.687E-10	9.207E-10
TH230	2.025E-06	7.319E-06	7.092E-05	7.622E-05	8.153E-05	8.683E-05	9.214E-05	9.745E-05	1.028E-04
TH231	5.690E-09	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10
TH232	7.520E-08	4.528E-07	4.984E-06	5.362E-06	5.739E-06	6.117E-06	6.494E-06	6.872E-06	7.250E-06
TH234	1.577E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10
PA231	2.238E-07	3.541E-07	1.849E-06	1.974E-06	2.099E-06	2.224E-06	2.349E-06	2.474E-06	2.599E-06
PA233	9.454E-09	1.885E-08	1.885E-08	1.886E-08	1.886E-08	1.886E-08	1.886E-08	1.886E-08	1.886E-08
PA234M	1.507E-14	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15
PA234	3.338E-12	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15
U230	2.263E-15	1.171E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.712E-07	1.994E-07	2.664E-07	2.650E-07	2.634E-07	2.616E-07	2.596E-07	2.576E-07	2.555E-07
U233	8.724E-06	8.910E-06	1.103E-05	1.123E-05	1.142E-05	1.162E-05	1.181E-05	1.201E-05	1.220E-05
U234	1.900E+00	1.900E+00	1.904E+00	1.904E+00	1.904E+00	1.905E+00	1.905E+00	1.905E+00	1.906E+00
U235	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02
U236	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01
U237	8.333E-02	9.971E-10	5.596E-10	5.333E-10	5.082E-10	4.843E-10	4.616E-10	4.399E-10	4.192E-10
U238	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01
U240	2.879E-08	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18
NP235	4.704E-09	2.482E-09	1.158E-12	6.109E-13	3.224E-13	1.701E-13	8.977E-14	4.737E-14	2.500E-14
NP236	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07
NP237	4.716E-01	5.549E-01	5.551E-01	5.552E-01	5.552E-01	5.552E-01	5.552E-01	5.553E-01	5.553E-01
NP238	3.220E-03	2.431E-13	2.301E-13	2.291E-13	2.280E-13	2.270E-13	2.260E-13	2.249E-13	2.239E-13
NP239	1.828E-02	1.608E-10	1.607E-10	1.606E-10	1.606E-10	1.606E-10	1.606E-10	1.606E-10	1.606E-10
NP240M	2.781E-08	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21
PU236	1.272E-07	1.036E-07	5.600E-09	4.392E-09	3.444E-09	2.701E-09	2.118E-09	1.661E-09	1.303E-09
PU237	6.793E-08	2.637E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	3.854E-02	4.145E-02	3.770E-02	3.741E-02	3.711E-02	3.682E-02	3.653E-02	3.624E-02	3.596E-02
PU239	3.438E-01	3.622E-01	3.621E-01	3.621E-01	3.621E-01	3.621E-01	3.621E-01	3.620E-01	3.620E-01

Appendix D-2
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sbwal2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:17

	3336.0HR	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
PU240	5.082E-02	5.082E-02	5.076E-02	5.076E-02	5.075E-02	5.075E-02	5.074E-02	5.074E-02	5.073E-02
PU241	3.379E-02	3.220E-02	1.807E-02	1.722E-02	1.641E-02	1.564E-02	1.491E-02	1.421E-02	1.354E-02
PU242	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03
PU243	2.293E-06	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22
PU244	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08
PU246	8.022E-14	5.896E-24	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28
AM241	1.437E-04	1.730E-03	1.568E-02	1.650E-02	1.729E-02	1.803E-02	1.873E-02	1.940E-02	2.004E-02
AM242M	1.302E-06	1.296E-06	1.227E-06	1.222E-06	1.216E-06	1.211E-06	1.205E-06	1.200E-06	1.194E-06
AM242	8.587E-07	1.551E-11	1.468E-11	1.462E-11	1.455E-11	1.448E-11	1.442E-11	1.435E-11	1.429E-11
AM243	1.849E-04	1.872E-04	1.869E-04	1.869E-04	1.869E-04	1.869E-04	1.869E-04	1.869E-04	1.868E-04
AM245	1.478E-12	3.179E-24	2.396E-28	1.086E-28	4.921E-29	2.229E-29	1.015E-29	4.625E-30	2.097E-30
AM246	1.284E-16	9.449E-27	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31
CM241	1.223E-12	1.079E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	1.837E-05	4.047E-06	2.969E-09	2.959E-09	2.946E-09	2.933E-09	2.919E-09	2.906E-09	2.893E-09
CM243	1.435E-07	1.400E-07	1.046E-07	1.021E-07	9.961E-08	9.722E-08	9.488E-08	9.260E-08	9.038E-08
CM244	1.547E-05	1.493E-05	9.429E-06	9.075E-06	8.734E-06	8.406E-06	8.091E-06	7.787E-06	7.494E-06
CM245	2.945E-07	2.945E-07	2.942E-07	2.942E-07	2.941E-07	2.941E-07	2.941E-07	2.941E-07	2.940E-07
CM246	8.884E-09	8.882E-09	8.867E-09	8.865E-09	8.864E-09	8.863E-09	8.862E-09	8.860E-09	8.859E-09
CM247	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11
CM248	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13
CM249	1.288E-17	4.059E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21
BK249	1.811E-15	8.267E-16	6.229E-20	2.822E-20	1.279E-20	5.792E-21	2.639E-21	1.202E-21	5.282E-22
BK250	5.705E-18	7.472E-27	4.024E-30	4.024E-30	4.024E-30	4.024E-30	4.024E-30	4.024E-30	4.024E-30
CF249	3.487E-17	1.030E-15	1.816E-15	1.812E-15	1.808E-15	1.805E-15	1.801E-15	1.798E-15	1.794E-15
CF250	2.228E-16	2.167E-16	1.148E-16	1.088E-16	1.032E-16	9.788E-17	9.283E-17	8.804E-17	8.350E-17
CF251	4.585E-17	4.582E-17	4.540E-17	4.536E-17	4.533E-17	4.529E-17	4.526E-17	4.522E-17	4.519E-17
CF252	6.911E-18	5.314E-18	2.270E-19	1.745E-19	1.342E-19	1.032E-19	7.934E-20	6.099E-20	4.689E-20
CF253	7.898E-21	5.307E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	1.021E-22	1.456E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	1.720E-21	2.245E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	3.901E-23	3.188E-24	5.221E-29	5.221E-29	5.221E-29	5.221E-29	5.221E-29	5.221E-29	5.221E-29
ES255	0.000E+00	6.054E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	2.713E-13	3.080E-12	2.195E-11	2.333E-11	2.468E-11	2.601E-11	2.732E-11	2.860E-11	2.987E-11
H 3	8.201E-05	7.753E-05	3.953E-05	3.738E-05	3.534E-05	3.341E-05	3.158E-05	2.986E-05	2.823E-05
LI 6	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07
LI 7	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08
BE 9	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08
BE 10	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07
C 14	4.556E-08	4.556E-08	4.549E-08	4.549E-08	4.548E-08	4.548E-08	4.547E-08	4.547E-08	4.546E-08
ZN 66	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11
ZN 67	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12
ZN 68	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14
GA 69	8.549E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18
GE 70	9.226E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21
GA 71	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09
GE 72	1.264E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05
GE 73	4.483E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05
GE 74	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04
AS 75	2.891E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
GE 76	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04
SE 76	2.760E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06
SE 77	1.904E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03
SE 78	4.077E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03
SE 79	1.048E-02	1.048E-02	1.048E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02
BR 79	2.177E-08	1.336E-07	1.475E-06	1.587E-06	1.698E-06	1.810E-06	1.922E-06	2.034E-06	2.146E-06
SE 80	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
KR 80	1.252E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07
BR 81	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02
KR 81	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09
SE 82	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02
KR 82	3.453E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04
KR 83	1.024E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01
KR 84	2.257E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01
KR 85	5.678E-02	5.333E-02	2.455E-02	2.301E-02	2.157E-02	2.022E-02	1.895E-02	1.777E-02	1.665E-02
RB 85	2.135E-01	2.175E-01	2.462E-01	2.478E-01	2.492E-01	2.506E-01	2.518E-01	2.530E-01	2.541E-01
KR 86	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01
RB 86	7.830E-05	1.001E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	1.626E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04
RB 87	5.599E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01
SR 87	9.284E-07	9.289E-07	9.290E-07	9.290E-07	9.290E-07	9.290E-07	9.290E-07	9.290E-07	9.290E-07
SR 88	8.062E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01
SR 89	4.726E-01	3.142E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.923E-01	1.062E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00
SR 90	1.282E+00	1.252E+00	9.409E-01	9.188E-01	8.972E-01	8.761E-01	8.555E-01	8.354E-01	8.157E-01

Appendix D-2
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sbwal2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:17

	3336.0HR	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
Y 90	3.345E-04	3.140E-04	2.360E-04	2.304E-04	2.250E-04	2.197E-04	2.145E-04	2.095E-04	2.046E-04
ZR 90	7.754E-03	3.793E-02	3.491E-01	3.712E-01	3.928E-01	4.139E-01	4.346E-01	4.547E-01	4.743E-01
Y 91	6.460E-01	8.605E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.788E-01	1.322E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00
ZR 92	1.378E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00
NB 92	2.982E-15	4.493E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.490E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00
NB 93	9.491E-09	6.571E-08	2.761E-06	3.119E-06	3.492E-06	3.880E-06	4.283E-06	4.700E-06	5.130E-06
NB 93M	1.244E-07	7.462E-07	6.187E-06	6.507E-06	6.812E-06	7.102E-06	7.377E-06	7.638E-06	7.887E-06
ZR 94	1.474E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00
NB 94	2.129E-07	2.129E-07	2.129E-07	2.128E-07	2.128E-07	2.128E-07	2.128E-07	2.128E-07	2.128E-07
ZR 95	7.839E-01	1.499E-02	3.581E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.263E-01	1.845E-02	4.368E-23	8.643E-25	6.439E-28	4.795E-31	3.571E-34	2.659E-37	1.981E-40
NB 95M	3.076E-04	6.273E-06	1.498E-26	2.865E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	4.072E-01	1.485E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00
ZR 96	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00
MO 96	6.211E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03
MO 97	1.415E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00
MO 98	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00
TC 98	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06
TC 99	1.384E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00
RU 99	8.587E-07	5.510E-06	6.133E-05	6.598E-05	7.063E-05	7.528E-05	7.993E-05	8.458E-05	8.923E-05
MO100	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00
RU100	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02
RU101	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00
RU102	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00
RH102	2.949E-07	2.322E-07	1.319E-08	1.039E-08	8.178E-09	6.439E-09	5.070E-09	3.992E-09	3.144E-09
RU103	3.008E-01	4.770E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.468E-01	7.474E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01
RH103M	2.690E-04	4.274E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	5.001E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01
PD104	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02
PD105	2.413E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01
RU106	1.005E-01	5.052E-02	1.317E-05	6.623E-06	3.330E-06	1.674E-06	8.417E-07	4.232E-07	2.128E-07
RH106	1.760E-07	4.748E-08	1.238E-11	6.226E-12	3.130E-12	1.574E-12	7.912E-13	3.978E-13	2.000E-13
PD106	4.584E-02	9.581E-02	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01
AG106	2.945E-16	3.417E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	5.378E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02
AG107	1.065E-09	6.804E-09	7.568E-08	8.142E-08	8.716E-08	9.290E-08	9.864E-08	1.044E-07	1.101E-07
PD108	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02
AG108	8.176E-13	6.265E-20	5.868E-20	5.836E-20	5.804E-20	5.773E-20	5.741E-20	5.710E-20	5.679E-20
AG108M	1.995E-11	1.984E-11	1.858E-11	1.848E-11	1.838E-11	1.828E-11	1.818E-11	1.808E-11	1.798E-11
CD108	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08
AG109	1.170E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02
AG109M	7.844E-08	7.284E-18	1.044E-20	6.041E-21	3.501E-21	2.029E-21	1.176E-21	6.812E-22	3.947E-22
CD109	1.273E-11	7.375E-12	1.055E-14	6.116E-15	3.544E-15	2.054E-15	1.190E-15	6.896E-16	3.996E-16
PD110	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03
AG110	1.553E-08	5.853E-13	3.071E-18	1.115E-18	4.048E-19	1.470E-19	5.336E-20	1.937E-20	7.034E-21
AG110M	1.064E-04	3.862E-05	2.026E-10	7.357E-11	2.671E-11	9.698E-12	3.521E-12	1.278E-12	4.642E-13
CD110	2.315E-03	2.383E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03
AG111	5.944E-04	1.040E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	6.904E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03
CD112	5.522E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03
CD113	1.687E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04
CD113M	1.074E-04	1.026E-04	5.799E-05	5.530E-05	5.274E-05	5.029E-05	4.796E-05	4.573E-05	4.361E-05
IN113	9.379E-07	5.923E-06	5.045E-05	5.313E-05	5.570E-05	5.814E-05	6.047E-05	6.270E-05	6.482E-05
CD114	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02
IN114	4.456E-13	5.769E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	5.960E-09	3.587E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.438E-08	1.986E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08
CD115M	1.678E-04	5.744E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	2.821E-03	3.092E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03
IN115M	7.995E-06	1.622E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.522E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04
CD116	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03
SN116	1.476E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03
SN117	4.833E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03
SN117M	2.525E-07	3.559E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	5.399E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03
SN119	5.103E-03	5.145E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03
SN119M	6.368E-05	2.266E-05	9.342E-11	3.324E-11	1.183E-11	4.209E-12	1.498E-12	5.330E-13	1.897E-13
SN120	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03
SN121M	2.696E-06	2.658E-06	2.251E-06	2.220E-06	2.189E-06	2.159E-06	2.129E-06	2.100E-06	2.071E-06
SB121	5.536E-03	5.602E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03
SN122	6.068E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03
TE122	1.234E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04

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sbwal2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:17

	3336.0HR	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
SN123	1.237E-03	1.742E-04	1.062E-14	1.496E-15	2.108E-16	2.969E-17	4.181E-18	5.889E-19	8.295E-20
SB123	5.902E-03	6.966E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03
TE123	5.000E-07	6.733E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07
TE123M	1.972E-07	2.377E-08	2.245E-19	2.706E-20	3.265E-21	4.000E-22	4.502E-23	1.156E-24	1.156E-24
SN124	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03
SB124	8.410E-05	1.254E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	4.714E-05	1.300E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04
SN125	4.835E-04	1.900E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	1.150E-02	9.331E-03	4.632E-04	3.606E-04	2.808E-04	2.186E-04	1.702E-04	1.325E-04	1.032E-04
TE125	4.613E-04	3.062E-03	1.205E-02	1.216E-02	1.224E-02	1.230E-02	1.235E-02	1.239E-02	1.242E-02
TE125M	7.717E-05	1.294E-04	6.479E-06	5.044E-06	3.928E-06	3.058E-06	2.381E-06	1.854E-06	1.443E-06
SN126	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.296E-02
SB126	4.889E-05	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09
SB126M	2.298E-08	8.293E-12	8.293E-12	8.293E-12	8.292E-12	8.292E-12	8.292E-12	8.292E-12	8.292E-12
TE126	4.501E-04	4.992E-04	5.011E-04	5.013E-04	5.014E-04	5.016E-04	5.017E-04	5.019E-04	5.021E-04
TE127	1.946E-04	1.662E-06	1.307E-18	1.281E-19	1.256E-20	1.231E-21	1.207E-22	1.185E-23	1.162E-24
TE127M	4.548E-03	4.746E-04	3.734E-16	3.660E-17	3.587E-18	3.516E-19	3.447E-20	3.386E-21	3.284E-22
I127	4.416E-02	5.048E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02
XE127	4.707E-09	4.499E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.283E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01
XE128	8.405E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04
TE129	1.085E-04	5.413E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.077E-02	5.781E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.179E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01
XE129	1.824E-05	1.857E-05	1.869E-05	1.870E-05	1.871E-05	1.872E-05	1.873E-05	1.874E-05	1.875E-05
XE129M	3.186E-07	5.746E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.927E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01
XE130	2.935E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03
I131	7.727E-02	1.679E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	7.688E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01
XE131M	1.274E-03	2.289E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.478E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00
CS132	7.674E-07	7.997E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	9.137E-08	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07
XE133	1.131E-01	1.533E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	2.008E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00
XE134	2.597E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00
CS134	9.815E-02	7.015E-02	1.242E-03	8.873E-04	6.340E-04	4.530E-04	3.237E-04	2.313E-04	1.652E-04
BA134	3.828E-03	3.186E-02	1.008E-01	1.011E-01	1.014E-01	1.016E-01	1.017E-01	1.018E-01	1.018E-01
CS135	2.870E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01
BA135	7.450E-06	7.566E-06	8.628E-06	8.717E-06	8.806E-06	8.894E-06	8.983E-06	9.071E-06	9.160E-06
XE136	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00
CS136	9.521E-04	3.861E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	4.044E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03
BA136M	4.269E-11	1.731E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	2.090E+00	2.043E+00	1.548E+00	1.513E+00	1.478E+00	1.444E+00	1.411E+00	1.379E+00	1.348E+00
BA137	9.414E-03	5.716E-02	5.518E-01	5.872E-01	6.217E-01	6.555E-01	6.885E-01	7.207E-01	7.522E-01
BA137M	3.215E-07	3.125E-07	2.368E-07	2.314E-07	2.261E-07	2.210E-07	2.159E-07	2.110E-07	2.062E-07
BA138	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00
LA138	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05
LA139	2.236E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
BA140	2.835E-01	7.169E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	3.751E-02	1.081E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.916E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
CE141	6.551E-01	2.734E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.407E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00
CE142	2.099E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00
ND142	7.029E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03
PR143	2.819E-01	2.473E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.620E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00
CE144	1.653E+00	6.784E-01	1.548E-05	6.355E-06	2.608E-06	1.070E-06	4.393E-07	1.803E-07	7.398E-08
PR144	7.401E-05	2.865E-05	6.538E-10	2.683E-10	1.101E-10	4.519E-11	1.855E-11	7.612E-12	3.124E-12
PR144M	3.496E-07	1.432E-07	3.269E-12	1.341E-12	5.505E-13	2.259E-13	9.272E-14	3.805E-14	1.562E-14
ND144	4.966E-01	1.471E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00
ND145	1.360E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00
ND146	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00
PM146	5.779E-06	5.095E-06	1.123E-06	9.900E-07	8.727E-07	7.694E-07	6.783E-07	5.980E-07	5.272E-07
SM146	4.668E-07	7.200E-07	2.190E-06	2.239E-06	2.282E-06	2.320E-06	2.354E-06	2.384E-06	2.410E-06
ND147	9.263E-02	1.062E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	5.263E-01	4.761E-01	1.999E-02	1.535E-02	1.178E-02	9.047E-03	6.946E-03	5.334E-03	4.095E-03
SM147	2.518E-02	1.691E-01	6.253E-01	6.299E-01	6.335E-01	6.362E-01	6.383E-01	6.399E-01	6.412E-01
ND148	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01
PM148	8.968E-03	8.979E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	5.632E-03	1.226E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	8.010E-02	9.469E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02
SM149	1.030E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02

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sbwal2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:17

	3336.0HR	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
ND150	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01
SM150	4.608E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01
EU150	9.551E-11	9.369E-11	7.436E-11	7.294E-11	7.155E-11	7.019E-11	6.885E-11	6.753E-11	6.625E-11
SM151	2.818E-02	2.990E-02	2.726E-02	2.705E-02	2.684E-02	2.664E-02	2.643E-02	2.623E-02	2.603E-02
EU151	1.477E-05	2.460E-04	2.886E-03	3.095E-03	3.302E-03	3.508E-03	3.713E-03	3.915E-03	4.117E-03
SM152	1.801E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01
EU152	2.937E-05	2.791E-05	1.514E-05	1.439E-05	1.367E-05	1.299E-05	1.235E-05	1.173E-05	1.115E-05
GD152	9.600E-06	1.010E-05	1.366E-05	1.387E-05	1.406E-05	1.425E-05	1.443E-05	1.460E-05	1.477E-05
EU153	1.097E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
GD153	5.460E-06	1.918E-06	6.778E-12	2.381E-12	8.365E-13	2.939E-13	1.032E-13	3.627E-14	1.274E-14
SM154	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02
EU154	2.119E-02	1.955E-02	7.431E-03	6.855E-03	6.324E-03	5.835E-03	5.383E-03	4.966E-03	4.582E-03
GD154	1.908E-04	1.831E-03	1.395E-02	1.452E-02	1.505E-02	1.554E-02	1.599E-02	1.641E-02	1.680E-02
EU155	8.968E-03	7.800E-03	1.458E-03	1.268E-03	1.102E-03	9.585E-04	8.335E-04	7.247E-04	6.302E-04
GD155	1.779E-05	1.188E-03	7.530E-03	7.721E-03	7.886E-03	8.030E-03	8.155E-03	8.263E-03	8.358E-03
EU156	4.301E-03	2.485E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	1.391E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02
GD157	5.689E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05
GD158	6.091E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03
TB159	5.677E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04
GD160	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04
TB160	2.147E-05	6.472E-07	3.653E-25	3.653E-25	3.653E-25	3.653E-25	3.653E-25	3.653E-25	3.653E-25
DY160	8.770E-06	2.959E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05
TB161	5.996E-06	7.753E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	4.991E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05
DY162	3.436E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05
DY163	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05
DY164	4.678E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06
HO165	4.824E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06
HO166M	2.011E-08	2.010E-08	1.996E-08	1.995E-08	1.994E-08	1.993E-08	1.992E-08	1.990E-08	1.989E-08
ER166	1.453E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06
ER167	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07
ER168	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07
ER169	2.695E-10	5.415E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	7.180E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10
ER170	1.271E-14	9.427E-14	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13
TM170	6.493E-11	9.065E-12	4.973E-22	7.846E-23	6.033E-24	6.033E-24	6.033E-24	6.033E-24	6.033E-24
YB170	8.603E-12	6.439E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11
TM171	1.965E-12	1.370E-12	1.800E-14	1.254E-14	8.742E-15	6.093E-15	4.247E-15	2.960E-15	2.063E-15
YB171	1.371E-13	7.327E-13	2.085E-12	2.090E-12	2.094E-12	2.096E-12	2.098E-12	2.100E-12	2.100E-12
YB172	9.830E-15	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14

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File SBWAL4.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) MTR
  BAS     ONE MTR ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE MTR ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP     400.0   .4065  1   2   3 2
  IRP     800.0   .4065  2   3   3 0
  IRP    1600.0   .4065  3   4   3 0
  IRP    2000.0   .4065  4   5   3 0
  IRP    3100.0   .4065  5   6   3 0
  IRP    3336.0   .4065  6   7   3 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC      1.0    1   2   5   4
  DEC     27.0    2   3   5   0
  DEC     28.0    3   4   5   0
  DEC     29.0    4   5   5   0
  DEC     30.0    5   6   5   0
  DEC     31.0    6   7   5   0
  DEC     32.0    7   8   5   0
  DEC     33.0    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340  2.317 922350   200. 922360  .4343  922380  11.53 FUEL 93.3%
  0
```

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File SBWAL4.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwal4.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwal4.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out sbwal4.u6 >nul
copy tape13.out+tape11.out sbwal4.u11 >nul
ren tape7.out sbwal4.pch
ren tape15.out sbwal4.dbg
ren tape16.out sbwal4.vxs
ren tape50.out sbwal4.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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sbwal4.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:21

	3336.0HR	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
HE 4	5.756E-07	6.753E-06	1.565E-04	1.620E-04	1.675E-04	1.729E-04	1.783E-04	1.837E-04	1.891E-04
TL206	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32
TL207	1.122E-19	2.492E-18	3.066E-16	3.261E-16	3.452E-16	3.647E-16	3.846E-16	4.048E-16	4.254E-16
TL208	2.197E-16	1.654E-15	6.316E-15	6.296E-15	6.248E-15	6.197E-15	6.144E-15	6.090E-15	6.035E-15
TL209	2.473E-21	1.203E-21	1.527E-20	1.592E-20	1.659E-20	1.726E-20	1.795E-20	1.864E-20	1.934E-20
PB206	1.059E-18	1.243E-16	1.127E-11	1.292E-11	1.470E-11	1.666E-11	1.880E-11	2.115E-11	2.371E-11
PB207	7.884E-16	8.919E-14	2.399E-10	2.641E-10	2.897E-10	3.168E-10	3.454E-10	3.756E-10	4.073E-10
PB208	8.944E-12	3.252E-10	5.323E-08	5.532E-08	5.739E-08	5.944E-08	6.148E-08	6.350E-08	6.550E-08
PB209	1.031E-17	5.011E-18	6.361E-17	6.634E-17	6.912E-17	7.193E-17	7.478E-17	7.767E-17	8.059E-17
PB210	3.456E-15	1.336E-14	5.266E-11	5.824E-11	6.417E-11	7.046E-11	7.712E-11	8.416E-11	9.158E-11
PB211	8.682E-19	1.928E-17	2.372E-15	2.522E-15	2.671E-15	2.822E-15	2.975E-15	3.132E-15	3.291E-15
PB212	1.296E-13	9.757E-13	3.725E-12	3.713E-12	3.685E-12	3.655E-12	3.624E-12	3.592E-12	3.559E-12
PB214	1.019E-19	1.354E-18	5.279E-16	5.671E-16	6.077E-16	6.498E-16	6.932E-16	7.380E-16	7.842E-16
BI208	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21
BI209	1.851E-15	1.092E-14	1.554E-12	1.673E-12	1.797E-12	1.927E-12	2.062E-12	2.202E-12	2.347E-12
BI210M	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20
BI210	1.842E-18	8.224E-18	3.241E-14	3.586E-14	3.951E-14	4.338E-14	4.748E-14	5.181E-14	5.638E-14
BI211	5.122E-20	1.137E-18	1.400E-16	1.488E-16	1.576E-16	1.665E-16	1.755E-16	1.848E-16	1.942E-16
BI212	1.229E-14	9.256E-14	3.534E-13	3.522E-13	3.496E-13	3.467E-13	3.438E-13	3.407E-13	3.376E-13
BI213	2.421E-18	1.177E-18	1.495E-17	1.559E-17	1.624E-17	1.690E-17	1.757E-17	1.825E-17	1.894E-17
BI214	7.566E-20	1.005E-18	3.920E-16	4.211E-16	4.513E-16	4.825E-16	5.147E-16	5.480E-16	5.823E-16
PO210	7.703E-18	1.312E-16	8.951E-13	9.363E-13	1.025E-12	1.126E-12	1.234E-12	1.349E-12	1.470E-12
PO211	6.285E-25	1.395E-23	1.717E-21	1.826E-21	1.933E-21	2.043E-21	2.154E-21	2.267E-21	2.382E-21
PO212	6.504E-25	4.897E-24	1.870E-23	1.864E-23	1.849E-23	1.834E-23	1.819E-23	1.803E-23	1.786E-23
PO213	3.633E-27	1.766E-27	2.242E-26	2.339E-26	2.436E-26	2.536E-26	2.636E-26	2.738E-26	2.841E-26
PO214	2.030E-25	1.383E-25	5.393E-23	5.794E-23	6.208E-23	6.638E-23	7.081E-23	7.539E-23	8.011E-23
PO215	7.266E-25	1.614E-23	1.986E-21	2.112E-21	2.236E-21	2.363E-21	2.491E-21	2.622E-21	2.756E-21
PO216	5.172E-19	3.894E-18	1.487E-17	1.482E-17	1.471E-17	1.459E-17	1.446E-17	1.433E-17	1.420E-17
PO218	1.182E-20	1.570E-19	6.122E-17	6.576E-17	7.047E-17	7.534E-17	8.038E-17	8.557E-17	9.093E-17
AT217	2.909E-23	1.415E-23	1.796E-22	1.873E-22	1.951E-22	2.030E-22	2.111E-22	2.192E-22	2.275E-22
RN218	4.180E-23	2.164E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.647E-21	3.658E-20	4.501E-18	4.786E-18	5.067E-18	5.354E-18	5.646E-18	5.943E-18	6.245E-18
RN220	1.952E-16	1.470E-15	5.612E-15	5.594E-15	5.552E-15	5.506E-15	5.459E-15	5.411E-15	5.362E-15
RN222	2.172E-17	2.887E-16	1.126E-13	1.209E-13	1.296E-13	1.385E-13	1.478E-13	1.573E-13	1.672E-13
FR221	2.642E-19	1.285E-19	1.631E-18	1.701E-18	1.772E-18	1.844E-18	1.917E-18	1.991E-18	2.066E-18
FR223	1.599E-20	1.697E-19	2.089E-17	2.217E-17	2.347E-17	2.480E-17	2.615E-17	2.752E-17	2.892E-17
RA222	4.621E-20	2.392E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	4.183E-16	9.292E-15	1.143E-12	1.216E-12	1.287E-12	1.360E-12	1.434E-12	1.510E-12	1.586E-12
RA224	1.131E-12	8.512E-12	3.250E-11	3.239E-11	3.215E-11	3.188E-11	3.161E-11	3.133E-11	3.105E-11
RA225	1.576E-15	5.808E-16	7.373E-15	7.689E-15	8.011E-15	8.336E-15	8.667E-15	9.002E-15	9.341E-15
RA226	3.592E-12	4.491E-11	1.751E-08	1.881E-08	2.016E-08	2.155E-08	2.299E-08	2.448E-08	2.601E-08
RA228	4.739E-19	1.274E-17	3.205E-15	3.372E-15	3.540E-15	3.709E-15	3.878E-15	4.048E-15	4.219E-15
AC225	8.067E-16	3.923E-16	4.980E-15	5.194E-15	5.411E-15	5.631E-15	5.855E-15	6.081E-15	6.310E-15
AC227	6.195E-13	6.577E-12	8.096E-10	8.590E-10	9.094E-10	9.609E-10	1.013E-09	1.066E-09	1.121E-09
AC228	7.721E-16	1.329E-21	3.346E-19	3.520E-19	3.695E-19	3.871E-19	4.048E-19	4.226E-19	4.405E-19
TH226	2.303E-18	1.192E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	9.385E-16	1.527E-14	1.879E-12	1.998E-12	2.115E-12	2.235E-12	2.357E-12	2.481E-12	2.607E-12
TH228	2.352E-10	1.653E-09	6.315E-09	6.272E-09	6.224E-09	6.173E-09	6.121E-09	6.067E-09	6.012E-09
TH229	6.913E-11	1.070E-10	1.359E-09	1.417E-09	1.476E-09	1.536E-09	1.597E-09	1.659E-09	1.722E-09
TH230	2.025E-06	7.319E-06	1.453E-04	1.506E-04	1.559E-04	1.612E-04	1.665E-04	1.718E-04	1.771E-04
TH231	5.690E-09	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10
TH232	7.520E-08	4.528E-07	1.027E-05	1.065E-05	1.103E-05	1.140E-05	1.178E-05	1.216E-05	1.254E-05
TH234	1.577E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10
PA231	2.238E-07	3.541E-07	3.592E-06	3.717E-06	3.842E-06	3.967E-06	4.092E-06	4.217E-06	4.342E-06
PA233	9.454E-09	1.885E-08	1.887E-08	1.887E-08	1.887E-08	1.888E-08	1.888E-08	1.888E-08	1.888E-08
PA234M	1.507E-14	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15
PA234	3.338E-12	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15
U230	2.263E-15	1.171E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.712E-07	1.994E-07	2.376E-07	2.354E-07	2.331E-07	2.309E-07	2.287E-07	2.266E-07	2.244E-07
U233	8.724E-06	8.910E-06	1.351E-05	1.370E-05	1.390E-05	1.409E-05	1.429E-05	1.448E-05	1.468E-05
U234	1.900E+00	1.900E+00	1.908E+00	1.908E+00	1.908E+00	1.908E+00	1.909E+00	1.909E+00	1.909E+00
U235	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02
U236	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01
U237	8.333E-02	9.971E-10	2.852E-10	2.718E-10	2.590E-10	2.469E-10	2.353E-10	2.242E-10	2.137E-10
U238	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01
U240	2.879E-08	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18
NP235	4.704E-09	2.482E-09	1.503E-16	7.933E-17	4.186E-17	2.209E-17	1.166E-17	6.152E-18	3.246E-18
NP236	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07
NP237	4.716E-01	5.549E-01	5.556E-01	5.556E-01	5.557E-01	5.557E-01	5.557E-01	5.558E-01	5.558E-01
NP238	3.220E-03	2.431E-13	2.159E-13	2.149E-13	2.139E-13	2.130E-13	2.120E-13	2.110E-13	2.101E-13
NP239	1.828E-02	1.608E-10	1.604E-10	1.604E-10	1.604E-10	1.604E-10	1.604E-10	1.604E-10	1.604E-10
NP240M	2.781E-08	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21
PU236	1.272E-07	1.036E-07	1.868E-10	1.466E-10	1.151E-10	9.032E-11	7.093E-11	5.572E-11	4.379E-11
PU237	6.793E-08	2.637E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	3.854E-02	4.145E-02	3.376E-02	3.349E-02	3.323E-02	3.297E-02	3.271E-02	3.245E-02	3.219E-02
PU239	3.438E-01	3.622E-01	3.620E-01	3.619E-01	3.619E-01	3.619E-01	3.619E-01	3.619E-01	3.619E-01

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sbwal4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:21

	3336.0HR	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
PU240	5.082E-02	5.082E-02	5.069E-02	5.069E-02	5.068E-02	5.067E-02	5.067E-02	5.066E-02	5.066E-02
PU241	3.379E-02	3.220E-02	9.212E-03	8.779E-03	8.366E-03	7.973E-03	7.599E-03	7.241E-03	6.901E-03
PU242	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03
PU243	2.293E-06	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22
PU244	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08
PU246	8.022E-14	5.896E-24	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28
AM241	1.437E-04	1.730E-03	2.408E-02	2.448E-02	2.485E-02	2.520E-02	2.554E-02	2.585E-02	2.615E-02
AM242M	1.302E-06	1.296E-06	1.152E-06	1.146E-06	1.141E-06	1.136E-06	1.131E-06	1.126E-06	1.120E-06
AM242	8.587E-07	1.551E-11	1.377E-11	1.371E-11	1.365E-11	1.359E-11	1.353E-11	1.346E-11	1.340E-11
AM243	1.849E-04	1.872E-04	1.867E-04	1.867E-04	1.867E-04	1.866E-04	1.866E-04	1.866E-04	1.866E-04
AM245	1.478E-12	3.179E-24	3.711E-33	3.710E-33	3.710E-33	3.710E-33	3.710E-33	3.710E-33	3.710E-33
AM246	1.284E-16	9.449E-27	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31
CM241	1.223E-12	1.079E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	1.837E-05	4.047E-06	2.785E-09	2.776E-09	2.764E-09	2.751E-09	2.739E-09	2.726E-09	2.714E-09
CM243	1.435E-07	1.400E-07	7.440E-08	7.261E-08	7.087E-08	6.916E-08	6.750E-08	6.588E-08	6.430E-08
CM244	1.547E-05	1.493E-05	5.518E-06	5.310E-06	5.111E-06	4.919E-06	4.734E-06	4.557E-06	4.386E-06
CM245	2.945E-07	2.945E-07	2.939E-07	2.938E-07	2.938E-07	2.938E-07	2.938E-07	2.937E-07	2.937E-07
CM246	8.884E-09	8.882E-09	8.849E-09	8.847E-09	8.846E-09	8.845E-09	8.843E-09	8.842E-09	8.841E-09
CM247	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11
CM248	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13
CM249	1.288E-17	4.059E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21
BK249	1.811E-15	8.267E-16	9.648E-25	9.648E-25	9.648E-25	9.648E-25	9.648E-25	9.648E-25	9.648E-25
BK250	5.705E-18	7.472E-27	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30
CF249	3.487E-17	1.030E-15	1.766E-15	1.763E-15	1.759E-15	1.756E-15	1.752E-15	1.749E-15	1.745E-15
CF250	2.228E-16	2.167E-16	5.465E-17	5.183E-17	4.915E-17	4.662E-17	4.421E-17	4.193E-17	3.976E-17
CF251	4.585E-17	4.582E-17	4.491E-17	4.487E-17	4.484E-17	4.481E-17	4.477E-17	4.474E-17	4.470E-17
CF252	6.911E-18	5.314E-18	5.741E-21	4.431E-21	3.420E-21	2.639E-21	2.037E-21	1.572E-21	1.213E-21
CF253	7.898E-21	5.307E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	1.021E-22	1.456E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	1.720E-21	2.245E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	3.901E-23	3.188E-24	1.363E-34	1.363E-34	1.363E-34	1.363E-34	1.363E-34	1.363E-34	1.363E-34
ES255	0.000E+00	6.054E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	2.713E-13	3.080E-12	3.936E-11	4.047E-11	4.157E-11	4.265E-11	4.372E-11	4.477E-11	4.582E-11
H 3	8.201E-05	7.753E-05	1.802E-05	1.703E-05	1.610E-05	1.523E-05	1.439E-05	1.361E-05	1.287E-05
LI 6	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07
LI 7	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08
BE 9	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08
BE 10	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07
C 14	4.556E-08	4.556E-08	4.542E-08	4.541E-08	4.540E-08	4.540E-08	4.539E-08	4.539E-08	4.538E-08
ZN 66	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11
ZN 67	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12
ZN 68	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14
GA 69	8.549E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18
GE 70	9.226E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21
GA 71	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09
GE 72	1.264E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05
GE 73	4.483E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05
GE 74	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04
AS 75	2.891E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
GE 76	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04
SE 76	2.760E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06
SE 77	1.904E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03
SE 78	4.077E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03
SE 79	1.048E-02	1.048E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02
BR 79	2.177E-08	1.336E-07	3.040E-06	3.151E-06	3.263E-06	3.375E-06	3.487E-06	3.598E-06	3.710E-06
SE 80	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
KR 80	1.252E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07
BR 81	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02
KR 81	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09
SE 82	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02
KR 82	3.453E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04
KR 83	1.024E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01
KR 84	2.257E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01
KR 85	5.678E-02	5.333E-02	9.928E-03	9.306E-03	8.724E-03	8.177E-03	7.665E-03	7.185E-03	6.736E-03
RB 85	2.135E-01	2.175E-01	2.609E-01	2.615E-01	2.621E-01	2.626E-01	2.631E-01	2.636E-01	2.640E-01
KR 86	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01
RB 86	7.830E-05	1.001E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	1.626E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04
RB 87	5.599E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01
SR 87	9.284E-07	9.289E-07	9.291E-07	9.291E-07	9.291E-07	9.291E-07	9.291E-07	9.291E-07	9.291E-07
SR 88	8.062E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01
SR 89	4.726E-01	3.142E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.923E-01	1.062E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00
SR 90	1.282E+00	1.252E+00	6.743E-01	6.584E-01	6.429E-01	6.278E-01	6.130E-01	5.986E-01	5.845E-01

Appendix D-2
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sbwal4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:21

	3336.0HR	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
Y 90	3.345E-04	3.140E-04	1.691E-04	1.651E-04	1.612E-04	1.574E-04	1.537E-04	1.501E-04	1.466E-04
ZR 90	7.754E-03	3.793E-02	6.158E-01	6.317E-01	6.472E-01	6.623E-01	6.771E-01	6.915E-01	7.056E-01
Y 91	6.460E-01	8.605E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.788E-01	1.322E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00
ZR 92	1.378E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00
NB 92	2.982E-15	4.493E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.490E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00
NB 93	9.491E-09	6.571E-08	8.963E-06	9.484E-06	1.001E-05	1.055E-05	1.109E-05	1.164E-05	1.220E-05
NB 93M	1.244E-07	7.462E-07	9.478E-06	9.635E-06	9.784E-06	9.926E-06	1.006E-05	1.019E-05	1.031E-05
ZR 94	1.474E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00
NB 94	2.129E-07	2.129E-07	2.128E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07
ZR 95	7.839E-01	1.499E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.263E-01	1.845E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	3.076E-04	6.273E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	4.072E-01	1.485E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00
ZR 96	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00
MO 96	6.211E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03
MO 97	1.415E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00
MO 98	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00
TC 98	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06
TC 99	1.384E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00
RU 99	8.587E-07	5.510E-06	1.264E-04	1.311E-04	1.357E-04	1.404E-04	1.450E-04	1.497E-04	1.543E-04
MO100	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00
RU100	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02
RU101	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00
RU102	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00
RH102	2.949E-07	2.322E-07	4.643E-10	3.656E-10	2.879E-10	2.267E-10	1.785E-10	1.405E-10	1.107E-10
RU103	3.008E-01	4.770E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.468E-01	7.474E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01
RH103M	2.690E-04	4.274E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	5.001E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01
PD104	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02
PD105	2.413E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01
RU106	1.005E-01	5.052E-02	8.685E-10	4.366E-10	2.195E-10	1.104E-10	5.549E-11	2.790E-11	1.402E-11
RH106	1.760E-07	4.748E-08	8.163E-16	4.104E-16	2.063E-16	1.037E-16	5.215E-17	2.622E-17	1.318E-17
PD106	4.584E-02	9.581E-02	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01
AG106	2.945E-16	3.417E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	5.378E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02
AG107	1.065E-09	6.804E-09	1.560E-07	1.618E-07	1.675E-07	1.733E-07	1.790E-07	1.847E-07	1.905E-07
PD108	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02
AG108	8.176E-13	6.265E-20	5.436E-20	5.407E-20	5.377E-20	5.348E-20	5.319E-20	5.290E-20	5.261E-20
AG108M	1.995E-11	1.984E-11	1.722E-11	1.712E-11	1.703E-11	1.694E-11	1.684E-11	1.675E-11	1.666E-11
CD108	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08
AG109	1.170E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02
AG109M	7.844E-08	7.284E-18	5.028E-24	2.914E-24	1.688E-24	9.784E-25	5.670E-25	3.285E-25	1.904E-25
CD109	1.273E-11	7.375E-12	5.090E-18	2.950E-18	1.709E-18	9.905E-19	5.740E-19	3.326E-19	1.927E-19
PD110	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03
AG110	1.553E-08	5.853E-13	2.124E-24	7.711E-25	2.800E-25	1.017E-25	3.691E-26	1.340E-26	4.865E-27
AG110M	1.064E-04	3.862E-05	1.402E-16	5.089E-17	1.847E-17	6.708E-18	2.435E-18	8.842E-19	3.210E-19
CD110	2.315E-03	2.383E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03
AG111	5.944E-04	1.040E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	6.904E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03
CD112	5.522E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03
CD113	1.687E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04
CD113M	1.074E-04	1.026E-04	2.982E-05	2.844E-05	2.712E-05	2.586E-05	2.466E-05	2.351E-05	2.242E-05
IN113	9.379E-07	5.923E-06	7.859E-05	7.997E-05	8.129E-05	8.255E-05	8.375E-05	8.489E-05	8.598E-05
CD114	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02
IN114	4.456E-13	5.769E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	5.960E-09	3.587E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.438E-08	1.986E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08
CD115M	1.678E-04	5.744E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	2.821E-03	3.092E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03
IN115M	7.995E-06	1.622E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.522E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04
CD116	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03
SN116	1.476E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03
SN117	4.833E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03
SN117M	2.525E-07	3.559E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	5.399E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03
SN119	5.103E-03	5.145E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03
SN119M	6.368E-05	2.266E-05	4.876E-17	1.735E-17	6.175E-18	2.197E-18	7.819E-19	2.782E-19	9.900E-20
SN120	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03
SN121M	2.696E-06	2.658E-06	1.854E-06	1.828E-06	1.803E-06	1.778E-06	1.754E-06	1.729E-06	1.706E-06
SB121	5.536E-03	5.602E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03
SN122	6.068E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03
TE122	1.234E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04

Appendix D-2
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sbwal4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:21

	3336.0HR	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
SN123	1.237E-03	1.742E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	5.902E-03	6.966E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03
TE123	5.000E-07	6.733E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07
TE123M	1.972E-07	2.377E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03
SB124	8.410E-05	1.254E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	4.714E-05	1.300E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04
SN125	4.835E-04	1.900E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	1.150E-02	9.331E-03	1.398E-05	1.088E-05	8.472E-06	6.596E-06	5.136E-06	3.999E-06	3.114E-06
TE125	4.613E-04	3.062E-03	1.251E-02	1.251E-02	1.251E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02
TE125M	7.717E-05	1.294E-04	1.954E-07	1.522E-07	1.185E-07	9.227E-08	7.184E-08	5.593E-08	4.355E-08
SN126	2.296E-02	2.296E-02	2.296E-02	2.296E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02
SB126	4.889E-05	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09
SB126M	2.298E-08	8.293E-12	8.292E-12	8.292E-12	8.292E-12	8.292E-12	8.292E-12	8.292E-12	8.291E-12
TE126	4.501E-04	4.992E-04	5.033E-04	5.035E-04	5.036E-04	5.038E-04	5.040E-04	5.041E-04	5.043E-04
TE127	1.946E-04	1.662E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.548E-03	4.746E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	4.416E-02	5.048E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02
XE127	4.707E-09	4.499E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.283E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01
XE128	8.405E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04
TE129	1.085E-04	5.413E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.077E-02	5.781E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.179E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01
XE129	1.824E-05	1.857E-05	1.883E-05	1.884E-05	1.885E-05	1.886E-05	1.887E-05	1.888E-05	1.889E-05
XE129M	3.186E-07	5.746E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.927E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01
XE130	2.935E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03
I131	7.727E-02	1.679E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	7.688E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01
XE131M	1.274E-03	2.289E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.478E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00
CS132	7.674E-07	7.997E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	9.137E-08	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07
XE133	1.131E-01	1.533E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	2.008E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00
XE134	2.597E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00
CS134	9.815E-02	7.015E-02	1.122E-05	8.020E-06	5.731E-06	4.095E-06	2.926E-06	2.090E-06	1.494E-06
BA134	3.828E-03	3.186E-02	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01
CS135	2.870E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01
BA135	7.450E-06	7.566E-06	9.868E-06	9.957E-06	1.005E-05	1.013E-05	1.022E-05	1.031E-05	1.040E-05
XE136	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00
CS136	9.521E-04	3.861E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	4.044E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03
BA136M	4.269E-11	1.731E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	2.090E+00	2.043E+00	1.120E+00	1.095E+00	1.070E+00	1.045E+00	1.021E+00	9.980E-01	9.752E-01
BA137	9.414E-03	5.716E-02	9.797E-01	1.005E+00	1.030E+00	1.055E+00	1.079E+00	1.102E+00	1.125E+00
BA137M	3.215E-07	3.125E-07	1.714E-07	1.675E-07	1.636E-07	1.599E-07	1.563E-07	1.527E-07	1.492E-07
BA138	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00
LA138	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05
LA139	2.236E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
BA140	2.835E-01	7.169E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	3.751E-02	1.081E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.916E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
CE141	6.551E-01	2.734E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.407E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00
CE142	2.099E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00
ND142	7.029E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03
PR143	2.819E-01	2.473E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.620E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00
CE144	1.653E+00	6.784E-01	5.953E-11	2.443E-11	1.003E-11	4.115E-12	1.689E-12	6.930E-13	2.844E-13
PR144	7.401E-05	2.865E-05	2.514E-15	1.032E-15	4.233E-16	1.737E-16	7.130E-17	2.926E-17	1.201E-17
PR144M	3.496E-07	1.432E-07	1.257E-17	5.157E-18	2.116E-18	8.685E-19	3.564E-19	1.463E-19	6.003E-20
ND144	4.966E-01	1.471E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00
ND145	1.360E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00
ND146	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00
PM146	5.779E-06	5.095E-06	1.924E-07	1.696E-07	1.495E-07	1.318E-07	1.162E-07	1.024E-07	9.030E-08
SM146	4.668E-07	7.200E-07	2.534E-06	2.542E-06	2.550E-06	2.556E-06	2.562E-06	2.567E-06	2.572E-06
ND147	9.263E-02	1.062E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	5.263E-01	4.761E-01	4.942E-04	3.795E-04	2.914E-04	2.237E-04	1.718E-04	1.319E-04	1.013E-04
SM147	2.518E-02	1.691E-01	6.448E-01	6.449E-01	6.450E-01	6.450E-01	6.451E-01	6.451E-01	6.451E-01
ND148	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01
PM148	8.968E-03	8.979E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	5.632E-03	1.226E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	8.010E-02	9.469E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02
SM149	1.030E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02

Appendix D-2
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sbwal4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:21

	3336.0HR	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
ND150	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01
SM150	4.608E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01
EU150	9.551E-11	9.369E-11	5.679E-11	5.571E-11	5.464E-11	5.360E-11	5.258E-11	5.158E-11	5.059E-11
SM151	2.818E-02	2.990E-02	2.447E-02	2.429E-02	2.410E-02	2.391E-02	2.373E-02	2.355E-02	2.337E-02
EU151	1.477E-05	2.460E-04	5.672E-03	5.860E-03	6.046E-03	6.231E-03	6.415E-03	6.597E-03	6.777E-03
SM152	1.801E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01
EU152	2.937E-05	2.791E-05	7.418E-06	7.049E-06	6.699E-06	6.366E-06	6.050E-06	5.749E-06	5.463E-06
GD152	9.600E-06	1.010E-05	1.581E-05	1.591E-05	1.601E-05	1.610E-05	1.619E-05	1.627E-05	1.635E-05
EU153	1.097E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
GD153	5.460E-06	1.918E-06	2.956E-18	1.038E-18	3.648E-19	1.281E-19	4.501E-20	1.582E-20	5.562E-21
SM154	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02
EU154	2.119E-02	1.955E-02	2.404E-03	2.218E-03	2.046E-03	1.888E-03	1.742E-03	1.607E-03	1.482E-03
GD154	1.908E-04	1.831E-03	1.897E-02	1.916E-02	1.933E-02	1.949E-02	1.964E-02	1.977E-02	1.990E-02
EU155	8.968E-03	7.800E-03	2.060E-04	1.791E-04	1.558E-04	1.354E-04	1.178E-04	1.024E-04	8.905E-05
GD155	1.779E-05	1.188E-03	8.782E-03	8.809E-03	8.832E-03	8.853E-03	8.870E-03	8.886E-03	8.899E-03
EU156	4.301E-03	2.485E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	1.391E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02
GD157	5.689E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05
GD158	6.091E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03
TB159	5.677E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04
GD160	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04
TB160	2.147E-05	6.472E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	8.770E-06	2.959E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05
TB161	5.996E-06	7.753E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	4.991E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05
DY162	3.436E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05
DY163	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05
DY164	4.678E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06
HO165	4.824E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06
HO166M	2.011E-08	2.010E-08	1.980E-08	1.979E-08	1.978E-08	1.977E-08	1.976E-08	1.974E-08	1.973E-08
ER166	1.453E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06
ER167	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07
ER168	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07
ER169	2.695E-10	5.415E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	7.180E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10
ER170	1.271E-14	9.427E-14	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13
TM170	6.493E-11	9.065E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	8.603E-12	6.439E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11
TM171	1.965E-12	1.370E-12	1.149E-16	8.006E-17	5.580E-17	3.889E-17	2.710E-17	1.889E-17	1.317E-17
YB171	1.371E-13	7.327E-13	2.102E-12	2.102E-12	2.102E-12	2.102E-12	2.102E-12	2.102E-12	2.102E-12
YB172	9.830E-15	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14

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File SBWAL5.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) MTR
  BAS     ONE MTR ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE MTR ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP     400.0   .4065  1   2   3 2
  IRP     800.0   .4065  2   3   3 0
  IRP    1600.0   .4065  3   4   3 0
  IRP    2000.0   .4065  4   5   3 0
  IRP    3100.0   .4065  5   6   3 0
  IRP    3336.0   .4065  6   7   3 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC      1.0    1   2   5   4
  DEC     34.0    2   3   5   0
  DEC     35.0    3   4   5   0
  DEC     36.0    4   5   5   0
  DEC     37.0    5   6   5   0
  DEC     38.0    6   7   5   0
  DEC     39.0    7   8   5   0
  DEC     40.0    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340  2.317 922350   200. 922360  .4343  922380  11.53 FUEL 93.3%
  0
```

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File SBWAL5.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwal5.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwal5.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out sbwal5.u6 >nul
copy tape13.out+tape11.out sbwal5.u11 >nul
ren tape7.out sbwal5.pch
ren tape15.out sbwal5.dbg
ren tape16.out sbwal5.vxs
ren tape50.out sbwal5.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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sbwal5.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:26

	3336.0HR	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
HE 4	5.756E-07	6.753E-06	1.944E-04	1.997E-04	2.050E-04	2.102E-04	2.154E-04	2.206E-04	2.258E-04
TL206	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32
TL207	1.122E-19	2.492E-18	4.452E-16	4.673E-16	4.888E-16	5.106E-16	5.327E-16	5.550E-16	5.777E-16
TL208	2.197E-16	1.654E-15	5.963E-15	5.928E-15	5.871E-15	5.815E-15	5.759E-15	5.704E-15	5.649E-15
TL209	2.473E-21	1.203E-21	2.003E-20	2.075E-20	2.147E-20	2.221E-20	2.295E-20	2.370E-20	2.446E-20
PB206	1.059E-18	1.243E-16	2.707E-11	3.017E-11	3.346E-11	3.700E-11	4.082E-11	4.492E-11	4.932E-11
PB207	7.884E-16	8.919E-14	4.407E-10	4.755E-10	5.121E-10	5.503E-10	5.901E-10	6.317E-10	6.750E-10
PB208	8.944E-12	3.252E-10	7.089E-08	7.286E-08	7.480E-08	7.673E-08	7.865E-08	8.054E-08	8.241E-08
PB209	1.031E-17	5.011E-18	8.347E-17	8.645E-17	8.947E-17	9.253E-17	9.562E-17	9.876E-17	1.019E-16
PB210	3.456E-15	1.336E-14	9.941E-11	1.076E-10	1.162E-10	1.252E-10	1.347E-10	1.445E-10	1.548E-10
PB211	8.682E-19	1.928E-17	3.444E-15	3.615E-15	3.782E-15	3.950E-15	4.121E-15	4.294E-15	4.469E-15
PB212	1.296E-13	9.757E-13	3.517E-12	3.496E-12	3.463E-12	3.430E-12	3.397E-12	3.364E-12	3.332E-12
PB214	1.019E-19	1.354E-18	8.318E-16	8.808E-16	9.312E-16	9.830E-16	1.036E-15	1.091E-15	1.147E-15
BI208	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21
BI209	1.851E-15	1.092E-14	2.498E-12	2.654E-12	2.816E-12	2.983E-12	3.156E-12	3.335E-12	3.519E-12
BI210M	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20
BI210	1.842E-18	8.224E-18	6.117E-14	6.625E-14	7.155E-14	7.710E-14	8.290E-14	8.896E-14	9.528E-14
BI211	5.122E-20	1.137E-18	2.032E-16	2.133E-16	2.231E-16	2.331E-16	2.431E-16	2.534E-16	2.637E-16
BI212	1.229E-14	9.256E-14	3.336E-13	3.316E-13	3.285E-13	3.253E-13	3.222E-13	3.191E-13	3.161E-13
BI213	2.421E-18	1.177E-18	1.961E-17	2.031E-17	2.102E-17	2.174E-17	2.247E-17	2.321E-17	2.395E-17
BI214	7.566E-20	1.005E-18	6.176E-16	6.540E-16	6.914E-16	7.299E-16	7.694E-16	8.099E-16	8.515E-16
PO210	7.703E-18	1.312E-16	1.689E-12	1.746E-12	1.875E-12	2.020E-12	2.175E-12	2.336E-12	2.504E-12
PO211	6.285E-25	1.395E-23	2.493E-21	2.617E-21	2.738E-21	2.860E-21	2.983E-21	3.108E-21	3.235E-21
PO212	6.504E-25	4.897E-24	1.765E-23	1.755E-23	1.738E-23	1.721E-23	1.705E-23	1.688E-23	1.672E-23
PO213	3.633E-27	1.766E-27	2.942E-26	3.048E-26	3.154E-26	3.262E-26	3.371E-26	3.482E-26	3.593E-26
PO214	2.030E-25	1.383E-25	8.497E-23	8.998E-23	9.512E-23	1.004E-22	1.058E-22	1.114E-22	1.171E-22
PO215	7.266E-25	1.614E-23	2.884E-21	3.027E-21	3.167E-21	3.308E-21	3.451E-21	3.596E-21	3.742E-21
PO216	5.172E-19	3.894E-18	1.403E-17	1.395E-17	1.382E-17	1.369E-17	1.355E-17	1.343E-17	1.330E-17
PO218	1.182E-20	1.570E-19	9.645E-17	1.021E-16	1.080E-16	1.140E-16	1.201E-16	1.265E-16	1.330E-16
AT217	2.909E-23	1.415E-23	2.356E-22	2.440E-22	2.526E-22	2.612E-22	2.699E-22	2.788E-22	2.878E-22
RN218	4.180E-23	2.164E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.647E-21	3.658E-20	6.536E-18	6.861E-18	7.176E-18	7.496E-18	7.820E-18	8.148E-18	8.480E-18
RN220	1.952E-16	1.470E-15	5.298E-15	5.267E-15	5.217E-15	5.167E-15	5.117E-15	5.068E-15	5.020E-15
RN222	2.172E-17	2.887E-16	1.773E-13	1.878E-13	1.985E-13	2.096E-13	2.209E-13	2.325E-13	2.445E-13
FR221	2.642E-19	1.285E-19	2.140E-18	2.216E-18	2.293E-18	2.372E-18	2.451E-18	2.532E-18	2.613E-18
FR223	1.599E-20	1.697E-19	3.033E-17	3.177E-17	3.324E-17	3.472E-17	3.622E-17	3.774E-17	3.927E-17
RA222	4.621E-20	2.392E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	4.183E-16	9.292E-15	1.660E-12	1.743E-12	1.823E-12	1.904E-12	1.986E-12	2.070E-12	2.154E-12
RA224	1.131E-12	8.512E-12	3.068E-11	3.050E-11	3.021E-11	2.992E-11	2.963E-11	2.935E-11	2.907E-11
RA225	1.576E-15	5.808E-16	9.674E-15	1.002E-14	1.037E-14	1.072E-14	1.108E-14	1.145E-14	1.181E-14
RA226	3.592E-12	4.491E-11	2.759E-08	2.921E-08	3.088E-08	3.260E-08	3.437E-08	3.618E-08	3.803E-08
RA228	4.739E-19	1.274E-17	4.391E-15	4.563E-15	4.736E-15	4.909E-15	5.082E-15	5.256E-15	5.430E-15
AC225	8.067E-16	3.923E-16	6.535E-15	6.769E-15	7.005E-15	7.244E-15	7.487E-15	7.733E-15	7.981E-15
AC227	6.195E-13	6.577E-12	1.175E-09	1.231E-09	1.288E-09	1.345E-09	1.403E-09	1.462E-09	1.522E-09
AC228	7.721E-16	1.329E-21	4.583E-19	4.763E-19	4.944E-19	5.124E-19	5.305E-19	5.486E-19	5.668E-19
TH226	2.303E-18	1.192E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	9.385E-16	1.527E-14	2.728E-12	2.864E-12	2.995E-12	3.129E-12	3.264E-12	3.401E-12	3.540E-12
TH228	2.352E-10	1.653E-09	5.962E-09	5.905E-09	5.849E-09	5.793E-09	5.737E-09	5.682E-09	5.628E-09
TH229	6.913E-11	1.070E-10	1.783E-09	1.847E-09	1.911E-09	1.976E-09	2.043E-09	2.110E-09	2.177E-09
TH230	2.025E-06	7.319E-06	1.825E-04	1.878E-04	1.931E-04	1.984E-04	2.037E-04	2.091E-04	2.144E-04
TH231	5.690E-09	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10
TH232	7.520E-08	4.528E-07	1.291E-05	1.329E-05	1.367E-05	1.405E-05	1.442E-05	1.480E-05	1.518E-05
TH234	1.577E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10
PA231	2.238E-07	3.541E-07	4.464E-06	4.589E-06	4.714E-06	4.839E-06	4.964E-06	5.089E-06	5.214E-06
PA233	9.454E-09	1.885E-08	1.888E-08	1.888E-08	1.888E-08	1.889E-08	1.889E-08	1.889E-08	1.889E-08
PA234M	1.507E-14	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15
PA234	3.338E-12	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15
U230	2.263E-15	1.171E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.712E-07	1.994E-07	2.223E-07	2.201E-07	2.180E-07	2.159E-07	2.139E-07	2.118E-07	2.098E-07
U233	8.724E-06	8.910E-06	1.474E-05	1.494E-05	1.514E-05	1.533E-05	1.553E-05	1.572E-05	1.592E-05
U234	1.900E+00	1.900E+00	1.909E+00	1.910E+00	1.910E+00	1.910E+00	1.910E+00	1.911E+00	1.911E+00
U235	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02
U236	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01
U237	8.333E-02	9.971E-10	2.036E-10	1.941E-10	1.849E-10	1.762E-10	1.680E-10	1.601E-10	1.525E-10
U238	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01
U240	2.879E-08	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18
NP235	4.704E-09	2.482E-09	1.713E-18	9.040E-19	4.771E-19	2.518E-19	1.329E-19	7.010E-20	3.698E-20
NP236	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07
NP237	4.716E-01	5.549E-01	5.559E-01	5.559E-01	5.559E-01	5.560E-01	5.560E-01	5.561E-01	5.561E-01
NP238	3.220E-03	2.431E-13	2.091E-13	2.082E-13	2.072E-13	2.063E-13	2.053E-13	2.044E-13	2.035E-13
NP239	1.828E-02	1.608E-10	1.603E-10	1.603E-10	1.603E-10	1.603E-10	1.603E-10	1.603E-10	1.603E-10
NP240M	2.781E-08	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21
PU236	1.272E-07	1.036E-07	3.441E-11	2.708E-11	2.134E-11	1.683E-11	1.330E-11	1.053E-11	8.357E-12
PU237	6.793E-08	2.637E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	3.854E-02	4.145E-02	3.194E-02	3.169E-02	3.144E-02	3.119E-02	3.095E-02	3.070E-02	3.046E-02
PU239	3.438E-01	3.622E-01	3.619E-01	3.619E-01	3.619E-01	3.618E-01	3.618E-01	3.618E-01	3.618E-01

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sbwal5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:26

	3336.0HR	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
PU240	5.082E-02	5.082E-02	5.065E-02	5.065E-02	5.064E-02	5.064E-02	5.063E-02	5.063E-02	5.062E-02
PU241	3.379E-02	3.220E-02	6.577E-03	6.268E-03	5.973E-03	5.692E-03	5.425E-03	5.170E-03	4.927E-03
PU242	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03
PU243	2.293E-06	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22
PU244	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08
PU246	8.022E-14	5.896E-24	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28
AM241	1.437E-04	1.730E-03	2.643E-02	2.670E-02	2.695E-02	2.719E-02	2.741E-02	2.762E-02	2.782E-02
AM242M	1.302E-06	1.296E-06	1.115E-06	1.110E-06	1.105E-06	1.100E-06	1.095E-06	1.090E-06	1.085E-06
AM242	8.587E-07	1.551E-11	1.334E-11	1.328E-11	1.322E-11	1.316E-11	1.310E-11	1.304E-11	1.298E-11
AM243	1.849E-04	1.872E-04	1.866E-04	1.866E-04	1.865E-04	1.865E-04	1.865E-04	1.865E-04	1.865E-04
AM245	1.478E-12	3.179E-24	1.460E-35	1.460E-35	1.460E-35	1.460E-35	1.460E-35	1.460E-35	1.460E-35
AM246	1.284E-16	9.449E-27	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31
CM241	1.223E-12	1.079E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	1.837E-05	4.047E-06	2.698E-09	2.688E-09	2.677E-09	2.665E-09	2.653E-09	2.641E-09	2.629E-09
CM243	1.435E-07	1.400E-07	6.275E-08	6.124E-08	5.977E-08	5.834E-08	5.693E-08	5.557E-08	5.423E-08
CM244	1.547E-05	1.493E-05	4.221E-06	4.062E-06	3.910E-06	3.763E-06	3.622E-06	3.486E-06	3.355E-06
CM245	2.945E-07	2.945E-07	2.937E-07	2.937E-07	2.936E-07	2.936E-07	2.936E-07	2.936E-07	2.935E-07
CM246	8.884E-09	8.882E-09	8.840E-09	8.838E-09	8.837E-09	8.836E-09	8.834E-09	8.833E-09	8.832E-09
CM247	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11
CM248	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13
CM249	1.288E-17	4.059E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21
BK249	1.811E-15	8.267E-16	3.797E-27	3.797E-27	3.797E-27	3.797E-27	3.797E-27	3.797E-27	3.797E-27
BK250	5.705E-18	7.472E-27	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30
CF249	3.487E-17	1.030E-15	1.742E-15	1.738E-15	1.735E-15	1.731E-15	1.728E-15	1.725E-15	1.721E-15
CF250	2.228E-16	2.167E-16	3.771E-17	3.577E-17	3.392E-17	3.217E-17	3.051E-17	2.893E-17	2.744E-17
CF251	4.585E-17	4.582E-17	4.467E-17	4.463E-17	4.460E-17	4.456E-17	4.453E-17	4.449E-17	4.446E-17
CF252	6.911E-18	5.314E-18	9.114E-22	7.034E-22	5.186E-22	3.823E-22	2.819E-22	2.078E-22	1.532E-22
CF253	7.898E-21	5.307E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	1.021E-22	1.456E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	1.720E-21	2.245E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	3.901E-23	3.188E-24	2.202E-37	2.202E-37	2.202E-37	2.202E-37	2.202E-37	2.202E-37	2.202E-37
ES255	0.000E+00	6.054E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	2.713E-13	3.080E-12	4.684E-11	4.786E-11	4.887E-11	4.986E-11	5.084E-11	5.181E-11	5.277E-11
H 3	8.201E-05	7.753E-05	1.216E-05	1.150E-05	1.087E-05	1.028E-05	9.717E-06	9.187E-06	8.685E-06
LI 6	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07
LI 7	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08
BE 9	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08
BE 10	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07
C 14	4.556E-08	4.556E-08	4.538E-08	4.537E-08	4.537E-08	4.536E-08	4.536E-08	4.535E-08	4.534E-08
ZN 66	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11
ZN 67	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12
ZN 68	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14
GA 69	8.549E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18
GE 70	9.226E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21
GA 71	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09
GE 72	1.264E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05
GE 73	4.483E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05
GE 74	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04
AS 75	2.891E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
GE 76	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04
SE 76	2.760E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06
SE 77	1.904E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03
SE 78	4.077E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03
SE 79	1.048E-02	1.048E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02
BR 79	2.177E-08	1.336E-07	3.822E-06	3.934E-06	4.045E-06	4.157E-06	4.269E-06	4.381E-06	4.492E-06
SE 80	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
KR 80	1.252E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07
BR 81	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02
KR 81	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09
SE 82	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02
KR 82	3.453E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04
KR 83	1.024E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01
KR 84	2.257E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01
KR 85	5.678E-02	5.333E-02	6.314E-03	5.918E-03	5.548E-03	5.201E-03	4.875E-03	4.570E-03	4.284E-03
RB 85	2.135E-01	2.175E-01	2.645E-01	2.649E-01	2.652E-01	2.656E-01	2.659E-01	2.662E-01	2.665E-01
KR 86	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01
RB 86	7.830E-05	1.001E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	1.626E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04
RB 87	5.599E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01
SR 87	9.284E-07	9.289E-07	9.291E-07	9.291E-07	9.291E-07	9.292E-07	9.292E-07	9.292E-07	9.292E-07
SR 88	8.062E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01
SR 89	4.726E-01	3.142E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.923E-01	1.062E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00
SR 90	1.282E+00	1.252E+00	5.708E-01	5.574E-01	5.443E-01	5.315E-01	5.190E-01	5.068E-01	4.948E-01

Appendix D-2
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sbwal5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:26

	3336.0HR	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
Y 90	3.345E-04	3.140E-04	1.431E-04	1.398E-04	1.365E-04	1.333E-04	1.301E-04	1.271E-04	1.241E-04
ZR 90	7.754E-03	3.793E-02	7.193E-01	7.327E-01	7.459E-01	7.587E-01	7.712E-01	7.834E-01	7.953E-01
Y 91	6.460E-01	8.605E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.788E-01	1.322E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00
ZR 92	1.378E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00
NB 92	2.982E-15	4.493E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.490E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00
NB 93	9.491E-09	6.571E-08	1.276E-05	1.333E-05	1.390E-05	1.448E-05	1.506E-05	1.565E-05	1.625E-05
NB 93M	1.244E-07	7.462E-07	1.043E-05	1.054E-05	1.064E-05	1.074E-05	1.083E-05	1.092E-05	1.101E-05
ZR 94	1.474E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00
NB 94	2.129E-07	2.129E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07	2.127E-07
ZR 95	7.839E-01	1.499E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.263E-01	1.845E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	3.076E-04	6.273E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	4.072E-01	1.485E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00
ZR 96	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00
MO 96	6.211E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03
MO 97	1.415E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00
MO 98	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00
TC 98	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06
TC 99	1.384E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00
RU 99	8.587E-07	5.510E-06	1.590E-04	1.636E-04	1.683E-04	1.729E-04	1.776E-04	1.823E-04	1.869E-04
MO100	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00
RU100	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02
RU101	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00
RU102	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00
RH102	2.949E-07	2.322E-07	8.717E-11	6.864E-11	5.405E-11	4.256E-11	3.351E-11	2.638E-11	2.078E-11
RU103	3.008E-01	4.770E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.468E-01	7.474E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01
RH103M	2.690E-04	4.274E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	5.001E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01
PD104	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02
PD105	2.413E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01
RU106	1.005E-01	5.052E-02	7.051E-12	3.545E-12	1.782E-12	8.961E-13	4.505E-13	2.265E-13	1.139E-13
RH106	1.760E-07	4.748E-08	6.628E-18	3.332E-18	1.675E-18	8.423E-19	4.234E-19	2.129E-19	1.070E-19
PD106	4.584E-02	9.581E-02	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01
AG106	2.945E-16	3.417E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	5.378E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02
AG107	1.065E-09	6.804E-09	1.962E-07	2.020E-07	2.077E-07	2.134E-07	2.192E-07	2.249E-07	2.307E-07
PD108	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02
AG108	8.176E-13	6.265E-20	5.232E-20	5.204E-20	5.176E-20	5.147E-20	5.119E-20	5.092E-20	5.064E-20
AG108M	1.995E-11	1.984E-11	1.657E-11	1.648E-11	1.639E-11	1.630E-11	1.621E-11	1.612E-11	1.604E-11
CD108	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08
AG109	1.170E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02
AG109M	7.844E-08	7.284E-18	1.103E-25	6.393E-26	3.704E-26	2.147E-26	1.245E-26	7.217E-27	4.185E-27
CD109	1.273E-11	7.375E-12	1.117E-19	6.472E-20	3.750E-20	2.173E-20	1.260E-20	7.306E-21	4.236E-21
PD110	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03
AG110	1.553E-08	5.853E-13	1.766E-27	6.413E-28	2.329E-28	8.462E-29	3.072E-29	1.111E-29	4.105E-30
AG110M	1.064E-04	3.862E-05	1.166E-19	4.232E-20	1.537E-20	5.584E-21	2.020E-21	7.308E-22	2.709E-22
CD110	2.315E-03	2.383E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03
AG111	5.944E-04	1.040E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	6.904E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03
CD112	5.522E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03
CD113	1.687E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04	1.796E-04
CD113M	1.074E-04	1.026E-04	2.138E-05	2.039E-05	1.944E-05	1.854E-05	1.768E-05	1.686E-05	1.608E-05
IN113	9.379E-07	5.923E-06	8.702E-05	8.801E-05	8.896E-05	8.986E-05	9.072E-05	9.154E-05	9.232E-05
CD114	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02
IN114	4.456E-13	5.769E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	5.960E-09	3.587E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.438E-08	1.986E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08
CD115M	1.678E-04	5.744E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	2.821E-03	3.092E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03
IN115M	7.995E-06	1.622E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.522E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04
CD116	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03
SN116	1.476E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03
SN117	4.833E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03
SN117M	2.525E-07	3.559E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	5.399E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03
SN119	5.103E-03	5.145E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03
SN119M	6.368E-05	2.266E-05	3.523E-20	1.254E-20	4.467E-21	1.583E-21	5.610E-22	2.043E-22	6.470E-23
SN120	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03
SN121M	2.696E-06	2.658E-06	1.682E-06	1.659E-06	1.636E-06	1.614E-06	1.591E-06	1.569E-06	1.548E-06
SB121	5.536E-03	5.602E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03	5.603E-03
SN122	6.068E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03
TE122	1.234E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04

Appendix D-2
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sbwal5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:26

	3336.0HR	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
SN123	1.237E-03	1.742E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	5.902E-03	6.966E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03
TE123	5.000E-07	6.733E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07
TE123M	1.972E-07	2.377E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03
SB124	8.410E-05	1.254E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	4.714E-05	1.300E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04
SN125	4.835E-04	1.900E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	1.150E-02	9.331E-03	2.418E-06	1.883E-06	1.466E-06	1.141E-06	8.887E-07	6.919E-07	5.387E-07
TE125	4.613E-04	3.062E-03	1.252E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02
TE125M	7.717E-05	1.294E-04	3.382E-08	2.633E-08	2.050E-08	1.596E-08	1.243E-08	9.678E-09	7.536E-09
SN126	2.296E-02	2.296E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02
SB126	4.889E-05	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.091E-09	1.090E-09	1.090E-09
SB126M	2.298E-08	8.293E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12
TE126	4.501E-04	4.992E-04	5.044E-04	5.046E-04	5.048E-04	5.049E-04	5.051E-04	5.052E-04	5.054E-04
TE127	1.946E-04	1.662E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.548E-03	4.746E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	4.416E-02	5.048E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02
XE127	4.707E-09	4.499E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.283E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01
XE128	8.405E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04
TE129	1.085E-04	5.413E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.077E-02	5.781E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.179E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01
XE129	1.824E-05	1.857E-05	1.890E-05	1.891E-05	1.892E-05	1.893E-05	1.894E-05	1.895E-05	1.897E-05
XE129M	3.186E-07	5.746E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.927E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01
XE130	2.935E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03
I131	7.727E-02	1.679E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	7.688E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01
XE131M	1.274E-03	2.289E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.478E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00
CS132	7.674E-07	7.997E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	9.137E-08	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07
XE133	1.131E-01	1.533E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	2.008E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00
XE134	2.597E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00
CS134	9.815E-02	7.015E-02	1.067E-06	7.625E-07	5.448E-07	3.893E-07	2.781E-07	1.987E-07	1.420E-07
BA134	3.828E-03	3.186E-02	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01
CS135	2.870E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01
BA135	7.450E-06	7.566E-06	1.049E-05	1.058E-05	1.067E-05	1.075E-05	1.084E-05	1.093E-05	1.102E-05
XE136	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00
CS136	9.521E-04	3.861E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	4.044E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03
BA136M	4.269E-11	1.731E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	2.090E+00	2.043E+00	9.530E-01	9.312E-01	9.099E-01	8.891E-01	8.688E-01	8.490E-01	8.296E-01
BA137	9.414E-03	5.716E-02	1.147E+00	1.169E+00	1.190E+00	1.211E+00	1.231E+00	1.251E+00	1.270E+00
BA137M	3.215E-07	3.125E-07	1.458E-07	1.425E-07	1.392E-07	1.360E-07	1.329E-07	1.299E-07	1.269E-07
BA138	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00
LA138	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05
LA139	2.236E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
BA140	2.835E-01	7.169E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	3.751E-02	1.081E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.916E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
CE141	6.551E-01	2.734E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.407E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00
CE142	2.099E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00
ND142	7.029E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03
PR143	2.819E-01	2.473E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.620E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00
CE144	1.653E+00	6.784E-01	1.167E-13	4.790E-14	1.966E-14	8.067E-15	3.311E-15	1.359E-15	5.576E-16
PR144	7.401E-05	2.865E-05	4.928E-18	2.023E-18	8.300E-19	3.406E-19	1.398E-19	5.737E-20	2.355E-20
PR144M	3.496E-07	1.432E-07	2.464E-20	1.011E-20	4.149E-21	1.703E-21	6.988E-22	2.868E-22	1.177E-22
ND144	4.966E-01	1.471E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00
ND145	1.360E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00
ND146	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00
PM146	5.779E-06	5.095E-06	7.961E-08	7.018E-08	6.187E-08	5.455E-08	4.809E-08	4.239E-08	3.737E-08
SM146	4.668E-07	7.200E-07	2.576E-06	2.579E-06	2.582E-06	2.585E-06	2.587E-06	2.589E-06	2.591E-06
ND147	9.263E-02	1.062E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	5.263E-01	4.761E-01	7.782E-05	5.975E-05	4.588E-05	3.523E-05	2.705E-05	2.077E-05	1.594E-05
SM147	2.518E-02	1.691E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01
ND148	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01
PM148	8.968E-03	8.979E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	5.632E-03	1.226E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	8.010E-02	9.469E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02
SM149	1.030E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02

Appendix D-2
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sbwal5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:26

	3336.0HR	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
ND150	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01
SM150	4.608E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01
EU150	9.551E-11	9.369E-11	4.963E-11	4.868E-11	4.775E-11	4.684E-11	4.595E-11	4.507E-11	4.421E-11
SM151	2.818E-02	2.990E-02	2.319E-02	2.301E-02	2.283E-02	2.266E-02	2.249E-02	2.231E-02	2.214E-02
EU151	1.477E-05	2.460E-04	6.957E-03	7.135E-03	7.311E-03	7.486E-03	7.660E-03	7.833E-03	8.004E-03
SM152	1.801E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01
EU152	2.937E-05	2.791E-05	5.192E-06	4.934E-06	4.689E-06	4.456E-06	4.234E-06	4.024E-06	3.824E-06
GD152	9.600E-06	1.010E-05	1.643E-05	1.650E-05	1.657E-05	1.663E-05	1.669E-05	1.675E-05	1.681E-05
EU153	1.097E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
GD153	5.460E-06	1.918E-06	1.952E-21	6.826E-22	2.458E-22	7.627E-23	3.822E-23	1.915E-23	0.000E+00
SM154	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02
EU154	2.119E-02	1.955E-02	1.368E-03	1.262E-03	1.164E-03	1.074E-03	9.907E-04	9.140E-04	8.432E-04
GD154	1.908E-04	1.831E-03	2.001E-02	2.012E-02	2.021E-02	2.030E-02	2.039E-02	2.046E-02	2.053E-02
EU155	8.968E-03	7.800E-03	7.744E-05	6.734E-05	5.855E-05	5.092E-05	4.427E-05	3.850E-05	3.348E-05
GD155	1.779E-05	1.188E-03	8.911E-03	8.921E-03	8.930E-03	8.937E-03	8.944E-03	8.950E-03	8.955E-03
EU156	4.301E-03	2.485E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	1.391E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02
GD157	5.689E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05
GD158	6.091E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03
TB159	5.677E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04
GD160	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04
TB160	2.147E-05	6.472E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	8.770E-06	2.959E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05
TB161	5.996E-06	7.753E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	4.991E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05
DY162	3.436E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05
DY163	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05
DY164	4.678E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06
HO165	4.824E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06
HO166M	2.011E-08	2.010E-08	1.972E-08	1.971E-08	1.970E-08	1.969E-08	1.968E-08	1.966E-08	1.965E-08
ER166	1.453E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06
ER167	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07
ER168	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07
ER169	2.695E-10	5.415E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	7.180E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10
ER170	1.271E-14	9.427E-14	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13
TM170	6.493E-11	9.065E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	8.603E-12	6.439E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11
TM171	1.965E-12	1.370E-12	9.176E-18	6.396E-18	4.458E-18	3.107E-18	2.165E-18	1.509E-18	1.052E-18
YB171	1.371E-13	7.327E-13	2.103E-12	2.103E-12	2.103E-12	2.103E-12	2.103E-12	2.103E-12	2.103E-12
YB172	9.830E-15	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14

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File SBWAL6.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) MTR
  BAS     ONE MTR ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE MTR ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP     400.0   .4065  1   2   3 2
  IRP     800.0   .4065  2   3   3 0
  IRP    1600.0   .4065  3   4   3 0
  IRP    2000.0   .4065  4   5   3 0
  IRP    3100.0   .4065  5   6   3 0
  IRP    3336.0   .4065  6   7   3 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC      1.0    1   2   5   4
  DEC     41.0    2   3   5   0
  DEC     42.0    3   4   5   0
  DEC     43.0    4   5   5   0
  DEC     44.0    5   6   5   0
  DEC     45.0    6   7   5   0
  DEC     46.0    7   8   5   0
  DEC     47.0    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340  2.317 922350   200. 922360  .4343  922380  11.53 FUEL 93.3%
  0
```

Appendix D-2
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File SBWAL6.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwal6.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwal6.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out sbwal6.u6 >nul
copy tape13.out+tape11.out sbwal6.u11 >nul
ren tape7.out sbwal6.pch
ren tape15.out sbwal6.dbg
ren tape16.out sbwal6.vxs
ren tape50.out sbwal6.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

Appendix D-2
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sbwal6.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:29

	3336.0HR	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
HE 4	5.756E-07	6.753E-06	2.309E-04	2.361E-04	2.412E-04	2.462E-04	2.512E-04	2.563E-04	2.612E-04
TL206	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32	2.662E-32
TL207	1.122E-19	2.492E-18	5.992E-16	6.236E-16	6.469E-16	6.705E-16	6.944E-16	7.184E-16	7.427E-16
TL208	2.197E-16	1.654E-15	5.575E-15	5.542E-15	5.489E-15	5.436E-15	5.384E-15	5.333E-15	5.282E-15
TL209	2.473E-21	1.203E-21	2.521E-20	2.599E-20	2.677E-20	2.757E-20	2.837E-20	2.918E-20	3.000E-20
PB206	1.059E-18	1.243E-16	5.485E-11	6.000E-11	6.540E-11	7.114E-11	7.724E-11	8.372E-11	9.059E-11
PB207	7.884E-16	8.919E-14	7.200E-10	7.668E-10	8.154E-10	8.657E-10	9.179E-10	9.719E-10	1.028E-09
PB208	8.944E-12	3.252E-10	8.424E-08	8.608E-08	8.790E-08	8.971E-08	9.149E-08	9.326E-08	9.502E-08
PB209	1.031E-17	5.011E-18	1.051E-16	1.083E-16	1.116E-16	1.149E-16	1.182E-16	1.216E-16	1.250E-16
PB210	3.456E-15	1.336E-14	1.655E-10	1.766E-10	1.882E-10	2.002E-10	2.127E-10	2.256E-10	2.390E-10
PB211	8.682E-19	1.928E-17	4.635E-15	4.824E-15	5.005E-15	5.187E-15	5.372E-15	5.558E-15	5.745E-15
PB212	1.296E-13	9.757E-13	3.288E-12	3.269E-12	3.237E-12	3.206E-12	3.176E-12	3.145E-12	3.115E-12
PB214	1.019E-19	1.354E-18	1.204E-15	1.263E-15	1.323E-15	1.385E-15	1.448E-15	1.512E-15	1.578E-15
BI208	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21	1.851E-21
BI209	1.851E-15	1.092E-14	3.710E-12	3.906E-12	4.108E-12	4.316E-12	4.530E-12	4.751E-12	4.978E-12
BI210M	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20	1.026E-20
BI210	1.842E-18	8.224E-18	1.018E-13	1.087E-13	1.159E-13	1.233E-13	1.309E-13	1.389E-13	1.471E-13
BI211	5.122E-20	1.137E-18	2.735E-16	2.846E-16	2.953E-16	3.061E-16	3.169E-16	3.279E-16	3.390E-16
BI212	1.229E-14	9.256E-14	3.119E-13	3.101E-13	3.071E-13	3.042E-13	3.012E-13	2.984E-13	2.955E-13
BI213	2.421E-18	1.177E-18	2.469E-17	2.544E-17	2.621E-17	2.699E-17	2.777E-17	2.857E-17	2.937E-17
BI214	7.566E-20	1.005E-18	8.941E-16	9.377E-16	9.824E-16	1.028E-15	1.075E-15	1.123E-15	1.171E-15
PO210	7.703E-18	1.312E-16	2.813E-12	2.885E-12	3.057E-12	3.252E-12	3.457E-12	3.670E-12	3.890E-12
PO211	6.285E-25	1.395E-23	3.355E-21	3.492E-21	3.623E-21	3.755E-21	3.889E-21	4.023E-21	4.159E-21
PO212	6.504E-25	4.897E-24	1.650E-23	1.640E-23	1.625E-23	1.609E-23	1.594E-23	1.579E-23	1.563E-23
PO213	3.633E-27	1.766E-27	3.704E-26	3.817E-26	3.932E-26	4.049E-26	4.167E-26	4.286E-26	4.407E-26
PO214	2.030E-25	1.383E-25	1.230E-22	1.290E-22	1.352E-22	1.414E-22	1.479E-22	1.544E-22	1.612E-22
PO215	7.266E-25	1.614E-23	3.881E-21	4.039E-21	4.191E-21	4.344E-21	4.498E-21	4.654E-21	4.811E-21
PO216	5.172E-19	3.894E-18	1.312E-17	1.304E-17	1.292E-17	1.279E-17	1.267E-17	1.255E-17	1.243E-17
PO218	1.182E-20	1.570E-19	1.396E-16	1.464E-16	1.534E-16	1.606E-16	1.679E-16	1.753E-16	1.829E-16
AT217	2.909E-23	1.415E-23	2.966E-22	3.057E-22	3.149E-22	3.242E-22	3.337E-22	3.432E-22	3.529E-22
RN218	4.180E-23	2.164E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.647E-21	3.658E-20	8.795E-18	9.154E-18	9.497E-18	9.843E-18	1.019E-17	1.055E-17	1.090E-17
RN220	1.952E-16	1.470E-15	4.954E-15	4.924E-15	4.877E-15	4.830E-15	4.784E-15	4.738E-15	4.693E-15
RN222	2.172E-17	2.887E-16	2.567E-13	2.692E-13	2.821E-13	2.952E-13	3.086E-13	3.223E-13	3.363E-13
FR221	2.642E-19	1.285E-19	2.693E-18	2.776E-18	2.860E-18	2.944E-18	3.030E-18	3.117E-18	3.205E-18
FR223	1.599E-20	1.697E-19	4.082E-17	4.239E-17	4.398E-17	4.559E-17	4.721E-17	4.884E-17	5.049E-17
RA222	4.621E-20	2.392E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	4.183E-16	9.292E-15	2.234E-12	2.325E-12	2.412E-12	2.500E-12	2.589E-12	2.679E-12	2.769E-12
RA224	1.131E-12	8.512E-12	2.868E-11	2.851E-11	2.824E-11	2.797E-11	2.770E-11	2.744E-11	2.717E-11
RA225	1.576E-15	5.808E-16	1.218E-14	1.255E-14	1.293E-14	1.331E-14	1.370E-14	1.409E-14	1.449E-14
RA226	3.592E-12	4.491E-11	3.994E-08	4.188E-08	4.388E-08	4.592E-08	4.801E-08	5.014E-08	5.232E-08
RA228	4.739E-19	1.274E-17	5.604E-15	5.779E-15	5.953E-15	6.128E-15	6.304E-15	6.479E-15	6.655E-15
AC225	8.067E-16	3.923E-16	8.226E-15	8.478E-15	8.734E-15	8.993E-15	9.255E-15	9.520E-15	9.788E-15
AC227	6.195E-13	6.577E-12	1.582E-09	1.643E-09	1.704E-09	1.766E-09	1.829E-09	1.893E-09	1.956E-09
AC228	7.721E-16	1.329E-21	5.850E-19	6.032E-19	6.215E-19	6.398E-19	6.580E-19	6.764E-19	6.947E-19
TH226	2.303E-18	1.192E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	9.385E-16	1.527E-14	3.671E-12	3.821E-12	3.964E-12	4.109E-12	4.255E-12	4.402E-12	4.551E-12
TH228	2.352E-10	1.653E-09	5.574E-09	5.521E-09	5.468E-09	5.416E-09	5.364E-09	5.312E-09	5.261E-09
TH229	6.913E-11	1.070E-10	2.244E-09	2.313E-09	2.383E-09	2.453E-09	2.525E-09	2.597E-09	2.670E-09
TH230	2.025E-06	7.319E-06	2.197E-04	2.250E-04	2.304E-04	2.357E-04	2.410E-04	2.463E-04	2.517E-04
TH231	5.690E-09	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10	5.232E-10
TH232	7.520E-08	4.528E-07	1.556E-05	1.593E-05	1.631E-05	1.669E-05	1.707E-05	1.744E-05	1.782E-05
TH234	1.577E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10	1.583E-10
PA231	2.238E-07	3.541E-07	5.335E-06	5.460E-06	5.585E-06	5.710E-06	5.835E-06	5.960E-06	6.085E-06
PA233	9.454E-09	1.885E-08	1.889E-08	1.889E-08	1.889E-08	1.890E-08	1.890E-08	1.890E-08	1.890E-08
PA234M	1.507E-14	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15	5.338E-15
PA234	3.338E-12	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15	2.384E-15
U230	2.263E-15	1.171E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.712E-07	1.994E-07	2.078E-07	2.058E-07	2.038E-07	2.019E-07	1.999E-07	1.980E-07	1.961E-07
U233	8.724E-06	8.910E-06	1.598E-05	1.618E-05	1.637E-05	1.657E-05	1.677E-05	1.696E-05	1.716E-05
U234	1.900E+00	1.900E+00	1.911E+00	1.911E+00	1.912E+00	1.912E+00	1.912E+00	1.912E+00	1.912E+00
U235	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02	1.287E+02
U236	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01	1.298E+01
U237	8.333E-02	9.971E-10	1.454E-10	1.385E-10	1.320E-10	1.258E-10	1.199E-10	1.143E-10	1.089E-10
U238	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01	1.090E+01
U240	2.879E-08	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18	1.137E-18
NP235	4.704E-09	2.482E-09	1.952E-20	1.032E-20	5.453E-21	2.882E-21	1.503E-21	7.839E-22	4.089E-22
NP236	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07	2.075E-07
NP237	4.716E-01	5.549E-01	5.562E-01	5.562E-01	5.562E-01	5.563E-01	5.563E-01	5.564E-01	5.564E-01
NP238	3.220E-03	2.431E-13	2.026E-13	2.016E-13	2.007E-13	1.998E-13	1.989E-13	1.980E-13	1.971E-13
NP239	1.828E-02	1.608E-10	1.602E-10	1.602E-10	1.602E-10	1.602E-10	1.602E-10	1.602E-10	1.601E-10
NP240M	2.781E-08	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21	9.947E-21
PU236	1.272E-07	1.036E-07	6.653E-12	5.317E-12	4.269E-12	3.448E-12	2.804E-12	2.298E-12	1.902E-12
PU237	6.793E-08	2.637E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	3.854E-02	4.145E-02	3.022E-02	2.998E-02	2.975E-02	2.951E-02	2.928E-02	2.905E-02	2.882E-02
PU239	3.438E-01	3.622E-01	3.618E-01	3.618E-01	3.618E-01	3.618E-01	3.618E-01	3.618E-01	3.617E-01

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sbwal6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:29

	3336.0HR	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
PU240	5.082E-02	5.082E-02	5.062E-02	5.061E-02	5.061E-02	5.060E-02	5.060E-02	5.059E-02	5.059E-02
PU241	3.379E-02	3.220E-02	4.695E-03	4.475E-03	4.264E-03	4.064E-03	3.873E-03	3.691E-03	3.517E-03
PU242	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03	2.970E-03
PU243	2.293E-06	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22	8.746E-22
PU244	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08	5.945E-08
PU246	8.022E-14	5.896E-24	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28	5.678E-28
AM241	1.437E-04	1.730E-03	2.801E-02	2.819E-02	2.835E-02	2.850E-02	2.865E-02	2.879E-02	2.891E-02
AM242M	1.302E-06	1.296E-06	1.080E-06	1.075E-06	1.070E-06	1.066E-06	1.061E-06	1.056E-06	1.051E-06
AM242	8.587E-07	1.551E-11	1.292E-11	1.286E-11	1.281E-11	1.275E-11	1.269E-11	1.263E-11	1.257E-11
AM243	1.849E-04	1.872E-04	1.865E-04	1.864E-04	1.864E-04	1.864E-04	1.864E-04	1.864E-04	1.864E-04
AM245	1.478E-12	3.179E-24	5.747E-38	5.906E-38	5.906E-38	5.906E-38	5.906E-38	5.906E-38	5.906E-38
AM246	1.284E-16	9.449E-27	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31	9.086E-31
CM241	1.223E-12	1.079E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	1.837E-05	4.047E-06	2.613E-09	2.604E-09	2.593E-09	2.581E-09	2.569E-09	2.558E-09	2.546E-09
CM243	1.435E-07	1.400E-07	5.293E-08	5.166E-08	5.042E-08	4.920E-08	4.802E-08	4.687E-08	4.574E-08
CM244	1.547E-05	1.493E-05	3.229E-06	3.108E-06	2.991E-06	2.879E-06	2.770E-06	2.666E-06	2.566E-06
CM245	2.945E-07	2.945E-07	2.935E-07	2.935E-07	2.935E-07	2.934E-07	2.934E-07	2.934E-07	2.934E-07
CM246	8.884E-09	8.882E-09	8.830E-09	8.829E-09	8.828E-09	8.827E-09	8.825E-09	8.824E-09	8.823E-09
CM247	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11	2.453E-11
CM248	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13	3.856E-13
CM249	1.288E-17	4.059E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21	1.352E-21
BK249	1.811E-15	8.267E-16	1.494E-29	1.494E-29	1.494E-29	1.494E-29	1.494E-29	1.494E-29	1.494E-29
BK250	5.705E-18	7.472E-27	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30	3.999E-30
CF249	3.487E-17	1.030E-15	1.718E-15	1.714E-15	1.711E-15	1.708E-15	1.704E-15	1.701E-15	1.698E-15
CF250	2.228E-16	2.167E-16	2.602E-17	2.468E-17	2.341E-17	2.220E-17	2.105E-17	1.997E-17	1.894E-17
CF251	4.585E-17	4.582E-17	4.443E-17	4.439E-17	4.436E-17	4.432E-17	4.429E-17	4.426E-17	4.422E-17
CF252	6.911E-18	5.314E-18	1.449E-22	1.068E-22	7.873E-23	7.873E-23	7.873E-23	7.873E-23	7.873E-23
CF253	7.898E-21	5.307E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	1.021E-22	1.456E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	1.720E-21	2.245E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	3.901E-23	3.188E-24	3.559E-40	3.559E-40	3.559E-40	3.559E-40	3.559E-40	3.559E-40	3.559E-40
ES255	0.000E+00	6.054E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	2.713E-13	3.080E-12	5.372E-11	5.466E-11	5.559E-11	5.651E-11	5.742E-11	5.832E-11	5.921E-11
H 3	8.201E-05	7.753E-05	8.211E-06	7.763E-06	7.339E-06	6.939E-06	6.560E-06	6.202E-06	5.863E-06
LI 6	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07	5.354E-07
LI 7	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08	1.753E-08
BE 9	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08	3.378E-08
BE 10	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07	2.253E-07
C 14	4.556E-08	4.556E-08	4.534E-08	4.533E-08	4.533E-08	4.532E-08	4.532E-08	4.531E-08	4.531E-08
ZN 66	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11	8.945E-11
ZN 67	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12	3.967E-12
ZN 68	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14
GA 69	8.549E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18	8.573E-18
GE 70	9.226E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21	9.233E-21
GA 71	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09	1.020E-09
GE 72	1.264E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05	1.297E-05
GE 73	4.483E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05	4.492E-05
GE 74	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04	1.192E-04
AS 75	2.891E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
GE 76	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04	8.729E-04
SE 76	2.760E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06	2.833E-06
SE 77	1.904E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03	1.939E-03
SE 78	4.077E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03	4.082E-03
SE 79	1.048E-02	1.048E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02	1.047E-02
BR 79	2.177E-08	1.336E-07	4.604E-06	4.716E-06	4.828E-06	4.939E-06	5.051E-06	5.163E-06	5.274E-06
SE 80	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02	2.522E-02
KR 80	1.252E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07	1.253E-07
BR 81	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02	4.296E-02
KR 81	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09	2.246E-09
SE 82	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02	6.824E-02
KR 82	3.453E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04	3.570E-04
KR 83	1.024E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01	1.026E-01
KR 84	2.257E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01	2.258E-01
KR 85	5.678E-02	5.333E-02	4.015E-03	3.764E-03	3.528E-03	3.307E-03	3.100E-03	2.906E-03	2.724E-03
RB 85	2.135E-01	2.175E-01	2.668E-01	2.670E-01	2.673E-01	2.675E-01	2.677E-01	2.679E-01	2.681E-01
KR 86	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01	4.329E-01
RB 86	7.830E-05	1.001E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	1.626E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04	2.409E-04
RB 87	5.599E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01	5.602E-01
SR 87	9.284E-07	9.289E-07	9.292E-07	9.292E-07	9.292E-07	9.292E-07	9.292E-07	9.292E-07	9.292E-07
SR 88	8.062E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01	8.073E-01
SR 89	4.726E-01	3.142E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.923E-01	1.062E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00	1.065E+00
SR 90	1.282E+00	1.252E+00	4.832E-01	4.718E-01	4.607E-01	4.499E-01	4.393E-01	4.290E-01	4.189E-01

Appendix D-2
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sbwal6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:29

	3336.0HR	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
Y 90	3.345E-04	3.140E-04	1.212E-04	1.183E-04	1.155E-04	1.128E-04	1.102E-04	1.076E-04	1.050E-04
ZR 90	7.754E-03	3.793E-02	8.069E-01	8.183E-01	8.294E-01	8.402E-01	8.508E-01	8.612E-01	8.713E-01
Y 91	6.460E-01	8.605E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.788E-01	1.322E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00	1.330E+00
ZR 92	1.378E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00	1.382E+00
NB 92	2.982E-15	4.493E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.490E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00	1.496E+00
NB 93	9.491E-09	6.571E-08	1.684E-05	1.744E-05	1.805E-05	1.866E-05	1.927E-05	1.988E-05	2.050E-05
NB 93M	1.244E-07	7.462E-07	1.109E-05	1.117E-05	1.124E-05	1.131E-05	1.138E-05	1.144E-05	1.150E-05
ZR 94	1.474E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00	1.475E+00
NB 94	2.129E-07	2.129E-07	2.127E-07	2.126E-07	2.126E-07	2.126E-07	2.126E-07	2.126E-07	2.126E-07
ZR 95	7.839E-01	1.499E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.263E-01	1.845E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	3.076E-04	6.273E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	4.072E-01	1.485E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00	1.518E+00
ZR 96	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00	1.513E+00
MO 96	6.211E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03	6.241E-03
MO 97	1.415E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00	1.426E+00
MO 98	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00	1.438E+00
TC 98	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06	3.038E-06
TC 99	1.384E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00	1.429E+00
RU 99	8.587E-07	5.510E-06	1.916E-04	1.962E-04	2.009E-04	2.055E-04	2.102E-04	2.148E-04	2.195E-04
MO100	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00	1.576E+00
RU100	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02	6.982E-02
RU101	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00	1.271E+00
RU102	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00	1.099E+00
RH102	2.949E-07	2.322E-07	1.636E-11	1.288E-11	1.014E-11	7.986E-12	6.288E-12	4.951E-12	3.899E-12
RU103	3.008E-01	4.770E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.468E-01	7.474E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01	7.479E-01
RH103M	2.690E-04	4.274E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	5.001E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01	5.002E-01
PD104	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02	6.518E-02
PD105	2.413E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01	2.455E-01
RU106	1.005E-01	5.052E-02	5.725E-14	2.878E-14	1.447E-14	7.275E-15	3.658E-15	1.839E-15	9.245E-16
RH106	1.760E-07	4.748E-08	5.381E-20	2.705E-20	1.360E-20	6.838E-21	3.438E-21	1.729E-21	8.690E-22
PD106	4.584E-02	9.581E-02	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01	1.463E-01
AG106	2.945E-16	3.417E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	5.378E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02	5.379E-02
AG107	1.065E-09	6.804E-09	2.364E-07	2.421E-07	2.479E-07	2.536E-07	2.594E-07	2.651E-07	2.708E-07
PD108	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02	2.654E-02
AG108	8.176E-13	6.265E-20	5.036E-20	5.009E-20	4.982E-20	4.955E-20	4.928E-20	4.901E-20	4.874E-20
AG108M	1.995E-11	1.984E-11	1.595E-11	1.586E-11	1.578E-11	1.569E-11	1.561E-11	1.552E-11	1.544E-11
CD108	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08	2.064E-08
AG109	1.170E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02	1.180E-02
AG109M	7.844E-08	7.284E-18	2.421E-27	1.403E-27	8.082E-28	4.656E-28	2.683E-28	1.609E-28	9.707E-29
CD109	1.273E-11	7.375E-12	2.451E-21	1.412E-21	8.135E-22	4.687E-22	2.700E-22	1.629E-22	9.827E-23
PD110	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03	9.529E-03
AG110	1.553E-08	5.853E-13	1.469E-30	5.333E-31	2.400E-31	8.715E-32	0.000E+00	0.000E+00	0.000E+00
AG110M	1.064E-04	3.862E-05	9.694E-23	3.167E-23	1.584E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD110	2.315E-03	2.383E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03	2.422E-03
AG111	5.944E-04	1.040E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	6.904E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03	7.500E-03
CD112	5.522E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03	5.577E-03
CD113	1.687E-04	1.796E-04	1.796E-04	1.797E-04	1.797E-04	1.797E-04	1.797E-04	1.797E-04	1.797E-04
CD113M	1.074E-04	1.026E-04	1.533E-05	1.462E-05	1.394E-05	1.330E-05	1.268E-05	1.209E-05	1.153E-05
IN113	9.379E-07	5.923E-06	9.306E-05	9.377E-05	9.445E-05	9.510E-05	9.572E-05	9.630E-05	9.686E-05
CD114	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02	1.003E-02
IN114	4.456E-13	5.769E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	5.960E-09	3.587E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.438E-08	1.986E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08	1.989E-08
CD115M	1.678E-04	5.744E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	2.821E-03	3.092E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03	3.093E-03
IN115M	7.995E-06	1.622E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.522E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04	1.562E-04
CD116	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03	4.933E-03
SN116	1.476E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03	1.477E-03
SN117	4.833E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03	4.843E-03
SN117M	2.525E-07	3.559E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	5.399E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03	5.401E-03
SN119	5.103E-03	5.145E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03	5.167E-03
SN119M	6.368E-05	2.266E-05	2.545E-23	1.274E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN120	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03	5.412E-03
SN121M	2.696E-06	2.658E-06	1.526E-06	1.505E-06	1.485E-06	1.464E-06	1.444E-06	1.424E-06	1.405E-06
SB121	5.536E-03	5.602E-03	5.603E-03	5.603E-03	5.604E-03	5.604E-03	5.604E-03	5.604E-03	5.604E-03
SN122	6.068E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03	6.069E-03
TE122	1.234E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04	1.315E-04

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sbwal6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:29

	3336.0HR	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
SN123	1.237E-03	1.742E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	5.902E-03	6.966E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03	7.140E-03
TE123	5.000E-07	6.733E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07	6.971E-07
TE123M	1.972E-07	2.377E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03	9.503E-03
SB124	8.410E-05	1.254E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	4.714E-05	1.300E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04	1.312E-04
SN125	4.835E-04	1.900E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	1.150E-02	9.331E-03	4.195E-07	3.266E-07	2.543E-07	1.980E-07	1.542E-07	1.200E-07	9.346E-08
TE125	4.613E-04	3.062E-03	1.252E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02	1.252E-02
TE125M	7.717E-05	1.294E-04	5.867E-09	4.568E-09	3.557E-09	2.769E-09	2.156E-09	1.679E-09	1.307E-09
SN126	2.296E-02	2.296E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02	2.295E-02
SB126	4.889E-05	1.091E-09	1.090E-09	1.090E-09	1.090E-09	1.090E-09	1.090E-09	1.090E-09	1.090E-09
SB126M	2.298E-08	8.293E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12	8.291E-12
TE126	4.501E-04	4.992E-04	5.056E-04	5.057E-04	5.059E-04	5.060E-04	5.062E-04	5.064E-04	5.065E-04
TE127	1.946E-04	1.662E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.548E-03	4.746E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	4.416E-02	5.048E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02	5.096E-02
XE127	4.707E-09	4.499E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.283E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01	1.284E-01
XE128	8.405E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04	8.408E-04
TE129	1.085E-04	5.413E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.077E-02	5.781E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.179E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01	2.292E-01
XE129	1.824E-05	1.857E-05	1.898E-05	1.899E-05	1.900E-05	1.901E-05	1.902E-05	1.903E-05	1.904E-05
XE129M	3.186E-07	5.746E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.927E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01	4.928E-01
XE130	2.935E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03	2.969E-03
I131	7.727E-02	1.679E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	7.688E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01	8.492E-01
XE131M	1.274E-03	2.289E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.478E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00	1.526E+00
CS132	7.674E-07	7.997E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	9.137E-08	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07	1.067E-07
XE133	1.131E-01	1.533E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	2.008E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00	2.143E+00
XE134	2.597E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00	2.599E+00
CS134	9.815E-02	7.015E-02	1.015E-07	7.249E-08	5.180E-08	3.701E-08	2.644E-08	1.889E-08	1.350E-08
BA134	3.828E-03	3.186E-02	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01	1.020E-01
CS135	2.870E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01	2.939E-01
BA135	7.450E-06	7.566E-06	1.111E-05	1.120E-05	1.129E-05	1.137E-05	1.146E-05	1.155E-05	1.164E-05
XE136	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00	4.127E+00
CS136	9.521E-04	3.861E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	4.044E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03	4.996E-03
BA136M	4.269E-11	1.731E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	2.090E+00	2.043E+00	8.106E-01	7.921E-01	7.740E-01	7.564E-01	7.391E-01	7.222E-01	7.057E-01
BA137	9.414E-03	5.716E-02	1.289E+00	1.308E+00	1.326E+00	1.344E+00	1.361E+00	1.378E+00	1.394E+00
BA137M	3.215E-07	3.125E-07	1.240E-07	1.212E-07	1.184E-07	1.157E-07	1.131E-07	1.105E-07	1.080E-07
BA138	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00	2.350E+00
LA138	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05
LA139	2.236E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
BA140	2.835E-01	7.169E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	3.751E-02	1.081E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.916E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00	2.237E+00
CE141	6.551E-01	2.734E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.407E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00	2.066E+00
CE142	2.099E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00	2.101E+00
ND142	7.029E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03	7.196E-03
PR143	2.819E-01	2.473E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.620E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00	1.932E+00
CE144	1.653E+00	6.784E-01	2.288E-16	9.392E-17	3.854E-17	1.582E-17	6.491E-18	2.664E-18	1.093E-18
PR144	7.401E-05	2.865E-05	9.663E-21	3.966E-21	1.627E-21	6.679E-22	2.741E-22	1.125E-22	4.616E-23
PR144M	3.496E-07	1.432E-07	4.830E-23	1.982E-23	8.136E-24	3.339E-24	1.370E-24	5.623E-25	2.308E-25
ND144	4.966E-01	1.471E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00	2.150E+00
ND145	1.360E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00	1.363E+00
ND146	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00	1.144E+00
PM146	5.779E-06	5.095E-06	3.295E-08	2.905E-08	2.561E-08	2.258E-08	1.991E-08	1.755E-08	1.547E-08
SM146	4.668E-07	7.200E-07	2.593E-06	2.594E-06	2.596E-06	2.597E-06	2.598E-06	2.599E-06	2.599E-06
ND147	9.263E-02	1.062E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	5.263E-01	4.761E-01	1.224E-05	9.400E-06	7.217E-06	5.542E-06	4.255E-06	3.267E-06	2.508E-06
SM147	2.518E-02	1.691E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01	6.452E-01
ND148	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01	6.392E-01
PM148	8.968E-03	8.979E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	5.632E-03	1.226E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	8.010E-02	9.469E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02	9.470E-02
SM149	1.030E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02	2.458E-02

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sbwal6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 22:13:29

	3336.0HR	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
ND150	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01	2.441E-01
SM150	4.608E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01	4.609E-01
EU150	9.551E-11	9.369E-11	4.337E-11	4.254E-11	4.173E-11	4.094E-11	4.016E-11	3.939E-11	3.864E-11
SM151	2.818E-02	2.990E-02	2.197E-02	2.180E-02	2.164E-02	2.147E-02	2.131E-02	2.114E-02	2.098E-02
EU151	1.477E-05	2.460E-04	8.174E-03	8.343E-03	8.510E-03	8.676E-03	8.841E-03	9.004E-03	9.166E-03
SM152	1.801E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01	1.802E-01
EU152	2.937E-05	2.791E-05	3.634E-06	3.453E-06	3.282E-06	3.119E-06	2.964E-06	2.817E-06	2.677E-06
GD152	9.600E-06	1.010E-05	1.686E-05	1.691E-05	1.696E-05	1.701E-05	1.705E-05	1.709E-05	1.713E-05
EU153	1.097E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01	1.146E-01
GD153	5.460E-06	1.918E-06	1.289E-24	1.289E-24	1.289E-24	1.289E-24	1.289E-24	1.289E-24	1.289E-24
SM154	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02	3.194E-02
EU154	2.119E-02	1.955E-02	7.779E-04	7.177E-04	6.621E-04	6.109E-04	5.636E-04	5.199E-04	4.797E-04
GD154	1.908E-04	1.831E-03	2.060E-02	2.066E-02	2.072E-02	2.077E-02	2.081E-02	2.086E-02	2.090E-02
EU155	8.968E-03	7.800E-03	2.912E-05	2.532E-05	2.202E-05	1.915E-05	1.665E-05	1.448E-05	1.259E-05
GD155	1.779E-05	1.188E-03	8.959E-03	8.963E-03	8.966E-03	8.969E-03	8.972E-03	8.974E-03	8.976E-03
EU156	4.301E-03	2.485E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	1.391E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02	1.823E-02
GD157	5.689E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05	9.706E-05
GD158	6.091E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03	6.092E-03
TB159	5.677E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04	5.736E-04
GD160	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04	2.252E-04
TB160	2.147E-05	6.472E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	8.770E-06	2.959E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05	3.024E-05
TB161	5.996E-06	7.753E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	4.991E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05	5.591E-05
DY162	3.436E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05	3.437E-05
DY163	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05	1.972E-05
DY164	4.678E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06	4.679E-06
HO165	4.824E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06	4.835E-06
HO166M	2.011E-08	2.010E-08	1.964E-08	1.963E-08	1.962E-08	1.961E-08	1.960E-08	1.959E-08	1.957E-08
ER166	1.453E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06	1.529E-06
ER167	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07	3.035E-07
ER168	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07	3.345E-07
ER169	2.695E-10	5.415E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	7.180E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10	9.874E-10
ER170	1.271E-14	9.427E-14	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13	1.075E-13
TM170	6.493E-11	9.065E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	8.603E-12	6.439E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11	7.344E-11
TM171	1.965E-12	1.370E-12	7.331E-19	5.109E-19	3.561E-19	2.482E-19	1.730E-19	1.206E-19	8.405E-20
YB171	1.371E-13	7.327E-13	2.103E-12	2.103E-12	2.103E-12	2.103E-12	2.103E-12	2.103E-12	2.103E-12
YB172	9.830E-15	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14	1.133E-14

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File SBWSS2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) EBR-II
  BAS     ONE ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  381  382  383   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE EBR-II ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP      50.0   .01068   1   2   4 2
  IRP     100.0   .01068   2   3   4 0
  IRP     200.0   .01068   3   4   4 0
  IRP     250.0   .01068   4   5   4 0
  IRP     300.0   .01068   5   6   4 0
  IRP     345.0   .01068   6   7   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC       1.    1   2   5   4
  DEC      13.    2   3   5   0
  DEC      14.    3   4   5   0
  DEC      15.    4   5   5   0
  DEC      16.    5   6   5   0
  DEC      17.    6   7   5   0
  DEC      18.    7   8   5   0
  DEC      19.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340 1.04E-2 922350 33.6    922360 5.10E-2 922380 30.34    FUEL 52.5%
  1    60120 5.64E-3  60130 6.27E-5 140280 1.75E-1 140290 8.87E-3
  1   140300 5.89E-3 150310 8.55E-3 160320 5.42E-3 160330 4.28E-5
  1   160340 2.40E-4 160350 1.14E-6 260540 7.61E-1 240500 1.57E-1
  1   240520 3.02E+0 240530 3.43E-1 240540 8.54E-2 250240 3.00E-1
  1   250250 3.80E-2 250260 4.18E-2 260560 1.18E+1 260570 2.71E-1
  1   260580 3.61E-2 410930 1.90E+0 280580 2.69E+0 280600 1.03E+0
  1   280610 4.45E-2 280620 1.41E-1 280640 3.59E-2      0 0.
  0
```

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File SBWSS2.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwss2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwss2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\fftfc.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwss2.u6 >nul
copy tape13.out+tape11.out sbwss2.u11 >nul
ren tape7.out sbwss2.pch
ren tape15.out sbwss2.dbg
ren tape16.out sbwss2.vxs
ren tape50.out sbwss2.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed **************************
echo ************************************************************************
echo on
```

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sbwss2.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
H 1	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05
H 2	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10
H 3	1.587E-13	1.501E-13	7.651E-14	7.233E-14	6.839E-14	6.465E-14	6.112E-14	5.779E-14	5.463E-14
HE 3	1.869E-15	1.053E-14	8.408E-14	8.825E-14	9.220E-14	9.593E-14	9.946E-14	1.028E-13	1.060E-13
HE 4	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06
LI 6	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11
LI 7	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17
BE 9	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08
BE 10	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09
B 10	2.862E-16	9.352E-16	8.724E-15	9.373E-15	1.002E-14	1.067E-14	1.132E-14	1.197E-14	1.262E-14
B 11	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17
C 12	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03
C 13	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05
C 14	7.848E-12	7.847E-12	7.836E-12	7.835E-12	7.834E-12	7.833E-12	7.832E-12	7.831E-12	7.830E-12
N 14	4.393E-16	1.389E-15	1.277E-14	1.372E-14	1.467E-14	1.562E-14	1.656E-14	1.751E-14	1.846E-14
N 15	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22
O 16	3.185E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34
O 17	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21
NE 20	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17
NE 21	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19
NE 22	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10
NA 22	4.882E-20	3.741E-20	1.531E-21	1.172E-21	8.979E-22	6.877E-22	5.289E-22	4.068E-22	3.128E-22
NA 23	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12
MG 24	2.210E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14
MG 25	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06
MG 26	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07
AL 27	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09
SI 28	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01
SI 29	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03
SI 30	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03
SI 32	2.944E-14	2.941E-14	2.903E-14	2.900E-14	2.897E-14	2.894E-14	2.891E-14	2.888E-14	2.885E-14
P 31	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03
P 32	2.484E-07	5.086E-15	1.749E-18	1.747E-18	1.745E-18	1.743E-18	1.741E-18	1.739E-18	1.738E-18
P 33	3.781E-13	1.512E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S 32	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03
S 33	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05
S 34	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04
S 35	7.620E-08	4.291E-09	4.357E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S 36	1.891E-17	7.072E-17	6.925E-16	7.443E-16	7.961E-16	8.479E-16	8.997E-16	9.515E-16	1.003E-15
CL 35	1.065E-06	1.137E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06
CL 36	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09
CL 37	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13
AR 36	9.759E-16	3.651E-15	3.575E-14	3.843E-14	4.110E-14	4.378E-14	4.645E-14	4.913E-14	5.180E-14
AR 37	2.405E-20	1.745E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AR 38	1.538E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18
AR 39	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24
AR 42	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29
K 41	4.569E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18
K 42	1.506E-24	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33
CA 42	1.478E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22
CA 43	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20
CA 44	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11
CA 45	4.404E-16	9.313E-17	7.459E-25	7.459E-25	7.459E-25	7.459E-25	7.459E-25	7.459E-25	7.459E-25
CA 46	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11
SC 45	1.650E-16	5.123E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16
SC 46	2.401E-20	1.169E-21	2.100E-37	2.100E-37	2.100E-37	2.100E-37	2.100E-37	2.100E-37	2.100E-37
TI 46	1.199E-20	3.483E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20
TI 47	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06
TI 48	9.616E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11
TI 49	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06
TI 50	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05
V 50	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05
V 51	1.138E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04
CR 50	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01
CR 51	1.567E-05	1.686E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00
CR 53	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01
CR 54	8.586E-02	8.610E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02
MN 54	4.228E-04	1.880E-04	1.128E-08	5.015E-09	2.231E-09	9.922E-10	4.413E-10	1.963E-10	8.731E-11
MN 55	1.174E-05	3.040E-05	8.902E-05	8.960E-05	9.005E-05	9.039E-05	9.065E-05	9.085E-05	9.101E-05
FE 54	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01
FE 55	7.977E-05	6.111E-05	2.493E-06	1.910E-06	1.463E-06	1.120E-06	8.582E-07	6.574E-07	5.035E-07
FE 56	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01
FE 57	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01
FE 58	3.840E-02	3.928E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02
FE 59	8.180E-07	2.949E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwss2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
CO 58	9.057E-04	2.532E-05	5.771E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	4.272E-04	4.280E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04
CO 60	2.423E-05	2.124E-05	4.382E-06	3.842E-06	3.369E-06	2.953E-06	2.589E-06	2.270E-06	1.990E-06
NI 58	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00
NI 59	5.344E-04	5.344E-04	5.344E-04	5.344E-04	5.344E-04	5.344E-04	5.343E-04	5.343E-04	5.343E-04
NI 60	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00
NI 61	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02
NI 62	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01
NI 63	8.675E-05	8.609E-05	7.865E-05	7.806E-05	7.748E-05	7.689E-05	7.632E-05	7.574E-05	7.518E-05
NI 64	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02
CU 63	3.030E-07	9.541E-07	8.396E-06	8.987E-06	9.573E-06	1.015E-05	1.073E-05	1.130E-05	1.187E-05
CU 65	3.584E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06
ZN 64	2.255E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11
ZN 65	6.480E-16	2.294E-16	8.918E-22	3.144E-22	1.140E-22	3.583E-23	1.126E-23	0.000E+00	0.000E+00
ZN 66	3.905E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10
ZN 67	9.450E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15
ZN 68	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18
GA 69	2.285E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22
GA 71	0.000E+00	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43
GE 70	1.155E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29
SR 87	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14
SR 88	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15
SR 89	4.655E-12	3.094E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	3.419E-12	3.339E-12	2.509E-12	2.450E-12	2.393E-12	2.336E-12	2.281E-12	2.228E-12	2.175E-12
Y 89	8.492E-12	1.312E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11
Y 90	1.522E-08	8.373E-16	6.293E-16	6.145E-16	6.000E-16	5.859E-16	5.721E-16	5.587E-16	5.455E-16
Y 91	2.580E-11	3.406E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	1.285E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06
ZR 91	9.769E-10	1.002E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09
ZR 92	3.195E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05
ZR 93	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05
ZR 94	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08
ZR 95	5.361E-12	1.025E-13	2.449E-34	2.449E-34	2.449E-34	2.449E-34	2.449E-34	2.449E-34	2.449E-34
ZR 96	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14
NB 92	1.491E-06	2.247E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00
NB 93M	2.337E-12	7.211E-12	4.986E-11	5.238E-11	5.476E-11	5.703E-11	5.919E-11	6.124E-11	6.319E-11
NB 94	2.118E-02	2.118E-02	2.117E-02	2.117E-02	2.117E-02	2.116E-02	2.116E-02	2.116E-02	2.116E-02
NB 95	3.366E-05	2.506E-08	2.987E-34	1.379E-34	1.378E-34	1.378E-34	1.378E-34	1.378E-34	1.378E-34
NB 95M	2.171E-15	4.290E-17	1.025E-37	1.198E-37	1.198E-37	1.198E-37	1.198E-37	1.198E-37	1.198E-37
MO 94	3.358E-07	1.059E-06	9.734E-06	1.046E-05	1.118E-05	1.190E-05	1.262E-05	1.335E-05	1.407E-05
MO 95	9.551E-05	1.291E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04
MO 96	7.299E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07
MO 97	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10
MO 98	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12
MO100	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19
TC 98	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22
TC 99	2.070E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16
RU 99	6.594E-23	7.900E-22	9.478E-21	1.020E-20	1.093E-20	1.165E-20	1.237E-20	1.310E-20	1.382E-20
RU100	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19
RU101	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21
HE 4	1.575E-07	5.346E-07	5.008E-06	5.377E-06	5.746E-06	6.113E-06	6.481E-06	6.847E-06	7.213E-06
TL206	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34
TL207	7.950E-20	4.091E-19	1.858E-17	2.118E-17	2.388E-17	2.671E-17	2.967E-17	3.276E-17	3.597E-17
TL208	3.290E-17	2.240E-16	2.627E-15	2.674E-15	2.700E-15	2.715E-15	2.722E-15	2.722E-15	2.716E-15
TL209	9.943E-23	2.703E-22	2.170E-21	2.331E-21	2.492E-21	2.653E-21	2.814E-21	2.976E-21	3.138E-21
PB206	2.879E-18	4.281E-17	5.775E-15	7.403E-15	9.299E-15	1.156E-14	1.425E-14	1.742E-14	2.112E-14
PB207	1.758E-15	1.858E-14	6.802E-12	8.314E-12	1.003E-11	1.195E-11	1.410E-11	1.647E-11	1.909E-11
PB208	2.664E-12	4.067E-11	6.986E-09	7.863E-09	8.751E-09	9.645E-09	1.054E-08	1.144E-08	1.234E-08
PB209	4.143E-19	1.126E-18	9.043E-18	9.712E-18	1.038E-17	1.105E-17	1.173E-17	1.240E-17	1.308E-17
PB210	1.564E-15	2.075E-15	5.086E-14	6.188E-14	7.438E-14	8.842E-14	1.041E-13	1.215E-13	1.406E-13
PB211	6.150E-19	3.165E-18	1.438E-16	1.638E-16	1.847E-16	2.066E-16	2.295E-16	2.534E-16	2.782E-16
PB212	1.940E-14	1.321E-13	1.549E-12	1.577E-12	1.592E-12	1.601E-12	1.605E-12	1.605E-12	1.602E-12
PB214	3.649E-21	1.629E-20	8.921E-19	1.025E-18	1.168E-18	1.320E-18	1.481E-18	1.651E-18	1.831E-18
BI208	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21
BI209	2.231E-16	1.631E-15	1.129E-13	1.301E-13	1.485E-13	1.682E-13	1.891E-13	2.113E-13	2.347E-13
BI210M	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22
BI210	8.993E-19	1.278E-18	3.130E-17	3.810E-17	4.579E-17	5.444E-17	6.409E-17	7.478E-17	8.656E-17
BI211	3.629E-20	1.867E-19	8.482E-18	9.667E-18	1.090E-17	1.219E-17	1.354E-17	1.495E-17	1.642E-17
BI212	1.840E-15	1.253E-14	1.470E-13	1.496E-13	1.511E-13	1.519E-13	1.523E-13	1.523E-13	1.520E-13
BI213	9.735E-20	2.646E-19	2.125E-18	2.282E-18	2.439E-18	2.597E-18	2.755E-18	2.914E-18	3.073E-18
BI214	2.709E-21	1.210E-20	6.624E-19	7.614E-19	8.673E-19	9.801E-19	1.100E-18	1.226E-18	1.360E-18
PO210	7.778E-18	2.996E-17	8.644E-16	9.542E-16	1.137E-15	1.357E-15	1.605E-15	1.881E-15	2.186E-15
PO211	4.452E-25	2.291E-24	1.041E-22	1.186E-22	1.337E-22	1.496E-22	1.662E-22	1.834E-22	2.014E-22
PO212	9.737E-26	6.631E-25	7.776E-24	7.917E-24	7.992E-24	8.036E-24	8.056E-24	8.056E-24	8.040E-24

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sbwss2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
PO213	1.460E-28	3.970E-28	3.188E-27	3.424E-27	3.660E-27	3.896E-27	4.134E-27	4.372E-27	4.610E-27
PO214	4.241E-26	1.664E-27	9.114E-26	1.048E-25	1.193E-25	1.348E-25	1.513E-25	1.687E-25	1.871E-25
PO215	5.150E-25	2.650E-24	1.204E-22	1.372E-22	1.547E-22	1.730E-22	1.922E-22	2.122E-22	2.330E-22
PO216	7.742E-20	5.273E-19	6.183E-18	6.295E-18	6.354E-18	6.390E-18	6.405E-18	6.405E-18	6.393E-18
PO218	4.231E-22	1.889E-21	1.034E-19	1.189E-19	1.354E-19	1.531E-19	1.717E-19	1.915E-19	2.123E-19
AT217	1.170E-24	3.179E-24	2.553E-23	2.742E-23	2.931E-23	3.120E-23	3.310E-23	3.501E-23	3.692E-23
RN218	9.123E-24	4.725E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.167E-21	6.006E-21	2.728E-19	3.109E-19	3.505E-19	3.921E-19	4.355E-19	4.809E-19	5.280E-19
RN220	2.923E-17	1.991E-16	2.334E-15	2.376E-15	2.399E-15	2.412E-15	2.418E-15	2.418E-15	2.414E-15
RN222	7.779E-19	3.473E-18	1.902E-16	2.186E-16	2.490E-16	2.814E-16	3.158E-16	3.521E-16	3.904E-16
FR221	1.062E-20	2.887E-20	2.318E-19	2.490E-19	2.661E-19	2.833E-19	3.006E-19	3.179E-19	3.352E-19
FR223	6.848E-21	2.786E-20	1.266E-18	1.440E-18	1.624E-18	1.816E-18	2.017E-18	2.227E-18	2.446E-18
RA222	1.009E-20	5.224E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	2.965E-16	1.526E-15	6.930E-14	7.897E-14	8.903E-14	9.959E-14	1.106E-13	1.222E-13	1.341E-13
RA224	1.693E-13	1.153E-12	1.352E-11	1.376E-11	1.389E-11	1.397E-11	1.400E-11	1.400E-11	1.398E-11
RA225	5.258E-17	1.305E-16	1.048E-15	1.126E-15	1.203E-15	1.281E-15	1.359E-15	1.437E-15	1.516E-15
RA226	1.210E-13	5.403E-13	2.959E-11	3.401E-11	3.874E-11	4.378E-11	4.912E-11	5.477E-11	6.073E-11
RA228	2.283E-19	1.559E-18	8.513E-17	9.559E-17	1.064E-16	1.174E-16	1.287E-16	1.403E-16	1.521E-16
AC225	3.244E-17	8.818E-17	7.080E-16	7.604E-16	8.128E-16	8.654E-16	9.181E-16	9.709E-16	1.024E-15
AC227	2.654E-13	1.080E-12	4.906E-11	5.580E-11	6.291E-11	7.037E-11	7.817E-11	8.631E-11	9.476E-11
AC228	6.223E-18	1.627E-22	8.886E-21	9.979E-21	1.110E-20	1.226E-20	1.344E-20	1.465E-20	1.587E-20
TH226	5.026E-19	2.603E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	5.359E-16	2.507E-15	1.139E-13	1.298E-13	1.463E-13	1.637E-13	1.818E-13	2.007E-13	2.204E-13
TH228	3.275E-11	2.239E-10	2.627E-09	2.665E-09	2.690E-09	2.705E-09	2.711E-09	2.711E-09	2.706E-09
TH229	1.015E-11	2.406E-11	1.932E-10	2.074E-10	2.218E-10	2.361E-10	2.505E-10	2.649E-10	2.793E-10
TH230	3.001E-08	6.484E-08	4.839E-07	5.190E-07	5.540E-07	5.890E-07	6.241E-07	6.591E-07	6.942E-07
TH231	1.192E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10
TH232	1.453E-08	4.372E-08	3.939E-07	4.231E-07	4.523E-07	4.815E-07	5.106E-07	5.398E-07	5.690E-07
TH234	4.309E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10
PA231	2.599E-08	5.414E-08	3.905E-07	4.186E-07	4.468E-07	4.749E-07	5.030E-07	5.312E-07	5.593E-07
PA233	6.108E-10	7.473E-10	7.472E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10
PA234M	1.459E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14
PA234	2.762E-14	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15
U230	4.941E-16	2.557E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.263E-08	3.566E-08	1.054E-07	1.053E-07	1.051E-07	1.047E-07	1.042E-07	1.035E-07	1.028E-07
U233	3.231E-06	3.239E-06	3.323E-06	3.331E-06	3.338E-06	3.346E-06	3.354E-06	3.361E-06	3.369E-06
U234	1.250E-02	1.251E-02	1.256E-02	1.257E-02	1.257E-02	1.258E-02	1.258E-02	1.259E-02	1.259E-02
U235	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01
U236	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
U237	1.087E-03	2.284E-12	1.282E-12	1.222E-12	1.164E-12	1.110E-12	1.058E-12	1.008E-12	9.605E-13
U238	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01
U240	1.000E-10	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24
NP235	1.471E-09	7.763E-10	3.620E-13	1.910E-13	1.008E-13	5.320E-14	2.807E-14	1.481E-14	7.818E-15
NP236	8.392E-08	8.392E-08	8.391E-08	8.391E-08	8.391E-08	8.391E-08	8.391E-08	8.391E-08	8.391E-08
NP237	2.091E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02
NP238	1.604E-05	6.239E-16	5.906E-16	5.880E-16	5.853E-16	5.826E-16	5.800E-16	5.773E-16	5.747E-16
NP239	6.254E-03	2.328E-15	2.326E-15	2.325E-15	2.325E-15	2.325E-15	2.325E-15	2.325E-15	2.324E-15
NP240M	1.784E-10	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27
PU236	1.083E-07	8.591E-08	4.645E-09	3.643E-09	2.856E-09	2.240E-09	1.757E-09	1.377E-09	1.080E-09
PU237	1.198E-08	4.647E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	6.478E-04	6.586E-04	5.990E-04	5.943E-04	5.897E-04	5.850E-04	5.804E-04	5.758E-04	5.713E-04
PU239	5.604E-01	5.667E-01	5.665E-01	5.665E-01	5.665E-01	5.664E-01	5.664E-01	5.664E-01	5.664E-01
PU240	7.751E-03	7.750E-03	7.740E-03	7.739E-03	7.738E-03	7.737E-03	7.737E-03	7.736E-03	7.735E-03
PU241	7.742E-05	7.378E-05	4.141E-05	3.946E-05	3.761E-05	3.584E-05	3.416E-05	3.255E-05	3.102E-05
PU242	5.141E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07
PU243	1.211E-11	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29
PU244	5.970E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14
PU246	9.442E-22	6.939E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM241	8.548E-07	4.489E-06	3.644E-05	3.832E-05	4.012E-05	4.182E-05	4.343E-05	4.497E-05	4.643E-05
AM242M	3.343E-09	3.327E-09	3.150E-09	3.136E-09	3.122E-09	3.107E-09	3.093E-09	3.079E-09	3.065E-09
AM242	1.970E-10	3.980E-14	3.768E-14	3.751E-14	3.734E-14	3.717E-14	3.700E-14	3.683E-14	3.667E-14
AM243	2.697E-09	2.709E-09	2.706E-09	2.706E-09	2.706E-09	2.705E-09	2.705E-09	2.705E-09	2.705E-09
AM245	2.502E-19	1.138E-35	8.580E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM246	1.511E-24	1.112E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM241	1.849E-15	1.632E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	9.149E-09	1.980E-09	7.619E-12	7.593E-12	7.560E-12	7.526E-12	7.492E-12	7.458E-12	7.424E-12
CM243	2.608E-11	2.545E-11	1.901E-11	1.855E-11	1.811E-11	1.767E-11	1.725E-11	1.683E-11	1.643E-11
CM244	2.558E-11	2.465E-11	1.557E-11	1.498E-11	1.442E-11	1.388E-11	1.336E-11	1.286E-11	1.237E-11
CM245	1.726E-13	1.726E-13	1.724E-13	1.724E-13	1.724E-13	1.724E-13	1.723E-13	1.723E-13	1.723E-13
CM246	3.874E-16	3.873E-16	3.866E-16	3.866E-16	3.865E-16	3.865E-16	3.864E-16	3.863E-16	3.863E-16
CM247	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19
CM248	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22
CM250	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36
BK249	4.700E-28	2.960E-27	2.231E-31	2.231E-31	2.231E-31	2.231E-31	2.231E-31	2.231E-31	2.231E-31
CF250	0.000E+00	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32
CF251	0.000E+00	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38

Appendix D-2
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sbwss2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
SF250	1.875E-14	7.484E-14	7.353E-13	7.898E-13	8.443E-13	8.986E-13	9.529E-13	1.007E-12	1.061E-12
H 3	9.585E-06	9.062E-06	4.621E-06	4.369E-06	4.130E-06	3.905E-06	3.691E-06	3.490E-06	3.299E-06
LI 6	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08
LI 7	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09
BE 9	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09
BE 10	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08
C 14	2.974E-09	2.974E-09	2.970E-09	2.969E-09	2.969E-09	2.969E-09	2.968E-09	2.968E-09	2.968E-09
ZN 66	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11
ZN 67	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12
ZN 68	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15
GA 69	3.786E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19
GE 70	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22
GA 71	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09
GE 72	6.756E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06
GE 73	1.792E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05
GE 74	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05
AS 75	6.092E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05
GE 76	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04
SE 76	6.077E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07
SE 77	2.871E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
SE 78	5.850E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04
SE 79	8.705E-04	8.705E-04	8.704E-04	8.704E-04	8.704E-04	8.703E-04	8.703E-04	8.703E-04	8.703E-04
BR 79	4.384E-09	1.367E-08	1.251E-07	1.344E-07	1.437E-07	1.530E-07	1.623E-07	1.716E-07	1.808E-07
SE 80	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03
KR 80	3.617E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09
BR 81	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03
KR 81	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10
SE 82	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03
KR 82	3.884E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05
KR 83	7.574E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03
KR 84	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02
KR 85	3.634E-03	3.409E-03	1.569E-03	1.471E-03	1.379E-03	1.292E-03	1.212E-03	1.136E-03	1.065E-03
RB 85	1.387E-02	1.411E-02	1.595E-02	1.605E-02	1.614E-02	1.623E-02	1.631E-02	1.638E-02	1.645E-02
KR 86	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02
RB 86	1.233E-05	1.577E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	7.161E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05
RB 87	3.467E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02
SR 87	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07
SR 88	5.106E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02
SR 89	1.344E-02	8.939E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.111E-02	6.446E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02
SR 90	7.720E-02	7.538E-02	5.665E-02	5.532E-02	5.402E-02	5.275E-02	5.151E-02	5.030E-02	4.911E-02
Y 90	2.023E-05	1.890E-05	1.421E-05	1.387E-05	1.355E-05	1.323E-05	1.292E-05	1.261E-05	1.232E-05
ZR 90	1.668E-03	3.485E-03	2.222E-02	2.355E-02	2.485E-02	2.612E-02	2.737E-02	2.858E-02	2.976E-02
Y 91	1.951E-02	2.595E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.198E-02	8.138E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02
ZR 92	8.553E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02
NB 92	1.046E-15	1.576E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	9.383E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02
NB 93	1.443E-09	5.528E-09	1.797E-07	2.024E-07	2.261E-07	2.508E-07	2.764E-07	3.028E-07	3.300E-07
NB 93M	1.896E-08	5.746E-08	3.944E-07	4.142E-07	4.331E-07	4.510E-07	4.680E-07	4.842E-07	4.996E-07
ZR 94	9.087E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02
NB 94	1.254E-08	1.254E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08
ZR 95	2.520E-02	4.819E-04	1.151E-24	1.151E-24	1.151E-24	1.151E-24	1.151E-24	1.151E-24	1.151E-24
NB 95	1.343E-02	5.954E-04	1.404E-24	6.481E-25	6.476E-25	6.476E-25	6.476E-25	6.476E-25	6.476E-25
NB 95M	1.032E-05	2.016E-07	4.817E-28	4.550E-28	4.550E-28	4.550E-28	4.550E-28	4.550E-28	4.550E-28
MO 95	5.764E-02	9.523E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02
ZR 96	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02
MO 96	5.126E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04
MO 97	9.175E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02
MO 98	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02
TC 98	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06
TC 99	8.944E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02
RU 99	1.369E-07	4.316E-07	3.968E-06	4.263E-06	4.558E-06	4.852E-06	5.147E-06	5.442E-06	5.737E-06
MO100	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01
RU100	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03
RU101	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02
RU102	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02
RH102	1.709E-07	1.346E-07	7.643E-09	6.018E-09	4.739E-09	3.731E-09	2.938E-09	2.313E-09	1.821E-09
RU103	9.405E-03	1.499E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.649E-02	5.589E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02
RH103M	8.406E-06	1.340E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02
PD104	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04
PD105	2.170E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02

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sbwss2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
RU106	9.048E-03	4.549E-03	1.186E-06	5.964E-07	2.999E-07	1.508E-07	7.579E-08	3.811E-08	1.916E-08
RH106	8.513E-09	4.276E-09	1.115E-12	5.606E-13	2.819E-13	1.417E-13	7.124E-14	3.582E-14	1.801E-14
PD106	3.737E-03	8.236E-03	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02
AG106	2.554E-16	2.963E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	8.100E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03
AG107	3.973E-10	1.262E-09	1.163E-08	1.250E-08	1.336E-08	1.423E-08	1.509E-08	1.596E-08	1.682E-08
PD108	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03
AG108	5.075E-13	1.652E-20	1.547E-20	1.539E-20	1.530E-20	1.522E-20	1.514E-20	1.506E-20	1.497E-20
AG108M	5.260E-12	5.232E-12	4.900E-12	4.873E-12	4.847E-12	4.820E-12	4.794E-12	4.768E-12	4.742E-12
CD108	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08
AG109	3.613E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03
AG109M	7.552E-09	6.682E-17	9.580E-20	5.537E-20	3.209E-20	1.859E-20	1.077E-20	6.244E-21	3.618E-21
CD109	1.167E-10	6.764E-11	9.674E-14	5.606E-14	3.248E-14	1.882E-14	1.091E-14	6.321E-15	3.663E-15
PD110	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03
AG110	1.247E-10	4.697E-14	2.465E-19	8.948E-20	3.249E-20	1.180E-20	4.283E-21	1.555E-21	5.645E-22
AG110M	8.537E-06	3.100E-06	1.626E-11	5.905E-12	2.144E-12	7.784E-13	2.826E-13	1.026E-13	3.725E-14
CD110	5.204E-05	5.748E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05
AG111	7.071E-05	1.237E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	2.126E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03
CD112	1.958E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03
CD113	1.903E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03
CD113M	3.208E-05	3.061E-05	1.731E-05	1.651E-05	1.574E-05	1.501E-05	1.431E-05	1.365E-05	1.302E-05
IN113	7.017E-07	2.190E-06	1.548E-05	1.628E-05	1.705E-05	1.778E-05	1.847E-05	1.914E-05	1.977E-05
CD114	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03
IN114	1.187E-13	1.650E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	1.705E-09	1.026E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.041E-08	1.198E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08
CD115M	3.099E-05	1.061E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.559E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03
IN115M	1.290E-06	2.997E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	6.265E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05
CD116	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03
SN116	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04
SN117	1.831E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03
SN117M	1.146E-08	1.616E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	1.919E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03
SN119	1.884E-03	1.896E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03
SN119M	1.792E-05	6.376E-06	2.629E-11	9.354E-12	3.328E-12	1.184E-12	4.215E-13	1.500E-13	5.337E-14
SN120	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03
SN121M	8.759E-07	8.639E-07	7.314E-07	7.213E-07	7.114E-07	7.016E-07	6.919E-07	6.824E-07	6.730E-07
SB121	1.915E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03
SN122	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03
TE122	2.501E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05
SN123	2.122E-04	2.989E-05	1.823E-15	2.567E-16	3.616E-17	5.093E-18	7.174E-19	1.010E-19	1.423E-20
SB123	2.063E-03	2.246E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03
TE123	1.684E-07	1.824E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07
TE123M	1.586E-08	1.913E-09	1.806E-20	2.170E-21	2.659E-22	3.993E-23	1.026E-24	1.026E-24	1.026E-24
SN124	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03
SB124	6.413E-06	9.561E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.107E-05	1.739E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05
SN125	3.964E-05	1.558E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.839E-03	2.242E-03	1.113E-04	8.663E-05	6.745E-05	5.252E-05	4.089E-05	3.184E-05	2.479E-05
TE125	3.156E-04	9.508E-04	3.111E-03	3.136E-03	3.155E-03	3.170E-03	3.182E-03	3.191E-03	3.198E-03
TE125M	2.901E-05	3.121E-05	1.556E-06	1.212E-06	9.435E-07	7.346E-07	5.720E-07	4.453E-07	3.468E-07
SN126	4.710E-03	4.710E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03
SB126	6.236E-06	2.238E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10
SB126M	3.319E-09	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12
TE126	1.478E-04	1.541E-04	1.545E-04	1.545E-04	1.545E-04	1.546E-04	1.546E-04	1.546E-04	1.547E-04
TE127	1.372E-05	1.709E-07	1.344E-19	1.318E-20	1.292E-21	1.266E-22	1.244E-23	1.219E-24	1.182E-25
TE127M	4.778E-04	4.881E-05	3.840E-17	3.764E-18	3.689E-19	3.617E-20	3.553E-21	3.446E-22	2.805E-23
I127	7.886E-03	8.470E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03
XE127	2.377E-10	2.272E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02
XE128	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04
TE129	4.553E-06	2.367E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	4.710E-04	2.527E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.309E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02
XE129	4.332E-07	4.345E-07	4.470E-07	4.481E-07	4.491E-07	4.502E-07	4.512E-07	4.522E-07	4.533E-07
XE129M	2.648E-10	4.776E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02
XE130	2.733E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04
I131	2.324E-03	5.048E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.691E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02
XE131M	3.841E-05	6.889E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	9.865E-02	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01
CS132	1.116E-07	1.163E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwss2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
BA132	3.857E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08
XE133	2.972E-03	4.005E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.353E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01
XE134	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01
CS134	1.800E-03	1.287E-03	2.278E-05	1.628E-05	1.163E-05	8.309E-06	5.937E-06	4.242E-06	3.031E-06
BA134	1.890E-04	7.031E-04	1.967E-03	1.973E-03	1.978E-03	1.981E-03	1.984E-03	1.985E-03	1.987E-03
CS135	1.377E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01
BA135	4.061E-07	4.480E-07	9.473E-07	9.889E-07	1.031E-06	1.072E-06	1.114E-06	1.155E-06	1.197E-06
XE136	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01
CS136	6.083E-05	2.467E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	7.910E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04
BA136M	2.728E-12	1.106E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.318E-01	1.288E-01	9.763E-02	9.540E-02	9.323E-02	9.110E-02	8.902E-02	8.698E-02	8.500E-02
BA137	1.466E-03	4.477E-03	3.567E-02	3.790E-02	4.008E-02	4.221E-02	4.429E-02	4.633E-02	4.831E-02
BA137M	2.025E-08	1.971E-08	1.494E-08	1.460E-08	1.426E-08	1.394E-08	1.362E-08	1.331E-08	1.300E-08
BA138	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01
LA138	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07
LA139	1.411E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01
BA140	7.152E-03	1.809E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	9.531E-04	2.728E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.311E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01
CE141	1.826E-02	7.621E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.162E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01
CE142	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01
ND142	4.491E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04
PR143	7.103E-03	6.220E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.215E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01
CE144	8.136E-02	3.339E-02	7.621E-07	3.128E-07	1.284E-07	5.268E-08	2.162E-08	8.872E-09	3.641E-09
PR144	3.443E-06	1.410E-06	3.218E-11	1.321E-11	5.420E-12	2.224E-12	9.129E-13	3.746E-13	1.537E-13
PR144M	1.719E-08	7.048E-09	1.609E-13	6.602E-14	2.709E-14	1.112E-14	4.563E-15	1.873E-15	7.686E-16
ND144	4.009E-02	8.807E-02	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01
ND145	8.743E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02
ND146	6.923E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02
PM146	2.374E-06	2.093E-06	4.613E-07	4.067E-07	3.585E-07	3.161E-07	2.786E-07	2.456E-07	2.166E-07
SM146	4.650E-07	5.690E-07	1.173E-06	1.193E-06	1.211E-06	1.226E-06	1.240E-06	1.253E-06	1.263E-06
ND147	2.584E-03	2.961E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	4.409E-02	3.586E-02	1.505E-03	1.156E-03	8.875E-04	6.814E-04	5.232E-04	4.017E-04	3.084E-04
SM147	5.523E-03	1.637E-02	5.072E-02	5.107E-02	5.134E-02	5.154E-02	5.170E-02	5.182E-02	5.192E-02
ND148	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02
PM148	7.201E-05	9.576E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	6.010E-04	1.306E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.999E-03	3.671E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03
SM149	2.554E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02
ND150	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02
SM150	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03
EU150	5.410E-10	5.306E-10	4.212E-10	4.131E-10	4.053E-10	3.975E-10	3.900E-10	3.825E-10	3.752E-10
SM151	1.038E-02	1.036E-02	9.444E-03	9.372E-03	9.300E-03	9.229E-03	9.158E-03	9.088E-03	9.018E-03
EU151	3.487E-05	1.150E-04	1.029E-03	1.102E-03	1.174E-03	1.245E-03	1.316E-03	1.386E-03	1.456E-03
SM152	8.023E-03	8.023E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03
EU152	2.325E-06	2.210E-06	1.199E-06	1.139E-06	1.083E-06	1.029E-06	9.776E-07	9.290E-07	8.829E-07
GD152	8.930E-07	9.297E-07	1.211E-06	1.228E-06	1.244E-06	1.259E-06	1.273E-06	1.286E-06	1.299E-06
EU153	4.845E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03
GD153	5.280E-08	1.855E-08	6.554E-14	2.303E-14	8.089E-15	2.842E-15	9.983E-16	3.507E-16	1.232E-16
SM154	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03
EU154	2.818E-04	2.600E-04	9.885E-05	9.119E-05	8.413E-05	7.762E-05	7.161E-05	6.606E-05	6.095E-05
GD154	7.059E-06	2.888E-05	1.900E-04	1.977E-04	2.048E-04	2.113E-04	2.173E-04	2.228E-04	2.279E-04
EU155	1.350E-03	1.174E-03	2.195E-04	1.908E-04	1.660E-04	1.443E-04	1.255E-04	1.091E-04	9.488E-05
GD155	8.849E-05	2.647E-04	1.220E-03	1.248E-03	1.273E-03	1.295E-03	1.314E-03	1.330E-03	1.344E-03
EU156	5.782E-05	3.393E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	7.808E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04
GD157	4.394E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04
GD158	2.925E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04
TB159	1.044E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GD160	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05
TB160	1.625E-06	4.901E-08	2.766E-26	2.766E-26	2.766E-26	2.766E-26	2.766E-26	2.766E-26	2.766E-26
DY160	2.020E-06	3.596E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06
TB161	7.571E-07	9.789E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	2.199E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05
DY162	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05
DY163	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06
DY164	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06
HO165	1.741E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06
HO166M	4.336E-09	4.334E-09	4.304E-09	4.301E-09	4.299E-09	4.296E-09	4.294E-09	4.291E-09	4.289E-09
ER166	9.888E-07	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06
ER167	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07
ER168	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08

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sbwss2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:46:41

	345.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
ER169	2.553E-12	5.129E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.925E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11
ER170	2.927E-16	9.664E-16	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15
TM170	5.364E-13	7.488E-14	4.108E-24	4.108E-24	4.108E-24	4.108E-24	4.108E-24	4.108E-24	4.108E-24
YB170	1.993E-13	6.601E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13
TM171	4.384E-15	3.055E-15	4.015E-17	2.798E-17	1.950E-17	1.359E-17	9.473E-18	6.602E-18	4.602E-18
YB171	1.181E-15	2.509E-15	5.524E-15	5.537E-15	5.545E-15	5.551E-15	5.555E-15	5.558E-15	5.560E-15
YB172	1.302E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17

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File SBWSS3.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) EBR-II
  BAS     ONE ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  381  382  383   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE EBR-II ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP      50.0   .01068   1   2   4 2
  IRP     100.0   .01068   2   3   4 0
  IRP     200.0   .01068   3   4   4 0
  IRP     250.0   .01068   4   5   4 0
  IRP     300.0   .01068   5   6   4 0
  IRP     345.0   .01068   6   7   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC       1.    1   2   5   4
  DEC      20.    2   3   5   0
  DEC      21.    3   4   5   0
  DEC      22.    4   5   5   0
  DEC      23.    5   6   5   0
  DEC      24.    6   7   5   0
  DEC      25.    7   8   5   0
  DEC      26.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340 1.04E-2 922350 33.6    922360 5.10E-2 922380 30.34    FUEL 52.5%
  1    60120 5.64E-3  60130 6.27E-5 140280 1.75E-1 140290 8.87E-3
  1   140300 5.89E-3 150310 8.55E-3 160320 5.42E-3 160330 4.28E-5
  1   160340 2.40E-4 160350 1.14E-6 260540 7.61E-1 240500 1.57E-1
  1   240520 3.02E+0 240530 3.43E-1 240540 8.54E-2 250240 3.00E-1
  1   250250 3.80E-2 250260 4.18E-2 260560 1.18E+1 260570 2.71E-1
  1   260580 3.61E-2 410930 1.90E+0 280580 2.69E+0 280600 1.03E+0
  1   280610 4.45E-2 280620 1.41E-1 280640 3.59E-2      0 0.
  0
```

Appendix D-2

File SBWSS3.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwss3.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwss3.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\fftfc.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwss3.u6 >nul
copy tape13.out+tape11.out sbwss3.u11 >nul
ren tape7.out sbwss3.pch
ren tape15.out sbwss3.dbg
ren tape16.out sbwss3.vxs
ren tape50.out sbwss3.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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sbwss3.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
H 1	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05
H 2	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10
H 3	1.587E-13	1.501E-13	5.165E-14	4.883E-14	4.617E-14	4.365E-14	4.126E-14	3.901E-14	3.688E-14
HE 3	1.869E-15	1.053E-14	1.089E-13	1.118E-13	1.144E-13	1.169E-13	1.193E-13	1.216E-13	1.237E-13
HE 4	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06
LI 6	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11
LI 7	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17
BE 9	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08
BE 10	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09
B 10	2.862E-16	9.352E-16	1.327E-14	1.392E-14	1.456E-14	1.521E-14	1.586E-14	1.651E-14	1.716E-14
B 11	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17
C 12	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03
C 13	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05
C 14	7.848E-12	7.847E-12	7.829E-12	7.828E-12	7.827E-12	7.826E-12	7.826E-12	7.825E-12	7.824E-12
N 14	4.393E-16	1.389E-15	1.941E-14	2.035E-14	2.130E-14	2.225E-14	2.319E-14	2.414E-14	2.509E-14
N 15	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22
O 16	3.185E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34
O 17	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21
NE 20	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17
NE 21	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19
NE 22	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10
NA 22	4.882E-20	3.741E-20	2.355E-22	1.811E-22	1.393E-22	1.071E-22	8.238E-23	6.336E-23	4.873E-23
NA 23	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12
MG 24	2.210E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14
MG 25	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06
MG 26	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07
AL 27	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09
SI 28	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01
SI 29	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03
SI 30	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03
SI 32	2.944E-14	2.941E-14	2.882E-14	2.878E-14	2.875E-14	2.872E-14	2.869E-14	2.866E-14	2.863E-14
P 31	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03
P 32	2.484E-07	5.086E-15	1.736E-18	1.734E-18	1.732E-18	1.730E-18	1.728E-18	1.727E-18	1.725E-18
P 33	3.781E-13	1.512E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S 32	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03
S 33	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05
S 34	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04
S 35	7.620E-08	4.291E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S 36	1.891E-17	7.072E-17	1.055E-15	1.107E-15	1.159E-15	1.211E-15	1.262E-15	1.314E-15	1.366E-15
CL 35	1.065E-06	1.137E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06
CL 36	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09
CL 37	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13
AR 36	9.759E-16	3.651E-15	5.448E-14	5.715E-14	5.983E-14	6.250E-14	6.518E-14	6.785E-14	7.053E-14
AR 37	2.405E-20	1.745E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AR 38	1.538E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18
AR 39	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24
AR 42	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29
K 41	4.569E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18
K 42	1.506E-24	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33
CA 42	1.478E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22
CA 43	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20
CA 44	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11
CA 45	4.404E-16	9.313E-17	1.412E-29	1.412E-29	1.412E-29	1.412E-29	1.412E-29	1.412E-29	1.412E-29
CA 46	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11
SC 45	1.650E-16	5.123E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16
SC 46	2.401E-20	1.169E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	1.199E-20	3.483E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20
TI 47	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06
TI 48	9.616E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11
TI 49	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06
TI 50	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05
V 50	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05
V 51	1.138E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04
CR 50	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01
CR 51	1.567E-05	1.686E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00
CR 53	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01
CR 54	8.586E-02	8.610E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02
MN 54	4.228E-04	1.880E-04	3.883E-11	1.727E-11	7.683E-12	3.417E-12	1.520E-12	6.761E-13	3.007E-13
MN 55	1.174E-05	3.040E-05	9.112E-05	9.121E-05	9.128E-05	9.134E-05	9.138E-05	9.141E-05	9.143E-05
FE 54	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01
FE 55	7.977E-05	6.111E-05	3.857E-07	2.954E-07	2.263E-07	1.733E-07	1.328E-07	1.017E-07	7.791E-08
FE 56	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01
FE 57	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01
FE 58	3.840E-02	3.928E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02
FE 59	8.180E-07	2.949E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwss3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
CO 58	9.057E-04	2.532E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	4.272E-04	4.280E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04	4.281E-04
CO 60	2.423E-05	2.124E-05	1.745E-06	1.530E-06	1.341E-06	1.176E-06	1.031E-06	9.041E-07	7.926E-07
NI 58	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00
NI 59	5.344E-04	5.344E-04	5.343E-04	5.343E-04	5.343E-04	5.343E-04	5.343E-04	5.343E-04	5.343E-04
NI 60	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00
NI 61	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02
NI 62	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01
NI 63	8.675E-05	8.609E-05	7.461E-05	7.405E-05	7.350E-05	7.294E-05	7.240E-05	7.185E-05	7.131E-05
NI 64	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02
CU 63	3.030E-07	9.541E-07	1.244E-05	1.300E-05	1.355E-05	1.410E-05	1.465E-05	1.520E-05	1.573E-05
CU 65	3.584E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06
ZN 64	2.255E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11
ZN 65	6.480E-16	2.294E-16	6.226E-25	6.226E-25	6.226E-25	6.226E-25	6.226E-25	6.226E-25	6.226E-25
ZN 66	3.905E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10
ZN 67	9.450E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15
ZN 68	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18
GA 69	2.285E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22
GA 71	0.000E+00	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43
GE 70	1.155E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29
SR 87	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14
SR 88	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15
SR 89	4.655E-12	3.094E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	3.419E-12	3.339E-12	2.124E-12	2.074E-12	2.025E-12	1.978E-12	1.931E-12	1.886E-12	1.842E-12
Y 89	8.492E-12	1.312E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11
Y 90	1.522E-08	8.373E-16	5.327E-16	5.202E-16	5.079E-16	4.960E-16	4.843E-16	4.729E-16	4.618E-16
Y 91	2.580E-11	3.406E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	1.285E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06
ZR 91	9.769E-10	1.002E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09
ZR 92	3.195E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05
ZR 93	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05
ZR 94	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08
ZR 95	5.361E-12	1.025E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14
NB 92	1.491E-06	2.247E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00
NB 93M	2.337E-12	7.211E-12	6.504E-11	6.680E-11	6.847E-11	7.006E-11	7.157E-11	7.300E-11	7.436E-11
NB 94	2.118E-02	2.118E-02	2.116E-02	2.116E-02	2.116E-02	2.116E-02	2.116E-02	2.116E-02	2.116E-02
NB 95	3.366E-05	2.506E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	2.171E-15	4.290E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	3.358E-07	1.059E-06	1.479E-05	1.551E-05	1.624E-05	1.696E-05	1.768E-05	1.840E-05	1.913E-05
MO 95	9.551E-05	1.291E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04
MO 96	7.299E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07
MO 97	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10
MO 98	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12
MO100	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19
TC 98	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22
TC 99	2.070E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16
RU 99	6.594E-23	7.900E-22	1.455E-20	1.527E-20	1.599E-20	1.672E-20	1.744E-20	1.817E-20	1.889E-20
RU100	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19
RU101	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21
HE 4	1.575E-07	5.346E-07	7.579E-06	7.943E-06	8.308E-06	8.671E-06	9.035E-06	9.397E-06	9.759E-06
TL206	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34
TL207	7.950E-20	4.091E-19	3.919E-17	4.270E-17	4.625E-17	4.991E-17	5.366E-17	5.752E-17	6.148E-17
TL208	3.290E-17	2.240E-16	2.697E-15	2.694E-15	2.678E-15	2.661E-15	2.642E-15	2.622E-15	2.601E-15
TL209	9.943E-23	2.703E-22	3.300E-21	3.463E-21	3.626E-21	3.789E-21	3.953E-21	4.117E-21	4.282E-21
PB206	2.879E-18	4.281E-17	2.664E-14	3.174E-14	3.739E-14	4.376E-14	5.095E-14	5.902E-14	6.804E-14
PB207	1.758E-15	1.858E-14	2.198E-11	2.510E-11	2.849E-11	3.216E-11	3.611E-11	4.035E-11	4.489E-11
PB208	2.664E-12	4.067E-11	1.322E-08	1.411E-08	1.500E-08	1.588E-08	1.675E-08	1.762E-08	1.849E-08
PB209	4.143E-19	1.126E-18	1.375E-17	1.443E-17	1.511E-17	1.579E-17	1.647E-17	1.716E-17	1.784E-17
PB210	1.564E-15	2.075E-15	1.616E-13	1.845E-13	2.093E-13	2.362E-13	2.652E-13	2.963E-13	3.295E-13
PB211	6.150E-19	3.165E-18	3.032E-16	3.304E-16	3.578E-16	3.861E-16	4.151E-16	4.450E-16	4.756E-16
PB212	1.940E-14	1.321E-13	1.591E-12	1.589E-12	1.580E-12	1.569E-12	1.558E-12	1.546E-12	1.534E-12
PB214	3.649E-21	1.629E-20	2.020E-18	2.218E-18	2.426E-18	2.643E-18	2.869E-18	3.104E-18	3.349E-18
BI208	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21
BI209	2.231E-16	1.631E-15	2.593E-13	2.852E-13	3.123E-13	3.407E-13	3.703E-13	4.012E-13	4.334E-13
BI210M	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22
BI210	8.993E-19	1.278E-18	9.945E-17	1.136E-16	1.289E-16	1.454E-16	1.632E-16	1.824E-16	2.029E-16
BI211	3.629E-20	1.867E-19	1.789E-17	1.949E-17	2.111E-17	2.278E-17	2.449E-17	2.626E-17	2.806E-17
BI212	1.840E-15	1.253E-14	1.509E-13	1.507E-13	1.499E-13	1.489E-13	1.478E-13	1.467E-13	1.455E-13
BI213	9.735E-20	2.646E-19	3.231E-18	3.390E-18	3.550E-18	3.710E-18	3.870E-18	4.031E-18	4.192E-18
BI214	2.709E-21	1.210E-20	1.500E-18	1.647E-18	1.801E-18	1.962E-18	2.130E-18	2.305E-18	2.487E-18
PO210	7.778E-18	2.996E-17	2.747E-15	2.925E-15	3.294E-15	3.721E-15	4.187E-15	4.690E-15	5.228E-15
PO211	4.452E-25	2.291E-24	2.195E-22	2.392E-22	2.590E-22	2.795E-22	3.005E-22	3.221E-22	3.443E-22
PO212	9.737E-26	6.631E-25	7.983E-24	7.974E-24	7.928E-24	7.876E-24	7.820E-24	7.760E-24	7.698E-24

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sbwss3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
PO213	1.460E-28	3.970E-28	4.847E-27	5.086E-27	5.326E-27	5.566E-27	5.807E-27	6.048E-27	6.289E-27
PO214	4.241E-26	1.664E-27	2.064E-25	2.266E-25	2.478E-25	2.700E-25	2.931E-25	3.171E-25	3.421E-25
PO215	5.150E-25	2.650E-24	2.539E-22	2.766E-22	2.996E-22	3.233E-22	3.476E-22	3.726E-22	3.983E-22
PO216	7.742E-20	5.273E-19	6.347E-18	6.340E-18	6.304E-18	6.263E-18	6.218E-18	6.170E-18	6.121E-18
PO218	4.231E-22	1.889E-21	2.342E-19	2.572E-19	2.813E-19	3.064E-19	3.327E-19	3.599E-19	3.883E-19
AT217	1.170E-24	3.179E-24	3.882E-23	4.073E-23	4.265E-23	4.457E-23	4.650E-23	4.843E-23	5.036E-23
RN218	9.123E-24	4.725E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.167E-21	6.006E-21	5.753E-19	6.269E-19	6.790E-19	7.326E-19	7.878E-19	8.444E-19	9.025E-19
RN220	2.923E-17	1.991E-16	2.396E-15	2.394E-15	2.380E-15	2.364E-15	2.347E-15	2.330E-15	2.311E-15
RN222	7.779E-19	3.473E-18	4.307E-16	4.730E-16	5.172E-16	5.634E-16	6.116E-16	6.618E-16	7.139E-16
FR221	1.062E-20	2.887E-20	3.525E-19	3.699E-19	3.873E-19	4.047E-19	4.222E-19	4.398E-19	4.573E-19
FR223	6.848E-21	2.786E-20	2.670E-18	2.904E-18	3.145E-18	3.393E-18	3.649E-18	3.911E-18	4.180E-18
RA222	1.009E-20	5.224E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	2.965E-16	1.526E-15	1.461E-13	1.592E-13	1.725E-13	1.861E-13	2.001E-13	2.145E-13	2.293E-13
RA224	1.693E-13	1.153E-12	1.388E-11	1.386E-11	1.378E-11	1.369E-11	1.359E-11	1.349E-11	1.338E-11
RA225	5.258E-17	1.305E-16	1.594E-15	1.672E-15	1.751E-15	1.830E-15	1.909E-15	1.988E-15	2.068E-15
RA226	1.210E-13	5.403E-13	6.700E-11	7.358E-11	8.046E-11	8.765E-11	9.515E-11	1.030E-10	1.111E-10
RA228	2.283E-19	1.559E-18	1.640E-16	1.761E-16	1.884E-16	2.008E-16	2.133E-16	2.260E-16	2.387E-16
AC225	3.244E-17	8.818E-17	1.077E-15	1.130E-15	1.183E-15	1.236E-15	1.290E-15	1.343E-15	1.397E-15
AC227	2.654E-13	1.080E-12	1.035E-10	1.125E-10	1.219E-10	1.315E-10	1.414E-10	1.515E-10	1.620E-10
AC228	6.223E-18	1.627E-22	1.712E-20	1.839E-20	1.967E-20	2.096E-20	2.227E-20	2.359E-20	2.492E-20
TH226	5.026E-19	2.603E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	5.359E-16	2.507E-15	2.401E-13	2.617E-13	2.834E-13	3.058E-13	3.288E-13	3.525E-13	3.767E-13
TH228	3.275E-11	2.239E-10	2.696E-09	2.684E-09	2.668E-09	2.651E-09	2.632E-09	2.612E-09	2.591E-09
TH229	1.015E-11	2.406E-11	2.937E-10	3.082E-10	3.227E-10	3.373E-10	3.518E-10	3.664E-10	3.811E-10
TH230	3.001E-08	6.484E-08	7.293E-07	7.644E-07	7.995E-07	8.346E-07	8.697E-07	9.049E-07	9.400E-07
TH231	1.192E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10
TH232	1.453E-08	4.372E-08	5.982E-07	6.274E-07	6.566E-07	6.857E-07	7.149E-07	7.441E-07	7.733E-07
TH234	4.309E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10
PA231	2.599E-08	5.414E-08	5.866E-07	6.147E-07	6.429E-07	6.710E-07	6.991E-07	7.272E-07	7.554E-07
PA233	6.108E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10	7.473E-10
PA234M	1.459E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14
PA234	2.762E-14	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15
U230	4.941E-16	2.557E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.263E-08	3.566E-08	1.021E-07	1.013E-07	1.004E-07	9.958E-08	9.872E-08	9.784E-08	9.695E-08
U233	3.231E-06	3.239E-06	3.372E-06	3.379E-06	3.387E-06	3.395E-06	3.403E-06	3.410E-06	3.418E-06
U234	1.250E-02	1.251E-02	1.259E-02	1.260E-02	1.260E-02	1.261E-02	1.261E-02	1.262E-02	1.262E-02
U235	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01
U236	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
U237	1.087E-03	2.284E-12	9.153E-13	8.723E-13	8.313E-13	7.922E-13	7.550E-13	7.195E-13	6.857E-13
U238	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01
U240	1.000E-10	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24
NP235	1.471E-09	7.763E-10	4.126E-15	2.177E-15	1.149E-15	6.063E-16	3.199E-16	1.688E-16	8.909E-17
NP236	8.392E-08	8.392E-08	8.391E-08	8.391E-08	8.391E-08	8.391E-08	8.390E-08	8.390E-08	8.390E-08
NP237	2.091E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02
NP238	1.604E-05	6.239E-16	5.721E-16	5.695E-16	5.669E-16	5.643E-16	5.617E-16	5.592E-16	5.566E-16
NP239	6.254E-03	2.328E-15	2.324E-15	2.324E-15	2.324E-15	2.323E-15	2.323E-15	2.323E-15	2.323E-15
NP240M	1.784E-10	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27
PU236	1.083E-07	8.591E-08	8.472E-10	6.644E-10	5.210E-10	4.086E-10	3.205E-10	2.513E-10	1.971E-10
PU237	1.198E-08	4.647E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	6.478E-04	6.586E-04	5.668E-04	5.624E-04	5.579E-04	5.535E-04	5.492E-04	5.449E-04	5.406E-04
PU239	5.604E-01	5.667E-01	5.664E-01	5.664E-01	5.663E-01	5.663E-01	5.663E-01	5.663E-01	5.663E-01
PU240	7.751E-03	7.750E-03	7.734E-03	7.733E-03	7.733E-03	7.732E-03	7.731E-03	7.730E-03	7.729E-03
PU241	7.742E-05	7.378E-05	2.956E-05	2.817E-05	2.685E-05	2.559E-05	2.438E-05	2.324E-05	2.215E-05
PU242	5.141E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07
PU243	1.211E-11	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29
PU244	5.970E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14
PU246	9.442E-22	6.939E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM241	8.548E-07	4.489E-06	4.781E-05	4.912E-05	5.036E-05	5.154E-05	5.266E-05	5.372E-05	5.473E-05
AM242M	3.343E-09	3.327E-09	3.051E-09	3.037E-09	3.023E-09	3.010E-09	2.996E-09	2.982E-09	2.969E-09
AM242	1.970E-10	3.980E-14	3.650E-14	3.633E-14	3.617E-14	3.600E-14	3.584E-14	3.568E-14	3.551E-14
AM243	2.697E-09	2.709E-09	2.704E-09	2.704E-09	2.704E-09	2.704E-09	2.703E-09	2.703E-09	2.703E-09
AM245	2.502E-19	1.138E-35	3.433E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM246	1.511E-24	1.112E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM241	1.849E-15	1.632E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	9.149E-09	1.980E-09	7.380E-12	7.354E-12	7.323E-12	7.290E-12	7.257E-12	7.224E-12	7.191E-12
CM243	2.608E-11	2.545E-11	1.603E-11	1.565E-11	1.527E-11	1.491E-11	1.455E-11	1.420E-11	1.386E-11
CM244	2.558E-11	2.465E-11	1.191E-11	1.146E-11	1.103E-11	1.062E-11	1.022E-11	9.835E-12	9.466E-12
CM245	1.726E-13	1.726E-13	1.723E-13	1.723E-13	1.723E-13	1.723E-13	1.722E-13	1.722E-13	1.722E-13
CM246	3.874E-16	3.873E-16	3.862E-16	3.862E-16	3.861E-16	3.861E-16	3.860E-16	3.859E-16	3.859E-16
CM247	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19
CM248	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22
CM250	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36
BK249	4.700E-28	2.960E-27	8.778E-34	8.778E-34	8.778E-34	8.778E-34	8.778E-34	8.778E-34	8.778E-34
CF250	0.000E+00	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32
CF251	0.000E+00	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38

Appendix D-2
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sbwss3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
SF250	1.875E-14	7.484E-14	1.115E-12	1.169E-12	1.223E-12	1.277E-12	1.331E-12	1.385E-12	1.438E-12
H 3	9.585E-06	9.062E-06	3.119E-06	2.949E-06	2.788E-06	2.636E-06	2.492E-06	2.356E-06	2.227E-06
LI 6	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08
LI 7	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09
BE 9	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09
BE 10	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08
C 14	2.974E-09	2.974E-09	2.967E-09	2.967E-09	2.966E-09	2.966E-09	2.966E-09	2.965E-09	2.965E-09
ZN 66	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11
ZN 67	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12
ZN 68	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15
GA 69	3.786E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19
GE 70	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22
GA 71	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09
GE 72	6.756E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06
GE 73	1.792E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05
GE 74	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05
AS 75	6.092E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05
GE 76	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04
SE 76	6.077E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07
SE 77	2.871E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
SE 78	5.850E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04
SE 79	8.705E-04	8.705E-04	8.703E-04	8.703E-04	8.703E-04	8.703E-04	8.703E-04	8.703E-04	8.703E-04
BR 79	4.384E-09	1.367E-08	1.901E-07	1.994E-07	2.087E-07	2.180E-07	2.273E-07	2.366E-07	2.458E-07
SE 80	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03
KR 80	3.617E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09
BR 81	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03
KR 81	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10
SE 82	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03
KR 82	3.884E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05
KR 83	7.574E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03
KR 84	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02
KR 85	3.634E-03	3.409E-03	9.979E-04	9.354E-04	8.769E-04	8.220E-04	7.705E-04	7.223E-04	6.770E-04
RB 85	1.387E-02	1.411E-02	1.652E-02	1.658E-02	1.664E-02	1.670E-02	1.675E-02	1.680E-02	1.684E-02
KR 86	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02
RB 86	1.233E-05	1.577E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	7.161E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05
RB 87	3.467E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02
SR 87	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07
SR 88	5.106E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02
SR 89	1.344E-02	8.939E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.111E-02	6.446E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02
SR 90	7.720E-02	7.538E-02	4.796E-02	4.683E-02	4.573E-02	4.465E-02	4.360E-02	4.258E-02	4.158E-02
Y 90	2.023E-05	1.890E-05	1.203E-05	1.174E-05	1.147E-05	1.120E-05	1.093E-05	1.068E-05	1.043E-05
ZR 90	1.668E-03	3.485E-03	3.092E-02	3.204E-02	3.315E-02	3.422E-02	3.527E-02	3.630E-02	3.730E-02
Y 91	1.951E-02	2.595E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.198E-02	8.138E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02
ZR 92	8.553E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02
NB 92	1.046E-15	1.576E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	9.383E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02
NB 93	1.443E-09	5.528E-09	3.579E-07	3.866E-07	4.160E-07	4.460E-07	4.767E-07	5.080E-07	5.398E-07
NB 93M	1.896E-08	5.746E-08	5.142E-07	5.281E-07	5.413E-07	5.539E-07	5.658E-07	5.771E-07	5.879E-07
ZR 94	9.087E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02
NB 94	1.254E-08	1.254E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08	1.253E-08
ZR 95	2.520E-02	4.819E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	1.343E-02	5.954E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	1.032E-05	2.016E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	5.764E-02	9.523E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02
ZR 96	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02
MO 96	5.126E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04
MO 97	9.175E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02
MO 98	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02
TC 98	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06
TC 99	8.944E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02	9.057E-02
RU 99	1.369E-07	4.316E-07	6.031E-06	6.326E-06	6.621E-06	6.915E-06	7.210E-06	7.505E-06	7.800E-06
MO100	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01
RU100	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03
RU101	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02
RU102	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02
RH102	1.709E-07	1.346E-07	1.434E-09	1.129E-09	8.893E-10	7.002E-10	5.514E-10	4.341E-10	3.418E-10
RU103	9.405E-03	1.499E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.649E-02	5.589E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02
RH103M	8.406E-06	1.340E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02
PD104	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04
PD105	2.170E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02

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sbwss3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
RU106	9.048E-03	4.549E-03	9.632E-09	4.843E-09	2.435E-09	1.224E-09	6.154E-10	3.094E-10	1.555E-10
RH106	8.513E-09	4.276E-09	9.054E-15	4.552E-15	2.288E-15	1.151E-15	5.784E-16	2.908E-16	1.462E-16
PD106	3.737E-03	8.236E-03	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02
AG106	2.554E-16	2.963E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	8.100E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03
AG107	3.973E-10	1.262E-09	1.768E-08	1.855E-08	1.941E-08	2.028E-08	2.114E-08	2.201E-08	2.287E-08
PD108	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03
AG108	5.075E-13	1.652E-20	1.489E-20	1.481E-20	1.473E-20	1.465E-20	1.457E-20	1.449E-20	1.441E-20
AG108M	5.260E-12	5.232E-12	4.716E-12	4.691E-12	4.665E-12	4.640E-12	4.614E-12	4.589E-12	4.564E-12
CD108	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08
AG109	3.613E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03
AG109M	7.552E-09	6.682E-17	2.102E-21	1.218E-21	7.058E-22	4.090E-22	2.370E-22	1.373E-22	7.959E-23
CD109	1.167E-10	6.764E-11	2.128E-15	1.233E-15	7.146E-16	4.141E-16	2.399E-16	1.390E-16	8.057E-17
PD110	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03
AG110	1.247E-10	4.697E-14	2.050E-22	7.442E-23	2.702E-23	9.810E-24	3.562E-24	1.293E-24	4.695E-25
AG110M	8.537E-06	3.100E-06	1.353E-14	4.911E-15	1.783E-15	6.473E-16	2.350E-16	8.533E-17	3.098E-17
CD110	5.204E-05	5.748E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05
AG111	7.071E-05	1.237E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	2.126E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03
CD112	1.958E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03
CD113	1.903E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03
CD113M	3.208E-05	3.061E-05	1.241E-05	1.184E-05	1.129E-05	1.076E-05	1.026E-05	9.788E-06	9.334E-06
IN113	7.017E-07	2.190E-06	2.037E-05	2.095E-05	2.150E-05	2.202E-05	2.252E-05	2.299E-05	2.345E-05
CD114	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03
IN114	1.187E-13	1.650E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	1.705E-09	1.026E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.041E-08	1.198E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08
CD115M	3.099E-05	1.061E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.559E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03
IN115M	1.290E-06	2.997E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	6.265E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05
CD116	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03
SN116	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04
SN117	1.831E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03
SN117M	1.146E-08	1.616E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	1.919E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03
SN119	1.884E-03	1.896E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03
SN119M	1.792E-05	6.376E-06	1.899E-14	6.758E-15	2.405E-15	8.557E-16	3.045E-16	1.084E-16	3.856E-17
SN120	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03
SN121M	8.759E-07	8.639E-07	6.637E-07	6.546E-07	6.456E-07	6.367E-07	6.279E-07	6.193E-07	6.107E-07
SB121	1.915E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03
SN122	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03
TE122	2.501E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05
SN123	2.122E-04	2.989E-05	2.005E-21	2.735E-22	4.334E-23	1.390E-23	0.000E+00	0.000E+00	0.000E+00
SB123	2.063E-03	2.246E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03
TE123	1.684E-07	1.824E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07
TE123M	1.586E-08	1.913E-09	6.692E-27	6.692E-27	6.692E-27	6.692E-27	6.692E-27	6.692E-27	6.692E-27
SN124	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03
SB124	6.413E-06	9.561E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.107E-05	1.739E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05
SN125	3.964E-05	1.558E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.839E-03	2.242E-03	1.930E-05	1.503E-05	1.170E-05	9.111E-06	7.094E-06	5.524E-06	4.301E-06
TE125	3.156E-04	9.508E-04	3.204E-03	3.208E-03	3.212E-03	3.214E-03	3.216E-03	3.218E-03	3.219E-03
TE125M	2.901E-05	3.121E-05	2.700E-07	2.102E-07	1.637E-07	1.274E-07	9.923E-08	7.726E-08	6.016E-08
SN126	4.710E-03	4.710E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03
SB126	6.236E-06	2.238E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10
SB126M	3.319E-09	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12
TE126	1.478E-04	1.541E-04	1.547E-04	1.547E-04	1.548E-04	1.548E-04	1.548E-04	1.549E-04	1.549E-04
TE127	1.372E-05	1.709E-07	1.169E-26	1.165E-26	1.165E-26	1.165E-26	1.165E-26	1.165E-26	1.165E-26
TE127M	4.778E-04	4.881E-05	3.338E-24	3.338E-24	3.338E-24	3.338E-24	3.338E-24	3.338E-24	3.338E-24
I127	7.886E-03	8.470E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03
XE127	2.377E-10	2.272E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02
XE128	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04
TE129	4.553E-06	2.367E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	4.710E-04	2.527E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.309E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02
XE129	4.332E-07	4.345E-07	4.543E-07	4.554E-07	4.564E-07	4.575E-07	4.585E-07	4.595E-07	4.606E-07
XE129M	2.648E-10	4.776E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02
XE130	2.733E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04
I131	2.324E-03	5.048E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.691E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02
XE131M	3.841E-05	6.889E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	9.865E-02	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01
CS132	1.116E-07	1.163E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwss3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
BA132	3.857E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08
XE133	2.972E-03	4.005E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.353E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01
XE134	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01
CS134	1.800E-03	1.287E-03	2.170E-06	1.551E-06	1.108E-06	7.917E-07	5.657E-07	4.042E-07	2.888E-07
BA134	1.890E-04	7.031E-04	1.988E-03	1.988E-03	1.989E-03	1.989E-03	1.989E-03	1.989E-03	1.989E-03
CS135	1.377E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01
BA135	4.061E-07	4.480E-07	1.239E-06	1.280E-06	1.322E-06	1.363E-06	1.405E-06	1.447E-06	1.488E-06
XE136	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01
CS136	6.083E-05	2.467E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	7.910E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04
BA136M	2.728E-12	1.106E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.318E-01	1.288E-01	8.305E-02	8.116E-02	7.930E-02	7.749E-02	7.572E-02	7.399E-02	7.230E-02
BA137	1.466E-03	4.477E-03	5.025E-02	5.215E-02	5.400E-02	5.582E-02	5.759E-02	5.931E-02	6.100E-02
BA137M	2.025E-08	1.971E-08	1.271E-08	1.242E-08	1.213E-08	1.186E-08	1.158E-08	1.132E-08	1.106E-08
BA138	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01
LA138	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07
LA139	1.411E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01
BA140	7.152E-03	1.809E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	9.531E-04	2.728E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.311E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01
CE141	1.826E-02	7.621E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.162E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01
CE142	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01
ND142	4.491E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04
PR143	7.103E-03	6.220E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.215E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01
CE144	8.136E-02	3.339E-02	1.494E-09	6.133E-10	2.517E-10	1.033E-10	4.239E-11	1.740E-11	7.139E-12
PR144	3.443E-06	1.410E-06	6.310E-14	2.589E-14	1.063E-14	4.361E-15	1.790E-15	7.345E-16	3.015E-16
PR144M	1.719E-08	7.048E-09	3.154E-16	1.294E-16	5.312E-17	2.180E-17	8.947E-18	3.672E-18	1.507E-18
ND144	4.009E-02	8.807E-02	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01
ND145	8.743E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02
ND146	6.923E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02
PM146	2.374E-06	2.093E-06	1.909E-07	1.683E-07	1.484E-07	1.308E-07	1.153E-07	1.017E-07	8.963E-08
SM146	4.650E-07	5.690E-07	1.273E-06	1.281E-06	1.288E-06	1.295E-06	1.301E-06	1.306E-06	1.310E-06
ND147	2.584E-03	2.961E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	4.409E-02	3.586E-02	2.368E-04	1.818E-04	1.396E-04	1.072E-04	8.230E-05	6.319E-05	4.852E-05
SM147	5.523E-03	1.637E-02	5.199E-02	5.204E-02	5.208E-02	5.212E-02	5.214E-02	5.216E-02	5.218E-02
ND148	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02
PM148	7.201E-05	9.576E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	6.010E-04	1.306E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.999E-03	3.671E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03
SM149	2.554E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02
ND150	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02
SM150	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03
EU150	5.410E-10	5.306E-10	3.681E-10	3.610E-10	3.542E-10	3.474E-10	3.408E-10	3.343E-10	3.279E-10
SM151	1.038E-02	1.036E-02	8.949E-03	8.880E-03	8.812E-03	8.744E-03	8.677E-03	8.611E-03	8.545E-03
EU151	3.487E-05	1.150E-04	1.525E-03	1.594E-03	1.662E-03	1.730E-03	1.797E-03	1.863E-03	1.929E-03
SM152	8.023E-03	8.023E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03	8.024E-03
EU152	2.325E-06	2.210E-06	8.390E-07	7.973E-07	7.577E-07	7.201E-07	6.843E-07	6.503E-07	6.180E-07
GD152	8.930E-07	9.297E-07	1.312E-06	1.323E-06	1.334E-06	1.345E-06	1.355E-06	1.364E-06	1.373E-06
EU153	4.845E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03
GD153	5.280E-08	1.855E-08	4.328E-17	1.520E-17	5.342E-18	1.877E-18	6.592E-19	2.316E-19	8.135E-20
SM154	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03
EU154	2.818E-04	2.600E-04	5.623E-05	5.187E-05	4.786E-05	4.415E-05	4.073E-05	3.758E-05	3.467E-05
GD154	7.059E-06	2.888E-05	2.327E-04	2.370E-04	2.410E-04	2.447E-04	2.482E-04	2.513E-04	2.542E-04
EU155	1.350E-03	1.174E-03	8.250E-05	7.174E-05	6.238E-05	5.425E-05	4.717E-05	4.102E-05	3.567E-05
GD155	8.849E-05	2.647E-04	1.357E-03	1.367E-03	1.377E-03	1.385E-03	1.392E-03	1.398E-03	1.403E-03
EU156	5.782E-05	3.393E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	7.808E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04
GD157	4.394E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04
GD158	2.925E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04
TB159	1.044E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GD160	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05
TB160	1.625E-06	4.901E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	2.020E-06	3.596E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06
TB161	7.571E-07	9.789E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	2.199E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05
DY162	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05
DY163	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06
DY164	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06
HO165	1.741E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06
HO166M	4.336E-09	4.334E-09	4.286E-09	4.284E-09	4.282E-09	4.279E-09	4.277E-09	4.274E-09	4.272E-09
ER166	9.888E-07	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06
ER167	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07
ER168	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08

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sbwss3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:29

	345.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
ER169	2.553E-12	5.129E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.925E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11
ER170	2.927E-16	9.664E-16	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15
TM170	5.364E-13	7.488E-14	4.247E-30	4.247E-30	4.247E-30	4.247E-30	4.247E-30	4.247E-30	4.247E-30
YB170	1.993E-13	6.601E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13
TM171	4.384E-15	3.055E-15	3.201E-18	2.231E-18	1.555E-18	1.084E-18	7.554E-19	5.265E-19	3.669E-19
YB171	1.181E-15	2.509E-15	5.561E-15	5.562E-15	5.563E-15	5.563E-15	5.564E-15	5.564E-15	5.564E-15
YB172	1.302E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17

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File SBWSS5.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) EBR-II
  BAS     ONE ELEMENT
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  381  382  383   9   50  0  4  0
  TIT     ONE CYCLE FOR ONE EBR-II ELEMENT
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                ELEMENT
  BUP
  IRP      50.0   .01068   1   2   4 2
  IRP     100.0   .01068   2   3   4 0
  IRP     200.0   .01068   3   4   4 0
  IRP     250.0   .01068   4   5   4 0
  IRP     300.0   .01068   5   6   4 0
  IRP     345.0   .01068   6   7   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV      7    1    0   1.0
  DEC       1.    1   2   5   4
  DEC      34.    2   3   5   0
  DEC      35.    3   4   5   0
  DEC      36.    4   5   5   0
  DEC      37.    5   6   5   0
  DEC      38.    6   7   5   0
  DEC      39.    7   8   5   0
  DEC      40.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922340 1.04E-2 922350 33.6    922360 5.10E-2 922380 30.34    FUEL 52.5%
  1    60120 5.64E-3  60130 6.27E-5 140280 1.75E-1 140290 8.87E-3
  1   140300 5.89E-3 150310 8.55E-3 160320 5.42E-3 160330 4.28E-5
  1   160340 2.40E-4 160350 1.14E-6 260540 7.61E-1 240500 1.57E-1
  1   240520 3.02E+0 240530 3.43E-1 240540 8.54E-2 250240 3.00E-1
  1   250250 3.80E-2 250260 4.18E-2 260560 1.18E+1 260570 2.71E-1
  1   260580 3.61E-2 410930 1.90E+0 280580 2.69E+0 280600 1.03E+0
  1   280610 4.45E-2 280620 1.41E-1 280640 3.59E-2      0 0.
  0
```

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File SBWSS5.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwss5.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwss5.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\fftfc.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwss5.u6 >nul
copy tape13.out+tape11.out sbwss5.u11 >nul
ren tape7.out sbwss5.pch
ren tape15.out sbwss5.dbg
ren tape16.out sbwss5.vxs
ren tape50.out sbwss5.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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sbwss5.g
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
H 1	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05	7.784E-05
H 2	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10	8.300E-10
H 3	1.587E-13	1.501E-13	2.354E-14	2.225E-14	2.104E-14	1.989E-14	1.881E-14	1.778E-14	1.681E-14
HE 3	1.869E-15	1.053E-14	1.370E-13	1.383E-13	1.395E-13	1.407E-13	1.418E-13	1.428E-13	1.438E-13
HE 4	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06	8.998E-06
LI 6	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11	3.129E-11
LI 7	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17	2.377E-17
BE 9	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08	6.356E-08
BE 10	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09	1.498E-09
B 10	2.862E-16	9.352E-16	2.235E-14	2.300E-14	2.365E-14	2.430E-14	2.495E-14	2.560E-14	2.625E-14
B 11	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17	3.328E-17
C 12	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03	5.640E-03
C 13	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05	6.270E-05
C 14	7.848E-12	7.847E-12	7.816E-12	7.815E-12	7.814E-12	7.813E-12	7.812E-12	7.811E-12	7.810E-12
N 14	4.393E-16	1.389E-15	3.266E-14	3.360E-14	3.455E-14	3.549E-14	3.644E-14	3.738E-14	3.833E-14
N 15	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22	7.087E-22
O 16	3.185E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34	5.670E-34
O 17	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21	1.193E-21
NE 20	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17	2.356E-17
NE 21	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19	1.154E-19
NE 22	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10	1.233E-10
NA 22	4.882E-20	3.741E-20	5.688E-24	5.688E-24	5.688E-24	5.688E-24	5.688E-24	5.688E-24	5.688E-24
NA 23	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12	9.634E-12
MG 24	2.210E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14	2.222E-14
MG 25	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06	1.380E-06
MG 26	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07	6.077E-07
AL 27	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09	6.334E-09
SI 28	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01	1.750E-01
SI 29	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03	8.871E-03
SI 30	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03	5.890E-03
SI 32	2.944E-14	2.941E-14	2.839E-14	2.836E-14	2.833E-14	2.830E-14	2.827E-14	2.824E-14	2.821E-14
P 31	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03	8.550E-03
P 32	2.484E-07	5.086E-15	1.710E-18	1.708E-18	1.706E-18	1.705E-18	1.703E-18	1.701E-18	1.699E-18
P 33	3.781E-13	1.512E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S 32	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03	5.419E-03
S 33	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05	4.292E-05
S 34	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04	2.400E-04
S 35	7.620E-08	4.291E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
S 36	1.891E-17	7.072E-17	1.780E-15	1.832E-15	1.884E-15	1.936E-15	1.988E-15	2.039E-15	2.091E-15
CL 35	1.065E-06	1.137E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06	1.141E-06
CL 36	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09	1.184E-09
CL 37	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13	1.943E-13
AR 36	9.759E-16	3.651E-15	9.193E-14	9.460E-14	9.728E-14	9.995E-14	1.026E-13	1.053E-13	1.080E-13
AR 37	2.405E-20	1.745E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AR 38	1.538E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18	1.539E-18
AR 39	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24	4.556E-24
AR 42	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29	5.043E-29
K 41	4.569E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18	4.574E-18
K 42	1.506E-24	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33	2.155E-33
CA 42	1.478E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22	1.493E-22
CA 43	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20	1.577E-20
CA 44	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11	3.523E-11
CA 45	4.404E-16	9.313E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CA 46	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11	1.131E-11
SC 45	1.650E-16	5.123E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16	6.054E-16
SC 46	2.401E-20	1.169E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	1.199E-20	3.483E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20	3.600E-20
TI 47	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06	1.145E-06
TI 48	9.616E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11	9.620E-11
TI 49	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06	2.493E-06
TI 50	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05	1.160E-05
V 50	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05	4.738E-05
V 51	1.138E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04	1.295E-04
CR 50	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01	1.568E-01
CR 51	1.567E-05	1.686E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00	3.020E+00
CR 53	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01	3.429E-01
CR 54	8.586E-02	8.610E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02	8.629E-02
MN 54	4.228E-04	1.880E-04	4.607E-16	2.049E-16	9.114E-17	4.054E-17	1.803E-17	8.020E-18	3.567E-18
MN 55	1.174E-05	3.040E-05	9.150E-05	9.150E-05	9.150E-05	9.151E-05	9.151E-05	9.151E-05	9.151E-05
FE 54	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01	7.603E-01
FE 55	7.977E-05	6.111E-05	9.232E-09	7.072E-09	5.417E-09	4.149E-09	3.178E-09	2.434E-09	1.865E-09
FE 56	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01	1.180E+01
FE 57	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01	2.725E-01
FE 58	3.840E-02	3.928E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02	3.930E-02
FE 59	8.180E-07	2.949E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix D-2
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sbwss5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
CO 58	9.057E-04	2.532E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	4.272E-04	4.280E-04	4.282E-04	4.282E-04	4.282E-04	4.282E-04	4.282E-04	4.282E-04	4.282E-04
CO 60	2.423E-05	2.124E-05	2.767E-07	2.426E-07	2.127E-07	1.865E-07	1.635E-07	1.434E-07	1.257E-07
NI 58	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00	2.686E+00
NI 59	5.344E-04	5.344E-04	5.343E-04	5.343E-04	5.343E-04	5.343E-04	5.343E-04	5.342E-04	5.342E-04
NI 60	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00	1.030E+00
NI 61	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02	4.463E-02
NI 62	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01	1.409E-01
NI 63	8.675E-05	8.609E-05	6.714E-05	6.664E-05	6.614E-05	6.564E-05	6.515E-05	6.466E-05	6.417E-05
NI 64	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02	3.590E-02
CU 63	3.030E-07	9.541E-07	1.991E-05	2.041E-05	2.091E-05	2.141E-05	2.190E-05	2.239E-05	2.287E-05
CU 65	3.584E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06	3.586E-06
ZN 64	2.255E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11	2.270E-11
ZN 65	6.480E-16	2.294E-16	3.034E-31	3.034E-31	3.034E-31	3.034E-31	3.034E-31	3.034E-31	3.034E-31
ZN 66	3.905E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10	3.906E-10
ZN 67	9.450E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15	9.451E-15
ZN 68	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18	4.288E-18
GA 69	2.285E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22	2.290E-22
GA 71	0.000E+00	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43	1.990E-43
GE 70	1.155E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29	3.245E-29
SR 87	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14	2.686E-14
SR 88	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15	5.783E-15
SR 89	4.655E-12	3.094E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	3.419E-12	3.339E-12	1.522E-12	1.486E-12	1.451E-12	1.417E-12	1.384E-12	1.351E-12	1.320E-12
Y 89	8.492E-12	1.312E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11	1.315E-11
Y 90	1.522E-08	8.373E-16	3.817E-16	3.728E-16	3.640E-16	3.554E-16	3.471E-16	3.389E-16	3.309E-16
Y 91	2.580E-11	3.406E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	1.285E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06	1.301E-06
ZR 91	9.769E-10	1.002E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09	1.003E-09
ZR 92	3.195E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05	3.344E-05
ZR 93	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05	1.189E-05
ZR 94	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08	2.679E-08
ZR 95	5.361E-12	1.025E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14	1.258E-14
NB 92	1.491E-06	2.247E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00	1.879E+00
NB 93M	2.337E-12	7.211E-12	8.309E-11	8.396E-11	8.478E-11	8.555E-11	8.629E-11	8.700E-11	8.766E-11
NB 94	2.118E-02	2.118E-02	2.115E-02	2.115E-02	2.115E-02	2.115E-02	2.115E-02	2.115E-02	2.115E-02
NB 95	3.366E-05	2.506E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	2.171E-15	4.290E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	3.358E-07	1.059E-06	2.491E-05	2.563E-05	2.635E-05	2.707E-05	2.779E-05	2.852E-05	2.924E-05
MO 95	9.551E-05	1.291E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04	1.292E-04
MO 96	7.299E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07	7.326E-07
MO 97	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10	5.944E-10
MO 98	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12	1.797E-12
MO100	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19	5.273E-19
TC 98	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22	6.784E-22
TC 99	2.070E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16	2.225E-16
RU 99	6.594E-23	7.900E-22	2.468E-20	2.541E-20	2.613E-20	2.685E-20	2.758E-20	2.830E-20	2.903E-20
RU100	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19	7.872E-19
RU101	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21	1.159E-21
HE 4	1.575E-07	5.346E-07	1.264E-05	1.299E-05	1.335E-05	1.371E-05	1.406E-05	1.442E-05	1.477E-05
TL206	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34	8.624E-34
TL207	7.950E-20	4.091E-19	9.600E-17	1.009E-16	1.057E-16	1.105E-16	1.154E-16	1.204E-16	1.254E-16
TL208	3.290E-17	2.240E-16	2.413E-15	2.398E-15	2.375E-15	2.353E-15	2.330E-15	2.308E-15	2.286E-15
TL209	9.943E-23	2.703E-22	5.607E-21	5.774E-21	5.942E-21	6.110E-21	6.278E-21	6.447E-21	6.616E-21
PB206	2.879E-18	4.281E-17	1.893E-13	2.106E-13	2.331E-13	2.573E-13	2.834E-13	3.114E-13	3.414E-13
PB207	1.758E-15	1.858E-14	9.282E-11	1.004E-10	1.082E-10	1.165E-10	1.251E-10	1.341E-10	1.435E-10
PB208	2.664E-12	4.067E-11	2.818E-08	2.898E-08	2.977E-08	3.055E-08	3.132E-08	3.209E-08	3.285E-08
PB209	4.143E-19	1.126E-18	2.336E-17	2.406E-17	2.476E-17	2.546E-17	2.616E-17	2.686E-17	2.757E-17
PB210	1.564E-15	2.075E-15	6.815E-13	7.369E-13	7.949E-13	8.556E-13	9.191E-13	9.854E-13	1.055E-12
PB211	6.150E-19	3.165E-18	7.427E-16	7.806E-16	8.175E-16	8.549E-16	8.929E-16	9.313E-16	9.702E-16
PB212	1.940E-14	1.321E-13	1.423E-12	1.415E-12	1.401E-12	1.388E-12	1.374E-12	1.361E-12	1.348E-12
PB214	3.649E-21	1.629E-20	5.639E-18	5.967E-18	6.304E-18	6.651E-18	7.007E-18	7.372E-18	7.746E-18
BI208	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21	1.192E-21
BI209	2.231E-16	1.631E-15	7.363E-13	7.799E-13	8.247E-13	8.709E-13	9.183E-13	9.671E-13	1.017E-12
BI210M	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22	3.324E-22
BI210	8.993E-19	1.278E-18	4.193E-16	4.537E-16	4.894E-16	5.268E-16	5.659E-16	6.067E-16	6.492E-16
BI211	3.629E-20	1.867E-19	4.382E-17	4.606E-17	4.823E-17	5.044E-17	5.268E-17	5.495E-17	5.725E-17
BI212	1.840E-15	1.253E-14	1.350E-13	1.342E-13	1.329E-13	1.316E-13	1.304E-13	1.291E-13	1.279E-13
BI213	9.735E-20	2.646E-19	5.490E-18	5.653E-18	5.817E-18	5.982E-18	6.147E-18	6.312E-18	6.477E-18
BI214	2.709E-21	1.210E-20	4.187E-18	4.431E-18	4.681E-18	4.938E-18	5.203E-18	5.474E-18	5.752E-18
PO210	7.778E-18	2.996E-17	1.158E-14	1.197E-14	1.283E-14	1.381E-14	1.485E-14	1.594E-14	1.707E-14
PO211	4.452E-25	2.291E-24	5.376E-22	5.651E-22	5.918E-22	6.189E-22	6.464E-22	6.742E-22	7.024E-22
PO212	9.737E-26	6.631E-25	7.141E-24	7.099E-24	7.031E-24	6.964E-24	6.898E-24	6.832E-24	6.767E-24

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sbwss5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
PO213	1.460E-28	3.970E-28	8.236E-27	8.482E-27	8.728E-27	8.974E-27	9.222E-27	9.469E-27	9.718E-27
PO214	4.241E-26	1.664E-27	5.761E-25	6.096E-25	6.440E-25	6.794E-25	7.158E-25	7.530E-25	7.913E-25
PO215	5.150E-25	2.650E-24	6.219E-22	6.537E-22	6.846E-22	7.159E-22	7.477E-22	7.798E-22	8.124E-22
PO216	7.742E-20	5.273E-19	5.678E-18	5.645E-18	5.591E-18	5.537E-18	5.485E-18	5.432E-18	5.380E-18
PO218	4.231E-22	1.889E-21	6.539E-19	6.919E-19	7.310E-19	7.712E-19	8.125E-19	8.548E-19	8.982E-19
AT217	1.170E-24	3.179E-24	6.595E-23	6.792E-23	6.989E-23	7.187E-23	7.385E-23	7.583E-23	7.782E-23
RN218	9.123E-24	4.725E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	1.167E-21	6.006E-21	1.409E-18	1.481E-18	1.551E-18	1.622E-18	1.694E-18	1.767E-18	1.841E-18
RN220	2.923E-17	1.991E-16	2.144E-15	2.131E-15	2.111E-15	2.091E-15	2.071E-15	2.051E-15	2.031E-15
RN222	7.779E-19	3.473E-18	1.202E-15	1.272E-15	1.344E-15	1.418E-15	1.494E-15	1.572E-15	1.651E-15
FR221	1.062E-20	2.887E-20	5.989E-19	6.168E-19	6.347E-19	6.526E-19	6.706E-19	6.886E-19	7.066E-19
FR223	6.848E-21	2.786E-20	6.541E-18	6.860E-18	7.185E-18	7.514E-18	7.847E-18	8.185E-18	8.527E-18
RA222	1.009E-20	5.224E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	2.965E-16	1.526E-15	3.580E-13	3.763E-13	3.941E-13	4.121E-13	4.304E-13	4.489E-13	4.677E-13
RA224	1.693E-13	1.153E-12	1.241E-11	1.234E-11	1.222E-11	1.211E-11	1.199E-11	1.188E-11	1.176E-11
RA225	5.258E-17	1.305E-16	2.708E-15	2.789E-15	2.870E-15	2.951E-15	3.032E-15	3.113E-15	3.195E-15
RA226	1.210E-13	5.403E-13	1.870E-10	1.979E-10	2.091E-10	2.206E-10	2.324E-10	2.445E-10	2.569E-10
RA228	2.283E-19	1.559E-18	3.433E-16	3.566E-16	3.700E-16	3.834E-16	3.968E-16	4.102E-16	4.237E-16
AC225	3.244E-17	8.818E-17	1.829E-15	1.884E-15	1.938E-15	1.993E-15	2.048E-15	2.103E-15	2.158E-15
AC227	2.654E-13	1.080E-12	2.535E-10	2.658E-10	2.784E-10	2.911E-10	3.041E-10	3.171E-10	3.304E-10
AC228	6.223E-18	1.627E-22	3.584E-20	3.723E-20	3.862E-20	4.002E-20	4.142E-20	4.282E-20	4.423E-20
TH226	5.026E-19	2.603E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	5.359E-16	2.507E-15	5.882E-13	6.183E-13	6.475E-13	6.772E-13	7.072E-13	7.377E-13	7.685E-13
TH228	3.275E-11	2.239E-10	2.412E-09	2.389E-09	2.366E-09	2.344E-09	2.321E-09	2.299E-09	2.277E-09
TH229	1.015E-11	2.406E-11	4.990E-10	5.139E-10	5.288E-10	5.438E-10	5.588E-10	5.738E-10	5.888E-10
TH230	3.001E-08	6.484E-08	1.222E-06	1.257E-06	1.292E-06	1.327E-06	1.363E-06	1.398E-06	1.433E-06
TH231	1.192E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10
TH232	1.453E-08	4.372E-08	1.007E-06	1.036E-06	1.065E-06	1.094E-06	1.123E-06	1.153E-06	1.182E-06
TH234	4.309E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10	4.298E-10
PA231	2.599E-08	5.414E-08	9.787E-07	1.007E-06	1.035E-06	1.063E-06	1.091E-06	1.119E-06	1.147E-06
PA233	6.108E-10	7.473E-10	7.473E-10	7.474E-10	7.474E-10	7.474E-10	7.474E-10	7.474E-10	7.474E-10
PA234M	1.459E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14	1.449E-14
PA234	2.762E-14	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15	6.473E-15
U230	4.941E-16	2.557E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.263E-08	3.566E-08	8.992E-08	8.907E-08	8.822E-08	8.738E-08	8.654E-08	8.572E-08	8.490E-08
U233	3.231E-06	3.239E-06	3.470E-06	3.477E-06	3.485E-06	3.493E-06	3.501E-06	3.508E-06	3.516E-06
U234	1.250E-02	1.251E-02	1.265E-02	1.266E-02	1.266E-02	1.266E-02	1.267E-02	1.267E-02	1.268E-02
U235	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01	2.895E+01
U236	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
U237	1.087E-03	2.284E-12	4.665E-13	4.446E-13	4.237E-13	4.038E-13	3.848E-13	3.667E-13	3.495E-13
U238	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01	2.960E+01
U240	1.000E-10	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24	1.142E-24
NP235	1.471E-09	7.763E-10	5.357E-19	2.827E-19	1.492E-19	7.872E-20	4.153E-20	2.191E-20	1.158E-20
NP236	8.392E-08	8.392E-08	8.390E-08	8.390E-08	8.390E-08	8.390E-08	8.390E-08	8.390E-08	8.390E-08
NP237	2.091E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02	2.200E-02
NP238	1.604E-05	6.239E-16	5.367E-16	5.343E-16	5.318E-16	5.294E-16	5.270E-16	5.246E-16	5.222E-16
NP239	6.254E-03	2.328E-15	2.321E-15	2.321E-15	2.321E-15	2.320E-15	2.320E-15	2.320E-15	2.320E-15
NP240M	1.784E-10	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27	9.989E-27
PU236	1.083E-07	8.591E-08	2.835E-11	2.227E-11	1.750E-11	1.377E-11	1.084E-11	8.537E-12	6.735E-12
PU237	1.198E-08	4.647E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	6.478E-04	6.586E-04	5.075E-04	5.035E-04	4.995E-04	4.956E-04	4.917E-04	4.878E-04	4.840E-04
PU239	5.604E-01	5.667E-01	5.661E-01	5.661E-01	5.661E-01	5.661E-01	5.661E-01	5.661E-01	5.660E-01
PU240	7.751E-03	7.750E-03	7.723E-03	7.722E-03	7.721E-03	7.720E-03	7.719E-03	7.719E-03	7.718E-03
PU241	7.742E-05	7.378E-05	1.507E-05	1.436E-05	1.368E-05	1.304E-05	1.243E-05	1.184E-05	1.129E-05
PU242	5.141E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07	5.142E-07
PU243	1.211E-11	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29	1.977E-29
PU244	5.970E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14	5.971E-14
PU246	9.442E-22	6.939E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM241	8.548E-07	4.489E-06	6.106E-05	6.167E-05	6.225E-05	6.279E-05	6.330E-05	6.378E-05	6.424E-05
AM242M	3.343E-09	3.327E-09	2.862E-09	2.849E-09	2.836E-09	2.824E-09	2.811E-09	2.798E-09	2.785E-09
AM242	1.970E-10	3.980E-14	3.424E-14	3.409E-14	3.393E-14	3.378E-14	3.362E-14	3.347E-14	3.332E-14
AM243	2.697E-09	2.709E-09	2.701E-09	2.701E-09	2.700E-09	2.700E-09	2.700E-09	2.700E-09	2.699E-09
AM245	2.502E-19	1.138E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM246	1.511E-24	1.112E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM241	1.849E-15	1.632E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	9.149E-09	1.980E-09	6.923E-12	6.900E-12	6.870E-12	6.839E-12	6.808E-12	6.777E-12	6.746E-12
CM243	2.608E-11	2.545E-11	1.141E-11	1.113E-11	1.087E-11	1.060E-11	1.035E-11	1.010E-11	9.858E-12
CM244	2.558E-11	2.465E-11	6.969E-12	6.708E-12	6.456E-12	6.213E-12	5.980E-12	5.755E-12	5.539E-12
CM245	1.726E-13	1.726E-13	1.721E-13	1.721E-13	1.721E-13	1.721E-13	1.720E-13	1.720E-13	1.720E-13
CM246	3.874E-16	3.873E-16	3.854E-16	3.854E-16	3.853E-16	3.853E-16	3.852E-16	3.852E-16	3.851E-16
CM247	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19	5.546E-19
CM248	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22	9.206E-22
CM250	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36	5.969E-36
BK249	4.700E-28	2.960E-27	1.360E-38	1.360E-38	1.360E-38	1.360E-38	1.360E-38	1.360E-38	1.360E-38
CF250	0.000E+00	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32	1.286E-32
CF251	0.000E+00	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38	8.677E-38

Appendix D-2
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sbwss5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
SF250	1.875E-14	7.484E-14	1.865E-12	1.918E-12	1.971E-12	2.024E-12	2.076E-12	2.129E-12	2.182E-12
H 3	9.585E-06	9.062E-06	1.422E-06	1.344E-06	1.271E-06	1.201E-06	1.136E-06	1.074E-06	1.015E-06
LI 6	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08	4.827E-08
LI 7	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09	1.144E-09
BE 9	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09	2.202E-09
BE 10	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08	1.471E-08
C 14	2.974E-09	2.974E-09	2.962E-09	2.962E-09	2.961E-09	2.961E-09	2.961E-09	2.960E-09	2.960E-09
ZN 66	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11	9.626E-11
ZN 67	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12	4.038E-12
ZN 68	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15	3.752E-15
GA 69	3.786E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19	3.790E-19
GE 70	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22	1.119E-22
GA 71	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09	1.066E-09
GE 72	6.756E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06	6.828E-06
GE 73	1.792E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05	1.794E-05
GE 74	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05	3.572E-05
AS 75	6.092E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05	6.093E-05
GE 76	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04	1.434E-04
SE 76	6.077E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07	6.134E-07
SE 77	2.871E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04	2.893E-04
SE 78	5.850E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04	5.853E-04
SE 79	8.705E-04	8.705E-04	8.702E-04	8.702E-04	8.702E-04	8.701E-04	8.701E-04	8.701E-04	8.701E-04
BR 79	4.384E-09	1.367E-08	3.201E-07	3.294E-07	3.387E-07	3.480E-07	3.573E-07	3.666E-07	3.758E-07
SE 80	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03	1.908E-03
KR 80	3.617E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09	3.619E-09
BR 81	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03	3.035E-03
KR 81	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10	1.177E-10
SE 82	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03	4.355E-03
KR 82	3.884E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05	3.932E-05
KR 83	7.574E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03	7.579E-03
KR 84	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02	1.443E-02
KR 85	3.634E-03	3.409E-03	4.036E-04	3.783E-04	3.547E-04	3.324E-04	3.116E-04	2.921E-04	2.738E-04
RB 85	1.387E-02	1.411E-02	1.712E-02	1.714E-02	1.716E-02	1.719E-02	1.721E-02	1.723E-02	1.725E-02
KR 86	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02	2.723E-02
RB 86	1.233E-05	1.577E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	7.161E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05	8.394E-05
RB 87	3.467E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02	3.468E-02
SR 87	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07	4.676E-07
SR 88	5.106E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02	5.109E-02
SR 89	1.344E-02	8.939E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	5.111E-02	6.446E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02	6.455E-02
SR 90	7.720E-02	7.538E-02	3.437E-02	3.356E-02	3.277E-02	3.200E-02	3.125E-02	3.051E-02	2.979E-02
Y 90	2.023E-05	1.890E-05	8.618E-06	8.416E-06	8.218E-06	8.025E-06	7.836E-06	7.651E-06	7.472E-06
ZR 90	1.668E-03	3.485E-03	4.451E-02	4.532E-02	4.611E-02	4.688E-02	4.763E-02	4.837E-02	4.909E-02
Y 91	1.951E-02	2.595E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	6.198E-02	8.138E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02	8.164E-02
ZR 92	8.553E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02	8.562E-02
NB 92	1.046E-15	1.576E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	9.383E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02	9.400E-02
NB 93	1.443E-09	5.528E-09	8.115E-07	8.473E-07	8.834E-07	9.199E-07	9.566E-07	9.936E-07	1.031E-06
NB 93M	1.896E-08	5.746E-08	6.568E-07	6.637E-07	6.701E-07	6.763E-07	6.821E-07	6.877E-07	6.929E-07
ZR 94	9.087E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02	9.088E-02
NB 94	1.254E-08	1.254E-08	1.252E-08	1.252E-08	1.252E-08	1.252E-08	1.252E-08	1.252E-08	1.252E-08
ZR 95	2.520E-02	4.819E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	1.343E-02	5.954E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	1.032E-05	2.016E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	5.764E-02	9.523E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02	9.630E-02
ZR 96	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02	9.533E-02
MO 96	5.126E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04	5.137E-04
MO 97	9.175E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02	9.204E-02
MO 98	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02	9.399E-02
TC 98	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06	1.064E-06
TC 99	8.944E-02	9.057E-02	9.056E-02	9.056E-02	9.056E-02	9.056E-02	9.056E-02	9.056E-02	9.056E-02
RU 99	1.369E-07	4.316E-07	1.016E-05	1.045E-05	1.075E-05	1.104E-05	1.134E-05	1.163E-05	1.193E-05
MO100	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01	1.009E-01
RU100	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03	1.176E-03
RU101	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02	8.733E-02
RU102	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02	7.721E-02
RH102	1.709E-07	1.346E-07	5.051E-11	3.977E-11	3.132E-11	2.466E-11	1.942E-11	1.529E-11	1.204E-11
RU103	9.405E-03	1.499E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.649E-02	5.589E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02	5.590E-02
RH103M	8.406E-06	1.340E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02	4.043E-02
PD104	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04	9.317E-04
PD105	2.170E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02	2.186E-02

Appendix D-2
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sbwss5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
RU106	9.048E-03	4.549E-03	6.349E-13	3.192E-13	1.605E-13	8.069E-14	4.057E-14	2.040E-14	1.025E-14
RH106	8.513E-09	4.276E-09	5.968E-19	3.001E-19	1.509E-19	7.584E-20	3.813E-20	1.917E-20	9.638E-21
PD106	3.737E-03	8.236E-03	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02	1.278E-02
AG106	2.554E-16	2.963E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	8.100E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03	8.101E-03
AG107	3.973E-10	1.262E-09	2.979E-08	3.065E-08	3.151E-08	3.238E-08	3.324E-08	3.411E-08	3.497E-08
PD108	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03	5.234E-03
AG108	5.075E-13	1.652E-20	1.380E-20	1.372E-20	1.365E-20	1.357E-20	1.350E-20	1.343E-20	1.335E-20
AG108M	5.260E-12	5.232E-12	4.369E-12	4.346E-12	4.322E-12	4.298E-12	4.275E-12	4.252E-12	4.229E-12
CD108	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08	3.401E-08
AG109	3.613E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03	3.623E-03
AG109M	7.552E-09	6.682E-17	1.012E-24	5.864E-25	3.398E-25	1.969E-25	1.141E-25	6.612E-26	3.831E-26
CD109	1.167E-10	6.764E-11	1.024E-18	5.937E-19	3.440E-19	1.994E-19	1.155E-19	6.693E-20	3.878E-20
PD110	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03	2.696E-03
AG110	1.247E-10	4.697E-14	1.418E-28	5.150E-29	1.870E-29	6.905E-30	2.559E-30	9.293E-31	4.182E-31
AG110M	8.537E-06	3.100E-06	9.355E-21	3.398E-21	1.229E-21	4.557E-22	1.689E-22	5.519E-23	2.760E-23
CD110	5.204E-05	5.748E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05	6.058E-05
AG111	7.071E-05	1.237E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	2.126E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03	2.197E-03
CD112	1.958E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03	1.965E-03
CD113	1.903E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03	1.904E-03
CD113M	3.208E-05	3.061E-05	6.382E-06	6.086E-06	5.804E-06	5.535E-06	5.278E-06	5.033E-06	4.799E-06
IN113	7.017E-07	2.190E-06	2.640E-05	2.669E-05	2.697E-05	2.724E-05	2.750E-05	2.774E-05	2.798E-05
CD114	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03
IN114	1.187E-13	1.650E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	1.705E-09	1.026E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	1.041E-08	1.198E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08	1.199E-08
CD115M	3.099E-05	1.061E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.559E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03	1.607E-03
IN115M	1.290E-06	2.997E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	6.265E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05	6.329E-05
CD116	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03	1.855E-03
SN116	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04	2.109E-04
SN117	1.831E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03	1.833E-03
SN117M	1.146E-08	1.616E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	1.919E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03	1.920E-03
SN119	1.884E-03	1.896E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03
SN119M	1.792E-05	6.376E-06	9.913E-21	3.530E-21	1.251E-21	4.433E-22	1.614E-22	5.113E-23	2.559E-23
SN120	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03	1.959E-03
SN121M	8.759E-07	8.639E-07	5.466E-07	5.391E-07	5.316E-07	5.243E-07	5.171E-07	5.100E-07	5.029E-07
SB121	1.915E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03	1.924E-03
SN122	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03	2.123E-03
TE122	2.501E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05	2.560E-05
SN123	2.122E-04	2.989E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	2.063E-03	2.246E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03	2.276E-03
TE123	1.684E-07	1.824E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07	1.843E-07
TE123M	1.586E-08	1.913E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03	2.729E-03
SB124	6.413E-06	9.561E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.107E-05	1.739E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05	1.748E-05
SN125	3.964E-05	1.558E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.839E-03	2.242E-03	5.809E-07	4.523E-07	3.521E-07	2.742E-07	2.135E-07	1.662E-07	1.294E-07
TE125	3.156E-04	9.508E-04	3.223E-03	3.223E-03	3.223E-03	3.223E-03	3.223E-03	3.223E-03	3.223E-03
TE125M	2.901E-05	3.121E-05	8.125E-09	6.326E-09	4.925E-09	3.835E-09	2.986E-09	2.325E-09	1.810E-09
SN126	4.710E-03	4.710E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.709E-03	4.708E-03
SB126	6.236E-06	2.238E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10	2.237E-10
SB126M	3.319E-09	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12	1.701E-12
TE126	1.478E-04	1.541E-04	1.551E-04	1.552E-04	1.552E-04	1.552E-04	1.553E-04	1.553E-04	1.553E-04
TE127	1.372E-05	1.709E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.778E-04	4.881E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	7.886E-03	8.470E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03	8.519E-03
XE127	2.377E-10	2.272E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02	1.596E-02
XE128	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04	1.068E-04
TE129	4.553E-06	2.367E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	4.710E-04	2.527E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.309E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02	2.358E-02
XE129	4.332E-07	4.345E-07	4.689E-07	4.699E-07	4.710E-07	4.720E-07	4.731E-07	4.741E-07	4.752E-07
XE129M	2.648E-10	4.776E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02	4.181E-02
XE130	2.733E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04	2.745E-04
I131	2.324E-03	5.048E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.691E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02	6.933E-02
XE131M	3.841E-05	6.889E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	9.865E-02	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01
CS132	1.116E-07	1.163E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix D-2
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sbwss5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
BA132	3.857E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08	4.080E-08
XE133	2.972E-03	4.005E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.353E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01	1.388E-01
XE134	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01	1.650E-01
CS134	1.800E-03	1.287E-03	1.957E-08	1.399E-08	9.992E-09	7.140E-09	5.101E-09	3.645E-09	2.604E-09
BA134	1.890E-04	7.031E-04	1.990E-03	1.990E-03	1.990E-03	1.990E-03	1.990E-03	1.990E-03	1.990E-03
CS135	1.377E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01	1.381E-01
BA135	4.061E-07	4.480E-07	1.821E-06	1.863E-06	1.904E-06	1.946E-06	1.987E-06	2.029E-06	2.071E-06
XE136	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01	1.402E-01
CS136	6.083E-05	2.467E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	7.910E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04	8.518E-04
BA136M	2.728E-12	1.106E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.318E-01	1.288E-01	6.010E-02	5.873E-02	5.739E-02	5.608E-02	5.479E-02	5.354E-02	5.232E-02
BA137	1.466E-03	4.477E-03	7.321E-02	7.458E-02	7.592E-02	7.723E-02	7.851E-02	7.976E-02	8.099E-02
BA137M	2.025E-08	1.971E-08	9.195E-09	8.985E-09	8.779E-09	8.579E-09	8.383E-09	8.191E-09	8.004E-09
BA138	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01	1.449E-01
LA138	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07	5.972E-07
LA139	1.411E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01	1.412E-01
BA140	7.152E-03	1.809E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	9.531E-04	2.728E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.311E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01	1.392E-01
CE141	1.826E-02	7.621E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.162E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01	1.346E-01
CE142	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01	1.267E-01
ND142	4.491E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04	4.524E-04
PR143	7.103E-03	6.220E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.215E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01	1.294E-01
CE144	8.136E-02	3.339E-02	5.745E-15	2.358E-15	9.675E-16	3.971E-16	1.630E-16	6.687E-17	2.744E-17
PR144	3.443E-06	1.410E-06	2.426E-19	9.955E-20	4.085E-20	1.677E-20	6.881E-21	2.824E-21	1.159E-21
PR144M	1.719E-08	7.048E-09	1.213E-21	4.976E-22	2.042E-22	8.381E-23	3.440E-23	1.412E-23	5.793E-24
ND144	4.009E-02	8.807E-02	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01	1.215E-01
ND145	8.743E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02	8.752E-02
ND146	6.923E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02	6.924E-02
PM146	2.374E-06	2.093E-06	3.270E-08	2.883E-08	2.542E-08	2.241E-08	1.975E-08	1.741E-08	1.535E-08
SM146	4.650E-07	5.690E-07	1.331E-06	1.333E-06	1.334E-06	1.335E-06	1.336E-06	1.337E-06	1.338E-06
ND147	2.584E-03	2.961E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	4.409E-02	3.586E-02	5.861E-06	4.500E-06	3.455E-06	2.653E-06	2.037E-06	1.564E-06	1.201E-06
SM147	5.523E-03	1.637E-02	5.222E-02	5.222E-02	5.222E-02	5.222E-02	5.222E-02	5.222E-02	5.222E-02
ND148	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02	4.038E-02
PM148	7.201E-05	9.576E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	6.010E-04	1.306E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.999E-03	3.671E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03	3.672E-03
SM149	2.554E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02
ND150	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02	1.679E-02
SM150	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03
EU150	5.410E-10	5.306E-10	2.811E-10	2.757E-10	2.705E-10	2.653E-10	2.603E-10	2.553E-10	2.504E-10
SM151	1.038E-02	1.036E-02	8.034E-03	7.972E-03	7.911E-03	7.850E-03	7.790E-03	7.730E-03	7.671E-03
EU151	3.487E-05	1.150E-04	2.440E-03	2.502E-03	2.563E-03	2.623E-03	2.684E-03	2.743E-03	2.803E-03
SM152	8.023E-03	8.023E-03	8.025E-03	8.025E-03	8.025E-03	8.025E-03	8.025E-03	8.025E-03	8.025E-03
EU152	2.325E-06	2.210E-06	4.111E-07	3.906E-07	3.712E-07	3.528E-07	3.352E-07	3.186E-07	3.028E-07
GD152	8.930E-07	9.297E-07	1.431E-06	1.437E-06	1.442E-06	1.447E-06	1.452E-06	1.457E-06	1.461E-06
EU153	4.845E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03	4.888E-03
GD153	5.280E-08	1.855E-08	1.887E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM154	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03	2.352E-03
EU154	2.818E-04	2.600E-04	1.819E-05	1.678E-05	1.548E-05	1.429E-05	1.318E-05	1.216E-05	1.122E-05
GD154	7.059E-06	2.888E-05	2.707E-04	2.721E-04	2.734E-04	2.746E-04	2.757E-04	2.767E-04	2.777E-04
EU155	1.350E-03	1.174E-03	1.166E-05	1.014E-05	8.816E-06	7.666E-06	6.666E-06	5.797E-06	5.040E-06
GD155	8.849E-05	2.647E-04	1.427E-03	1.429E-03	1.430E-03	1.431E-03	1.432E-03	1.433E-03	1.434E-03
EU156	5.782E-05	3.393E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	7.808E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04	8.398E-04
GD157	4.394E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04	4.407E-04
GD158	2.925E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04	2.926E-04
TB159	1.044E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GD160	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05	5.346E-05
TB160	1.625E-06	4.901E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	2.020E-06	3.596E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06	3.645E-06
TB161	7.571E-07	9.789E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	2.199E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05	2.274E-05
DY162	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05
DY163	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06	6.139E-06
DY164	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06	3.410E-06
HO165	1.741E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06	1.742E-06
HO166M	4.336E-09	4.334E-09	4.252E-09	4.249E-09	4.247E-09	4.245E-09	4.242E-09	4.240E-09	4.237E-09
ER166	9.888E-07	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06	1.010E-06
ER167	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07	5.707E-07
ER168	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08	2.068E-08

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sbwss5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/06/02 at 19:47:33

	345.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
ER169	2.553E-12	5.129E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.925E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11	2.180E-11
ER170	2.927E-16	9.664E-16	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15	1.076E-15
TM170	5.364E-13	7.488E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	1.993E-13	6.601E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13	7.349E-13
TM171	4.384E-15	3.055E-15	2.047E-20	1.425E-20	9.924E-21	6.910E-21	4.811E-21	3.350E-21	2.333E-21
YB171	1.181E-15	2.509E-15	5.565E-15	5.565E-15	5.565E-15	5.565E-15	5.565E-15	5.565E-15	5.565E-15
YB172	1.302E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17	1.357E-17

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File SBWZR1.INP

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-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                            CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       1.    1   2   5   4
  DEC       6.    2   3   5   0
  DEC       7.    3   4   5   0
  DEC       8.    4   5   5   0
  DEC       9.    5   6   5   0
  DEC      10.    6   7   5   0
  DEC      11.    7   8   5   0
  DEC      12.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
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File SBWZR1.INP (continued)

```
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File SBWZR1.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbwzr1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwzr1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwzr1.u6 >nul
copy tape13.out+tape11.out sbwzr1.u11 >nul
ren tape7.out sbwzr1.pch
ren tape15.out sbwzr1.dbg
ren tape16.out sbwzr1.vxs
ren tape50.out sbwzr1.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed **************************
echo ************************************************************************
echo on
```

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sbwzr1.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	7.650E-11	5.778E-11	5.463E-11	5.165E-11	4.883E-11	4.616E-11	4.364E-11	4.126E-11
HE 3	1.385E-12	5.802E-12	2.452E-11	2.768E-11	3.066E-11	3.348E-11	3.614E-11	3.866E-11	4.105E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08
B 10	4.994E-13	5.333E-13	7.032E-13	7.371E-13	7.711E-13	8.051E-13	8.390E-13	8.730E-13	9.070E-13
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.319E-03	3.317E-03	3.316E-03	3.316E-03	3.315E-03	3.315E-03	3.315E-03	3.314E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.518E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.505E-20	1.486E-20	1.482E-20	1.478E-20	1.474E-20	1.470E-20	1.467E-20	1.463E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	2.159E-21	1.944E-21	1.904E-21	1.864E-21	1.824E-21	1.786E-21	1.749E-21	1.712E-21
K 39	1.746E-23	5.634E-23	2.502E-22	2.885E-22	3.267E-22	3.648E-22	4.028E-22	4.407E-22	4.784E-22
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	9.229E-26	8.309E-26	8.136E-26	7.965E-26	7.798E-26	7.634E-26	7.474E-26	7.317E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	6.426E-10	2.719E-13	5.751E-14	1.216E-14	2.572E-15	5.440E-16	1.151E-16	2.433E-17
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.583E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	1.034E-08	2.844E-15	1.386E-16	6.757E-18	3.293E-19	1.605E-20	7.861E-22	4.132E-23
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	2.128E-07	3.070E-27	3.304E-31	3.555E-35	3.825E-39	4.288E-43	0.000E+00	0.000E+00
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	1.686E-04	2.935E-06	1.306E-06	5.807E-07	2.583E-07	1.149E-07	5.110E-08	2.273E-08
MN 55	7.699E-03	1.023E-02	1.633E-02	1.684E-02	1.723E-02	1.753E-02	1.776E-02	1.793E-02	1.807E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	8.280E-03	2.183E-03	1.673E-03	1.281E-03	9.813E-04	7.517E-04	5.758E-04	4.410E-04
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.706E-08	5.892E-20	2.109E-22	3.312E-24	2.146E-24	0.000E+00	0.000E+00	0.000E+00
CO 58	4.277E-04	1.196E-05	2.042E-13	5.708E-15	1.596E-16	4.461E-18	1.247E-19	3.483E-21	9.557E-23
CO 59	1.843E-03	1.871E-03	1.876E-03	1.877E-03	1.878E-03	1.879E-03	1.880E-03	1.881E-03	1.882E-03
CO 60	1.264E-04	1.108E-04	5.742E-05	5.034E-05	4.413E-05	3.870E-05	3.393E-05	2.974E-05	2.608E-05
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00

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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.087E-02	2.010E-02	1.995E-02	1.980E-02	1.965E-02	1.950E-02	1.935E-02	1.921E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	4.990E-04	1.271E-03	1.421E-03	1.571E-03	1.720E-03	1.867E-03	2.014E-03	2.159E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	2.690E-11	1.498E-13	5.304E-14	1.878E-14	6.651E-15	2.355E-15	8.340E-16	2.953E-16
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 71	7.964E-23	3.830E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.026E-06	1.331E-17	8.849E-20	5.853E-22	4.583E-25	4.583E-25	4.583E-25	4.583E-25
SR 90	1.544E-06	1.508E-06	1.339E-06	1.307E-06	1.277E-06	1.247E-06	1.217E-06	1.189E-06	1.161E-06
Y 89	2.396E-03	2.549E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.782E-10	3.357E-10	3.278E-10	3.201E-10	3.126E-10	3.052E-10	2.981E-10	2.911E-10
Y 91	4.667E-04	6.163E-06	2.474E-15	3.267E-17	4.313E-19	5.699E-21	7.198E-23	0.000E+00	0.000E+00
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.765E-03	1.218E-11	2.329E-13	4.453E-15	8.515E-17	1.628E-18	3.114E-20	5.910E-22
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 92	3.999E-07	6.025E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.190E+00	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	2.252E-05	5.228E-05	5.738E-05	6.222E-05	6.682E-05	7.120E-05	7.535E-05	7.930E-05
NB 94	3.937E-02	3.937E-02	3.936E-02	3.936E-02	3.936E-02	3.936E-02	3.935E-02	3.935E-02	3.935E-02
NB 95	1.328E-01	5.887E-03	1.486E-11	2.940E-13	5.629E-15	1.076E-16	2.058E-18	3.935E-20	7.525E-22
NB 95M	9.792E-05	1.994E-06	5.096E-15	9.745E-17	1.863E-18	3.563E-20	6.813E-22	1.303E-23	2.491E-25
MO 94	2.903E-06	4.248E-06	1.097E-05	1.231E-05	1.366E-05	1.500E-05	1.634E-05	1.769E-05	1.903E-05
MO 95	2.820E+00	3.192E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	1.076E-17	4.187E-17	4.810E-17	5.432E-17	6.054E-17	6.676E-17	7.299E-17	7.921E-17
RU 99	6.727E-11	1.400E-10	5.038E-10	5.766E-10	6.493E-10	7.221E-10	7.949E-10	8.676E-10	9.404E-10
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	3.829E-18	3.874E-32	3.874E-32	3.874E-32	3.874E-32	3.874E-32	3.874E-32	3.874E-32
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29	1.409E-29
RH102	1.578E-22	1.201E-22	3.837E-23	3.837E-23	3.837E-23	3.837E-23	3.837E-23	3.837E-23	3.837E-23
RH103	6.390E-16	8.778E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35	1.324E-35
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.212E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	5.283E-11	2.484E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.494E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	6.271E-07	1.050E-11	1.164E-12	1.290E-13	1.431E-14	1.586E-15	1.758E-16	1.949E-17
IN114	1.614E-08	3.561E-11	2.809E-22	1.690E-24	1.017E-26	6.070E-29	0.000E+00	0.000E+00	0.000E+00
IN114M	3.679E-04	2.214E-06	1.746E-17	1.051E-19	6.272E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.044E-03	1.748E-08	1.938E-09	2.149E-10	2.382E-11	2.641E-12	2.927E-13	3.245E-14
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN117M	9.722E-03	1.370E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix D-2
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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02
SN119	8.423E+01	8.433E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	5.365E-02	3.062E-04	1.090E-04	3.877E-05	1.380E-05	4.910E-06	1.747E-06	6.217E-07
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.524E-03	1.422E-03	1.403E-03	1.383E-03	1.364E-03	1.345E-03	1.327E-03	1.309E-03
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	6.097E-04	3.380E-08	4.761E-09	6.706E-10	9.446E-11	1.330E-11	1.874E-12	2.640E-13
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SN125	2.449E-03	9.625E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	2.832E-01	2.837E-01	2.838E-01	2.838E-01	2.838E-01	2.839E-01	2.839E-01	2.839E-01	2.839E-01
SB123	2.498E-02	2.869E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	1.309E-06	9.643E-16	1.438E-17	2.144E-19	3.191E-21	5.197E-23	7.757E-24	6.257E-24
SB125	2.127E-01	1.675E-01	4.793E-02	3.732E-02	2.906E-02	2.262E-02	1.762E-02	1.372E-02	1.068E-02
SB126	3.687E-05	4.974E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.279E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	1.972E-06	5.025E-11	6.059E-12	7.306E-13	8.809E-14	1.062E-14	1.281E-15	1.544E-16
TE124	6.257E-04	7.122E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	1.737E-01	2.949E-01	3.057E-01	3.141E-01	3.206E-01	3.257E-01	3.296E-01	3.327E-01
TE125M	2.654E-03	2.338E-03	6.704E-04	5.220E-04	4.064E-04	3.165E-04	2.464E-04	1.918E-04	1.494E-04
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	4.612E-11	4.174E-16	4.091E-17	4.010E-18	3.931E-19	3.853E-20	3.777E-21	3.702E-22
TE127M	1.344E-07	1.318E-08	1.192E-13	1.169E-14	1.145E-15	1.123E-16	1.101E-17	1.079E-18	1.058E-19
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	6.894E-21	2.996E-37	1.600E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.379E-14	7.363E-18	3.199E-34	1.709E-37	9.129E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.225E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
I131	1.297E-19	2.743E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.863E-14	1.780E-17	1.420E-32	1.357E-35	1.297E-38	1.246E-41	0.000E+00	0.000E+00	0.000E+00
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE129M	6.502E-13	1.173E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE131M	4.971E-17	2.854E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE133	3.734E-21	4.100E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS132	2.603E-26	1.850E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	7.205E-22	1.386E-22	9.203E-23	6.109E-23	4.055E-23	2.692E-23	2.692E-23	2.692E-23
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	3.590E-22	9.408E-22	9.874E-22	1.018E-21	1.039E-21	1.053E-21	1.053E-21	1.053E-21
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER169	1.553E-19	3.121E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER170	6.143E-22	9.649E-22	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	3.981E-20	2.112E-24	2.112E-24	2.112E-24	2.112E-24	2.112E-24	2.112E-24	2.112E-24
TM171	5.935E-20	4.144E-20	6.811E-21	4.743E-21	3.302E-21	2.299E-21	1.601E-21	1.127E-21	7.939E-22
YB170	4.405E-19	6.854E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	4.135E-20	7.598E-20	7.805E-20	7.949E-20	8.049E-20	8.119E-20	8.166E-20	8.199E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.021E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	5.175E-10	1.469E-13	2.869E-14	5.602E-15	1.094E-15	2.136E-16	4.171E-17	8.145E-18
LU177M	2.662E-07	5.199E-08	1.476E-11	2.882E-12	5.628E-13	1.099E-13	2.146E-14	4.191E-15	8.183E-16
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	1.589E-05	2.226E-13	5.982E-15	1.607E-16	4.319E-18	1.160E-19	3.114E-21	9.086E-23
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	1.966E-05	2.120E-18	5.397E-21	8.031E-24	1.105E-23	0.000E+00	0.000E+00	0.000E+00
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01

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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
TA182	9.547E-03	1.056E-03	1.752E-08	1.946E-09	2.235E-10	3.292E-11	1.183E-11	9.496E-12	9.238E-12
TA183	6.272E-04	1.731E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	7.216E-02	8.065E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.253E-08	4.425E-15	1.520E-16	5.222E-18	1.794E-19	6.171E-21	2.178E-22	0.000E+00
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	3.629E-14	4.346E-22	2.398E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RE185	7.346E-06	9.947E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	3.738E-16	4.476E-24	2.456E-25	6.431E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	7.064E-20	3.055E-19	3.524E-19	3.994E-19	4.464E-19	4.933E-19	5.403E-19	5.873E-19
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS191	1.181E-17	8.861E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS192	3.158E-19	5.976E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	1.992E-19	4.562E-24	4.562E-24	4.562E-24	4.562E-24	4.562E-24	4.562E-24	4.562E-24
IR192M	5.491E-21	5.491E-21	5.412E-21	5.412E-21	5.412E-21	5.412E-21	5.412E-21	5.412E-21	5.412E-21
IR193	8.109E-19	8.110E-19	8.111E-19	8.112E-19	8.112E-19	8.113E-19	8.113E-19	8.113E-19	8.114E-19
IR194	4.896E-22	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30
PT192	6.270E-18	1.188E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.583E-20	2.565E-20	2.562E-20	2.558E-20	2.554E-20	2.551E-20	2.547E-20	2.544E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	3.123E-04	1.048E-03	1.192E-03	1.334E-03	1.476E-03	1.616E-03	1.756E-03	1.894E-03
TL206	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29
TL207	3.787E-17	5.254E-17	1.611E-16	1.899E-16	2.207E-16	2.535E-16	2.882E-16	3.249E-16	3.635E-16
TL208	2.376E-14	4.772E-14	1.678E-13	1.842E-13	1.971E-13	2.075E-13	2.156E-13	2.218E-13	2.263E-13
TL209	1.073E-19	3.797E-20	4.160E-20	4.264E-20	4.379E-20	4.506E-20	4.644E-20	4.793E-20	4.954E-20
PB206	1.520E-15	3.826E-15	1.808E-14	2.137E-14	2.492E-14	2.893E-14	3.354E-14	3.894E-14	4.534E-14
PB207	6.465E-12	9.859E-12	4.851E-11	6.183E-11	7.741E-11	9.541E-11	1.160E-10	1.393E-10	1.655E-10
PB208	9.394E-09	2.104E-08	2.063E-07	2.645E-07	3.275E-07	3.944E-07	4.643E-07	5.365E-07	6.106E-07
PB209	4.482E-16	1.582E-16	1.733E-16	1.776E-16	1.825E-16	1.877E-16	1.935E-16	1.997E-16	2.064E-16
PB210	8.589E-14	9.112E-14	1.050E-13	1.159E-13	1.310E-13	1.510E-13	1.769E-13	2.095E-13	2.498E-13
PB211	2.930E-16	4.065E-16	1.247E-15	1.469E-15	1.707E-15	1.961E-15	2.230E-15	2.514E-15	2.812E-15
PB212	1.401E-11	2.814E-11	9.897E-11	1.086E-10	1.163E-10	1.224E-10	1.272E-10	1.308E-10	1.335E-10
PB214	6.485E-20	1.172E-19	9.209E-19	1.235E-18	1.615E-18	2.067E-18	2.597E-18	3.211E-18	3.915E-18
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	1.140E-12	2.656E-12	2.979E-12	3.310E-12	3.650E-12	4.001E-12	4.362E-12	4.735E-12
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	5.610E-17	6.465E-17	7.134E-17	8.062E-17	9.297E-17	1.089E-16	1.290E-16	1.538E-16
BI211	1.729E-17	2.398E-17	7.355E-17	8.670E-17	1.007E-16	1.157E-16	1.316E-16	1.483E-16	1.659E-16
BI212	1.329E-12	2.670E-12	9.388E-12	1.030E-11	1.103E-11	1.161E-11	1.206E-11	1.241E-11	1.266E-11
BI213	1.051E-16	3.718E-17	4.072E-17	4.174E-17	4.287E-17	4.411E-17	4.546E-17	4.693E-17	4.850E-17
BI214	4.815E-20	8.705E-20	6.838E-19	9.171E-19	1.199E-18	1.535E-18	1.928E-18	2.384E-18	2.907E-18
PO210	9.371E-16	1.441E-15	1.786E-15	1.861E-15	2.064E-15	2.353E-15	2.735E-15	3.221E-15	3.827E-15
PO211	2.121E-22	2.943E-22	9.025E-22	1.064E-21	1.236E-21	1.419E-21	1.614E-21	1.820E-21	2.036E-21
PO212	7.032E-23	1.412E-22	4.967E-22	5.452E-22	5.835E-22	6.142E-22	6.381E-22	6.565E-22	6.700E-22
PO213	1.576E-25	5.578E-26	6.110E-26	6.262E-26	6.432E-26	6.618E-26	6.821E-26	7.041E-26	7.277E-26
PO214	6.468E-25	1.198E-26	9.407E-26	1.262E-25	1.650E-25	2.111E-25	2.653E-25	3.280E-25	3.999E-25
PO215	2.453E-22	3.404E-22	1.044E-21	1.230E-21	1.430E-21	1.642E-21	1.867E-21	2.105E-21	2.355E-21
PO216	5.591E-17	1.123E-16	3.949E-16	4.335E-16	4.640E-16	4.883E-16	5.074E-16	5.220E-16	5.327E-16
PO218	7.519E-21	1.359E-20	1.068E-19	1.432E-19	1.873E-19	2.397E-19	3.011E-19	3.723E-19	4.539E-19
AT217	1.262E-21	4.467E-22	4.893E-22	5.015E-22	5.150E-22	5.300E-22	5.462E-22	5.638E-22	5.827E-22
RN218	1.389E-22	7.194E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.560E-19	7.713E-19	2.366E-18	2.788E-18	3.239E-18	3.721E-18	4.231E-18	4.770E-18	5.336E-18
RN220	2.111E-14	4.240E-14	1.491E-13	1.637E-13	1.752E-13	1.844E-13	1.916E-13	1.971E-13	2.011E-13
RN222	1.382E-17	2.499E-17	1.963E-16	2.633E-16	3.443E-16	4.406E-16	5.536E-16	6.845E-16	8.346E-16
FR221	1.146E-17	4.056E-18	4.443E-18	4.554E-18	4.677E-18	4.812E-18	4.960E-18	5.120E-18	5.292E-18
FR223	2.596E-18	3.574E-18	1.097E-17	1.292E-17	1.501E-17	1.724E-17	1.960E-17	2.210E-17	2.472E-17
RA222	1.536E-19	7.954E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	1.412E-13	1.959E-13	6.009E-13	7.083E-13	8.229E-13	9.451E-13	1.075E-12	1.212E-12	1.356E-12
RA224	1.222E-10	2.455E-10	8.634E-10	9.476E-10	1.014E-09	1.068E-09	1.109E-09	1.141E-09	1.165E-09
RA225	5.321E-14	1.834E-14	2.009E-14	2.059E-14	2.115E-14	2.176E-14	2.243E-14	2.315E-14	2.393E-14
RA226	2.170E-12	3.888E-12	3.054E-11	4.096E-11	5.356E-11	6.855E-11	8.612E-11	1.065E-10	1.298E-10
RA228	5.488E-16	9.166E-16	4.094E-15	4.940E-15	5.841E-15	6.791E-15	7.785E-15	8.819E-15	9.890E-15
AC225	3.500E-14	1.239E-14	1.357E-14	1.391E-14	1.429E-14	1.470E-14	1.515E-14	1.564E-14	1.616E-14
AC227	1.006E-10	1.385E-10	4.252E-10	5.005E-10	5.815E-10	6.678E-10	7.595E-10	8.562E-10	9.578E-10
AC228	2.287E-14	9.568E-20	4.274E-19	5.157E-19	6.097E-19	7.089E-19	8.127E-19	9.206E-19	1.032E-18
TH226	7.654E-18	3.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	2.321E-13	3.220E-13	9.874E-13	1.164E-12	1.352E-12	1.553E-12	1.766E-12	1.991E-12	2.227E-12
TH228	2.398E-08	4.762E-08	1.677E-07	1.835E-07	1.964E-07	2.067E-07	2.148E-07	2.210E-07	2.255E-07

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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
TH229	3.343E-09	3.380E-09	3.702E-09	3.795E-09	3.897E-09	4.010E-09	4.133E-09	4.266E-09	4.409E-09
TH230	1.506E-07	2.424E-07	1.064E-06	1.299E-06	1.558E-06	1.840E-06	2.145E-06	2.472E-06	2.822E-06
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	1.063E-05	2.558E-05	2.857E-05	3.156E-05	3.456E-05	3.755E-05	4.054E-05	4.353E-05
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	2.200E-06	4.138E-06	4.527E-06	4.915E-06	5.304E-06	5.693E-06	6.082E-06	6.470E-06
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U230	7.523E-15	3.893E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	3.050E-06	4.582E-06	8.257E-06	8.540E-06	8.742E-06	8.881E-06	8.971E-06	9.022E-06	9.043E-06
U233	7.255E-06	9.615E-06	2.031E-05	2.267E-05	2.504E-05	2.740E-05	2.977E-05	3.214E-05	3.450E-05
U234	2.856E-02	3.736E-02	8.031E-02	8.869E-02	9.701E-02	1.053E-01	1.135E-01	1.216E-01	1.297E-01
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.575E-10	2.024E-10	1.929E-10	1.838E-10	1.752E-10	1.669E-10	1.591E-10	1.516E-10
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.716E-08	7.020E-10	3.705E-10	1.955E-10	1.032E-10	5.444E-11	2.873E-11	1.516E-11
NP236	3.749E-06	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.880E-12	1.837E-12	1.829E-12	1.821E-12	1.812E-12	1.804E-12	1.796E-12	1.788E-12
NP239	3.690E-04	9.904E-11	9.899E-11	9.899E-11	9.898E-11	9.897E-11	9.896E-11	9.895E-11	9.894E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	5.789E-06	1.717E-06	1.346E-06	1.056E-06	8.277E-07	6.491E-07	5.090E-07	3.992E-07
PU237	7.562E-07	2.936E-09	2.580E-21	2.195E-24	2.195E-24	2.195E-24	2.195E-24	2.195E-24	2.195E-24
PU238	1.127E+00	1.128E+00	1.084E+00	1.076E+00	1.067E+00	1.059E+00	1.050E+00	1.042E+00	1.034E+00
PU239	1.613E-01	1.617E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01
PU240	3.359E-02	3.359E-02	3.358E-02	3.357E-02	3.357E-02	3.357E-02	3.356E-02	3.356E-02	3.356E-02
PU241	8.725E-03	8.315E-03	6.536E-03	6.229E-03	5.936E-03	5.657E-03	5.391E-03	5.138E-03	4.897E-03
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	3.107E-26	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27
AM241	3.068E-04	7.160E-04	2.482E-03	2.784E-03	3.073E-03	3.346E-03	3.607E-03	3.854E-03	4.089E-03
AM242M	1.007E-05	1.003E-05	9.799E-06	9.754E-06	9.710E-06	9.666E-06	9.622E-06	9.578E-06	9.535E-06
AM242	3.137E-07	1.199E-10	1.172E-10	1.167E-10	1.162E-10	1.156E-10	1.151E-10	1.146E-10	1.141E-10
AM243	1.151E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04	1.152E-04	1.151E-04	1.151E-04	1.151E-04
AM245	2.436E-14	3.523E-23	6.747E-25	3.059E-25	1.387E-25	6.286E-26	2.850E-26	1.292E-26	5.857E-27
AM246	6.436E-19	4.979E-29	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30
CM241	1.077E-12	9.509E-16	5.095E-31	4.497E-34	3.969E-37	3.502E-40	3.377E-43	0.000E+00	0.000E+00
CM242	3.549E-05	7.596E-06	2.695E-08	2.431E-08	2.366E-08	2.344E-08	2.331E-08	2.320E-08	2.309E-08
CM243	5.639E-07	5.503E-07	4.873E-07	4.756E-07	4.642E-07	4.530E-07	4.422E-07	4.315E-07	4.212E-07
CM244	1.624E-05	1.564E-05	1.291E-05	1.243E-05	1.196E-05	1.151E-05	1.108E-05	1.066E-05	1.026E-05
CM245	3.670E-07	3.670E-07	3.668E-07	3.668E-07	3.668E-07	3.667E-07	3.667E-07	3.667E-07	3.667E-07
CM246	2.209E-08	2.209E-08	2.207E-08	2.207E-08	2.207E-08	2.206E-08	2.206E-08	2.206E-08	2.205E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12
CM249	1.877E-17	1.307E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	3.617E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21
BK249	2.019E-14	9.161E-15	1.754E-16	7.952E-17	3.605E-17	1.634E-17	7.409E-18	3.359E-18	1.523E-18
BK250	1.228E-17	4.440E-24	4.494E-26	1.936E-26	7.735E-27	1.591E-27	1.591E-27	1.591E-27	1.591E-27
CF249	3.877E-15	1.490E-14	2.367E-14	2.372E-14	2.372E-14	2.369E-14	2.365E-14	2.361E-14	2.357E-14
CF250	3.409E-15	3.245E-15	2.490E-15	2.361E-15	2.239E-15	2.124E-15	2.014E-15	1.910E-15	1.812E-15
CF251	1.058E-15	1.057E-15	1.053E-15	1.052E-15	1.052E-15	1.051E-15	1.050E-15	1.049E-15	1.048E-15
CF252	3.213E-16	2.471E-16	6.642E-17	5.107E-17	3.927E-17	3.020E-17	2.322E-17	1.785E-17	1.373E-17
CF253	2.544E-19	1.709E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	5.630E-21	9.293E-23	7.608E-32	7.608E-32	7.608E-32	7.608E-32	7.608E-32	7.608E-32	7.608E-32
ES253	2.405E-19	8.017E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	2.319E-20	9.241E-21	8.016E-23	4.035E-23	3.297E-24	3.297E-24	3.297E-24	3.297E-24	3.297E-24
SF250	2.226E-11	4.257E-11	1.323E-10	1.497E-10	1.669E-10	1.839E-10	2.009E-10	2.176E-10	2.342E-10
H 3	6.014E-04	5.685E-04	4.294E-04	4.060E-04	3.838E-04	3.629E-04	3.431E-04	3.243E-04	3.066E-04
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.794E-07	3.792E-07	3.791E-07	3.791E-07	3.791E-07	3.790E-07	3.790E-07	3.789E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04

Appendix D-2
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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.723E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02	8.722E-02
BR 79	2.253E-06	3.184E-06	7.837E-06	8.768E-06	9.699E-06	1.063E-05	1.156E-05	1.249E-05	1.342E-05
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	3.859E-01	2.793E-01	2.618E-01	2.454E-01	2.301E-01	2.157E-01	2.022E-01	1.895E-01
RB 85	1.846E+00	1.873E+00	1.979E+00	1.997E+00	2.013E+00	2.028E+00	2.043E+00	2.056E+00	2.069E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
RB 86	1.883E-04	2.408E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.306E-03	2.992E-14	1.989E-16	1.322E-18	8.787E-21	5.407E-23	0.000E+00	0.000E+00
Y 89	8.536E+00	8.880E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	9.891E+00	8.781E+00	8.575E+00	8.373E+00	8.176E+00	7.984E+00	7.796E+00	7.613E+00
Y 90	2.594E-03	2.480E-03	2.202E-03	2.150E-03	2.100E-03	2.050E-03	2.002E-03	1.955E-03	1.909E-03
ZR 90	6.404E-01	8.788E-01	1.989E+00	2.195E+00	2.397E+00	2.594E+00	2.786E+00	2.974E+00	3.158E+00
Y 91	5.021E-01	6.678E-03	2.681E-12	3.539E-14	4.673E-16	6.171E-18	8.149E-20	1.073E-21	1.642E-23
ZR 91	1.058E+01	1.108E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
NB 92	1.142E-13	1.721E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	2.829E-06	1.120E-05	1.344E-05	1.586E-05	1.843E-05	2.115E-05	2.402E-05	2.703E-05
NB 93M	1.239E-05	1.700E-05	3.680E-05	4.019E-05	4.341E-05	4.647E-05	4.938E-05	5.214E-05	5.477E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.654E-06	1.653E-06
ZR 95	6.298E-01	1.204E-02	3.079E-11	5.887E-13	1.126E-14	2.152E-16	4.115E-18	7.870E-20	1.507E-21
NB 95	3.479E-01	1.489E-02	3.755E-11	7.430E-13	1.423E-14	2.720E-16	5.202E-18	9.947E-20	1.903E-21
NB 95M	2.492E-04	5.040E-06	1.288E-14	2.463E-16	4.710E-18	9.006E-20	1.722E-21	3.293E-23	6.307E-25
MO 95	1.132E+01	1.227E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	1.316E-04	3.191E-04	3.566E-04	3.941E-04	4.316E-04	4.691E-04	5.066E-04	5.442E-04
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	4.191E-06	1.269E-06	9.989E-07	7.866E-07	6.193E-07	4.877E-07	3.840E-07	3.024E-07
RU103	2.067E-01	3.285E-04	3.323E-18	5.291E-21	1.625E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	2.937E-07	2.972E-21	4.732E-24	1.453E-26	2.309E-29	0.000E+00	0.000E+00	0.000E+00
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	1.305E-01	4.191E-03	2.107E-03	1.059E-03	5.326E-04	2.678E-04	1.346E-04	6.768E-05
RH106	2.616E-07	1.226E-07	3.939E-09	1.980E-09	9.957E-10	5.006E-10	2.517E-10	1.265E-10	6.361E-11
PD106	7.981E-01	9.272E-01	1.053E+00	1.056E+00	1.057E+00	1.057E+00	1.057E+00	1.058E+00	1.058E+00
AG106	5.874E-15	6.816E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	1.545E-07	3.803E-07	4.255E-07	4.707E-07	5.159E-07	5.610E-07	6.062E-07	6.514E-07
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.666E-19	9.405E-19	9.354E-19	9.303E-19	9.253E-19	9.202E-19	9.152E-19	9.102E-19
AG108M	3.078E-10	3.061E-10	2.979E-10	2.962E-10	2.946E-10	2.930E-10	2.914E-10	2.898E-10	2.883E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.294E-16	8.458E-18	4.901E-18	2.840E-18	1.646E-18	9.537E-19	5.527E-19	3.203E-19
CD109	2.261E-10	1.310E-10	8.563E-12	4.962E-12	2.875E-12	1.666E-12	9.655E-13	5.595E-13	3.242E-13
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	2.972E-12	1.875E-14	6.806E-15	2.471E-15	8.972E-16	3.258E-16	1.183E-16	4.294E-17
AG110M	5.402E-04	1.961E-04	1.237E-06	4.491E-07	1.631E-07	5.921E-08	2.150E-08	7.805E-09	2.834E-09
CD110	3.243E-02	3.277E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02

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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
AG111	3.630E-04	6.352E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.452E-04	4.454E-04	4.454E-04	4.455E-04	4.455E-04	4.455E-04	4.456E-04	4.456E-04
CD113M	8.787E-04	8.380E-04	6.608E-04	6.302E-04	6.009E-04	5.730E-04	5.465E-04	5.211E-04	4.969E-04
IN113	9.476E-05	1.355E-04	3.125E-04	3.431E-04	3.724E-04	4.002E-04	4.268E-04	4.521E-04	4.763E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.835E-14	3.025E-25	1.877E-27	1.130E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.962E-07	2.384E-09	1.880E-20	1.167E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.664E-06	7.028E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	4.164E-07	1.957E-19	6.650E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	1.176E-13	5.527E-26	1.892E-28	6.429E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02
SN117M	1.819E-06	2.563E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.278E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	5.063E-05	2.889E-07	1.028E-07	3.659E-08	1.302E-08	4.633E-09	1.649E-09	5.866E-10
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.125E-05	1.983E-05	1.955E-05	1.929E-05	1.902E-05	1.876E-05	1.850E-05	1.824E-05
SB121	4.515E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	2.076E-04	1.151E-08	1.621E-09	2.284E-10	3.216E-11	4.530E-12	6.381E-13	8.988E-14
SB123	5.702E-02	5.829E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.470E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	3.725E-07	9.494E-12	1.145E-12	1.380E-13	1.664E-14	2.007E-15	2.420E-16	2.917E-17
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	3.096E-06	2.281E-15	3.401E-17	5.070E-19	7.562E-21	1.100E-22	0.000E+00	0.000E+00
TE124	1.566E-03	1.770E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SN125	3.077E-04	1.209E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	5.871E-02	4.596E-02	1.315E-02	1.024E-02	7.972E-03	6.207E-03	4.833E-03	3.763E-03	2.930E-03
TE125	4.338E-02	5.657E-02	8.983E-02	9.278E-02	9.508E-02	9.687E-02	9.826E-02	9.935E-02	1.002E-01
TE125M	7.575E-04	6.419E-04	1.839E-04	1.432E-04	1.115E-04	8.682E-05	6.760E-05	5.263E-05	4.098E-05
SN126	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01
SB126	3.619E-05	9.027E-09	9.027E-09	9.027E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09
SB126M	1.478E-08	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.863E-11
TE126	4.547E-03	4.585E-03	4.591E-03	4.592E-03	4.594E-03	4.595E-03	4.596E-03	4.598E-03	4.599E-03
TE127	1.288E-04	1.759E-06	1.591E-11	1.560E-12	1.529E-13	1.499E-14	1.469E-15	1.440E-16	1.411E-17
TE127M	4.938E-03	5.024E-04	4.546E-09	4.456E-10	4.368E-11	4.281E-12	4.196E-13	4.113E-14	4.032E-15
I127	3.994E-01	4.053E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	3.557E-12	2.837E-27	2.712E-30	2.592E-33	2.477E-36	2.368E-39	2.314E-42	0.000E+00
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	3.569E-09	1.551E-25	8.282E-29	4.423E-32	2.362E-35	1.262E-38	6.688E-42	0.000E+00
TE129M	7.102E-03	3.811E-06	1.656E-22	8.844E-26	4.723E-29	2.523E-32	1.347E-35	7.195E-39	3.796E-42
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.500E-05	6.541E-05	6.549E-05	6.557E-05	6.565E-05	6.573E-05	6.582E-05	6.590E-05
XE129M	1.213E-07	2.187E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
I131	4.926E-02	1.070E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE131M	7.973E-04	1.451E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
CS132	9.291E-06	9.682E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
XE133	7.367E-02	9.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	8.031E-01	1.495E-01	1.069E-01	7.635E-02	5.455E-02	3.898E-02	2.785E-02	1.990E-02
BA134	6.001E-01	9.210E-01	1.575E+00	1.617E+00	1.648E+00	1.670E+00	1.685E+00	1.696E+00	1.704E+00
CS135	9.090E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00
BA135	2.738E-03	2.742E-03	2.755E-03	2.758E-03	2.761E-03	2.763E-03	2.766E-03	2.769E-03	2.772E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
CS136	6.042E-03	2.450E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
BA136M	2.709E-10	1.099E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.651E+01	1.614E+01	1.438E+01	1.405E+01	1.373E+01	1.341E+01	1.311E+01	1.281E+01	1.252E+01
BA137	9.727E-01	1.350E+00	3.110E+00	3.439E+00	3.760E+00	4.073E+00	4.380E+00	4.679E+00	4.971E+00
BA137M	2.527E-06	2.469E-06	2.199E-06	2.149E-06	2.100E-06	2.052E-06	2.005E-06	1.959E-06	1.915E-06
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01

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sbwzr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:09

	1826.0D	1.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR	12.0YR
BA140	1.798E-01	4.548E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.504E-02	6.858E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	1.811E-04	2.230E-21	9.256E-25	3.841E-28	1.594E-31	6.617E-35	2.746E-38	1.146E-41
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
PR143	1.798E-01	1.577E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	1.473E+00	1.714E-02	7.036E-03	2.887E-03	1.185E-03	4.863E-04	1.996E-04	8.191E-05
PR144	1.520E-04	6.218E-05	7.239E-07	2.971E-07	1.219E-07	5.004E-08	2.053E-08	8.427E-09	3.458E-09
PR144M	7.579E-07	3.109E-07	3.619E-09	1.485E-09	6.095E-10	2.501E-10	1.026E-10	4.213E-11	1.729E-11
ND144	1.638E+01	1.850E+01	1.995E+01	1.996E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	4.372E-05	2.328E-05	2.053E-05	1.810E-05	1.595E-05	1.406E-05	1.240E-05	1.093E-05
SM146	8.176E-05	8.394E-05	9.150E-05	9.252E-05	9.342E-05	9.421E-05	9.491E-05	9.553E-05	9.607E-05
ND147	6.040E-02	6.922E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	2.102E+00	1.661E+00	4.432E-01	3.403E-01	2.613E-01	2.006E-01	1.540E-01	1.183E-01	9.080E-02
SM147	1.853E+00	2.355E+00	3.573E+00	3.676E+00	3.755E+00	3.815E+00	3.862E+00	3.898E+00	3.925E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	2.501E-07	1.218E-20	2.651E-23	5.768E-26	9.076E-27	9.076E-27	9.076E-27	9.076E-27
PM148M	1.569E-02	3.414E-05	1.663E-18	3.620E-21	1.424E-24	1.424E-24	1.424E-24	1.424E-24	1.424E-24
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.450E-09	4.042E-09	3.965E-09	3.889E-09	3.815E-09	3.742E-09	3.671E-09	3.601E-09
SM151	1.636E-01	1.636E-01	1.575E-01	1.563E-01	1.551E-01	1.539E-01	1.527E-01	1.515E-01	1.504E-01
EU151	2.742E-04	1.539E-03	7.722E-03	8.930E-03	1.013E-02	1.132E-02	1.250E-02	1.367E-02	1.483E-02
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	1.157E-03	8.969E-04	8.524E-04	8.100E-04	7.698E-04	7.315E-04	6.952E-04	6.606E-04
GD152	1.111E-03	1.128E-03	1.201E-03	1.213E-03	1.225E-03	1.236E-03	1.247E-03	1.257E-03	1.267E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	1.521E-05	8.137E-08	2.859E-08	1.004E-08	3.528E-09	1.239E-09	4.354E-10	1.530E-10
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	2.387E-01	1.596E-01	1.472E-01	1.358E-01	1.253E-01	1.156E-01	1.066E-01	9.838E-02
GD154	2.826E-02	4.830E-02	1.275E-01	1.398E-01	1.512E-01	1.618E-01	1.715E-01	1.804E-01	1.887E-01
EU155	7.979E-02	6.938E-02	3.449E-02	2.999E-02	2.608E-02	2.268E-02	1.972E-02	1.715E-02	1.491E-02
GD155	1.034E-03	1.144E-02	4.633E-02	5.083E-02	5.474E-02	5.814E-02	6.110E-02	6.368E-02	6.591E-02
EU156	8.598E-03	4.949E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	2.369E-06	5.904E-14	1.780E-15	5.368E-17	1.618E-18	4.880E-20	1.476E-21	3.628E-23
DY160	3.786E-04	4.548E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
TB161	3.523E-06	4.555E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.625E-07	4.612E-07	4.609E-07	4.607E-07	4.604E-07	4.601E-07	4.599E-07	4.596E-07
ER166	1.514E-05	1.519E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
ER169	5.081E-10	1.021E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.181E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	1.532E-10	8.129E-15	1.135E-15	1.585E-16	2.212E-17	3.089E-18	4.313E-19	6.021E-20
YB170	1.875E-09	2.818E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	4.004E-11	6.585E-12	4.590E-12	3.199E-12	2.229E-12	1.554E-12	1.083E-12	7.548E-13
YB171	6.068E-11	7.809E-11	1.115E-10	1.135E-10	1.149E-10	1.159E-10	1.166E-10	1.170E-10	1.174E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

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File SBWZR2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       1.    1   2   5   4
  DEC      13.    2   3   5   0
  DEC      14.    3   4   5   0
  DEC      15.    4   5   5   0
  DEC      16.    5   6   5   0
  DEC      17.    6   7   5   0
  DEC      18.    7   8   5   0
  DEC      19.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
```

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File SBWZR2.INP (continued)

```
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File SBWZR2.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy sbwzr2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwzr2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwzr2.u6 >nul
copy tape13.out+tape11.out sbwzr2.u11 >nul
ren tape7.out sbwzr2.pch
ren tape15.out sbwzr2.dbg
ren tape16.out sbwzr2.vxs
ren tape50.out sbwzr2.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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sbwzr2.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	7.650E-11	3.901E-11	3.688E-11	3.487E-11	3.296E-11	3.116E-11	2.946E-11	2.785E-11
HE 3	1.385E-12	5.802E-12	4.330E-11	4.543E-11	4.744E-11	4.934E-11	5.114E-11	5.284E-11	5.445E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.841E-08	7.840E-08	7.840E-08	7.840E-08
B 10	4.994E-13	5.333E-13	9.409E-13	9.749E-13	1.009E-12	1.043E-12	1.077E-12	1.111E-12	1.145E-12
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.319E-03	3.314E-03	3.313E-03	3.313E-03	3.313E-03	3.312E-03	3.312E-03	3.311E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.518E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.505E-20	1.459E-20	1.455E-20	1.452E-20	1.448E-20	1.444E-20	1.440E-20	1.437E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	2.159E-21	1.678E-21	1.643E-21	1.608E-21	1.574E-21	1.541E-21	1.509E-21	1.477E-21
K 39	1.746E-23	5.634E-23	5.145E-22	5.521E-22	5.896E-22	6.270E-22	6.643E-22	7.015E-22	7.386E-22
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	9.229E-26	7.171E-26	7.021E-26	6.873E-26	6.729E-26	6.588E-26	6.449E-26	6.314E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	6.426E-10	5.146E-18	1.088E-18	2.302E-19	4.869E-20	1.030E-20	2.179E-21	4.593E-22
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.583E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	1.034E-08	1.858E-24	2.635E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	2.128E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	1.686E-04	1.011E-08	4.497E-09	2.000E-09	8.896E-10	3.957E-10	1.760E-10	7.828E-11
MN 55	7.699E-03	1.023E-02	1.817E-02	1.825E-02	1.831E-02	1.836E-02	1.839E-02	1.842E-02	1.844E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	8.280E-03	3.378E-04	2.588E-04	1.982E-04	1.518E-04	1.163E-04	8.908E-05	6.823E-05
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.706E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	4.277E-04	1.196E-05	2.725E-24	2.843E-24	2.966E-24	3.095E-24	3.229E-24	3.369E-24	3.515E-24
CO 59	1.843E-03	1.871E-03	1.883E-03	1.884E-03	1.885E-03	1.886E-03	1.887E-03	1.888E-03	1.889E-03
CO 60	1.264E-04	1.108E-04	2.286E-05	2.005E-05	1.758E-05	1.541E-05	1.351E-05	1.185E-05	1.039E-05
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00

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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.087E-02	1.907E-02	1.892E-02	1.878E-02	1.864E-02	1.850E-02	1.836E-02	1.822E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	4.990E-04	2.303E-03	2.446E-03	2.588E-03	2.729E-03	2.869E-03	3.008E-03	3.146E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	2.690E-11	1.046E-16	3.702E-17	1.311E-17	4.642E-18	1.644E-18	5.821E-19	2.061E-19
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 71	7.964E-23	3.830E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.026E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	1.544E-06	1.508E-06	1.133E-06	1.107E-06	1.081E-06	1.055E-06	1.030E-06	1.006E-06	9.825E-07
Y 89	2.396E-03	2.549E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.782E-10	2.842E-10	2.775E-10	2.710E-10	2.646E-10	2.584E-10	2.523E-10	2.464E-10
Y 91	4.667E-04	6.163E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.765E-03	1.138E-23	5.520E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 92	3.999E-07	6.025E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.190E+00	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	2.252E-05	8.306E-05	8.662E-05	9.001E-05	9.323E-05	9.629E-05	9.920E-05	1.020E-04
NB 94	3.937E-02	3.937E-02	3.935E-02	3.935E-02	3.935E-02	3.935E-02	3.934E-02	3.934E-02	3.934E-02
NB 95	1.328E-01	5.887E-03	1.388E-23	3.188E-24	1.306E-25	9.729E-29	7.245E-32	5.396E-35	4.018E-38
NB 95M	9.792E-05	1.994E-06	4.763E-27	2.185E-27	4.417E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	2.903E-06	4.248E-06	2.037E-05	2.172E-05	2.306E-05	2.441E-05	2.575E-05	2.709E-05	2.844E-05
MO 95	2.820E+00	3.192E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	1.076E-17	8.543E-17	9.166E-17	9.788E-17	1.041E-16	1.103E-16	1.165E-16	1.228E-16
RU 99	6.727E-11	1.400E-10	1.013E-09	1.086E-09	1.159E-09	1.231E-09	1.304E-09	1.377E-09	1.450E-09
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	3.829E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	3.675E-33	3.675E-33	3.675E-33	3.675E-33	3.675E-33	3.675E-33	3.675E-33
RH102	1.578E-22	1.201E-22	1.018E-23	1.018E-23	1.018E-23	1.018E-23	1.018E-23	1.018E-23	1.018E-23
RH103	6.390E-16	8.778E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	3.454E-39	3.454E-39	3.454E-39	3.454E-39	3.454E-39	3.454E-39	3.454E-39
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.212E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	5.283E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.494E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	6.271E-07	2.161E-18	2.395E-19	2.655E-20	2.943E-21	3.263E-22	3.618E-23	4.015E-24
IN114	1.614E-08	3.561E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.679E-04	2.214E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.044E-03	3.598E-15	3.988E-16	4.421E-17	4.901E-18	5.433E-19	6.024E-20	6.685E-21
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN117M	9.722E-03	1.370E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02
SN119	8.423E+01	8.433E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	5.365E-02	2.212E-07	7.870E-08	2.801E-08	9.966E-09	3.546E-09	1.262E-09	4.491E-10
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.524E-03	1.291E-03	1.273E-03	1.255E-03	1.238E-03	1.221E-03	1.204E-03	1.187E-03
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	6.097E-04	3.718E-14	5.237E-15	7.376E-16	1.039E-16	1.463E-17	2.061E-18	2.903E-19
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SN125	2.449E-03	9.625E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	2.832E-01	2.837E-01	2.839E-01	2.839E-01	2.840E-01	2.840E-01	2.840E-01	2.840E-01	2.840E-01
SB123	2.498E-02	2.869E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	1.309E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.127E-01	1.675E-01	8.315E-03	6.474E-03	5.041E-03	3.925E-03	3.056E-03	2.379E-03	1.853E-03
SB126	3.687E-05	4.974E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.279E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	1.972E-06	1.862E-17	2.245E-18	2.707E-19	3.264E-20	3.938E-21	4.824E-22	5.429E-23
TE124	6.257E-04	7.122E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	1.737E-01	3.351E-01	3.370E-01	3.384E-01	3.396E-01	3.404E-01	3.411E-01	3.417E-01
TE125M	2.654E-03	2.338E-03	1.163E-04	9.055E-05	7.051E-05	5.490E-05	4.274E-05	3.328E-05	2.591E-05
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	4.612E-11	3.628E-23	3.565E-24	3.650E-25	5.605E-26	2.792E-26	2.745E-27	0.000E+00
TE127M	1.344E-07	1.318E-08	1.036E-20	1.018E-21	1.043E-22	1.603E-23	7.999E-24	0.000E+00	0.000E+00
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	6.894E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.379E-14	7.363E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.225E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
I131	1.297E-19	2.743E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.863E-14	1.780E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE129M	6.502E-13	1.173E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE131M	4.971E-17	2.854E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE133	3.734E-21	4.100E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS132	2.603E-26	1.850E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	7.205E-22	1.946E-23	1.946E-23	1.946E-23	1.946E-23	1.946E-23	1.946E-23	1.946E-23
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	3.590E-22	1.060E-21	1.060E-21	1.060E-21	1.060E-21	1.060E-21	1.060E-21	1.060E-21
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER169	1.553E-19	3.121E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER170	6.143E-22	9.649E-22	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	3.981E-20	2.184E-30	2.184E-30	2.184E-30	2.184E-30	2.184E-30	2.184E-30	2.184E-30
TM171	5.935E-20	4.144E-20	5.507E-22	3.877E-22	2.730E-22	1.923E-22	1.228E-22	7.850E-23	5.016E-23
YB170	4.405E-19	6.854E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	4.135E-20	8.224E-20	8.240E-20	8.252E-20	8.260E-20	8.267E-20	8.271E-20	8.274E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.021E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	5.175E-10	1.591E-18	3.106E-19	6.065E-20	1.184E-20	2.313E-21	4.516E-22	8.825E-23
LU177M	2.662E-07	5.199E-08	1.598E-16	3.120E-17	6.093E-18	1.190E-18	2.323E-19	4.536E-20	8.866E-21
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	1.589E-05	2.251E-24	2.251E-24	2.251E-24	2.251E-24	2.251E-24	2.251E-24	2.251E-24
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	1.966E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01

Appendix D-2
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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
TA182	9.547E-03	1.056E-03	9.209E-12	9.206E-12	9.206E-12	9.206E-12	9.206E-12	9.206E-12	9.206E-12
TA183	6.272E-04	1.731E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	7.216E-02	8.065E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.253E-08	2.497E-25	2.497E-25	2.497E-25	2.497E-25	2.497E-25	2.497E-25	2.497E-25
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	3.629E-14	3.528E-33	3.528E-33	3.528E-33	3.528E-33	3.528E-33	3.528E-33	3.528E-33
RE185	7.346E-06	9.947E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	3.738E-16	3.634E-35	3.599E-35	3.599E-35	3.599E-35	3.599E-35	3.599E-35	3.599E-35
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	7.064E-20	6.342E-19	6.812E-19	7.282E-19	7.751E-19	8.221E-19	8.691E-19	9.160E-19
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS191	1.181E-17	8.861E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS192	3.158E-19	5.976E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	1.992E-19	4.464E-24	4.464E-24	4.464E-24	4.464E-24	4.464E-24	4.464E-24	4.464E-24
IR192M	5.491E-21	5.491E-21	5.301E-21	5.301E-21	5.301E-21	5.301E-21	5.301E-21	5.301E-21	5.301E-21
IR193	8.109E-19	8.110E-19	8.114E-19	8.114E-19	8.115E-19	8.115E-19	8.115E-19	8.116E-19	8.116E-19
IR194	4.896E-22	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30
PT192	6.270E-18	1.188E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.583E-20	2.540E-20	2.536E-20	2.533E-20	2.529E-20	2.526E-20	2.522E-20	2.519E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	3.123E-04	2.031E-03	2.167E-03	2.302E-03	2.436E-03	2.569E-03	2.701E-03	2.831E-03
TL206	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29
TL207	3.787E-17	5.254E-17	4.028E-16	4.456E-16	4.894E-16	5.348E-16	5.818E-16	6.304E-16	6.804E-16
TL208	2.376E-14	4.772E-14	2.288E-13	2.318E-13	2.331E-13	2.336E-13	2.336E-13	2.332E-13	2.323E-13
TL209	1.073E-19	3.797E-20	5.100E-20	5.276E-20	5.463E-20	5.662E-20	5.873E-20	6.095E-20	6.328E-20
PB206	1.520E-15	3.826E-15	5.514E-14	6.467E-14	7.562E-14	8.863E-14	1.041E-13	1.224E-13	1.441E-13
PB207	6.465E-12	9.859E-12	1.948E-10	2.272E-10	2.628E-10	3.018E-10	3.443E-10	3.906E-10	4.405E-10
PB208	9.394E-09	2.104E-08	6.849E-07	7.611E-07	8.378E-07	9.149E-07	9.921E-07	1.069E-06	1.146E-06
PB209	4.482E-16	1.582E-16	2.125E-16	2.198E-16	2.276E-16	2.359E-16	2.447E-16	2.539E-16	2.637E-16
PB210	8.589E-14	9.112E-14	2.988E-13	3.573E-13	4.266E-13	5.078E-13	6.020E-13	7.105E-13	8.344E-13
PB211	2.930E-16	4.065E-16	3.116E-15	3.447E-15	3.786E-15	4.137E-15	4.501E-15	4.877E-15	5.264E-15
PB212	1.401E-11	2.814E-11	1.349E-10	1.367E-10	1.375E-10	1.378E-10	1.378E-10	1.375E-10	1.370E-10
PB214	6.485E-20	1.172E-19	4.714E-18	5.616E-18	6.626E-18	7.749E-18	8.992E-18	1.036E-17	1.186E-17
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	1.140E-12	5.118E-12	5.515E-12	5.927E-12	6.353E-12	6.794E-12	7.252E-12	7.728E-12
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	5.610E-17	1.839E-16	2.200E-16	2.626E-16	3.126E-16	3.706E-16	4.374E-16	5.137E-16
BI211	1.729E-17	2.398E-17	1.839E-16	2.034E-16	2.234E-16	2.441E-16	2.656E-16	2.877E-16	3.106E-16
BI212	1.329E-12	2.670E-12	1.280E-11	1.297E-11	1.304E-11	1.307E-11	1.307E-11	1.305E-11	1.300E-11
BI213	1.051E-16	3.718E-17	4.993E-17	5.165E-17	5.349E-17	5.544E-17	5.750E-17	5.967E-17	6.195E-17
BI214	4.815E-20	8.705E-20	3.501E-18	4.170E-18	4.920E-18	5.754E-18	6.677E-18	7.692E-18	8.805E-18
PO210	9.371E-16	1.441E-15	5.079E-15	5.547E-15	6.544E-15	7.788E-15	9.248E-15	1.094E-14	1.288E-14
PO211	2.121E-22	2.943E-22	2.256E-21	2.496E-21	2.741E-21	2.995E-21	3.258E-21	3.530E-21	3.811E-21
PO212	7.032E-23	1.412E-22	6.772E-22	6.861E-22	6.898E-22	6.915E-22	6.915E-22	6.902E-22	6.878E-22
PO213	1.576E-25	5.578E-26	7.491E-26	7.749E-26	8.025E-26	8.317E-26	8.626E-26	8.952E-26	9.294E-26
PO214	6.468E-25	1.198E-26	4.816E-25	5.737E-25	6.769E-25	7.916E-25	9.186E-25	1.058E-24	1.211E-24
PO215	2.453E-22	3.404E-22	2.610E-21	2.887E-21	3.170E-21	3.464E-21	3.769E-21	4.084E-21	4.408E-21
PO216	5.591E-17	1.123E-16	5.385E-16	5.455E-16	5.485E-16	5.499E-16	5.499E-16	5.488E-16	5.468E-16
PO218	7.519E-21	1.359E-20	5.467E-19	6.513E-19	7.683E-19	8.986E-19	1.043E-18	1.201E-18	1.375E-18
AT217	1.262E-21	4.467E-22	5.999E-22	6.206E-22	6.426E-22	6.660E-22	6.908E-22	7.168E-22	7.443E-22
RN218	1.389E-22	7.194E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.560E-19	7.713E-19	5.913E-18	6.542E-18	7.184E-18	7.851E-18	8.541E-18	9.254E-18	9.988E-18
RN220	2.111E-14	4.240E-14	2.033E-13	2.059E-13	2.071E-13	2.076E-13	2.076E-13	2.072E-13	2.065E-13
RN222	1.382E-17	2.499E-17	1.005E-15	1.197E-15	1.413E-15	1.652E-15	1.917E-15	2.209E-15	2.528E-15
FR221	1.146E-17	4.056E-18	5.447E-18	5.635E-18	5.836E-18	6.048E-18	6.273E-18	6.510E-18	6.759E-18
FR223	2.596E-18	3.574E-18	2.744E-17	3.030E-17	3.328E-17	3.636E-17	3.956E-17	4.286E-17	4.626E-17
RA222	1.536E-19	7.954E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	1.412E-13	1.959E-13	1.502E-12	1.662E-12	1.825E-12	1.994E-12	2.170E-12	2.351E-12	2.537E-12
RA224	1.222E-10	2.455E-10	1.177E-09	1.192E-09	1.199E-09	1.202E-09	1.202E-09	1.200E-09	1.195E-09
RA225	5.321E-14	1.834E-14	2.463E-14	2.548E-14	2.638E-14	2.735E-14	2.836E-14	2.943E-14	3.056E-14
RA226	2.170E-12	3.888E-12	1.564E-10	1.863E-10	2.198E-10	2.570E-10	2.982E-10	3.436E-10	3.933E-10
RA228	5.488E-16	9.166E-16	1.099E-14	1.212E-14	1.328E-14	1.447E-14	1.567E-14	1.689E-14	1.814E-14
AC225	3.500E-14	1.239E-14	1.664E-14	1.721E-14	1.782E-14	1.847E-14	1.916E-14	1.988E-14	2.064E-14
AC227	1.006E-10	1.385E-10	1.063E-09	1.174E-09	1.289E-09	1.409E-09	1.533E-09	1.661E-09	1.793E-09
AC228	2.287E-14	9.568E-20	1.147E-18	1.266E-18	1.387E-18	1.510E-18	1.636E-18	1.764E-18	1.893E-18
TH226	7.654E-18	3.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	2.321E-13	3.220E-13	2.468E-12	2.731E-12	2.999E-12	3.277E-12	3.565E-12	3.863E-12	4.169E-12
TH228	2.398E-08	4.762E-08	2.287E-07	2.309E-07	2.322E-07	2.327E-07	2.327E-07	2.323E-07	2.315E-07

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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
TH229	3.343E-09	3.380E-09	4.539E-09	4.696E-09	4.863E-09	5.040E-09	5.227E-09	5.424E-09	5.632E-09
TH230	1.506E-07	2.424E-07	3.195E-06	3.589E-06	4.006E-06	4.444E-06	4.904E-06	5.386E-06	5.889E-06
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	1.063E-05	4.652E-05	4.951E-05	5.250E-05	5.550E-05	5.849E-05	6.148E-05	6.447E-05
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	2.200E-06	6.848E-06	7.237E-06	7.625E-06	8.014E-06	8.403E-06	8.791E-06	9.180E-06
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U230	7.523E-15	3.893E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	3.050E-06	4.582E-06	9.041E-06	9.020E-06	8.986E-06	8.940E-06	8.886E-06	8.826E-06	8.761E-06
U233	7.255E-06	9.615E-06	3.527E-05	3.764E-05	4.001E-05	4.237E-05	4.474E-05	4.711E-05	4.947E-05
U234	2.856E-02	3.736E-02	1.376E-01	1.456E-01	1.535E-01	1.613E-01	1.690E-01	1.767E-01	1.843E-01
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.575E-10	1.445E-10	1.377E-10	1.312E-10	1.251E-10	1.192E-10	1.136E-10	1.082E-10
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.716E-08	8.000E-12	4.222E-12	2.228E-12	1.176E-12	6.204E-13	3.274E-13	1.728E-13
NP236	3.749E-06	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	06.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.880E-12	1.780E-12	1.771E-12	1.763E-12	1.755E-12	1.747E-12	1.739E-12	1.732E-12
NP239	3.690E-04	9.904E-11	9.893E-11	9.892E-11	9.891E-11	9.890E-11	9.889E-11	9.888E-11	9.887E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	5.789E-06	3.130E-07	2.455E-07	1.925E-07	1.509E-07	1.184E-07	9.282E-08	7.279E-08
PU237	7.562E-07	2.936E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	1.127E+00	1.128E+00	1.026E+00	1.018E+00	1.010E+00	1.002E+00	9.940E-01	9.862E-01	9.784E-01
PU239	1.613E-01	1.617E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01
PU240	3.359E-02	3.359E-02	3.355E-02	3.355E-02	3.355E-02	3.354E-02	3.354E-02	3.354E-02	3.353E-02
PU241	8.725E-03	8.315E-03	4.666E-03	4.447E-03	4.238E-03	4.039E-03	3.849E-03	3.668E-03	3.496E-03
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	3.107E-26	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27
AM241	3.068E-04	7.160E-04	4.313E-03	4.525E-03	4.726E-03	4.918E-03	5.100E-03	5.272E-03	5.436E-03
AM242M	1.007E-05	1.003E-05	9.491E-06	9.448E-06	9.405E-06	9.362E-06	9.320E-06	9.277E-06	9.235E-06
AM242	3.137E-07	1.199E-10	1.135E-10	1.130E-10	1.125E-10	1.120E-10	1.115E-10	1.110E-10	1.105E-10
AM243	1.151E-04	1.152E-04	1.151E-04	1.151E-04	1.151E-04	1.151E-04	1.151E-04	1.151E-04	1.151E-04
AM245	2.436E-14	3.523E-23	2.655E-27	1.204E-27	5.457E-28	2.474E-28	1.122E-28	5.081E-29	2.302E-29
AM246	6.436E-19	4.979E-29	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30
CM241	1.077E-12	9.509E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	3.549E-05	7.596E-06	2.296E-08	2.288E-08	2.278E-08	2.268E-08	2.257E-08	2.247E-08	2.237E-08
CM243	5.639E-07	5.503E-07	4.110E-07	4.012E-07	3.915E-07	3.821E-07	3.729E-07	3.640E-07	3.552E-07
CM244	1.624E-05	1.564E-05	9.878E-06	9.507E-06	9.150E-06	8.806E-06	8.475E-06	8.157E-06	7.851E-06
CM245	3.670E-07	3.670E-07	3.666E-07	3.666E-07	3.666E-07	3.665E-07	3.665E-07	3.665E-07	3.664E-07
CM246	2.209E-08	2.209E-08	2.205E-08	2.205E-08	2.204E-08	2.204E-08	2.204E-08	2.203E-08	2.203E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12
CM249	1.877E-17	1.307E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	3.617E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21
BK249	2.019E-14	9.161E-15	6.903E-19	3.129E-19	1.419E-19	6.433E-20	2.914E-20	1.320E-20	5.981E-21
BK250	1.228E-17	4.440E-24	8.330E-29	8.328E-29	8.328E-29	8.328E-29	8.328E-29	8.328E-29	8.328E-29
CF249	3.877E-15	1.490E-14	2.352E-14	2.347E-14	2.343E-14	2.338E-14	2.334E-14	2.329E-14	2.324E-14
CF250	3.409E-15	3.245E-15	1.718E-15	1.630E-15	1.545E-15	1.466E-15	1.390E-15	1.318E-15	1.250E-15
CF251	1.058E-15	1.057E-15	1.048E-15	1.047E-15	1.046E-15	1.045E-15	1.044E-15	1.044E-15	1.043E-15
CF252	3.213E-16	2.471E-16	1.056E-17	8.117E-18	6.241E-18	4.799E-18	3.690E-18	2.838E-18	2.182E-18
CF253	2.544E-19	1.709E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	5.630E-21	9.293E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	2.405E-19	8.017E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	2.319E-20	9.241E-21	1.514E-25	1.514E-25	1.514E-25	1.514E-25	1.514E-25	1.514E-25	1.514E-25
SF250	2.226E-11	4.257E-11	2.507E-10	2.670E-10	2.832E-10	2.992E-10	3.151E-10	3.309E-10	3.465E-10
H 3	6.014E-04	5.685E-04	2.899E-04	2.741E-04	2.591E-04	2.450E-04	2.316E-04	2.190E-04	2.070E-04
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.794E-07	3.789E-07	3.788E-07	3.788E-07	3.787E-07	3.787E-07	3.786E-07	3.786E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04

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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.723E-02	8.722E-02	8.721E-02	8.721E-02	8.721E-02	8.721E-02	8.721E-02	8.721E-02
BR 79	2.253E-06	3.184E-06	1.435E-05	1.528E-05	1.621E-05	1.714E-05	1.807E-05	1.900E-05	1.994E-05
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	3.859E-01	1.776E-01	1.665E-01	1.561E-01	1.463E-01	1.372E-01	1.286E-01	1.205E-01
RB 85	1.846E+00	1.873E+00	2.081E+00	2.092E+00	2.102E+00	2.112E+00	2.121E+00	2.130E+00	2.138E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
RB 86	1.883E-04	2.408E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.306E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	8.536E+00	8.880E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	9.891E+00	7.433E+00	7.259E+00	7.088E+00	6.921E+00	6.758E+00	6.599E+00	6.444E+00
Y 90	2.594E-03	2.480E-03	1.864E-03	1.820E-03	1.777E-03	1.736E-03	1.695E-03	1.655E-03	1.616E-03
ZR 90	6.404E-01	8.788E-01	3.337E+00	3.512E+00	3.682E+00	3.849E+00	4.012E+00	4.171E+00	4.326E+00
Y 91	5.021E-01	6.678E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	1.058E+01	1.108E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
NB 92	1.142E-13	1.721E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	2.829E-06	3.017E-05	3.343E-05	3.681E-05	4.030E-05	4.390E-05	4.760E-05	5.139E-05
NB 93M	1.239E-05	1.700E-05	5.727E-05	5.964E-05	6.190E-05	6.404E-05	6.607E-05	6.801E-05	6.985E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06
ZR 95	6.298E-01	1.204E-02	2.877E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.479E-01	1.489E-02	3.509E-23	6.944E-25	5.173E-28	3.853E-31	2.869E-34	2.137E-37	1.591E-40
NB 95M	2.492E-04	5.040E-06	1.204E-26	2.302E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	1.132E+01	1.227E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	1.316E-04	5.817E-04	6.192E-04	6.567E-04	6.942E-04	7.317E-04	7.692E-04	8.067E-04
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	4.191E-06	2.381E-07	1.875E-07	1.476E-07	1.162E-07	9.152E-08	7.206E-08	5.674E-08
RU103	2.067E-01	3.285E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	2.937E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	1.305E-01	3.403E-05	1.711E-05	8.600E-06	4.324E-06	2.174E-06	1.093E-06	5.495E-07
RH106	2.616E-07	1.226E-07	3.198E-11	1.608E-11	8.084E-12	4.064E-12	2.043E-12	1.027E-12	5.165E-13
PD106	7.981E-01	9.272E-01	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00
AG106	5.874E-15	6.816E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	1.545E-07	6.966E-07	7.417E-07	7.869E-07	8.321E-07	8.773E-07	9.224E-07	9.676E-07
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.666E-19	9.053E-19	9.004E-19	8.955E-19	8.906E-19	8.857E-19	8.809E-19	8.761E-19
AG108M	3.078E-10	3.061E-10	2.867E-10	2.851E-10	2.836E-10	2.820E-10	2.805E-10	2.790E-10	2.775E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.294E-16	1.856E-19	1.076E-19	6.233E-20	3.612E-20	2.093E-20	1.213E-20	7.028E-21
CD109	2.261E-10	1.310E-10	1.879E-13	1.089E-13	6.310E-14	3.656E-14	2.119E-14	1.228E-14	7.115E-15
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	2.972E-12	1.559E-17	5.662E-18	2.056E-18	7.463E-19	2.710E-19	9.838E-20	3.572E-20
AG110M	5.402E-04	1.961E-04	1.029E-09	3.736E-10	1.356E-10	4.925E-11	1.788E-11	6.492E-12	2.357E-12
CD110	3.243E-02	3.277E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02

Appendix D-2
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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
AG111	3.630E-04	6.352E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.452E-04	4.456E-04	4.456E-04	4.456E-04	4.457E-04	4.457E-04	4.457E-04	4.457E-04
CD113M	8.787E-04	8.380E-04	4.739E-04	4.519E-04	4.309E-04	4.109E-04	3.919E-04	3.737E-04	3.563E-04
IN113	9.476E-05	1.355E-04	4.993E-04	5.213E-04	5.422E-04	5.622E-04	5.812E-04	5.994E-04	6.167E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.835E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.962E-07	2.384E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.664E-06	7.028E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	4.164E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	1.176E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02
SN117M	1.819E-06	2.563E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.278E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	5.063E-05	2.087E-10	7.427E-11	2.643E-11	9.405E-12	3.347E-12	1.191E-12	4.238E-13
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.125E-05	1.799E-05	1.775E-05	1.750E-05	1.726E-05	1.702E-05	1.679E-05	1.656E-05
SB121	4.515E-02	4.519E-02	4.519E-02	4.519E-02	4.519E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	2.076E-04	1.266E-14	1.783E-15	2.512E-16	3.538E-17	4.983E-18	7.019E-19	9.886E-20
SB123	5.702E-02	5.829E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.470E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	3.725E-07	3.518E-18	4.242E-19	5.114E-20	6.170E-21	7.414E-22	8.345E-23	2.143E-24
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	3.096E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.566E-03	1.770E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SN125	3.077E-04	1.209E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	5.871E-02	4.596E-02	2.281E-03	1.776E-03	1.383E-03	1.077E-03	8.384E-04	6.528E-04	5.083E-04
TE125	4.338E-02	5.657E-02	1.008E-01	1.014E-01	1.018E-01	1.021E-01	1.023E-01	1.025E-01	1.026E-01
TE125M	7.575E-04	6.419E-04	3.191E-05	2.484E-05	1.934E-05	1.506E-05	1.173E-05	9.131E-06	7.109E-06
SN126	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01
SB126	3.619E-05	9.027E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09
SB126M	1.478E-08	6.863E-11	6.863E-11	6.863E-11	6.863E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11
TE126	4.547E-03	4.585E-03	4.600E-03	4.602E-03	4.603E-03	4.604E-03	4.606E-03	4.607E-03	4.608E-03
TE127	1.288E-04	1.759E-06	1.384E-18	1.356E-19	1.329E-20	1.303E-21	1.277E-22	1.255E-23	1.230E-24
TE127M	4.938E-03	5.024E-04	3.952E-16	3.874E-17	3.797E-18	3.722E-19	3.649E-20	3.584E-21	3.476E-22
I127	3.994E-01	4.053E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	3.557E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	3.569E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	7.102E-03	3.811E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.500E-05	6.598E-05	6.606E-05	6.614E-05	6.622E-05	6.630E-05	6.639E-05	6.647E-05
XE129M	1.213E-07	2.187E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
I131	4.926E-02	1.070E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE131M	7.973E-04	1.451E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
CS132	9.291E-06	9.682E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
XE133	7.367E-02	9.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	8.031E-01	1.422E-02	1.016E-02	7.258E-03	5.186E-03	3.705E-03	2.648E-03	1.892E-03
BA134	6.001E-01	9.210E-01	1.710E+00	1.714E+00	1.717E+00	1.719E+00	1.720E+00	1.721E+00	1.722E+00
CS135	9.090E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00
BA135	2.738E-03	2.742E-03	2.774E-03	2.777E-03	2.780E-03	2.783E-03	2.785E-03	2.788E-03	2.791E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
CS136	6.042E-03	2.450E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
BA136M	2.709E-10	1.099E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.651E+01	1.614E+01	1.223E+01	1.195E+01	1.168E+01	1.141E+01	1.115E+01	1.089E+01	1.065E+01
BA137	9.727E-01	1.350E+00	5.257E+00	5.537E+00	5.810E+00	6.076E+00	6.337E+00	6.592E+00	6.840E+00
BA137M	2.527E-06	2.469E-06	1.871E-06	1.828E-06	1.786E-06	1.746E-06	1.706E-06	1.667E-06	1.629E-06
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01

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sbwzr2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:12

	1826.0D	1.0YR	13.0YR	14.0YR	15.0YR	16.0YR	17.0YR	18.0YR	19.0YR
BA140	1.798E-01	4.548E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.504E-02	6.858E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	1.811E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
PR143	1.798E-01	1.577E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	1.473E+00	3.361E-05	1.380E-05	5.661E-06	2.323E-06	9.535E-07	3.913E-07	1.606E-07
PR144	1.520E-04	6.218E-05	1.419E-09	5.825E-10	2.391E-10	9.811E-11	4.026E-11	1.652E-11	6.781E-12
PR144M	7.579E-07	3.109E-07	7.095E-12	2.912E-12	1.195E-12	4.904E-13	2.013E-13	8.260E-14	3.390E-14
ND144	1.638E+01	1.850E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	4.372E-05	9.637E-06	8.496E-06	7.490E-06	6.603E-06	5.821E-06	5.132E-06	4.524E-06
SM146	8.176E-05	8.394E-05	9.655E-05	9.697E-05	9.734E-05	9.767E-05	9.796E-05	9.822E-05	9.844E-05
ND147	6.040E-02	6.922E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	2.102E+00	1.661E+00	6.972E-02	5.353E-02	4.110E-02	3.156E-02	2.423E-02	1.860E-02	1.428E-02
SM147	1.853E+00	2.355E+00	3.946E+00	3.962E+00	3.975E+00	3.984E+00	3.992E+00	3.997E+00	4.002E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	2.501E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	1.569E-02	3.414E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.450E-09	3.532E-09	3.465E-09	3.399E-09	3.334E-09	3.270E-09	3.208E-09	3.147E-09
SM151	1.636E-01	1.636E-01	1.492E-01	1.481E-01	1.469E-01	1.458E-01	1.447E-01	1.436E-01	1.425E-01
EU151	2.742E-04	1.539E-03	1.599E-02	1.713E-02	1.827E-02	1.939E-02	2.051E-02	2.162E-02	2.272E-02
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	1.157E-03	6.278E-04	5.966E-04	5.670E-04	5.388E-04	5.120E-04	4.866E-04	4.624E-04
GD152	1.111E-03	1.128E-03	1.276E-03	1.284E-03	1.293E-03	1.301E-03	1.308E-03	1.315E-03	1.322E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	1.521E-05	5.374E-11	1.888E-11	6.632E-12	2.330E-12	8.185E-13	2.876E-13	1.010E-13
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	2.387E-01	9.076E-02	8.373E-02	7.725E-02	7.127E-02	6.575E-02	6.066E-02	5.596E-02
GD154	2.826E-02	4.830E-02	1.963E-01	2.033E-01	2.098E-01	2.158E-01	2.213E-01	2.264E-01	2.311E-01
EU155	7.979E-02	6.938E-02	1.297E-02	1.128E-02	9.805E-03	8.526E-03	7.414E-03	6.446E-03	5.606E-03
GD155	1.034E-03	1.144E-02	6.786E-02	6.955E-02	7.102E-02	7.230E-02	7.341E-02	7.438E-02	7.522E-02
EU156	8.598E-03	4.949E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	2.369E-06	1.338E-24	1.338E-24	1.338E-24	1.338E-24	1.338E-24	1.338E-24	1.338E-24
DY160	3.786E-04	4.548E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
TB161	3.523E-06	4.555E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.625E-07	4.593E-07	4.591E-07	4.588E-07	4.585E-07	4.583E-07	4.580E-07	4.577E-07
ER166	1.514E-05	1.519E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
ER169	5.081E-10	1.021E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.181E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	1.532E-10	8.406E-21	1.182E-21	1.596E-22	1.227E-23	1.190E-23	1.153E-23	1.118E-23
YB170	1.875E-09	2.818E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	4.004E-11	5.261E-13	3.667E-13	2.556E-13	1.781E-13	1.241E-13	8.652E-14	6.030E-14
YB171	6.068E-11	7.809E-11	1.176E-10	1.178E-10	1.179E-10	1.180E-10	1.180E-10	1.180E-10	1.181E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

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File SBWZR3.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       1.    1   2   5   4
  DEC      20.    2   3   5   0
  DEC      21.    3   4   5   0
  DEC      22.    4   5   5   0
  DEC      23.    5   6   5   0
  DEC      24.    6   7   5   0
  DEC      25.    7   8   5   0
  DEC      26.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
```

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File SBWZR3.INP (continued)

```
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File SBWZR3.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy sbwzr3.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwzr3.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwzr3.u6 >nul
copy tape13.out+tape11.out sbwzr3.u11 >nul
ren tape7.out sbwzr3.pch
ren tape15.out sbwzr3.dbg
ren tape16.out sbwzr3.vxs
ren tape50.out sbwzr3.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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sbwzr3.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	7.650E-11	2.633E-11	2.490E-11	2.354E-11	2.225E-11	2.104E-11	1.989E-11	1.880E-11
HE 3	1.385E-12	5.802E-12	5.597E-11	5.741E-11	5.877E-11	6.005E-11	6.127E-11	6.242E-11	6.350E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08
B 10	4.994E-13	5.333E-13	1.179E-12	1.213E-12	1.247E-12	1.281E-12	1.315E-12	1.349E-12	1.383E-12
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.319E-03	3.311E-03	3.311E-03	3.310E-03	3.310E-03	3.309E-03	3.309E-03	3.309E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.518E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.505E-20	1.433E-20	1.429E-20	1.426E-20	1.422E-20	1.418E-20	1.415E-20	1.411E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	2.159E-21	1.447E-21	1.416E-21	1.386E-21	1.357E-21	1.329E-21	1.301E-21	1.274E-21
K 39	1.746E-23	5.634E-23	7.751E-22	8.120E-22	8.489E-22	8.856E-22	9.222E-22	9.588E-22	9.953E-22
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	9.229E-26	6.191E-26	6.053E-26	5.926E-26	5.802E-26	5.680E-26	5.560E-26	5.444E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	6.426E-10	9.741E-23	1.905E-23	5.163E-24	3.373E-24	0.000E+00	0.000E+00	0.000E+00
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.583E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	1.034E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	2.128E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	1.686E-04	3.482E-11	1.549E-11	6.889E-12	3.064E-12	1.363E-12	6.062E-13	2.696E-13
MN 55	7.699E-03	1.023E-02	1.846E-02	1.847E-02	1.848E-02	1.849E-02	1.849E-02	1.850E-02	1.850E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	8.280E-03	5.227E-05	4.004E-05	3.067E-05	2.349E-05	1.799E-05	1.378E-05	1.056E-05
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.706E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	4.277E-04	1.196E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	1.843E-03	1.871E-03	1.890E-03	1.891E-03	1.892E-03	1.893E-03	1.894E-03	1.895E-03	1.896E-03
CO 60	1.264E-04	1.108E-04	9.105E-06	7.983E-06	6.999E-06	6.136E-06	5.380E-06	4.717E-06	4.136E-06
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00

Appendix D-2
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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.087E-02	1.809E-02	1.795E-02	1.782E-02	1.768E-02	1.755E-02	1.742E-02	1.729E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	4.990E-04	3.282E-03	3.418E-03	3.553E-03	3.687E-03	3.819E-03	3.951E-03	4.082E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	2.690E-11	7.299E-20	2.584E-20	9.151E-21	3.242E-21	1.143E-21	4.031E-22	1.462E-22
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 71	7.964E-23	3.830E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.026E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	1.544E-06	1.508E-06	9.594E-07	9.369E-07	9.148E-07	8.933E-07	8.723E-07	8.518E-07	8.317E-07
Y 89	2.396E-03	2.549E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.782E-10	2.406E-10	2.349E-10	2.294E-10	2.240E-10	2.187E-10	2.136E-10	2.086E-10
Y 91	4.667E-04	6.163E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.765E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 92	3.999E-07	6.025E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.190E+00	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	2.252E-05	1.046E-04	1.071E-04	1.095E-04	1.117E-04	1.139E-04	1.159E-04	1.178E-04
NB 94	3.937E-02	3.937E-02	3.934E-02	3.934E-02	3.934E-02	3.934E-02	3.934E-02	3.933E-02	3.933E-02
NB 95	1.328E-01	5.887E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	9.792E-05	1.994E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	2.903E-06	4.248E-06	2.978E-05	3.112E-05	3.247E-05	3.381E-05	3.515E-05	3.650E-05	3.784E-05
MO 95	2.820E+00	3.192E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	1.076E-17	1.290E-16	1.352E-16	1.414E-16	1.477E-16	1.539E-16	1.601E-16	1.663E-16
RU 99	6.727E-11	1.400E-10	1.522E-09	1.595E-09	1.668E-09	1.741E-09	1.813E-09	1.886E-09	1.959E-09
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	3.829E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	2.984E-35	2.984E-35	2.984E-35	2.984E-35	2.984E-35	2.984E-35	2.984E-35
RH102	1.578E-22	1.201E-22	6.345E-24	6.345E-24	6.345E-24	6.345E-24	6.345E-24	6.345E-24	6.345E-24
RH103	6.390E-16	8.778E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	2.807E-41	2.570E-41	2.570E-41	2.570E-41	2.570E-41	2.570E-41	2.570E-41
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.212E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	5.283E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.494E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	6.271E-07	4.446E-25	4.928E-26	6.640E-27	7.362E-28	0.000E+00	0.000E+00	0.000E+00
IN114	1.614E-08	3.561E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.679E-04	2.214E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.044E-03	7.402E-22	7.401E-23	1.106E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN117M	9.722E-03	1.370E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02
SN119	8.423E+01	8.433E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	5.365E-02	1.598E-10	5.686E-11	2.023E-11	7.200E-12	2.562E-12	9.117E-13	3.244E-13
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.524E-03	1.171E-03	1.155E-03	1.139E-03	1.123E-03	1.108E-03	1.093E-03	1.078E-03
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	6.097E-04	4.089E-20	5.752E-21	8.158E-22	1.113E-22	8.874E-24	8.527E-24	8.193E-24
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SN125	2.449E-03	9.625E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	2.832E-01	2.837E-01	2.840E-01	2.841E-01	2.841E-01	2.841E-01	2.841E-01	2.841E-01	2.841E-01
SB123	2.498E-02	2.869E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	1.309E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.127E-01	1.675E-01	1.443E-03	1.123E-03	8.745E-04	6.809E-04	5.302E-04	4.128E-04	3.214E-04
SB126	3.687E-05	4.974E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.279E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	1.972E-06	6.899E-24	7.742E-24	8.687E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	6.257E-04	7.122E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	1.737E-01	3.421E-01	3.424E-01	3.426E-01	3.428E-01	3.430E-01	3.431E-01	3.432E-01
TE125M	2.654E-03	2.338E-03	2.018E-05	1.571E-05	1.223E-05	9.524E-06	7.415E-06	5.774E-06	4.495E-06
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	4.612E-11	3.155E-30	3.144E-30	3.144E-30	3.144E-30	3.144E-30	3.144E-30	3.144E-30
TE127M	1.344E-07	1.318E-08	9.011E-28	9.011E-28	9.011E-28	9.011E-28	9.011E-28	9.011E-28	9.011E-28
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	6.894E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.379E-14	7.363E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.225E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
I131	1.297E-19	2.743E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.863E-14	1.780E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE129M	6.502E-13	1.173E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE131M	4.971E-17	2.854E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE133	3.734E-21	4.100E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS132	2.603E-26	1.850E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	7.205E-22	1.016E-23	1.016E-23	1.016E-23	1.016E-23	1.016E-23	1.016E-23	1.016E-23
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	3.590E-22	1.069E-21	1.069E-21	1.069E-21	1.069E-21	1.069E-21	1.069E-21	1.069E-21
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER169	1.553E-19	3.121E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER170	6.143E-22	9.649E-22	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	3.981E-20	2.258E-36	2.258E-36	2.258E-36	2.258E-36	2.258E-36	2.258E-36	2.258E-36
TM171	5.935E-20	4.144E-20	3.757E-23	3.757E-23	3.757E-23	3.757E-23	3.757E-23	3.757E-23	3.757E-23
YB170	4.405E-19	6.854E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	4.135E-20	8.275E-20	8.275E-20	8.275E-20	8.275E-20	8.275E-20	8.275E-20	8.275E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.021E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	5.175E-10	1.722E-23	3.446E-24	6.737E-25	1.606E-25	1.104E-25	2.224E-26	9.921E-43
LU177M	2.662E-07	5.199E-08	1.730E-21	3.466E-22	6.030E-23	1.633E-23	1.144E-23	0.000E+00	0.000E+00
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	1.589E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	1.966E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01

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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
TA182	9.547E-03	1.056E-03	9.206E-12	9.206E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12
TA183	6.272E-04	1.731E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	7.216E-02	8.065E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.253E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	3.629E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RE185	7.346E-06	9.947E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	3.738E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	7.064E-20	9.630E-19	1.010E-18	1.057E-18	1.104E-18	1.151E-18	1.198E-18	1.245E-18
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS191	1.181E-17	8.861E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS192	3.158E-19	5.976E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	1.992E-19	4.375E-24	4.375E-24	4.375E-24	4.375E-24	4.375E-24	4.375E-24	4.375E-24
IR192M	5.491E-21	5.491E-21	5.191E-21	5.191E-21	5.191E-21	5.191E-21	5.191E-21	5.191E-21	5.191E-21
IR193	8.109E-19	8.110E-19	8.116E-19	8.117E-19	8.117E-19	8.118E-19	8.118E-19	8.118E-19	8.119E-19
IR194	4.896E-22	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30
PT192	6.270E-18	1.188E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.583E-20	2.515E-20	2.511E-20	2.508E-20	2.505E-20	2.501E-20	2.498E-20	2.494E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	3.123E-04	2.961E-03	3.090E-03	3.218E-03	3.344E-03	3.470E-03	3.595E-03	3.719E-03
TL206	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29
TL207	3.787E-17	5.254E-17	7.301E-16	7.844E-16	8.386E-16	8.941E-16	9.509E-16	1.009E-15	1.068E-15
TL208	2.376E-14	4.772E-14	2.304E-13	2.299E-13	2.284E-13	2.268E-13	2.250E-13	2.232E-13	2.214E-13
TL209	1.073E-19	3.797E-20	6.545E-20	6.794E-20	7.053E-20	7.324E-20	7.607E-20	7.901E-20	8.206E-20
PB206	1.520E-15	3.826E-15	1.774E-13	2.083E-13	2.430E-13	2.830E-13	3.290E-13	3.818E-13	4.420E-13
PB207	6.465E-12	9.859E-12	4.946E-10	5.524E-10	6.143E-10	6.805E-10	7.509E-10	8.257E-10	9.050E-10
PB208	9.394E-09	2.104E-08	1.221E-06	1.297E-06	1.373E-06	1.448E-06	1.523E-06	1.597E-06	1.670E-06
PB209	4.482E-16	1.582E-16	2.727E-16	2.831E-16	2.939E-16	3.052E-16	3.169E-16	3.292E-16	3.419E-16
PB210	8.589E-14	9.112E-14	9.756E-13	1.134E-12	1.313E-12	1.512E-12	1.733E-12	1.978E-12	2.248E-12
PB211	2.930E-16	4.065E-16	5.648E-15	6.068E-15	6.488E-15	6.917E-15	7.356E-15	7.805E-15	8.264E-15
PB212	1.401E-11	2.814E-11	1.359E-10	1.356E-10	1.347E-10	1.338E-10	1.327E-10	1.317E-10	1.306E-10
PB214	6.485E-20	1.172E-19	1.349E-17	1.527E-17	1.719E-17	1.927E-17	2.150E-17	2.390E-17	2.647E-17
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	1.140E-12	8.220E-12	8.731E-12	9.261E-12	9.811E-12	1.038E-11	1.098E-11	1.159E-11
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	5.610E-17	6.003E-16	6.984E-16	8.081E-16	9.306E-16	1.067E-15	1.218E-15	1.384E-15
BI211	1.729E-17	2.398E-17	3.333E-16	3.581E-16	3.828E-16	4.081E-16	4.341E-16	4.605E-16	4.876E-16
BI212	1.329E-12	2.670E-12	1.289E-11	1.286E-11	1.278E-11	1.269E-11	1.259E-11	1.249E-11	1.239E-11
BI213	1.051E-16	3.718E-17	6.408E-17	6.651E-17	6.905E-17	7.171E-17	7.447E-17	7.735E-17	8.034E-17
BI214	4.815E-20	8.705E-20	1.002E-17	1.134E-17	1.277E-17	1.431E-17	1.597E-17	1.775E-17	1.965E-17
PO210	9.371E-16	1.441E-15	1.658E-14	1.784E-14	2.045E-14	2.357E-14	2.707E-14	3.097E-14	3.527E-14
PO211	2.121E-22	2.943E-22	4.089E-21	4.393E-21	4.696E-21	5.007E-21	5.325E-21	5.650E-21	5.982E-21
PO212	7.032E-23	1.412E-22	6.820E-22	6.806E-22	6.761E-22	6.713E-22	6.662E-22	6.608E-22	6.553E-22
PO213	1.576E-25	5.578E-26	9.614E-26	9.979E-26	1.036E-25	1.076E-25	1.117E-25	1.160E-25	1.205E-25
PO214	6.468E-25	1.198E-26	1.378E-24	1.560E-24	1.756E-24	1.968E-24	2.197E-24	2.442E-24	2.704E-24
PO215	2.453E-22	3.404E-22	4.730E-21	5.081E-21	5.433E-21	5.792E-21	6.160E-21	6.536E-21	6.920E-21
PO216	5.591E-17	1.123E-16	5.422E-16	5.411E-16	5.376E-16	5.338E-16	5.297E-16	5.254E-16	5.210E-16
PO218	7.519E-21	1.359E-20	1.564E-18	1.770E-18	1.994E-18	2.234E-18	2.493E-18	2.772E-18	3.069E-18
AT217	1.262E-21	4.467E-22	7.699E-22	7.991E-22	8.296E-22	8.615E-22	8.947E-22	9.293E-22	9.652E-22
RN218	1.389E-22	7.194E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.560E-19	7.713E-19	1.072E-17	1.152E-17	1.231E-17	1.313E-17	1.396E-17	1.481E-17	1.568E-17
RN220	2.111E-14	4.240E-14	2.047E-13	2.043E-13	2.030E-13	2.015E-13	2.000E-13	1.984E-13	1.967E-13
RN222	1.382E-17	2.499E-17	2.876E-15	3.255E-15	3.665E-15	4.108E-15	4.584E-15	5.096E-15	5.643E-15
FR221	1.146E-17	4.056E-18	6.991E-18	7.256E-18	7.533E-18	7.823E-18	8.125E-18	8.439E-18	8.765E-18
FR223	2.596E-18	3.574E-18	4.974E-17	5.333E-17	5.702E-17	6.079E-17	6.465E-17	6.860E-17	7.263E-17
RA222	1.536E-19	7.954E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	1.412E-13	1.959E-13	2.723E-12	2.925E-12	3.127E-12	3.334E-12	3.546E-12	3.762E-12	3.983E-12
RA224	1.222E-10	2.455E-10	1.185E-09	1.183E-09	1.175E-09	1.167E-09	1.158E-09	1.149E-09	1.139E-09
RA225	5.321E-14	1.834E-14	3.161E-14	3.281E-14	3.406E-14	3.537E-14	3.673E-14	3.815E-14	3.963E-14
RA226	2.170E-12	3.888E-12	4.475E-10	5.064E-10	5.702E-10	6.391E-10	7.132E-10	7.927E-10	8.779E-10
RA228	5.488E-16	9.166E-16	1.939E-14	2.066E-14	2.195E-14	2.324E-14	2.455E-14	2.587E-14	2.719E-14
AC225	3.500E-14	1.239E-14	2.135E-14	2.216E-14	2.301E-14	2.389E-14	2.482E-14	2.577E-14	2.677E-14
AC227	1.006E-10	1.385E-10	1.927E-09	2.067E-09	2.209E-09	2.356E-09	2.505E-09	2.658E-09	2.814E-09
AC228	2.287E-14	9.568E-20	2.024E-18	2.157E-18	2.291E-18	2.426E-18	2.563E-18	2.700E-18	2.838E-18
TH226	7.654E-18	3.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	2.321E-13	3.220E-13	4.474E-12	4.807E-12	5.139E-12	5.479E-12	5.827E-12	6.183E-12	6.546E-12
TH228	2.398E-08	4.762E-08	2.304E-07	2.290E-07	2.275E-07	2.259E-07	2.242E-07	2.224E-07	2.205E-07

Appendix D-2
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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
TH229	3.343E-09	3.380E-09	5.825E-09	6.046E-09	6.277E-09	6.519E-09	6.770E-09	7.032E-09	7.303E-09
TH230	1.506E-07	2.424E-07	6.413E-06	6.958E-06	7.524E-06	8.111E-06	8.718E-06	9.346E-06	9.993E-06
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	1.063E-05	6.746E-05	7.045E-05	7.344E-05	7.643E-05	7.943E-05	8.242E-05	8.541E-05
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	2.200E-06	9.557E-06	9.946E-06	1.033E-05	1.072E-05	1.111E-05	1.150E-05	1.189E-05
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U230	7.523E-15	3.893E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	3.050E-06	4.582E-06	8.693E-06	8.621E-06	8.548E-06	8.474E-06	8.398E-06	8.323E-06	8.246E-06
U233	7.255E-06	9.615E-06	5.024E-05	5.261E-05	5.497E-05	5.734E-05	5.971E-05	6.207E-05	6.444E-05
U234	2.856E-02	3.736E-02	1.919E-01	1.994E-01	2.069E-01	2.143E-01	2.216E-01	2.289E-01	2.361E-01
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.575E-10	1.032E-10	9.830E-11	9.368E-11	8.928E-11	8.508E-11	8.109E-11	7.727E-11
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.716E-08	9.116E-14	4.811E-14	2.539E-14	1.340E-14	7.069E-15	3.731E-15	1.969E-15
NP236	3.749E-06	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.880E-12	1.724E-12	1.716E-12	1.708E-12	1.700E-12	1.692E-12	1.685E-12	1.677E-12
NP239	3.690E-04	9.904E-11	9.886E-11	9.886E-11	9.885E-11	9.884E-11	9.883E-11	9.882E-11	9.881E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	5.789E-06	5.709E-08	4.477E-08	3.511E-08	2.753E-08	2.159E-08	1.693E-08	1.328E-08
PU237	7.562E-07	2.936E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	1.127E+00	1.128E+00	9.707E-01	9.631E-01	9.555E-01	9.480E-01	9.405E-01	9.331E-01	9.258E-01
PU239	1.613E-01	1.617E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.616E-01	1.615E-01
PU240	3.359E-02	3.359E-02	3.353E-02	3.353E-02	3.352E-02	3.352E-02	3.352E-02	3.351E-02	3.351E-02
PU241	8.725E-03	8.315E-03	3.332E-03	3.175E-03	3.026E-03	2.884E-03	2.748E-03	2.619E-03	2.496E-03
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	3.107E-26	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27
AM241	3.068E-04	7.160E-04	5.591E-03	5.739E-03	5.879E-03	6.011E-03	6.137E-03	6.256E-03	6.369E-03
AM242M	1.007E-05	1.003E-05	9.193E-06	9.151E-06	9.110E-06	9.068E-06	9.027E-06	8.986E-06	8.945E-06
AM242	3.137E-07	1.199E-10	1.100E-10	1.095E-10	1.090E-10	1.085E-10	1.080E-10	1.075E-10	1.070E-10
AM243	1.151E-04	1.152E-04	1.150E-04	1.150E-04	1.150E-04	1.150E-04	1.150E-04	1.150E-04	1.150E-04
AM245	2.436E-14	3.523E-23	1.045E-29	4.761E-30	2.158E-30	9.481E-31	4.794E-31	2.502E-31	1.134E-31
AM246	6.436E-19	4.979E-29	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30
CM241	1.077E-12	9.509E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	3.549E-05	7.596E-06	2.224E-08	2.216E-08	2.206E-08	2.196E-08	2.186E-08	2.176E-08	2.167E-08
CM243	5.639E-07	5.503E-07	3.467E-07	3.384E-07	3.302E-07	3.223E-07	3.146E-07	3.070E-07	2.996E-07
CM244	1.624E-05	1.564E-05	7.556E-06	7.272E-06	6.999E-06	6.736E-06	6.483E-06	6.240E-06	6.006E-06
CM245	3.670E-07	3.670E-07	3.664E-07	3.664E-07	3.664E-07	3.663E-07	3.663E-07	3.663E-07	3.662E-07
CM246	2.209E-08	2.209E-08	2.203E-08	2.202E-08	2.202E-08	2.202E-08	2.201E-08	2.201E-08	2.201E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12
CM249	1.877E-17	1.307E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	3.617E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21
BK249	2.019E-14	9.161E-15	2.717E-21	1.238E-21	5.438E-22	2.389E-22	1.246E-22	6.504E-23	1.359E-23
BK250	1.228E-17	4.440E-24	1.083E-29	1.083E-29	1.083E-29	1.083E-29	1.083E-29	1.083E-29	1.083E-29
CF249	3.877E-15	1.490E-14	2.320E-14	2.315E-14	2.311E-14	2.306E-14	2.302E-14	2.297E-14	2.292E-14
CF250	3.409E-15	3.245E-15	1.186E-15	1.125E-15	1.066E-15	1.011E-15	9.592E-16	9.097E-16	8.628E-16
CF251	1.058E-15	1.057E-15	1.042E-15	1.041E-15	1.040E-15	1.040E-15	1.039E-15	1.038E-15	1.037E-15
CF252	3.213E-16	2.471E-16	1.678E-18	1.290E-18	9.921E-19	7.628E-19	5.866E-19	4.510E-19	3.468E-19
CF253	2.544E-19	1.709E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	5.630E-21	9.293E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	2.405E-19	8.017E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	2.319E-20	9.241E-21	2.446E-28	2.446E-28	2.446E-28	2.446E-28	2.446E-28	2.446E-28	2.446E-28
SF250	2.226E-11	4.257E-11	3.620E-10	3.773E-10	3.926E-10	4.077E-10	4.226E-10	4.375E-10	4.522E-10
H 3	6.014E-04	5.685E-04	1.957E-04	1.850E-04	1.749E-04	1.654E-04	1.563E-04	1.478E-04	1.397E-04
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.794E-07	3.786E-07	3.785E-07	3.785E-07	3.784E-07	3.784E-07	3.783E-07	3.783E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04

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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.723E-02	8.721E-02	8.721E-02	8.721E-02	8.721E-02	8.720E-02	8.720E-02	8.720E-02
BR 79	2.253E-06	3.184E-06	2.087E-05	2.180E-05	2.273E-05	2.366E-05	2.459E-05	2.552E-05	2.645E-05
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	3.859E-01	1.130E-01	1.059E-01	9.927E-02	9.305E-02	8.723E-02	8.177E-02	7.665E-02
RB 85	1.846E+00	1.873E+00	2.145E+00	2.153E+00	2.159E+00	2.165E+00	2.171E+00	2.177E+00	2.182E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
RB 86	1.883E-04	2.408E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.306E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	8.536E+00	8.880E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	9.891E+00	6.293E+00	6.145E+00	6.000E+00	5.859E+00	5.721E+00	5.587E+00	5.455E+00
Y 90	2.594E-03	2.480E-03	1.578E-03	1.541E-03	1.505E-03	1.469E-03	1.435E-03	1.401E-03	1.368E-03
ZR 90	6.404E-01	8.788E-01	4.478E+00	4.626E+00	4.771E+00	4.912E+00	5.050E+00	5.184E+00	5.316E+00
Y 91	5.021E-01	6.678E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	1.058E+01	1.108E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
NB 92	1.142E-13	1.721E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	2.829E-06	5.528E-05	5.925E-05	6.331E-05	6.744E-05	7.165E-05	7.593E-05	8.028E-05
NB 93M	1.239E-05	1.700E-05	7.160E-05	7.326E-05	7.484E-05	7.634E-05	7.776E-05	7.911E-05	8.040E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06	1.653E-06
ZR 95	6.298E-01	1.204E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.479E-01	1.489E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	2.492E-04	5.040E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	1.132E+01	1.227E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	1.316E-04	8.442E-04	8.817E-04	9.192E-04	9.567E-04	9.942E-04	1.032E-03	1.069E-03
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	4.191E-06	4.468E-08	3.518E-08	2.770E-08	2.181E-08	1.717E-08	1.352E-08	1.065E-08
RU103	2.067E-01	3.285E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	2.937E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	1.305E-01	2.763E-07	1.389E-07	6.983E-08	3.511E-08	1.765E-08	8.874E-09	4.461E-09
RH106	2.616E-07	1.226E-07	2.597E-13	1.306E-13	6.564E-14	3.300E-14	1.659E-14	8.341E-15	4.193E-15
PD106	7.981E-01	9.272E-01	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00
AG106	5.874E-15	6.816E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	1.545E-07	1.013E-06	1.058E-06	1.103E-06	1.148E-06	1.193E-06	1.239E-06	1.284E-06
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.666E-19	8.713E-19	8.666E-19	8.619E-19	8.572E-19	8.525E-19	8.479E-19	8.433E-19
AG108M	3.078E-10	3.061E-10	2.759E-10	2.744E-10	2.730E-10	2.715E-10	2.700E-10	2.685E-10	2.671E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.294E-16	4.072E-21	2.360E-21	1.367E-21	7.924E-22	4.592E-22	2.661E-22	1.542E-22
CD109	2.261E-10	1.310E-10	4.123E-15	2.389E-15	1.384E-15	8.022E-16	4.649E-16	2.694E-16	1.561E-16
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	2.972E-12	1.297E-20	4.708E-21	1.710E-21	6.207E-22	2.253E-22	8.182E-23	2.971E-23
AG110M	5.402E-04	1.961E-04	8.558E-13	3.107E-13	1.128E-13	4.096E-14	1.487E-14	5.399E-15	1.960E-15
CD110	3.243E-02	3.277E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02

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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
AG111	3.630E-04	6.352E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.452E-04	4.457E-04	4.457E-04	4.458E-04	4.458E-04	4.458E-04	4.458E-04	4.458E-04
CD113M	8.787E-04	8.380E-04	3.398E-04	3.240E-04	3.090E-04	2.947E-04	2.810E-04	2.679E-04	2.555E-04
IN113	9.476E-05	1.355E-04	6.332E-04	6.490E-04	6.640E-04	6.783E-04	6.920E-04	7.050E-04	7.174E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.835E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.962E-07	2.384E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.664E-06	7.028E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	4.164E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	1.176E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02
SN117M	1.819E-06	2.563E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.278E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	5.063E-05	1.508E-13	5.366E-14	1.909E-14	6.795E-15	2.418E-15	8.604E-16	3.062E-16
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.125E-05	1.633E-05	1.610E-05	1.588E-05	1.566E-05	1.545E-05	1.523E-05	1.502E-05
SB121	4.515E-02	4.519E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	2.076E-04	1.392E-20	1.959E-21	2.672E-22	4.235E-23	1.359E-23	0.000E+00	0.000E+00
SB123	5.702E-02	5.829E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.470E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	3.725E-07	1.303E-24	1.303E-24	1.303E-24	1.303E-24	1.303E-24	1.303E-24	1.303E-24
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	3.096E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.566E-03	1.770E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SN125	3.077E-04	1.209E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	5.871E-02	4.596E-02	3.957E-04	3.081E-04	2.399E-04	1.868E-04	1.454E-04	1.132E-04	8.817E-05
TE125	4.338E-02	5.657E-02	1.028E-01	1.029E-01	1.029E-01	1.030E-01	1.030E-01	1.030E-01	1.031E-01
TE125M	7.575E-04	6.419E-04	5.535E-06	4.310E-06	3.356E-06	2.613E-06	2.034E-06	1.584E-06	1.233E-06
SN126	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01
SB126	3.619E-05	9.027E-09	9.026E-09	9.026E-09	9.026E-09	9.026E-09	9.025E-09	9.025E-09	9.025E-09
SB126M	1.478E-08	6.863E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11
TE126	4.547E-03	4.585E-03	4.610E-03	4.611E-03	4.612E-03	4.614E-03	4.615E-03	4.616E-03	4.617E-03
TE127	1.288E-04	1.759E-06	1.203E-25	1.179E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.938E-03	5.024E-04	3.436E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	3.994E-01	4.053E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	3.557E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	3.569E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	7.102E-03	3.811E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.500E-05	6.655E-05	6.663E-05	6.671E-05	6.679E-05	6.687E-05	6.695E-05	6.704E-05
XE129M	1.213E-07	2.187E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
I131	4.926E-02	1.070E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE131M	7.973E-04	1.451E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
CS132	9.291E-06	9.682E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
XE133	7.367E-02	9.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	8.031E-01	1.351E-03	9.657E-04	6.900E-04	4.930E-04	3.522E-04	2.517E-04	1.798E-04
BA134	6.001E-01	9.210E-01	1.723E+00	1.723E+00	1.723E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00
CS135	9.090E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00
BA135	2.738E-03	2.742E-03	2.794E-03	2.796E-03	2.799E-03	2.802E-03	2.805E-03	2.807E-03	2.810E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
CS136	6.042E-03	2.450E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
BA136M	2.709E-10	1.099E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.651E+01	1.614E+01	1.040E+01	1.017E+01	9.933E+00	9.706E+00	9.485E+00	9.268E+00	9.056E+00
BA137	9.727E-01	1.350E+00	7.084E+00	7.321E+00	7.553E+00	7.780E+00	8.002E+00	8.219E+00	8.430E+00
BA137M	2.527E-06	2.469E-06	1.592E-06	1.555E-06	1.520E-06	1.485E-06	1.451E-06	1.418E-06	1.385E-06
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01

Appendix D-2
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sbwzr3.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:14

	1826.0D	1.0YR	20.0YR	21.0YR	22.0YR	23.0YR	24.0YR	25.0YR	26.0YR
BA140	1.798E-01	4.548E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.504E-02	6.858E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	1.811E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
PR143	1.798E-01	1.577E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	1.473E+00	6.591E-08	2.705E-08	1.110E-08	4.556E-09	1.870E-09	7.673E-10	3.149E-10
PR144	1.520E-04	6.218E-05	2.783E-12	1.142E-12	4.687E-13	1.924E-13	7.894E-14	3.240E-14	1.330E-14
PR144M	7.579E-07	3.109E-07	1.391E-14	5.709E-15	2.343E-15	9.616E-16	3.946E-16	1.620E-16	6.646E-17
ND144	1.638E+01	1.850E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	4.372E-05	3.988E-06	3.516E-06	3.100E-06	2.733E-06	2.409E-06	2.124E-06	1.872E-06
SM146	8.176E-05	8.394E-05	9.864E-05	9.881E-05	9.897E-05	9.910E-05	9.922E-05	9.933E-05	9.942E-05
ND147	6.040E-02	6.922E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	2.102E+00	1.661E+00	1.097E-02	8.421E-03	6.466E-03	4.965E-03	3.812E-03	2.927E-03	2.247E-03
SM147	1.853E+00	2.355E+00	4.005E+00	4.007E+00	4.009E+00	4.011E+00	4.012E+00	4.013E+00	4.014E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	2.501E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	1.569E-02	3.414E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.450E-09	3.087E-09	3.028E-09	2.970E-09	2.913E-09	2.858E-09	2.803E-09	2.750E-09
SM151	1.636E-01	1.636E-01	1.414E-01	1.403E-01	1.392E-01	1.381E-01	1.371E-01	1.360E-01	1.350E-01
EU151	2.742E-04	1.539E-03	2.382E-02	2.490E-02	2.598E-02	2.705E-02	2.811E-02	2.916E-02	3.020E-02
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	1.157E-03	4.394E-04	4.176E-04	3.968E-04	3.771E-04	3.584E-04	3.406E-04	3.237E-04
GD152	1.111E-03	1.128E-03	1.328E-03	1.334E-03	1.340E-03	1.346E-03	1.351E-03	1.356E-03	1.361E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	1.521E-05	3.549E-14	1.247E-14	4.380E-15	1.539E-15	5.405E-16	1.899E-16	6.671E-17
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	2.387E-01	5.163E-02	4.763E-02	4.394E-02	4.054E-02	3.740E-02	3.450E-02	3.183E-02
GD154	2.826E-02	4.830E-02	2.354E-01	2.394E-01	2.431E-01	2.465E-01	2.496E-01	2.525E-01	2.552E-01
EU155	7.979E-02	6.938E-02	4.874E-03	4.239E-03	3.686E-03	3.205E-03	2.787E-03	2.423E-03	2.107E-03
GD155	1.034E-03	1.144E-02	7.595E-02	7.659E-02	7.714E-02	7.762E-02	7.804E-02	7.840E-02	7.872E-02
EU156	8.598E-03	4.949E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	2.369E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	3.786E-04	4.548E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
TB161	3.523E-06	4.555E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.625E-07	4.575E-07	4.572E-07	4.570E-07	4.567E-07	4.564E-07	4.562E-07	4.559E-07
ER166	1.514E-05	1.519E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
ER169	5.081E-10	1.021E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.181E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	1.532E-10	8.692E-27	8.692E-27	8.692E-27	8.692E-27	8.692E-27	8.692E-27	8.692E-27
YB170	1.875E-09	2.818E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	4.004E-11	4.183E-14	2.915E-14	2.032E-14	1.416E-14	9.869E-15	6.879E-15	4.794E-15
YB171	6.068E-11	7.809E-11	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

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File SBWZR4.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       1.    1   2   5   4
  DEC      27.    2   3   5   0
  DEC      28.    3   4   5   0
  DEC      29.    4   5   5   0
  DEC      30.    5   6   5   0
  DEC      31.    6   7   5   0
  DEC      32.    7   8   5   0
  DEC      33.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
```

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File SBWZR4.INP (continued)

```
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File SBWZR4.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy sbwzr4.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwzr4.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwzr4.u6 >nul
copy tape13.out+tape11.out sbwzr4.u11 >nul
ren tape7.out sbwzr4.pch
ren tape15.out sbwzr4.dbg
ren tape16.out sbwzr4.vxs
ren tape50.out sbwzr4.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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sbwzr4.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	7.650E-11	1.778E-11	1.681E-11	1.589E-11	1.502E-11	1.420E-11	1.343E-11	1.269E-11
HE 3	1.385E-12	5.802E-12	6.453E-11	6.550E-11	6.642E-11	6.728E-11	6.810E-11	6.888E-11	6.961E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08
B 10	4.994E-13	5.333E-13	1.416E-12	1.450E-12	1.484E-12	1.518E-12	1.552E-12	1.586E-12	1.620E-12
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.319E-03	3.308E-03	3.308E-03	3.307E-03	3.307E-03	3.307E-03	3.306E-03	3.306E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.518E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.505E-20	1.408E-20	1.404E-20	1.400E-20	1.397E-20	1.393E-20	1.389E-20	1.386E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	2.159E-21	1.251E-21	1.225E-21	1.199E-21	1.174E-21	1.150E-21	1.125E-21	1.102E-21
K 39	1.746E-23	5.634E-23	1.031E-21	1.067E-21	1.103E-21	1.139E-21	1.175E-21	1.211E-21	1.247E-21
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	9.229E-26	5.348E-26	5.237E-26	5.127E-26	5.019E-26	4.913E-26	4.810E-26	4.709E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	6.426E-10	1.844E-27	1.844E-27	1.844E-27	1.844E-27	1.844E-27	1.844E-27	1.844E-27
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.583E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	1.034E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	2.128E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	1.686E-04	1.199E-13	5.334E-14	2.373E-14	1.055E-14	4.694E-15	2.088E-15	9.287E-16
MN 55	7.699E-03	1.023E-02	1.850E-02	1.850E-02	1.850E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	8.280E-03	8.086E-06	6.194E-06	4.745E-06	3.634E-06	2.784E-06	2.132E-06	1.633E-06
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.706E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	4.277E-04	1.196E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	1.843E-03	1.871E-03	1.897E-03	1.898E-03	1.899E-03	1.900E-03	1.901E-03	1.902E-03	1.903E-03
CO 60	1.264E-04	1.108E-04	3.626E-06	3.179E-06	2.787E-06	2.444E-06	2.142E-06	1.878E-06	1.647E-06
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00

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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.087E-02	1.716E-02	1.703E-02	1.690E-02	1.677E-02	1.665E-02	1.652E-02	1.640E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	4.990E-04	4.212E-03	4.340E-03	4.468E-03	4.595E-03	4.721E-03	4.846E-03	4.970E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	2.690E-11	5.096E-23	1.601E-23	8.018E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 71	7.964E-23	3.830E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.026E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	1.544E-06	1.508E-06	8.122E-07	7.931E-07	7.744E-07	7.562E-07	7.384E-07	7.210E-07	7.041E-07
Y 89	2.396E-03	2.549E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.782E-10	2.037E-10	1.989E-10	1.942E-10	1.896E-10	1.852E-10	1.808E-10	1.766E-10
Y 91	4.667E-04	6.163E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.765E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 92	3.999E-07	6.025E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.190E+00	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	2.252E-05	1.197E-04	1.214E-04	1.231E-04	1.247E-04	1.262E-04	1.276E-04	1.289E-04
NB 94	3.937E-02	3.937E-02	3.933E-02	3.933E-02	3.933E-02	3.933E-02	3.933E-02	3.932E-02	3.932E-02
NB 95	1.328E-01	5.887E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	9.792E-05	1.994E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	2.903E-06	4.248E-06	3.918E-05	4.052E-05	4.187E-05	4.321E-05	4.455E-05	4.590E-05	4.724E-05
MO 95	2.820E+00	3.192E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	1.076E-17	1.726E-16	1.788E-16	1.850E-16	1.912E-16	1.974E-16	2.037E-16	2.099E-16
RU 99	6.727E-11	1.400E-10	2.032E-09	2.104E-09	2.177E-09	2.250E-09	2.323E-09	2.395E-09	2.468E-09
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	3.829E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	2.422E-37	2.422E-37	2.422E-37	2.422E-37	2.422E-37	2.422E-37	2.422E-37
RH102	1.578E-22	1.201E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	6.390E-16	8.778E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	2.971E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.212E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	5.283E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.494E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	6.271E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114	1.614E-08	3.561E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.679E-04	2.214E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.044E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN117M	9.722E-03	1.370E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix D-2
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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02
SN119	8.423E+01	8.433E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	5.365E-02	1.155E-13	4.108E-14	1.462E-14	5.202E-15	1.851E-15	6.587E-16	2.344E-16
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.524E-03	1.063E-03	1.048E-03	1.034E-03	1.019E-03	1.005E-03	9.916E-04	9.779E-04
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	6.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SN125	2.449E-03	9.625E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	2.832E-01	2.837E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01
SB123	2.498E-02	2.869E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	1.309E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.127E-01	1.675E-01	2.511E-04	1.955E-04	1.522E-04	1.185E-04	9.229E-05	7.186E-05	5.595E-05
SB126	3.687E-05	4.974E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.279E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	1.972E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	6.257E-04	7.122E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	1.737E-01	3.433E-01	3.433E-01	3.434E-01	3.434E-01	3.434E-01	3.435E-01	3.435E-01
TE125M	2.654E-03	2.338E-03	3.512E-06	2.735E-06	2.129E-06	1.658E-06	1.291E-06	1.005E-06	7.826E-07
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	4.612E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	1.344E-07	1.318E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	6.894E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.379E-14	7.363E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.225E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
I131	1.297E-19	2.743E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.863E-14	1.780E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE129M	6.502E-13	1.173E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE131M	4.971E-17	2.854E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE133	3.734E-21	4.100E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS132	2.603E-26	1.850E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	7.205E-22	1.153E-25	1.153E-25	1.153E-25	1.153E-25	1.153E-25	1.153E-25	1.153E-25
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	3.590E-22	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER169	1.553E-19	3.121E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER170	6.143E-22	9.649E-22	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	3.981E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM171	5.935E-20	4.144E-20	3.475E-24	3.475E-24	3.475E-24	3.475E-24	3.475E-24	3.475E-24	3.475E-24
YB170	4.405E-19	6.854E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	4.135E-20	8.278E-20	8.278E-20	8.278E-20	8.278E-20	8.278E-20	8.278E-20	8.278E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.021E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	5.175E-10	1.864E-28	1.799E-28	1.799E-28	1.799E-28	1.799E-28	1.799E-28	1.799E-28
LU177M	2.662E-07	5.199E-08	1.873E-26	1.873E-26	1.873E-26	1.873E-26	1.873E-26	1.873E-26	1.873E-26
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	1.589E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	1.966E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01

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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
TA182	9.547E-03	1.056E-03	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12
TA183	6.272E-04	1.731E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	7.216E-02	8.065E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.253E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	3.629E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RE185	7.346E-06	9.947E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	3.738E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	7.064E-20	1.292E-18	1.339E-18	1.386E-18	1.433E-18	1.480E-18	1.527E-18	1.574E-18
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS191	1.181E-17	8.861E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS192	3.158E-19	5.976E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	1.992E-19	4.288E-24	4.288E-24	4.288E-24	4.288E-24	4.288E-24	4.288E-24	4.288E-24
IR192M	5.491E-21	5.491E-21	5.080E-21	5.080E-21	5.080E-21	5.080E-21	5.080E-21	5.080E-21	5.080E-21
IR193	8.109E-19	8.110E-19	8.119E-19	8.119E-19	8.120E-19	8.120E-19	8.120E-19	8.121E-19	8.121E-19
IR194	4.896E-22	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30
PT192	6.270E-18	1.188E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.583E-20	2.490E-20	2.486E-20	2.483E-20	2.480E-20	2.476E-20	2.473E-20	2.469E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	3.123E-04	3.842E-03	3.964E-03	4.085E-03	4.205E-03	4.324E-03	4.442E-03	4.559E-03
TL206	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29	2.223E-29
TL207	3.787E-17	5.254E-17	1.126E-15	1.190E-15	1.252E-15	1.316E-15	1.380E-15	1.446E-15	1.513E-15
TL208	2.376E-14	4.772E-14	2.159E-13	2.156E-13	2.143E-13	2.127E-13	2.110E-13	2.092E-13	2.074E-13
TL209	1.073E-19	3.797E-20	8.496E-20	8.816E-20	9.148E-20	9.491E-20	9.845E-20	1.021E-19	1.059E-19
PB206	1.520E-15	3.826E-15	5.295E-13	6.096E-13	6.974E-13	7.956E-13	9.055E-13	1.028E-12	1.164E-12
PB207	6.465E-12	9.859E-12	9.891E-10	1.078E-09	1.171E-09	1.269E-09	1.372E-09	1.480E-09	1.593E-09
PB208	9.394E-09	2.104E-08	1.760E-06	1.831E-06	1.902E-06	1.973E-06	2.043E-06	2.112E-06	2.181E-06
PB209	4.482E-16	1.582E-16	3.540E-16	3.673E-16	3.812E-16	3.954E-16	4.102E-16	4.255E-16	4.412E-16
PB210	8.589E-14	9.112E-14	2.545E-12	2.870E-12	3.224E-12	3.610E-12	4.028E-12	4.481E-12	4.969E-12
PB211	2.930E-16	4.065E-16	8.710E-15	9.204E-15	9.688E-15	1.018E-14	1.068E-14	1.119E-14	1.170E-14
PB212	1.401E-11	2.814E-11	1.274E-10	1.272E-10	1.264E-10	1.255E-10	1.245E-10	1.234E-10	1.223E-10
PB214	6.485E-20	1.172E-19	2.921E-17	3.213E-17	3.524E-17	3.853E-17	4.202E-17	4.572E-17	4.961E-17
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	1.140E-12	1.223E-11	1.290E-11	1.358E-11	1.430E-11	1.504E-11	1.581E-11	1.660E-11
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	5.610E-17	1.566E-15	1.767E-15	1.985E-15	2.222E-15	2.480E-15	2.759E-15	3.059E-15
BI211	1.729E-17	2.398E-17	5.139E-16	5.430E-16	5.716E-16	6.006E-16	6.301E-16	6.601E-16	6.905E-16
BI212	1.329E-12	2.670E-12	1.208E-11	1.206E-11	1.199E-11	1.190E-11	1.181E-11	1.171E-11	1.161E-11
BI213	1.051E-16	3.718E-17	8.317E-17	8.631E-17	8.956E-17	9.292E-17	9.639E-17	9.997E-17	1.037E-16
BI214	4.815E-20	8.705E-20	2.169E-17	2.386E-17	2.617E-17	2.861E-17	3.120E-17	3.395E-17	3.684E-17
PO210	9.371E-16	1.441E-15	4.326E-14	4.574E-14	5.098E-14	5.710E-14	6.381E-14	7.109E-14	7.896E-14
PO211	2.121E-22	2.943E-22	6.305E-21	6.663E-21	7.013E-21	7.369E-21	7.731E-21	8.098E-21	8.471E-21
PO212	7.032E-23	1.412E-22	6.391E-22	6.382E-22	6.342E-22	6.296E-22	6.246E-22	6.194E-22	6.140E-22
PO213	1.576E-25	5.578E-26	1.248E-25	1.295E-25	1.344E-25	1.394E-25	1.446E-25	1.500E-25	1.555E-25
PO214	6.468E-25	1.198E-26	2.984E-24	3.282E-24	3.600E-24	3.936E-24	4.293E-24	4.670E-24	5.068E-24
PO215	2.453E-22	3.404E-22	7.294E-21	7.707E-21	8.112E-21	8.524E-21	8.943E-21	9.368E-21	9.799E-21
PO216	5.591E-17	1.123E-16	5.082E-16	5.075E-16	5.043E-16	5.006E-16	4.966E-16	4.925E-16	4.882E-16
PO218	7.519E-21	1.359E-20	3.387E-18	3.726E-18	4.086E-18	4.468E-18	4.873E-18	5.301E-18	5.753E-18
AT217	1.262E-21	4.467E-22	9.993E-22	1.037E-21	1.076E-21	1.116E-21	1.158E-21	1.201E-21	1.245E-21
RN218	1.389E-22	7.194E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.560E-19	7.713E-19	1.653E-17	1.746E-17	1.838E-17	1.932E-17	2.027E-17	2.123E-17	2.221E-17
RN220	2.111E-14	4.240E-14	1.919E-13	1.916E-13	1.904E-13	1.890E-13	1.875E-13	1.859E-13	1.843E-13
RN222	1.382E-17	2.499E-17	6.228E-15	6.850E-15	7.513E-15	8.215E-15	8.959E-15	9.746E-15	1.058E-14
FR221	1.146E-17	4.056E-18	9.074E-18	9.416E-18	9.771E-18	1.014E-17	1.052E-17	1.091E-17	1.131E-17
FR223	2.596E-18	3.574E-18	7.671E-17	8.089E-17	8.514E-17	8.946E-17	9.386E-17	9.832E-17	1.028E-16
RA222	1.536E-19	7.954E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	1.412E-13	1.959E-13	4.199E-12	4.436E-12	4.670E-12	4.907E-12	5.148E-12	5.393E-12	5.641E-12
RA224	1.222E-10	2.455E-10	1.111E-09	1.109E-09	1.102E-09	1.094E-09	1.086E-09	1.077E-09	1.067E-09
RA225	5.321E-14	1.834E-14	4.103E-14	4.257E-14	4.418E-14	4.583E-14	4.755E-14	4.931E-14	5.113E-14
RA226	2.170E-12	3.888E-12	9.688E-10	1.066E-09	1.169E-09	1.278E-09	1.394E-09	1.516E-09	1.645E-09
RA228	5.488E-16	9.166E-16	2.852E-14	2.986E-14	3.120E-14	3.255E-14	3.391E-14	3.527E-14	3.663E-14
AC225	3.500E-14	1.239E-14	2.771E-14	2.876E-14	2.984E-14	3.096E-14	3.212E-14	3.331E-14	3.454E-14
AC227	1.006E-10	1.385E-10	2.972E-09	3.134E-09	3.299E-09	3.467E-09	3.637E-09	3.810E-09	3.985E-09
AC228	2.287E-14	9.568E-20	2.977E-18	3.117E-18	3.257E-18	3.398E-18	3.540E-18	3.682E-18	3.824E-18
TH226	7.654E-18	3.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	2.321E-13	3.220E-13	6.899E-12	7.290E-12	7.673E-12	8.063E-12	8.459E-12	8.861E-12	9.269E-12
TH228	2.398E-08	4.762E-08	2.159E-07	2.148E-07	2.134E-07	2.119E-07	2.102E-07	2.084E-07	2.066E-07

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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
TH229	3.343E-09	3.380E-09	7.561E-09	7.846E-09	8.142E-09	8.447E-09	8.762E-09	9.088E-09	9.424E-09
TH230	1.506E-07	2.424E-07	1.066E-05	1.135E-05	1.206E-05	1.278E-05	1.353E-05	1.429E-05	1.508E-05
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	1.063E-05	8.840E-05	9.139E-05	9.438E-05	9.737E-05	1.004E-04	1.034E-04	1.063E-04
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	2.200E-06	1.227E-05	1.266E-05	1.304E-05	1.343E-05	1.382E-05	1.421E-05	1.460E-05
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U230	7.523E-15	3.893E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	3.050E-06	4.582E-06	8.170E-06	8.094E-06	8.018E-06	7.943E-06	7.868E-06	7.793E-06	7.719E-06
U233	7.255E-06	9.615E-06	6.521E-05	6.758E-05	6.994E-05	7.231E-05	7.467E-05	7.704E-05	7.941E-05
U234	2.856E-02	3.736E-02	2.432E-01	2.503E-01	2.574E-01	2.644E-01	2.713E-01	2.782E-01	2.850E-01
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.575E-10	7.364E-11	7.018E-11	6.688E-11	6.374E-11	6.074E-11	5.789E-11	5.517E-11
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.716E-08	1.039E-15	5.482E-16	2.893E-16	1.527E-16	8.056E-17	4.251E-17	2.243E-17
NP236	3.749E-06	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.880E-12	1.670E-12	1.662E-12	1.654E-12	1.647E-12	1.639E-12	1.632E-12	1.624E-12
NP239	3.690E-04	9.904E-11	9.880E-11	9.879E-11	9.878E-11	9.877E-11	9.876E-11	9.875E-11	9.874E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	5.789E-06	1.041E-08	8.162E-09	6.402E-09	5.022E-09	3.940E-09	3.091E-09	2.426E-09
PU237	7.562E-07	2.936E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	1.127E+00	1.128E+00	9.185E-01	9.112E-01	9.041E-01	8.970E-01	8.899E-01	8.829E-01	8.760E-01
PU239	1.613E-01	1.617E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01
PU240	3.359E-02	3.359E-02	3.351E-02	3.350E-02	3.350E-02	3.350E-02	3.349E-02	3.349E-02	3.349E-02
PU241	8.725E-03	8.315E-03	2.378E-03	2.267E-03	2.160E-03	2.059E-03	1.962E-03	1.870E-03	1.782E-03
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	3.107E-26	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27
AM241	3.068E-04	7.160E-04	6.476E-03	6.578E-03	6.674E-03	6.764E-03	6.850E-03	6.931E-03	7.008E-03
AM242M	1.007E-05	1.003E-05	8.904E-06	8.864E-06	8.823E-06	8.783E-06	8.743E-06	8.703E-06	8.664E-06
AM242	3.137E-07	1.199E-10	1.065E-10	1.060E-10	1.055E-10	1.051E-10	1.046E-10	1.041E-10	1.036E-10
AM243	1.151E-04	1.152E-04	1.150E-04	1.150E-04	1.149E-04	1.149E-04	1.149E-04	1.149E-04	1.149E-04
AM245	2.436E-14	3.523E-23	4.112E-32	4.111E-32	4.111E-32	4.111E-32	4.111E-32	4.111E-32	4.111E-32
AM246	6.436E-19	4.979E-29	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30
CM241	1.077E-12	9.509E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	3.549E-05	7.596E-06	2.154E-08	2.146E-08	2.137E-08	2.127E-08	2.118E-08	2.108E-08	2.098E-08
CM243	5.639E-07	5.503E-07	2.924E-07	2.854E-07	2.785E-07	2.718E-07	2.653E-07	2.589E-07	2.527E-07
CM244	1.624E-05	1.564E-05	5.780E-06	5.563E-06	5.354E-06	5.153E-06	4.960E-06	4.773E-06	4.594E-06
CM245	3.670E-07	3.670E-07	3.662E-07	3.662E-07	3.661E-07	3.661E-07	3.661E-07	3.661E-07	3.660E-07
CM246	2.209E-08	2.209E-08	2.200E-08	2.200E-08	2.200E-08	2.200E-08	2.199E-08	2.199E-08	2.199E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12
CM249	1.877E-17	1.307E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	3.617E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21
BK249	2.019E-14	9.161E-15	1.069E-23	1.069E-23	1.069E-23	1.069E-23	1.069E-23	1.069E-23	1.069E-23
BK250	1.228E-17	4.440E-24	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29
CF249	3.877E-15	1.490E-14	2.288E-14	2.283E-14	2.279E-14	2.274E-14	2.270E-14	2.265E-14	2.261E-14
CF250	3.409E-15	3.245E-15	8.183E-16	7.760E-16	7.360E-16	6.980E-16	6.620E-16	6.278E-16	5.954E-16
CF251	1.058E-15	1.057E-15	1.036E-15	1.036E-15	1.035E-15	1.034E-15	1.033E-15	1.032E-15	1.032E-15
CF252	3.213E-16	2.471E-16	2.667E-19	2.051E-19	1.577E-19	1.213E-19	9.321E-20	7.166E-20	5.509E-20
CF253	2.544E-19	1.709E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	5.630E-21	9.293E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	2.405E-19	8.017E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	2.319E-20	9.241E-21	3.951E-31	3.951E-31	3.951E-31	3.951E-31	3.951E-31	3.951E-31	3.951E-31
SF250	2.226E-11	4.257E-11	4.668E-10	4.812E-10	4.956E-10	5.098E-10	5.239E-10	5.379E-10	5.518E-10
H 3	6.014E-04	5.685E-04	1.321E-04	1.249E-04	1.181E-04	1.116E-04	1.055E-04	9.979E-05	9.434E-05
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.794E-07	3.782E-07	3.782E-07	3.781E-07	3.781E-07	3.780E-07	3.780E-07	3.780E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04

Appendix D-2
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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.723E-02	8.720E-02	8.720E-02	8.720E-02	8.720E-02	8.720E-02	8.720E-02	8.720E-02
BR 79	2.253E-06	3.184E-06	2.738E-05	2.831E-05	2.924E-05	3.017E-05	3.110E-05	3.203E-05	3.296E-05
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	3.859E-01	7.185E-02	6.735E-02	6.313E-02	5.918E-02	5.547E-02	5.200E-02	4.874E-02
RB 85	1.846E+00	1.873E+00	2.187E+00	2.191E+00	2.195E+00	2.199E+00	2.203E+00	2.206E+00	2.210E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
RB 86	1.883E-04	2.408E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.306E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	8.536E+00	8.880E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	9.891E+00	5.327E+00	5.202E+00	5.079E+00	4.960E+00	4.843E+00	4.729E+00	4.618E+00
Y 90	2.594E-03	2.480E-03	1.336E-03	1.304E-03	1.274E-03	1.244E-03	1.215E-03	1.186E-03	1.158E-03
ZR 90	6.404E-01	8.788E-01	5.444E+00	5.569E+00	5.692E+00	5.811E+00	5.928E+00	6.042E+00	6.153E+00
Y 91	5.021E-01	6.678E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	1.058E+01	1.108E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
NB 92	1.142E-13	1.721E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	2.829E-06	8.469E-05	8.916E-05	9.369E-05	9.827E-05	1.029E-04	1.076E-04	1.123E-04
NB 93M	1.239E-05	1.700E-05	8.163E-05	8.279E-05	8.389E-05	8.494E-05	8.594E-05	8.689E-05	8.779E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.653E-06	1.653E-06	1.653E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06
ZR 95	6.298E-01	1.204E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.479E-01	1.489E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	2.492E-04	5.040E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	1.132E+01	1.227E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	1.316E-04	1.107E-03	1.144E-03	1.182E-03	1.219E-03	1.257E-03	1.294E-03	1.332E-03
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	4.191E-06	8.393E-09	6.609E-09	5.204E-09	4.098E-09	3.226E-09	2.540E-09	2.000E-09
RU103	2.067E-01	3.285E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	2.937E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	1.305E-01	2.243E-09	1.128E-09	5.669E-10	2.850E-10	1.433E-10	7.205E-11	3.622E-11
RH106	2.616E-07	1.226E-07	2.108E-15	1.060E-15	5.329E-16	2.679E-16	1.347E-16	6.772E-17	3.405E-17
PD106	7.981E-01	9.272E-01	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00
AG106	5.874E-15	6.816E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	1.545E-07	1.329E-06	1.374E-06	1.419E-06	1.465E-06	1.510E-06	1.555E-06	1.600E-06
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.666E-19	8.387E-19	8.341E-19	8.296E-19	8.251E-19	8.206E-19	8.161E-19	8.117E-19
AG108M	3.078E-10	3.061E-10	2.656E-10	2.642E-10	2.627E-10	2.613E-10	2.599E-10	2.585E-10	2.570E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.294E-16	8.935E-23	5.178E-23	3.000E-23	1.739E-23	1.007E-23	5.838E-24	3.383E-24
CD109	2.261E-10	1.310E-10	9.045E-17	5.242E-17	3.037E-17	1.760E-17	1.020E-17	5.910E-18	3.425E-18
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	2.972E-12	1.079E-23	3.916E-24	1.422E-24	5.162E-25	1.874E-25	6.804E-26	2.470E-26
AG110M	5.402E-04	1.961E-04	7.117E-16	2.584E-16	9.382E-17	3.406E-17	1.237E-17	4.490E-18	1.630E-18
CD110	3.243E-02	3.277E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02

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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
AG111	3.630E-04	6.352E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.452E-04	4.458E-04	4.458E-04	4.459E-04	4.459E-04	4.459E-04	4.459E-04	4.459E-04
CD113M	8.787E-04	8.380E-04	2.437E-04	2.324E-04	2.216E-04	2.113E-04	2.015E-04	1.921E-04	1.832E-04
IN113	9.476E-05	1.355E-04	7.293E-04	7.406E-04	7.513E-04	7.616E-04	7.714E-04	7.807E-04	7.897E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.835E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.962E-07	2.384E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.664E-06	7.028E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	4.164E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	1.176E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02
SN117M	1.819E-06	2.563E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.278E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	5.063E-05	1.089E-16	3.877E-17	1.380E-17	4.909E-18	1.747E-18	6.216E-19	2.212E-19
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.125E-05	1.482E-05	1.461E-05	1.441E-05	1.421E-05	1.402E-05	1.382E-05	1.363E-05
SB121	4.515E-02	4.519E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	2.076E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	5.702E-02	5.829E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.470E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	3.725E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	3.096E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.566E-03	1.770E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SN125	3.077E-04	1.209E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	5.871E-02	4.596E-02	6.869E-05	5.348E-05	4.164E-05	3.242E-05	2.525E-05	1.966E-05	1.530E-05
TE125	4.338E-02	5.657E-02	1.031E-01	1.031E-01	1.031E-01	1.031E-01	1.031E-01	1.031E-01	1.031E-01
TE125M	7.575E-04	6.419E-04	9.608E-07	7.481E-07	5.825E-07	4.535E-07	3.531E-07	2.749E-07	2.141E-07
SN126	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01
SB126	3.619E-05	9.027E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09
SB126M	1.478E-08	6.863E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11	6.862E-11
TE126	4.547E-03	4.585E-03	4.619E-03	4.620E-03	4.621E-03	4.623E-03	4.624E-03	4.625E-03	4.627E-03
TE127	1.288E-04	1.759E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.938E-03	5.024E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	3.994E-01	4.053E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	3.557E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	3.569E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	7.102E-03	3.811E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.500E-05	6.712E-05	6.720E-05	6.728E-05	6.736E-05	6.744E-05	6.752E-05	6.761E-05
XE129M	1.213E-07	2.187E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
I131	4.926E-02	1.070E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE131M	7.973E-04	1.451E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
CS132	9.291E-06	9.682E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
XE133	7.367E-02	9.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	8.031E-01	1.285E-04	9.182E-05	6.560E-05	4.687E-05	3.349E-05	2.393E-05	1.710E-05
BA134	6.001E-01	9.210E-01	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00
CS135	9.090E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.096E+00	9.095E+00
BA135	2.738E-03	2.742E-03	2.813E-03	2.816E-03	2.818E-03	2.821E-03	2.824E-03	2.826E-03	2.829E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
CS136	6.042E-03	2.450E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
BA136M	2.709E-10	1.099E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.651E+01	1.614E+01	8.849E+00	8.647E+00	8.450E+00	8.257E+00	8.068E+00	7.884E+00	7.704E+00
BA137	9.727E-01	1.350E+00	8.637E+00	8.839E+00	9.037E+00	9.230E+00	9.418E+00	9.603E+00	9.783E+00
BA137M	2.527E-06	2.469E-06	1.354E-06	1.323E-06	1.293E-06	1.263E-06	1.234E-06	1.206E-06	1.179E-06
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01

Appendix D-2
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sbwzr4.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:17

	1826.0D	1.0YR	27.0YR	28.0YR	29.0YR	30.0YR	31.0YR	32.0YR	33.0YR
BA140	1.798E-01	4.548E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.504E-02	6.858E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	1.811E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
PR143	1.798E-01	1.577E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	1.473E+00	1.292E-10	5.303E-11	2.176E-11	8.932E-12	3.666E-12	1.504E-12	6.174E-13
PR144	1.520E-04	6.218E-05	5.456E-15	2.239E-15	9.190E-16	3.771E-16	1.548E-16	6.352E-17	2.607E-17
PR144M	7.579E-07	3.109E-07	2.728E-17	1.119E-17	4.594E-18	1.885E-18	7.737E-19	3.175E-19	1.303E-19
ND144	1.638E+01	1.850E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	4.372E-05	1.651E-06	1.455E-06	1.283E-06	1.131E-06	9.971E-07	8.790E-07	7.750E-07
SM146	8.176E-05	8.394E-05	9.950E-05	9.958E-05	9.964E-05	9.970E-05	9.975E-05	9.979E-05	9.983E-05
ND147	6.040E-02	6.922E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	2.102E+00	1.661E+00	1.723E-03	1.323E-03	1.016E-03	7.800E-04	5.989E-04	4.598E-04	3.531E-04
SM147	1.853E+00	2.355E+00	4.014E+00	4.015E+00	4.015E+00	4.015E+00	4.015E+00	4.015E+00	4.015E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	2.501E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	1.569E-02	3.414E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.450E-09	2.697E-09	2.646E-09	2.596E-09	2.546E-09	2.498E-09	2.450E-09	2.403E-09
SM151	1.636E-01	1.636E-01	1.339E-01	1.329E-01	1.319E-01	1.309E-01	1.299E-01	1.289E-01	1.279E-01
EU151	2.742E-04	1.539E-03	3.124E-02	3.227E-02	3.329E-02	3.430E-02	3.530E-02	3.630E-02	3.729E-02
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	1.157E-03	3.076E-04	2.923E-04	2.778E-04	2.640E-04	2.508E-04	2.384E-04	2.265E-04
GD152	1.111E-03	1.128E-03	1.365E-03	1.369E-03	1.373E-03	1.377E-03	1.381E-03	1.384E-03	1.388E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	1.521E-05	2.343E-17	8.233E-18	2.892E-18	1.016E-18	3.569E-19	1.254E-19	4.404E-20
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	2.387E-01	2.937E-02	2.709E-02	2.500E-02	2.306E-02	2.127E-02	1.963E-02	1.811E-02
GD154	2.826E-02	4.830E-02	2.577E-01	2.599E-01	2.620E-01	2.640E-01	2.658E-01	2.674E-01	2.689E-01
EU155	7.979E-02	6.938E-02	1.832E-03	1.593E-03	1.385E-03	1.205E-03	1.048E-03	9.110E-04	7.921E-04
GD155	1.034E-03	1.144E-02	7.899E-02	7.923E-02	7.944E-02	7.962E-02	7.978E-02	7.991E-02	8.003E-02
EU156	8.598E-03	4.949E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	2.369E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	3.786E-04	4.548E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
TB161	3.523E-06	4.555E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.625E-07	4.556E-07	4.554E-07	4.551E-07	4.548E-07	4.546E-07	4.543E-07	4.541E-07
ER166	1.514E-05	1.519E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
ER169	5.081E-10	1.021E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.181E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	1.532E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	1.875E-09	2.818E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	4.004E-11	3.357E-15	2.340E-15	1.631E-15	1.137E-15	7.922E-16	5.522E-16	3.848E-16
YB171	6.068E-11	7.809E-11	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

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File SBWZR5.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       1.    1   2   5   4
  DEC      34.    2   3   5   0
  DEC      35.    3   4   5   0
  DEC      36.    4   5   5   0
  DEC      37.    5   6   5   0
  DEC      38.    6   7   5   0
  DEC      39.    7   8   5   0
  DEC      40.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
```

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File SBWZR5.INP (continued)

```
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File SBWZR5.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy sbwzr5.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwzr5.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwzr5.u6 >nul
copy tape13.out+tape11.out sbwzr5.u11 >nul
ren tape7.out sbwzr5.pch
ren tape15.out sbwzr5.dbg
ren tape16.out sbwzr5.vxs
ren tape50.out sbwzr5.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ***********************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ***********************************************************************
echo on
```

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sbwzr5.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	7.650E-11	1.200E-11	1.135E-11	1.073E-11	1.014E-11	9.588E-12	9.065E-12	8.570E-12
HE 3	1.385E-12	5.802E-12	7.030E-11	7.096E-11	7.158E-11	7.216E-11	7.272E-11	7.324E-11	7.374E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08
B 10	4.994E-13	5.333E-13	1.654E-12	1.688E-12	1.722E-12	1.756E-12	1.790E-12	1.824E-12	1.858E-12
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.319E-03	3.305E-03	3.305E-03	3.305E-03	3.304E-03	3.304E-03	3.303E-03	3.303E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.518E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.505E-20	1.382E-20	1.379E-20	1.375E-20	1.372E-20	1.368E-20	1.365E-20	1.361E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	2.159E-21	1.082E-21	1.059E-21	1.037E-21	1.015E-21	9.941E-22	9.732E-22	9.528E-22
K 39	1.746E-23	5.634E-23	1.282E-21	1.317E-21	1.353E-21	1.388E-21	1.424E-21	1.459E-21	1.494E-21
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	9.229E-26	4.625E-26	4.528E-26	4.433E-26	4.340E-26	4.249E-26	4.160E-26	4.072E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	6.426E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.583E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	1.034E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	2.128E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	1.686E-04	4.131E-16	1.837E-16	8.172E-17	3.635E-17	1.617E-17	7.191E-18	3.199E-18
MN 55	7.699E-03	1.023E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	8.280E-03	1.251E-06	9.583E-07	7.341E-07	5.623E-07	4.307E-07	3.299E-07	2.527E-07
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.706E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	4.277E-04	1.196E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	1.843E-03	1.871E-03	1.904E-03	1.905E-03	1.906E-03	1.907E-03	1.908E-03	1.909E-03	1.910E-03
CO 60	1.264E-04	1.108E-04	1.444E-06	1.266E-06	1.110E-06	9.732E-07	8.532E-07	7.481E-07	6.559E-07
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00

Appendix D-2
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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.087E-02	1.628E-02	1.615E-02	1.603E-02	1.591E-02	1.579E-02	1.567E-02	1.556E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	4.990E-04	5.093E-03	5.215E-03	5.336E-03	5.457E-03	5.576E-03	5.695E-03	5.812E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	2.690E-11	3.557E-26	3.557E-26	3.557E-26	3.557E-26	3.557E-26	3.557E-26	3.557E-26
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 71	7.964E-23	3.830E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.026E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	1.544E-06	1.508E-06	6.875E-07	6.714E-07	6.556E-07	6.401E-07	6.251E-07	6.104E-07	5.960E-07
Y 89	2.396E-03	2.549E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.782E-10	1.724E-10	1.684E-10	1.644E-10	1.605E-10	1.568E-10	1.531E-10	1.495E-10
Y 91	4.667E-04	6.163E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.765E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 92	3.999E-07	6.025E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.190E+00	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	2.252E-05	1.302E-04	1.314E-04	1.326E-04	1.337E-04	1.348E-04	1.358E-04	1.367E-04
NB 94	3.937E-02	3.937E-02	3.932E-02	3.932E-02	3.932E-02	3.932E-02	3.932E-02	3.932E-02	3.931E-02
NB 95	1.328E-01	5.887E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	9.792E-05	1.994E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	2.903E-06	4.248E-06	4.858E-05	4.992E-05	5.127E-05	5.261E-05	5.395E-05	5.529E-05	5.664E-05
MO 95	2.820E+00	3.192E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	1.076E-17	2.161E-16	2.223E-16	2.286E-16	2.348E-16	2.410E-16	2.472E-16	2.535E-16
RU 99	6.727E-11	1.400E-10	2.541E-09	2.614E-09	2.687E-09	2.759E-09	2.832E-09	2.905E-09	2.978E-09
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	3.829E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	1.967E-39	1.967E-39	1.967E-39	1.967E-39	1.967E-39	1.967E-39	1.967E-39
RH102	1.578E-22	1.201E-22	4.507E-26	4.507E-26	4.507E-26	4.507E-26	4.507E-26	4.507E-26	4.507E-26
RH103	6.390E-16	8.778E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.212E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	5.283E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.494E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	6.271E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114	1.614E-08	3.561E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.679E-04	2.214E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.044E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN117M	9.722E-03	1.370E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02
SN119	8.423E+01	8.433E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	5.365E-02	8.341E-17	2.968E-17	1.056E-17	3.759E-18	1.337E-18	4.759E-19	1.694E-19
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.524E-03	9.644E-04	9.511E-04	9.380E-04	9.251E-04	9.124E-04	8.998E-04	8.874E-04
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	6.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SN125	2.449E-03	9.625E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	2.832E-01	2.837E-01	2.843E-01	2.843E-01	2.843E-01	2.843E-01	2.843E-01	2.843E-01	2.843E-01
SB123	2.498E-02	2.869E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	1.309E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.127E-01	1.675E-01	4.341E-05	3.380E-05	2.631E-05	2.049E-05	1.595E-05	1.242E-05	9.671E-06
SB126	3.687E-05	4.974E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.279E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	1.972E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	6.257E-04	7.122E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	1.737E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01
TE125M	2.654E-03	2.338E-03	6.071E-07	4.727E-07	3.681E-07	2.866E-07	2.231E-07	1.737E-07	1.353E-07
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	4.612E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	1.344E-07	1.318E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	6.894E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.379E-14	7.363E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.225E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
I131	1.297E-19	2.743E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.863E-14	1.780E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE129M	6.502E-13	1.173E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE131M	4.971E-17	2.854E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE133	3.734E-21	4.100E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS132	2.603E-26	1.850E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	7.205E-22	1.096E-26	1.096E-26	1.096E-26	1.096E-26	1.096E-26	1.096E-26	1.096E-26
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	3.590E-22	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER169	1.553E-19	3.121E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER170	6.143E-22	9.649E-22	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	3.981E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM171	5.935E-20	4.144E-20	2.776E-25	2.776E-25	2.776E-25	2.776E-25	2.776E-25	2.776E-25	2.776E-25
YB170	4.405E-19	6.854E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	4.135E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.021E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	5.175E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LU177M	2.662E-07	5.199E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	1.589E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	1.966E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01

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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
TA182	9.547E-03	1.056E-03	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12
TA183	6.272E-04	1.731E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	7.216E-02	8.065E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.253E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	3.629E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RE185	7.346E-06	9.947E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	3.738E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	7.064E-20	1.621E-18	1.668E-18	1.714E-18	1.761E-18	1.808E-18	1.855E-18	1.902E-18
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS191	1.181E-17	8.861E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS192	3.158E-19	5.976E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19	6.071E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	1.992E-19	4.203E-24	4.203E-24	4.203E-24	4.203E-24	4.203E-24	4.203E-24	4.203E-24
IR192M	5.491E-21	5.491E-21	4.994E-21	4.994E-21	4.994E-21	4.994E-21	4.994E-21	4.994E-21	4.994E-21
IR193	8.109E-19	8.110E-19	8.121E-19	8.122E-19	8.122E-19	8.122E-19	8.123E-19	8.123E-19	8.123E-19
IR194	4.896E-22	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30
PT192	6.270E-18	1.188E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.583E-20	2.468E-20	2.464E-20	2.461E-20	2.457E-20	2.454E-20	2.450E-20	2.447E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	3.123E-04	4.675E-03	4.791E-03	4.905E-03	5.019E-03	5.131E-03	5.243E-03	5.354E-03
TL206	2.223E-29	2.223E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29
TL207	3.787E-17	5.254E-17	1.576E-15	1.648E-15	1.717E-15	1.787E-15	1.858E-15	1.930E-15	2.002E-15
TL208	2.376E-14	4.772E-14	2.051E-13	2.039E-13	2.020E-13	2.000E-13	1.981E-13	1.962E-13	1.944E-13
TL209	1.073E-19	3.797E-20	1.095E-19	1.134E-19	1.175E-19	1.216E-19	1.259E-19	1.303E-19	1.348E-19
PB206	1.520E-15	3.826E-15	1.353E-12	1.525E-12	1.710E-12	1.913E-12	2.136E-12	2.380E-12	2.647E-12
PB207	6.465E-12	9.859E-12	1.711E-09	1.835E-09	1.963E-09	2.097E-09	2.236E-09	2.381E-09	2.532E-09
PB208	9.394E-09	2.104E-08	2.440E-06	2.508E-06	2.575E-06	2.641E-06	2.707E-06	2.772E-06	2.836E-06
PB209	4.482E-16	1.582E-16	4.563E-16	4.726E-16	4.894E-16	5.067E-16	5.245E-16	5.428E-16	5.615E-16
PB210	8.589E-14	9.112E-14	5.497E-12	6.062E-12	6.669E-12	7.317E-12	8.011E-12	8.749E-12	9.536E-12
PB211	2.930E-16	4.065E-16	1.220E-14	1.275E-14	1.329E-14	1.383E-14	1.438E-14	1.493E-14	1.549E-14
PB212	1.401E-11	2.814E-11	1.210E-10	1.203E-10	1.191E-10	1.180E-10	1.169E-10	1.157E-10	1.146E-10
PB214	6.485E-20	1.172E-19	5.372E-17	5.804E-17	6.258E-17	6.734E-17	7.234E-17	7.757E-17	8.304E-17
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	1.140E-12	1.743E-11	1.828E-11	1.917E-11	2.008E-11	2.103E-11	2.201E-11	2.302E-11
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	5.610E-17	3.382E-15	3.732E-15	4.106E-15	4.505E-15	4.932E-15	5.387E-15	5.871E-15
BI211	1.729E-17	2.398E-17	7.196E-16	7.523E-16	7.839E-16	8.159E-16	8.482E-16	8.810E-16	9.140E-16
BI212	1.329E-12	2.670E-12	1.148E-11	1.141E-11	1.130E-11	1.119E-11	1.108E-11	1.098E-11	1.087E-11
BI213	1.051E-16	3.718E-17	1.072E-16	1.110E-16	1.150E-16	1.191E-16	1.232E-16	1.275E-16	1.319E-16
BI214	4.815E-20	8.705E-20	3.989E-17	4.310E-17	4.647E-17	5.001E-17	5.371E-17	5.760E-17	6.166E-17
PO210	9.371E-16	1.441E-15	9.343E-14	9.757E-14	1.066E-13	1.169E-13	1.282E-13	1.401E-13	1.529E-13
PO211	2.121E-22	2.943E-22	8.829E-21	9.230E-21	9.618E-21	1.001E-20	1.041E-20	1.081E-20	1.121E-20
PO212	7.032E-23	1.412E-22	6.072E-22	6.036E-22	5.978E-22	5.921E-22	5.865E-22	5.809E-22	5.753E-22
PO213	1.576E-25	5.578E-26	1.608E-25	1.666E-25	1.725E-25	1.786E-25	1.849E-25	1.913E-25	1.979E-25
PO214	6.468E-25	1.198E-26	5.487E-24	5.929E-24	6.393E-24	6.880E-24	7.390E-24	7.924E-24	8.483E-24
PO215	2.453E-22	3.404E-22	1.021E-20	1.068E-20	1.113E-20	1.158E-20	1.204E-20	1.250E-20	1.297E-20
PO216	5.591E-17	1.123E-16	4.828E-16	4.799E-16	4.754E-16	4.708E-16	4.663E-16	4.619E-16	4.574E-16
PO218	7.519E-21	1.359E-20	6.229E-18	6.730E-18	7.256E-18	7.809E-18	8.388E-18	8.995E-18	9.629E-18
AT217	1.262E-21	4.467E-22	1.288E-21	1.334E-21	1.382E-21	1.430E-21	1.481E-21	1.532E-21	1.585E-21
RN218	1.389E-22	7.194E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.560E-19	7.713E-19	2.314E-17	2.419E-17	2.521E-17	2.624E-17	2.728E-17	2.833E-17	2.940E-17
RN220	2.111E-14	4.240E-14	1.823E-13	1.812E-13	1.795E-13	1.777E-13	1.760E-13	1.744E-13	1.727E-13
RN222	1.382E-17	2.499E-17	1.145E-14	1.237E-14	1.334E-14	1.436E-14	1.542E-14	1.654E-14	1.770E-14
FR221	1.146E-17	4.056E-18	1.170E-17	1.212E-17	1.255E-17	1.299E-17	1.345E-17	1.391E-17	1.439E-17
FR223	2.596E-18	3.574E-18	1.074E-16	1.121E-16	1.168E-16	1.215E-16	1.263E-16	1.312E-16	1.361E-16
RA222	1.536E-19	7.954E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	1.412E-13	1.959E-13	5.879E-12	6.146E-12	6.404E-12	6.666E-12	6.930E-12	7.197E-12	7.467E-12
RA224	1.222E-10	2.455E-10	1.055E-09	1.049E-09	1.039E-09	1.029E-09	1.019E-09	1.010E-09	1.000E-09
RA225	5.321E-14	1.834E-14	5.288E-14	5.478E-14	5.673E-14	5.873E-14	6.079E-14	6.291E-14	6.508E-14
RA226	2.170E-12	3.888E-12	1.782E-09	1.925E-09	2.076E-09	2.234E-09	2.399E-09	2.573E-09	2.754E-09
RA228	5.488E-16	9.166E-16	3.800E-14	3.937E-14	4.075E-14	4.212E-14	4.350E-14	4.488E-14	4.627E-14
AC225	3.500E-14	1.239E-14	3.572E-14	3.700E-14	3.832E-14	3.967E-14	4.107E-14	4.249E-14	4.396E-14
AC227	1.006E-10	1.385E-10	4.162E-09	4.342E-09	4.524E-09	4.709E-09	4.896E-09	5.084E-09	5.275E-09
AC228	2.287E-14	9.568E-20	3.967E-18	4.110E-18	4.254E-18	4.397E-18	4.541E-18	4.686E-18	4.830E-18
TH226	7.654E-18	3.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	2.321E-13	3.220E-13	9.660E-12	1.010E-11	1.052E-11	1.095E-11	1.139E-11	1.183E-11	1.227E-11
TH228	2.398E-08	4.762E-08	2.051E-07	2.031E-07	2.012E-07	1.993E-07	1.974E-07	1.955E-07	1.936E-07

Appendix D-2
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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
TH229	3.343E-09	3.380E-09	9.746E-09	1.010E-08	1.045E-08	1.082E-08	1.120E-08	1.159E-08	1.199E-08
TH230	1.506E-07	2.424E-07	1.588E-05	1.671E-05	1.755E-05	1.841E-05	1.928E-05	2.018E-05	2.109E-05
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	1.063E-05	1.093E-04	1.123E-04	1.153E-04	1.183E-04	1.213E-04	1.243E-04	1.273E-04
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	2.200E-06	1.498E-05	1.536E-05	1.575E-05	1.614E-05	1.653E-05	1.692E-05	1.731E-05
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U230	7.523E-15	3.893E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	3.050E-06	4.582E-06	7.646E-06	7.573E-06	7.501E-06	7.429E-06	7.358E-06	7.288E-06	7.218E-06
U233	7.255E-06	9.615E-06	8.018E-05	8.254E-05	8.491E-05	8.727E-05	8.964E-05	9.201E-05	9.437E-05
U234	2.856E-02	3.736E-02	2.918E-01	2.985E-01	3.052E-01	3.118E-01	3.184E-01	3.249E-01	3.314E-01
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.575E-10	5.258E-11	5.011E-11	4.775E-11	4.551E-11	4.337E-11	4.133E-11	3.939E-11
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.716E-08	1.184E-17	6.247E-18	3.297E-18	1.740E-18	9.180E-19	4.845E-19	2.557E-19
NP236	3.749E-06	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.880E-12	1.617E-12	1.610E-12	1.602E-12	1.595E-12	1.588E-12	1.581E-12	1.573E-12
NP239	3.690E-04	9.904E-11	9.873E-11	9.873E-11	9.872E-11	9.871E-11	9.870E-11	9.869E-11	9.868E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	5.789E-06	1.906E-09	1.496E-09	1.175E-09	9.234E-10	7.259E-10	5.710E-10	4.496E-10
PU237	7.562E-07	2.936E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	1.127E+00	1.128E+00	8.691E-01	8.622E-01	8.554E-01	8.487E-01	8.420E-01	8.354E-01	8.288E-01
PU239	1.613E-01	1.617E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01
PU240	3.359E-02	3.359E-02	3.348E-02	3.348E-02	3.348E-02	3.347E-02	3.347E-02	3.347E-02	3.346E-02
PU241	8.725E-03	8.315E-03	1.698E-03	1.618E-03	1.542E-03	1.470E-03	1.401E-03	1.335E-03	1.272E-03
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	3.107E-26	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27
AM241	3.068E-04	7.160E-04	7.080E-03	7.149E-03	7.213E-03	7.274E-03	7.332E-03	7.386E-03	7.436E-03
AM242M	1.007E-05	1.003E-05	8.624E-06	8.585E-06	8.546E-06	8.507E-06	8.469E-06	8.430E-06	8.392E-06
AM242	3.137E-07	1.199E-10	1.032E-10	1.027E-10	1.022E-10	1.018E-10	1.013E-10	1.008E-10	1.004E-10
AM243	1.151E-04	1.152E-04	1.149E-04	1.149E-04	1.149E-04	1.149E-04	1.148E-04	1.148E-04	1.148E-04
AM245	2.436E-14	3.523E-23	1.618E-34	1.618E-34	1.618E-34	1.618E-34	1.618E-34	1.618E-34	1.618E-34
AM246	6.436E-19	4.979E-29	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30
CM241	1.077E-12	9.509E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	3.549E-05	7.596E-06	2.086E-08	2.079E-08	2.070E-08	2.061E-08	2.051E-08	2.042E-08	2.033E-08
CM243	5.639E-07	5.503E-07	2.466E-07	2.407E-07	2.349E-07	2.293E-07	2.238E-07	2.184E-07	2.132E-07
CM244	1.624E-05	1.564E-05	4.422E-06	4.256E-06	4.096E-06	3.942E-06	3.794E-06	3.651E-06	3.514E-06
CM245	3.670E-07	3.670E-07	3.660E-07	3.660E-07	3.659E-07	3.659E-07	3.659E-07	3.658E-07	3.658E-07
CM246	2.209E-08	2.209E-08	2.198E-08	2.198E-08	2.198E-08	2.197E-08	2.197E-08	2.197E-08	2.196E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12
CM249	1.877E-17	1.307E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	3.617E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21
BK249	2.019E-14	9.161E-15	4.207E-26	4.207E-26	4.207E-26	4.207E-26	4.207E-26	4.207E-26	4.207E-26
BK250	1.228E-17	4.440E-24	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29
CF249	3.877E-15	1.490E-14	2.256E-14	2.252E-14	2.248E-14	2.243E-14	2.239E-14	2.234E-14	2.230E-14
CF250	3.409E-15	3.245E-15	5.647E-16	5.355E-16	5.079E-16	4.817E-16	4.568E-16	4.332E-16	4.109E-16
CF251	1.058E-15	1.057E-15	1.031E-15	1.030E-15	1.029E-15	1.028E-15	1.028E-15	1.027E-15	1.026E-15
CF252	3.213E-16	2.471E-16	4.238E-20	3.258E-20	2.504E-20	1.925E-20	1.480E-20	1.138E-20	8.747E-21
CF253	2.544E-19	1.709E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	5.630E-21	9.293E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	2.405E-19	8.017E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	2.319E-20	9.241E-21	6.384E-34	6.384E-34	6.384E-34	6.384E-34	6.384E-34	6.384E-34	6.384E-34
SF250	2.226E-11	4.257E-11	5.656E-10	5.792E-10	5.928E-10	6.062E-10	6.195E-10	6.327E-10	6.458E-10
H 3	6.014E-04	5.685E-04	8.919E-05	8.432E-05	7.972E-05	7.537E-05	7.125E-05	6.736E-05	6.369E-05
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.794E-07	3.779E-07	3.779E-07	3.778E-07	3.778E-07	3.777E-07	3.777E-07	3.776E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04

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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.723E-02	8.720E-02	8.719E-02	8.719E-02	8.719E-02	8.719E-02	8.719E-02	8.719E-02
BR 79	2.253E-06	3.184E-06	3.389E-05	3.482E-05	3.575E-05	3.668E-05	3.761E-05	3.854E-05	3.947E-05
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	3.859E-01	4.569E-02	4.283E-02	4.015E-02	3.764E-02	3.528E-02	3.307E-02	3.100E-02
RB 85	1.846E+00	1.873E+00	2.213E+00	2.216E+00	2.218E+00	2.221E+00	2.223E+00	2.225E+00	2.227E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
RB 86	1.883E-04	2.408E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.306E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	8.536E+00	8.880E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	9.891E+00	4.509E+00	4.403E+00	4.300E+00	4.199E+00	4.100E+00	4.003E+00	3.909E+00
Y 90	2.594E-03	2.480E-03	1.131E-03	1.104E-03	1.078E-03	1.053E-03	1.028E-03	1.004E-03	9.803E-04
ZR 90	6.404E-01	8.788E-01	6.262E+00	6.368E+00	6.471E+00	6.573E+00	6.671E+00	6.768E+00	6.862E+00
Y 91	5.021E-01	6.678E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	1.058E+01	1.108E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
NB 92	1.142E-13	1.721E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	2.829E-06	1.171E-04	1.219E-04	1.268E-04	1.317E-04	1.366E-04	1.416E-04	1.466E-04
NB 93M	1.239E-05	1.700E-05	8.864E-05	8.946E-05	9.023E-05	9.097E-05	9.166E-05	9.233E-05	9.296E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06
ZR 95	6.298E-01	1.204E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.479E-01	1.489E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	2.492E-04	5.040E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	1.132E+01	1.227E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	1.316E-04	1.369E-03	1.407E-03	1.444E-03	1.482E-03	1.519E-03	1.557E-03	1.594E-03
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	4.191E-06	1.573E-09	1.239E-09	9.755E-10	7.681E-10	6.048E-10	4.762E-10	3.750E-10
RU103	2.067E-01	3.285E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	2.937E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	1.305E-01	1.821E-11	9.156E-12	4.603E-12	2.314E-12	1.164E-12	5.850E-13	2.941E-13
RH106	2.616E-07	1.226E-07	1.712E-17	8.606E-18	4.327E-18	2.175E-18	1.094E-18	5.498E-19	2.764E-19
PD106	7.981E-01	9.272E-01	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00
AG106	5.874E-15	6.816E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	1.545E-07	1.645E-06	1.690E-06	1.736E-06	1.781E-06	1.826E-06	1.871E-06	1.916E-06
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.666E-19	8.073E-19	8.029E-19	7.985E-19	7.941E-19	7.898E-19	7.855E-19	7.812E-19
AG108M	3.078E-10	3.061E-10	2.557E-10	2.543E-10	2.529E-10	2.515E-10	2.501E-10	2.488E-10	2.474E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.294E-16	1.960E-24	1.136E-24	6.583E-25	3.815E-25	2.211E-25	1.281E-25	7.423E-26
CD109	2.261E-10	1.310E-10	1.985E-18	1.150E-18	6.665E-19	3.862E-19	2.238E-19	1.297E-19	7.514E-20
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	2.972E-12	8.969E-27	3.257E-27	1.182E-27	4.293E-28	1.559E-28	5.664E-29	2.056E-29
AG110M	5.402E-04	1.961E-04	5.919E-19	2.149E-19	7.802E-20	2.832E-20	1.029E-20	3.738E-21	1.352E-21
CD110	3.243E-02	3.277E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02

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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
AG111	3.630E-04	6.352E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.452E-04	4.459E-04	4.459E-04	4.459E-04	4.459E-04	4.459E-04	4.459E-04	4.459E-04
CD113M	8.787E-04	8.380E-04	1.747E-04	1.666E-04	1.589E-04	1.515E-04	1.445E-04	1.378E-04	1.314E-04
IN113	9.476E-05	1.355E-04	7.981E-04	8.062E-04	8.140E-04	8.213E-04	8.284E-04	8.351E-04	8.414E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.835E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.962E-07	2.384E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.664E-06	7.028E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	4.164E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	1.176E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02
SN117M	1.819E-06	2.563E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.278E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	5.063E-05	7.872E-20	2.801E-20	9.973E-21	3.551E-21	1.258E-21	4.459E-22	1.624E-22
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.125E-05	1.345E-05	1.326E-05	1.308E-05	1.290E-05	1.272E-05	1.255E-05	1.237E-05
SB121	4.515E-02	4.519E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	2.076E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	5.702E-02	5.829E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.470E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	3.725E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	3.096E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.566E-03	1.770E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SN125	3.077E-04	1.209E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	5.871E-02	4.596E-02	1.191E-05	9.272E-06	7.220E-06	5.621E-06	4.377E-06	3.408E-06	2.653E-06
TE125	4.338E-02	5.657E-02	1.032E-01	1.032E-01	1.032E-01	1.032E-01	1.032E-01	1.032E-01	1.032E-01
TE125M	7.575E-04	6.419E-04	1.666E-07	1.297E-07	1.010E-07	7.863E-08	6.122E-08	4.767E-08	3.711E-08
SN126	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01	1.900E-01
SB126	3.619E-05	9.027E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09	9.025E-09	9.024E-09
SB126M	1.478E-08	6.863E-11	6.862E-11	6.862E-11	6.862E-11	6.861E-11	6.861E-11	6.861E-11	6.861E-11
TE126	4.547E-03	4.585E-03	4.628E-03	4.629E-03	4.631E-03	4.632E-03	4.633E-03	4.635E-03	4.636E-03
TE127	1.288E-04	1.759E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.938E-03	5.024E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	3.994E-01	4.053E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	3.557E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	3.569E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	7.102E-03	3.811E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.500E-05	6.769E-05	6.777E-05	6.785E-05	6.793E-05	6.801E-05	6.809E-05	6.818E-05
XE129M	1.213E-07	2.187E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
I131	4.926E-02	1.070E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE131M	7.973E-04	1.451E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
CS132	9.291E-06	9.682E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
XE133	7.367E-02	9.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	8.031E-01	1.222E-05	8.729E-06	6.237E-06	4.456E-06	3.184E-06	2.275E-06	1.626E-06
BA134	6.001E-01	9.210E-01	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00
CS135	9.090E+00	9.096E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00
BA135	2.738E-03	2.742E-03	2.832E-03	2.835E-03	2.837E-03	2.840E-03	2.843E-03	2.846E-03	2.848E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
CS136	6.042E-03	2.450E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
BA136M	2.709E-10	1.099E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.651E+01	1.614E+01	7.528E+00	7.356E+00	7.188E+00	7.024E+00	6.863E+00	6.707E+00	6.553E+00
BA137	9.727E-01	1.350E+00	9.959E+00	1.013E+01	1.030E+01	1.046E+01	1.062E+01	1.078E+01	1.093E+01
BA137M	2.527E-06	2.469E-06	1.152E-06	1.125E-06	1.100E-06	1.075E-06	1.050E-06	1.026E-06	1.003E-06
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01

Appendix D-2
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sbwzr5.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:20

	1826.0D	1.0YR	34.0YR	35.0YR	36.0YR	37.0YR	38.0YR	39.0YR	40.0YR
BA140	1.798E-01	4.548E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.504E-02	6.858E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	1.811E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
PR143	1.798E-01	1.577E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	1.473E+00	2.534E-13	1.040E-13	4.267E-14	1.751E-14	7.187E-15	2.950E-15	1.210E-15
PR144	1.520E-04	6.218E-05	1.070E-17	4.391E-18	1.802E-18	7.395E-19	3.035E-19	1.245E-19	5.111E-20
PR144M	7.579E-07	3.109E-07	5.348E-20	2.195E-20	9.007E-21	3.697E-21	1.517E-21	6.226E-22	2.555E-22
ND144	1.638E+01	1.850E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	4.372E-05	6.832E-07	6.023E-07	5.310E-07	4.681E-07	4.127E-07	3.638E-07	3.207E-07
SM146	8.176E-05	8.394E-05	9.986E-05	9.989E-05	9.992E-05	9.994E-05	9.996E-05	9.998E-05	1.000E-04
ND147	6.040E-02	6.922E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	2.102E+00	1.661E+00	2.714E-04	2.084E-04	1.600E-04	1.229E-04	9.434E-05	7.244E-05	5.562E-05
SM147	1.853E+00	2.355E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	2.501E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	1.569E-02	3.414E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.450E-09	2.357E-09	2.312E-09	2.268E-09	2.225E-09	2.183E-09	2.141E-09	2.100E-09
SM151	1.636E-01	1.636E-01	1.269E-01	1.259E-01	1.250E-01	1.240E-01	1.231E-01	1.221E-01	1.212E-01
EU151	2.742E-04	1.539E-03	3.827E-02	3.924E-02	4.021E-02	4.117E-02	4.212E-02	4.306E-02	4.400E-02
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	1.157E-03	2.153E-04	2.046E-04	1.944E-04	1.848E-04	1.756E-04	1.669E-04	1.586E-04
GD152	1.111E-03	1.128E-03	1.391E-03	1.394E-03	1.397E-03	1.399E-03	1.402E-03	1.404E-03	1.407E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	1.521E-05	1.548E-20	5.440E-21	1.903E-21	6.654E-22	2.396E-22	7.435E-23	3.725E-23
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	2.387E-01	1.670E-02	1.541E-02	1.422E-02	1.312E-02	1.210E-02	1.116E-02	1.030E-02
GD154	2.826E-02	4.830E-02	2.703E-01	2.716E-01	2.728E-01	2.739E-01	2.749E-01	2.759E-01	2.767E-01
EU155	7.979E-02	6.938E-02	6.888E-04	5.990E-04	5.208E-04	4.529E-04	3.938E-04	3.425E-04	2.978E-04
GD155	1.034E-03	1.144E-02	8.014E-02	8.023E-02	8.030E-02	8.037E-02	8.043E-02	8.048E-02	8.053E-02
EU156	8.598E-03	4.949E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	2.369E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	3.786E-04	4.548E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
TB161	3.523E-06	4.555E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.625E-07	4.538E-07	4.535E-07	4.533E-07	4.530E-07	4.527E-07	4.525E-07	4.522E-07
ER166	1.514E-05	1.519E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.520E-05	1.521E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
ER169	5.081E-10	1.021E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.181E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	1.532E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	1.875E-09	2.818E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	4.004E-11	2.682E-16	1.869E-16	1.303E-16	9.081E-17	6.329E-17	4.411E-17	3.074E-17
YB171	6.068E-11	7.809E-11	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

Appendix D-2
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File SBWZR6.INP

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-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     200.0   .2577   2   3   4 0
  IRP     400.0   .2577   3   4   4 0
  IRP     600.0   .2577   4   5   4 0
  IRP     800.0   .2577   5   6   4 0
  IRP    1000.0   .2577   6   7   4 0
  IRP    1200.0   .2577   7   8   4 0
  IRP    1400.0   .2577   8   9   4 0
  IRP    1600.0   .2577   9  10   4 0
  IRP    1800.0   .2577  10  11   4 0
  IRP    1826.0   .2577  11  12   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV       12    1   0  1.0
  DEC       1.    1   2   5   4
  DEC      41.    2   3   5   0
  DEC      42.    3   4   5   0
  DEC      43.    4   5   5   0
  DEC      44.    5   6   5   0
  DEC      45.    6   7   5   0
  DEC      46.    7   8   5   0
  DEC      47.    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
```

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File SBWZR6.INP (continued)

```
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
  1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
  1   501220  44.957 501240 56.221       0 .0           0 .0
  1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
  1   721790  1.7036 721800 4.3875       0 .0           0 .0
  1   731801  .00007 731810 .62393       0 .0           0 .0        Ta
  0
```

File SBWZR6.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy sbwzr6.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbwzr6.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out sbwzr6.u6 >nul
copy tape13.out+tape11.out sbwzr6.u11 >nul
ren tape7.out sbwzr6.pch
ren tape15.out sbwzr6.dbg
ren tape16.out sbwzr6.vxs
ren tape50.out sbwzr6.ech
rem  cleanup files
del tape*.inp
del tape*.out
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed **************************
echo ************************************************************************
echo on
```

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sbwzr6.g
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
H 1	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03	1.765E-03
H 2	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07	7.877E-07
H 3	8.092E-11	7.650E-11	8.102E-12	7.660E-12	7.242E-12	6.846E-12	6.473E-12	6.119E-12	5.785E-12
HE 3	1.385E-12	5.802E-12	7.420E-11	7.465E-11	7.506E-11	7.546E-11	7.583E-11	7.619E-11	7.652E-11
HE 4	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03	2.710E-03
LI 6	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10	3.730E-10
LI 7	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13	7.796E-13
BE 9	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06	3.804E-06
BE 10	7.841E-08	7.841E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08	7.840E-08
B 10	4.994E-13	5.333E-13	1.892E-12	1.926E-12	1.960E-12	1.994E-12	2.028E-12	2.062E-12	2.096E-12
B 11	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04	3.916E-04
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02	1.276E-02
C 14	3.319E-03	3.319E-03	3.303E-03	3.302E-03	3.302E-03	3.301E-03	3.301E-03	3.301E-03	3.300E-03
N 14	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00	1.241E+00
N 15	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03	4.765E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02	2.997E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08	7.567E-08
NE 20	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13	6.984E-13
NE 21	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12	5.454E-12
NE 22	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14	1.153E-14
NA 23	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18	1.057E-18
MG 24	2.446E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06	2.448E-06
MG 25	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10	5.761E-10
MG 26	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13	3.827E-13
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04	4.315E-04
SI 29	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08	5.118E-08
SI 30	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12	6.643E-12
SI 32	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23	1.207E-23
P 31	2.822E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16	2.824E-16
P 32	1.196E-21	7.518E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28	7.273E-28
S 32	1.340E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20	1.460E-20
S 34	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22	3.263E-22
CL 37	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16	3.626E-16
AR 38	5.748E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20	5.749E-20
AR 39	1.509E-20	1.505E-20	1.358E-20	1.354E-20	1.351E-20	1.347E-20	1.344E-20	1.340E-20	1.337E-20
AR 40	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12	1.387E-12
AR 42	2.206E-21	2.159E-21	9.311E-22	9.115E-22	8.924E-22	8.736E-22	8.553E-22	8.373E-22	8.197E-22
K 39	1.746E-23	5.634E-23	1.528E-21	1.563E-21	1.597E-21	1.632E-21	1.667E-21	1.702E-21	1.736E-21
K 41	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14	4.447E-14
K 42	1.111E-18	9.229E-26	3.983E-26	3.896E-26	3.814E-26	3.734E-26	3.656E-26	3.579E-26	3.504E-26
CA 42	7.716E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16	7.727E-16
CA 43	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07	1.044E-07
CA 44	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07	7.961E-07
CA 45	3.038E-09	6.426E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CA 46	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08	9.472E-08
SC 45	1.343E-08	1.583E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08	1.647E-08
SC 46	2.122E-07	1.034E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02	4.988E-02
TI 47	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02	4.548E-02
TI 48	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01	4.558E-01
TI 49	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02	3.916E-02
TI 50	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02	3.387E-02
V 50	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04	2.191E-04
V 51	5.683E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02	5.881E-02
CR 50	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00	2.653E+00
CR 51	1.978E-03	2.128E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CR 52	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01	5.213E+01
CR 53	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00	5.937E+00
CR 54	1.625E+00	1.625E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00	1.626E+00
MN 54	3.791E-04	1.686E-04	1.423E-18	6.328E-19	2.815E-19	1.252E-19	5.568E-20	2.477E-20	1.102E-20
MN 55	7.699E-03	1.023E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02	1.851E-02
FE 54	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00	5.510E+00
FE 55	1.081E-02	8.280E-03	1.936E-07	1.483E-07	1.136E-07	8.699E-08	6.663E-08	5.104E-08	3.910E-08
FE 56	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01	8.563E+01
FE 57	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00	2.275E+00
FE 58	2.744E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01	2.749E-01
FE 59	2.693E-05	9.706E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	4.277E-04	1.196E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	1.843E-03	1.871E-03	1.911E-03	1.911E-03	1.912E-03	1.913E-03	1.914E-03	1.915E-03	1.916E-03
CO 60	1.264E-04	1.108E-04	5.752E-07	5.043E-07	4.422E-07	3.877E-07	3.399E-07	2.980E-07	2.613E-07
NI 58	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01	2.117E+01
NI 59	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01	1.133E-01
NI 60	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00	8.121E+00

Appendix D-2
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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
NI 61	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01	3.831E-01
NI 62	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00	1.100E+00
NI 63	2.103E-02	2.087E-02	1.544E-02	1.532E-02	1.521E-02	1.509E-02	1.498E-02	1.487E-02	1.476E-02
NI 64	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01	2.836E-01
CU 63	3.412E-04	4.990E-04	5.929E-03	6.045E-03	6.160E-03	6.274E-03	6.387E-03	6.500E-03	6.612E-03
CU 65	6.203E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04	6.204E-04
ZN 64	3.540E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07	3.547E-07
ZN 65	7.597E-11	2.690E-11	2.483E-29	2.483E-29	2.483E-29	2.483E-29	2.483E-29	2.483E-29	2.483E-29
ZN 66	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06	1.081E-06
ZN 67	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10	4.713E-10
ZN 68	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12	1.832E-12
GA 69	9.098E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16	9.103E-16
GA 71	7.637E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22	8.433E-22
GE 70	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18	1.164E-18
GE 71	7.964E-23	3.830E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GE 72	9.679E-27	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26	1.952E-26
SR 87	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04	3.619E-04
SR 88	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02	3.383E-02
SR 89	1.543E-04	1.026E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 90	1.544E-06	1.508E-06	5.820E-07	5.683E-07	5.550E-07	5.419E-07	5.292E-07	5.167E-07	5.046E-07
Y 89	2.396E-03	2.549E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03	2.550E-03
Y 90	3.286E-04	3.782E-10	1.460E-10	1.425E-10	1.392E-10	1.359E-10	1.327E-10	1.296E-10	1.265E-10
Y 91	4.667E-04	6.163E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 90	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04	3.148E+04
ZR 91	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03	6.849E+03
ZR 92	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04	1.051E+04
ZR 93	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01	1.833E+01
ZR 94	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04	1.063E+04
ZR 95	2.492E-01	4.765E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 96	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03	1.709E+03
NB 92	3.999E-07	6.025E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.190E+00	6.190E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00	6.191E+00
NB 93M	1.560E-05	2.252E-05	1.376E-04	1.385E-04	1.393E-04	1.400E-04	1.408E-04	1.415E-04	1.421E-04
NB 94	3.937E-02	3.937E-02	3.931E-02	3.931E-02	3.931E-02	3.931E-02	3.931E-02	3.931E-02	3.930E-02
NB 95	1.328E-01	5.887E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	9.792E-05	1.994E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	2.903E-06	4.248E-06	5.798E-05	5.932E-05	6.066E-05	6.201E-05	6.335E-05	6.469E-05	6.603E-05
MO 95	2.820E+00	3.192E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00	3.203E+00
MO 96	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02	9.207E-02
MO 97	4.882E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00	4.886E+00
MO 98	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02	2.691E-02
MO100	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09	8.520E-09
TC 98	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11	3.769E-11
TC 99	2.212E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05	2.236E-05
RU 98	4.535E-18	1.076E-17	2.597E-16	2.659E-16	2.721E-16	2.783E-16	2.846E-16	2.908E-16	2.970E-16
RU 99	6.727E-11	1.400E-10	3.050E-09	3.123E-09	3.196E-09	3.269E-09	3.341E-09	3.414E-09	3.487E-09
RU100	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07	8.289E-07
RU101	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09	2.001E-09
RU102	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11	1.587E-11
RU103	2.407E-15	3.829E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17	1.342E-17
RU106	1.409E-29	1.409E-29	1.604E-41	1.604E-41	1.604E-41	1.604E-41	1.604E-41	1.604E-41	1.604E-41
RH102	1.578E-22	1.201E-22	8.458E-27	8.458E-27	8.458E-27	8.458E-27	8.458E-27	8.458E-27	8.458E-27
RH103	6.390E-16	8.778E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16	8.782E-16
RH106	7.088E-28	1.324E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD104	5.171E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17	5.172E-17
PD105	6.561E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20	6.573E-20
PD106	6.093E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22	6.094E-22
PD107	1.607E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32	3.596E-32
CD111	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07	3.889E-07
CD112	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06	3.234E-06
CD113	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08	1.629E-08
CD114	3.937E-04	4.212E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04	4.214E-04
CD115M	1.542E-08	5.283E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06	2.411E-06
IN113	8.656E-02	9.494E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02	9.599E-02
IN113M	5.656E-06	6.271E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114	1.614E-08	3.561E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.679E-04	2.214E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.255E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06	1.271E-06
SN112	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00	9.316E+00
SN113	9.419E-03	1.044E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.315E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00	6.316E+00
SN115	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00	3.269E+00
SN116	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02	1.400E+02
SN117	7.501E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01	7.502E+01
SN117M	9.722E-03	1.370E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix D-2
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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
SN118	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02	2.346E+02
SN119	8.423E+01	8.433E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01	8.438E+01
SN119M	1.508E-01	5.365E-02	6.027E-20	2.144E-20	7.635E-21	2.719E-21	9.634E-22	3.509E-22	1.278E-22
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	1.546E-03	1.524E-03	8.752E-04	8.631E-04	8.512E-04	8.395E-04	8.280E-04	8.165E-04	8.053E-04
SN122	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01	4.493E+01
SN123	4.329E-03	6.097E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01	5.588E+01
SN125	2.449E-03	9.625E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	2.832E-01	2.837E-01	2.843E-01	2.844E-01	2.844E-01	2.844E-01	2.844E-01	2.844E-01	2.844E-01
SB123	2.498E-02	2.869E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02	2.930E-02
SB124	8.778E-05	1.309E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	2.127E-01	1.675E-01	7.530E-06	5.863E-06	4.565E-06	3.554E-06	2.767E-06	2.155E-06	1.678E-06
SB126	3.687E-05	4.974E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	1.217E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02	1.225E-02
TE123	1.135E-04	1.279E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04	1.298E-04
TE123M	1.635E-05	1.972E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	6.257E-04	7.122E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04	7.135E-04
TE125	1.257E-01	1.737E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01	3.435E-01
TE125M	2.654E-03	2.338E-03	1.053E-07	8.201E-08	6.385E-08	4.971E-08	3.871E-08	3.014E-08	2.347E-08
TE126	2.154E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03	2.191E-03
TE127	7.772E-09	4.612E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	1.344E-07	1.318E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	7.063E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09	7.064E-09
TE129	8.155E-16	6.894E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.379E-14	7.363E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17	1.112E-17
I127	5.096E-06	5.225E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06	5.238E-06
I129	2.639E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12	2.654E-12
I131	1.297E-19	2.743E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.863E-14	1.780E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE128	9.228E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08	9.229E-08
XE129	1.963E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10	1.970E-10
XE129M	6.502E-13	1.173E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	4.286E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12	4.287E-12
XE131	5.920E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15	5.970E-15
XE131M	4.971E-17	2.854E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16	3.558E-16
XE133	3.734E-21	4.100E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE134	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22	1.171E-22
XE136	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30	6.949E-30
CS132	2.603E-26	1.850E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	6.236E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20	6.615E-20
CS134	1.000E-21	7.205E-22	1.042E-27	1.042E-27	1.042E-27	1.042E-27	1.042E-27	1.042E-27	1.042E-27
CS135	4.121E-30	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29	1.875E-29
CS137	6.896E-40	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39	6.672E-39
BA132	1.034E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28	6.241E-28
BA133	2.066E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34	4.043E-34
BA134	7.926E-23	3.590E-22	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21	1.079E-21
BA135	7.120E-29	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28	1.733E-28
BA136	1.555E-36	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35	1.369E-35
ER166	1.258E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28	1.977E-28
ER167	1.116E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37	2.541E-37
ER169	1.553E-19	3.121E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER170	6.143E-22	9.649E-22	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21	1.023E-21
TM169	3.807E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18	3.962E-18
TM170	2.851E-19	3.981E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM171	5.935E-20	4.144E-20	2.218E-26	2.218E-26	2.218E-26	2.218E-26	2.218E-26	2.218E-26	2.218E-26
YB170	4.405E-19	6.854E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19	7.252E-19
YB171	2.334E-20	4.135E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20	8.279E-20
YB172	3.370E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10	3.390E-10
YB173	2.121E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10	2.123E-10
YB174	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12	9.727E-12
LU175	7.445E-03	8.021E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03	8.037E-03
LU176	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04	1.960E-04
LU177	4.829E-06	5.175E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LU177M	2.662E-07	5.199E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF174	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02	1.081E-02
HF175	5.915E-04	1.589E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF176	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01	4.855E-01
HF177	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01	1.625E-01
HF178	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00	2.899E+00
HF179	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00	3.811E+00
HF180	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00	5.016E+00
HF181	7.713E-03	1.966E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04	2.631E-04
TA181	5.896E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01	5.973E-01

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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
TA182	9.547E-03	1.056E-03	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12	9.205E-12
TA183	6.272E-04	1.731E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	7.216E-02	8.065E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02	8.171E-02
W183	8.421E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02	8.484E-02
W184	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03	5.126E-03
W185	2.694E-06	9.253E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W186	8.086E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08	8.258E-08
W188	1.394E-12	3.629E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RE185	7.346E-06	9.947E-06	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05	1.004E-05
RE187	3.365E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09	3.388E-09
RE188	6.110E-13	3.738E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS186	1.213E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06	1.238E-06
OS187	2.367E-20	7.064E-20	1.949E-18	1.996E-18	2.043E-18	2.090E-18	2.137E-18	2.184E-18	2.231E-18
OS188	1.070E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10	1.090E-10
OS189	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13	7.571E-13
OS190	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14	2.676E-14
OS191	1.181E-17	8.861E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
OS192	3.158E-19	5.976E-19	6.072E-19	6.072E-19	6.072E-19	6.072E-19	6.072E-19	6.072E-19	6.072E-19
OS194	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27	6.360E-27
IR191	5.432E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17	6.647E-17
IR192	6.094E-18	1.992E-19	4.120E-24	4.120E-24	4.120E-24	4.120E-24	4.120E-24	4.120E-24	4.120E-24
IR192M	5.491E-21	5.491E-21	4.896E-21	4.896E-21	4.896E-21	4.896E-21	4.896E-21	4.896E-21	4.896E-21
IR193	8.109E-19	8.110E-19	8.124E-19	8.124E-19	8.124E-19	8.125E-19	8.125E-19	8.125E-19	8.126E-19
IR194	4.896E-22	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30	2.316E-30
PT192	6.270E-18	1.188E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17	1.207E-17
PT193	2.562E-20	2.583E-20	2.444E-20	2.440E-20	2.437E-20	2.434E-20	2.430E-20	2.427E-20	2.423E-20
PT194	4.234E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20	4.283E-20
PT195	2.565E-27	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26	2.791E-26
HE 4	1.613E-04	3.123E-04	5.464E-03	5.573E-03	5.682E-03	5.789E-03	5.896E-03	6.002E-03	6.107E-03
TL206	2.223E-29	2.223E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29	2.222E-29
TL207	3.787E-17	5.254E-17	2.071E-15	2.149E-15	2.224E-15	2.299E-15	2.375E-15	2.451E-15	2.529E-15
TL208	2.376E-14	4.772E-14	1.918E-13	1.907E-13	1.888E-13	1.870E-13	1.852E-13	1.835E-13	1.817E-13
TL209	1.073E-19	3.797E-20	1.391E-19	1.437E-19	1.485E-19	1.534E-19	1.583E-19	1.634E-19	1.687E-19
PB206	1.520E-15	3.826E-15	2.999E-12	3.323E-12	3.667E-12	4.039E-12	4.441E-12	4.875E-12	5.343E-12
PB207	6.465E-12	9.859E-12	2.687E-09	2.849E-09	3.016E-09	3.189E-09	3.368E-09	3.552E-09	3.743E-09
PB208	9.394E-09	2.104E-08	2.900E-06	2.963E-06	3.026E-06	3.088E-06	3.149E-06	3.210E-06	3.270E-06
PB209	4.482E-16	1.582E-16	5.795E-16	5.989E-16	6.187E-16	6.390E-16	6.598E-16	6.810E-16	7.028E-16
PB210	8.589E-14	9.112E-14	1.037E-11	1.126E-11	1.220E-11	1.320E-11	1.425E-11	1.535E-11	1.652E-11
PB211	2.930E-16	4.065E-16	1.602E-14	1.663E-14	1.720E-14	1.779E-14	1.837E-14	1.896E-14	1.956E-14
PB212	1.401E-11	2.814E-11	1.131E-10	1.125E-10	1.114E-10	1.103E-10	1.093E-10	1.082E-10	1.072E-10
PB214	6.485E-20	1.172E-19	8.875E-17	9.471E-17	1.009E-16	1.074E-16	1.141E-16	1.211E-16	1.284E-16
BI208	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18	1.204E-18
BI209	7.960E-13	1.140E-12	2.408E-11	2.516E-11	2.628E-11	2.743E-11	2.863E-11	2.986E-11	3.113E-11
BI210M	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18	8.566E-18
BI210	5.221E-17	5.610E-17	6.384E-15	6.933E-15	7.512E-15	8.124E-15	8.771E-15	9.453E-15	1.017E-14
BI211	1.729E-17	2.398E-17	9.453E-16	9.810E-16	1.015E-15	1.049E-15	1.084E-15	1.119E-15	1.154E-15
BI212	1.329E-12	2.670E-12	1.073E-11	1.067E-11	1.057E-11	1.046E-11	1.036E-11	1.026E-11	1.017E-11
BI213	1.051E-16	3.718E-17	1.362E-16	1.407E-16	1.454E-16	1.501E-16	1.550E-16	1.600E-16	1.651E-16
BI214	4.815E-20	8.705E-20	6.590E-17	7.033E-17	7.494E-17	7.974E-17	8.474E-17	8.994E-17	9.534E-17
PO210	9.371E-16	1.441E-15	1.763E-13	1.825E-13	1.965E-13	2.125E-13	2.296E-13	2.477E-13	2.667E-13
PO211	2.121E-22	2.943E-22	1.160E-20	1.204E-20	1.245E-20	1.287E-20	1.330E-20	1.373E-20	1.416E-20
PO212	7.032E-23	1.412E-22	5.677E-22	5.644E-22	5.590E-22	5.536E-22	5.483E-22	5.431E-22	5.379E-22
PO213	1.576E-25	5.578E-26	2.043E-25	2.111E-25	2.181E-25	2.253E-25	2.326E-25	2.401E-25	2.477E-25
PO214	6.468E-25	1.198E-26	9.066E-24	9.675E-24	1.031E-23	1.097E-23	1.166E-23	1.237E-23	1.312E-23
PO215	2.453E-22	3.404E-22	1.342E-20	1.392E-20	1.441E-20	1.489E-20	1.538E-20	1.588E-20	1.638E-20
PO216	5.591E-17	1.123E-16	4.514E-16	4.488E-16	4.445E-16	4.402E-16	4.360E-16	4.318E-16	4.277E-16
PO218	7.519E-21	1.359E-20	1.029E-17	1.098E-17	1.170E-17	1.245E-17	1.323E-17	1.405E-17	1.489E-17
AT217	1.262E-21	4.467E-22	1.636E-21	1.691E-21	1.747E-21	1.804E-21	1.863E-21	1.923E-21	1.984E-21
RN218	1.389E-22	7.194E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.560E-19	7.713E-19	3.040E-17	3.155E-17	3.264E-17	3.375E-17	3.486E-17	3.599E-17	3.712E-17
RN220	2.111E-14	4.240E-14	1.704E-13	1.694E-13	1.678E-13	1.662E-13	1.646E-13	1.630E-13	1.615E-13
RN222	1.382E-17	2.499E-17	1.892E-14	2.019E-14	2.152E-14	2.290E-14	2.433E-14	2.582E-14	2.737E-14
FR221	1.146E-17	4.056E-18	1.486E-17	1.535E-17	1.586E-17	1.638E-17	1.691E-17	1.746E-17	1.801E-17
FR223	2.596E-18	3.574E-18	1.411E-16	1.461E-16	1.512E-16	1.563E-16	1.615E-16	1.667E-16	1.719E-16
RA222	1.536E-19	7.954E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	1.412E-13	1.959E-13	7.722E-12	8.014E-12	8.292E-12	8.573E-12	8.856E-12	9.141E-12	9.429E-12
RA224	1.222E-10	2.455E-10	9.868E-10	9.810E-10	9.716E-10	9.623E-10	9.531E-10	9.440E-10	9.349E-10
RA225	5.321E-14	1.834E-14	6.717E-14	6.941E-14	7.171E-14	7.406E-14	7.647E-14	7.893E-14	8.145E-14
RA226	2.170E-12	3.888E-12	2.943E-09	3.141E-09	3.347E-09	3.562E-09	3.785E-09	4.017E-09	4.259E-09
RA228	5.488E-16	9.166E-16	4.765E-14	4.904E-14	5.043E-14	5.182E-14	5.321E-14	5.460E-14	5.599E-14
AC225	3.500E-14	1.239E-14	4.538E-14	4.689E-14	4.844E-14	5.003E-14	5.166E-14	5.332E-14	5.502E-14
AC227	1.006E-10	1.385E-10	5.467E-09	5.662E-09	5.858E-09	6.056E-09	6.256E-09	6.458E-09	6.661E-09
AC228	2.287E-14	9.568E-20	4.974E-18	5.119E-18	5.264E-18	5.409E-18	5.555E-18	5.700E-18	5.845E-18
TH226	7.654E-18	3.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	2.321E-13	3.220E-13	1.269E-11	1.317E-11	1.363E-11	1.409E-11	1.455E-11	1.502E-11	1.549E-11
TH228	2.398E-08	4.762E-08	1.918E-07	1.899E-07	1.881E-07	1.863E-07	1.845E-07	1.828E-07	1.810E-07

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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
TH229	3.343E-09	3.380E-09	1.238E-08	1.279E-08	1.322E-08	1.365E-08	1.409E-08	1.455E-08	1.501E-08
TH230	1.506E-07	2.424E-07	2.203E-05	2.298E-05	2.394E-05	2.493E-05	2.593E-05	2.695E-05	2.799E-05
TH231	1.704E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09	1.627E-09
TH232	7.634E-06	1.063E-05	1.303E-04	1.333E-04	1.363E-04	1.393E-04	1.422E-04	1.452E-04	1.482E-04
TH234	1.247E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10	1.243E-10
PA231	1.811E-06	2.200E-06	1.768E-05	1.807E-05	1.846E-05	1.885E-05	1.924E-05	1.963E-05	2.002E-05
PA233	2.221E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07	2.281E-07
PA234M	4.857E-14	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15	4.192E-15
PA234	1.531E-11	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15	1.872E-15
U230	7.523E-15	3.893E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	3.050E-06	4.582E-06	7.149E-06	7.080E-06	7.013E-06	6.946E-06	6.879E-06	6.813E-06	6.748E-06
U233	7.255E-06	9.615E-06	9.514E-05	9.751E-05	9.987E-05	1.022E-04	1.046E-04	1.070E-04	1.093E-04
U234	2.856E-02	3.736E-02	3.378E-01	3.441E-01	3.505E-01	3.567E-01	3.629E-01	3.691E-01	3.752E-01
U235	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02	4.000E+02
U236	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02	1.028E+02
U237	1.154E-01	2.575E-10	3.754E-11	3.577E-11	3.409E-11	3.249E-11	3.096E-11	2.951E-11	2.812E-11
U238	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00	8.563E+00
U240	5.608E-11	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19	2.422E-19
NP235	3.251E-08	1.716E-08	1.349E-19	7.118E-20	3.755E-20	1.981E-20	1.047E-20	5.535E-21	2.925E-21
NP236	3.749E-06	3.749E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.748E-06	3.747E-06
NP237	6.600E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00	6.715E+00
NP238	9.351E-03	1.880E-12	1.566E-12	1.559E-12	1.552E-12	1.545E-12	1.538E-12	1.531E-12	1.524E-12
NP239	3.690E-04	9.904E-11	9.867E-11	9.866E-11	9.865E-11	9.864E-11	9.863E-11	9.862E-11	9.861E-11
NP240M	1.021E-10	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21	2.118E-21
PU236	7.349E-06	5.789E-06	3.544E-10	2.797E-10	2.211E-10	1.752E-10	1.392E-10	1.110E-10	8.881E-11
PU237	7.562E-07	2.936E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	1.127E+00	1.128E+00	8.223E-01	8.158E-01	8.094E-01	8.031E-01	7.967E-01	7.905E-01	7.842E-01
PU239	1.613E-01	1.617E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.614E-01
PU240	3.359E-02	3.359E-02	3.346E-02	3.346E-02	3.345E-02	3.345E-02	3.345E-02	3.344E-02	3.344E-02
PU241	8.725E-03	8.315E-03	1.212E-03	1.155E-03	1.101E-03	1.049E-03	1.000E-03	9.530E-04	9.082E-04
PU242	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03	1.215E-03
PU243	1.529E-07	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21	4.098E-21
PU244	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08	1.266E-08
PU246	4.021E-16	3.107E-26	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27	1.521E-27
AM241	3.068E-04	7.160E-04	7.484E-03	7.529E-03	7.571E-03	7.611E-03	7.648E-03	7.683E-03	7.715E-03
AM242M	1.007E-05	1.003E-05	8.354E-06	8.316E-06	8.278E-06	8.240E-06	8.203E-06	8.165E-06	8.128E-06
AM242	3.137E-07	1.199E-10	9.993E-11	9.947E-11	9.902E-11	9.857E-11	9.812E-11	9.767E-11	9.723E-11
AM243	1.151E-04	1.152E-04	1.148E-04	1.148E-04	1.148E-04	1.148E-04	1.148E-04	1.148E-04	1.148E-04
AM245	2.436E-14	3.523E-23	6.369E-37	6.385E-37	6.385E-37	6.385E-37	6.385E-37	6.385E-37	6.385E-37
AM246	6.436E-19	4.979E-29	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30	2.433E-30
CM241	1.077E-12	9.509E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM242	3.549E-05	7.596E-06	2.020E-08	2.014E-08	2.005E-08	1.996E-08	1.987E-08	1.978E-08	1.969E-08
CM243	5.639E-07	5.503E-07	2.080E-07	2.030E-07	1.982E-07	1.934E-07	1.888E-07	1.842E-07	1.798E-07
CM244	1.624E-05	1.564E-05	3.382E-06	3.255E-06	3.133E-06	3.015E-06	2.902E-06	2.793E-06	2.688E-06
CM245	3.670E-07	3.670E-07	3.658E-07	3.658E-07	3.657E-07	3.657E-07	3.657E-07	3.656E-07	3.656E-07
CM246	2.209E-08	2.209E-08	2.196E-08	2.196E-08	2.195E-08	2.195E-08	2.195E-08	2.194E-08	2.194E-08
CM247	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10	1.149E-10
CM248	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.443E-12	3.442E-12	3.442E-12
CM249	1.877E-17	1.307E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM250	3.617E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21	3.621E-21
BK249	2.019E-14	9.161E-15	1.656E-28	1.656E-28	1.656E-28	1.656E-28	1.656E-28	1.656E-28	1.656E-28
BK250	1.228E-17	4.440E-24	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29	1.071E-29
CF249	3.877E-15	1.490E-14	2.225E-14	2.221E-14	2.217E-14	2.212E-14	2.208E-14	2.204E-14	2.199E-14
CF250	3.409E-15	3.245E-15	3.897E-16	3.696E-16	3.505E-16	3.324E-16	3.153E-16	2.990E-16	2.835E-16
CF251	1.058E-15	1.057E-15	1.025E-15	1.024E-15	1.024E-15	1.023E-15	1.022E-15	1.021E-15	1.020E-15
CF252	3.213E-16	2.471E-16	6.736E-21	5.198E-21	4.012E-21	3.096E-21	2.390E-21	1.844E-21	1.423E-21
CF253	2.544E-19	1.709E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CF254	5.630E-21	9.293E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES253	2.405E-19	8.017E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ES254	2.319E-20	9.241E-21	1.031E-36	1.031E-36	1.031E-36	1.031E-36	1.031E-36	1.031E-36	1.031E-36
SF250	2.226E-11	4.257E-11	6.588E-10	6.717E-10	6.845E-10	6.971E-10	7.097E-10	7.222E-10	7.346E-10
H 3	6.014E-04	5.685E-04	6.021E-05	5.692E-05	5.382E-05	5.088E-05	4.810E-05	4.548E-05	4.299E-05
LI 6	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06	3.308E-06
LI 7	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07	1.461E-07
BE 9	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07	2.814E-07
BE 10	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06	1.877E-06
C 14	3.795E-07	3.794E-07	3.776E-07	3.775E-07	3.775E-07	3.775E-07	3.774E-07	3.774E-07	3.773E-07
ZN 66	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10	7.465E-10
ZN 67	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11	3.324E-11
ZN 68	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06	5.868E-06
GA 69	9.063E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09	9.065E-09
ZN 70	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05	2.002E-05
GE 70	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11	2.602E-11
GA 71	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09	9.808E-09
GE 72	1.046E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04	1.048E-04
GE 73	3.676E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04	3.677E-04

Appendix D-2
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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
GE 74	9.973E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04	9.974E-04
AS 75	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03	2.385E-03
GE 76	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03	7.270E-03
SE 76	4.545E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05	4.556E-05
SE 77	1.581E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02	1.584E-02
SE 78	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02	3.426E-02
SE 79	8.723E-02	8.723E-02	8.719E-02	8.719E-02	8.719E-02	8.719E-02	8.719E-02	8.718E-02	8.718E-02
BR 79	2.253E-06	3.184E-06	4.040E-05	4.134E-05	4.227E-05	4.320E-05	4.413E-05	4.506E-05	4.599E-05
SE 80	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01	2.102E-01
KR 80	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06	1.077E-06
BR 81	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01	3.512E-01
KR 81	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08	4.171E-08
SE 82	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01	5.691E-01
KR 82	9.495E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03	9.527E-03
KR 83	7.796E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01	7.797E-01
KR 84	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00	1.959E+00
KR 85	4.116E-01	3.859E-01	2.906E-02	2.724E-02	2.553E-02	2.394E-02	2.244E-02	2.103E-02	1.971E-02
RB 85	1.846E+00	1.873E+00	2.229E+00	2.231E+00	2.233E+00	2.235E+00	2.236E+00	2.237E+00	2.239E+00
KR 86	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00	3.613E+00
RB 86	1.883E-04	2.408E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	4.630E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03	4.818E-03
RB 87	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00	4.675E+00
SR 87	2.043E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05	2.044E-05
SR 88	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00	6.738E+00
SR 89	3.468E-01	2.306E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Y 89	8.536E+00	8.880E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00	8.882E+00
SR 90	1.013E+01	9.891E+00	3.817E+00	3.727E+00	3.640E+00	3.554E+00	3.471E+00	3.389E+00	3.309E+00
Y 90	2.594E-03	2.480E-03	9.573E-04	9.347E-04	9.128E-04	8.913E-04	8.703E-04	8.499E-04	8.299E-04
ZR 90	6.404E-01	8.788E-01	6.954E+00	7.044E+00	7.131E+00	7.217E+00	7.301E+00	7.382E+00	7.462E+00
Y 91	5.021E-01	6.678E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	1.058E+01	1.108E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01	1.109E+01
ZR 92	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01	1.154E+01
NB 92	1.142E-13	1.721E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	1.243E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01	1.244E+01
NB 93	1.798E-06	2.829E-06	1.516E-04	1.567E-04	1.618E-04	1.669E-04	1.721E-04	1.772E-04	1.824E-04
NB 93M	1.239E-05	1.700E-05	9.356E-05	9.413E-05	9.467E-05	9.518E-05	9.567E-05	9.614E-05	9.658E-05
ZR 94	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01	1.235E+01
NB 94	1.654E-06	1.654E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06	1.652E-06	1.651E-06
ZR 95	6.298E-01	1.204E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	3.479E-01	1.489E-02	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	2.492E-04	5.040E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	1.132E+01	1.227E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01	1.230E+01
ZR 96	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01	1.259E+01
MO 96	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01	4.198E-01
MO 97	1.185E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01	1.186E+01
MO 98	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01	1.189E+01
TC 98	4.572E-05	4.572E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05	4.571E-05
TC 99	1.150E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01	1.153E+01
RU 99	9.405E-05	1.316E-04	1.632E-03	1.669E-03	1.707E-03	1.744E-03	1.782E-03	1.819E-03	1.857E-03
MO100	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01	1.312E+01
RU100	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00	1.003E+00
RU101	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01	1.045E+01
RU102	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00	9.287E+00
RH102	5.323E-06	4.191E-06	2.953E-10	2.325E-10	1.831E-10	1.441E-10	1.135E-10	8.937E-11	7.037E-11
RU103	2.067E-01	3.285E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.659E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00	4.866E+00
RH103M	1.847E-04	2.937E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU104	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00	4.110E+00
PD104	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00	1.925E+00
PD105	2.157E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00	2.160E+00
RU106	2.595E-01	1.305E-01	1.479E-13	7.434E-14	3.737E-14	1.879E-14	9.447E-15	4.749E-15	2.388E-15
RH106	2.616E-07	1.226E-07	1.390E-19	6.987E-20	3.513E-20	1.766E-20	8.880E-21	4.464E-21	2.244E-21
PD106	7.981E-01	9.272E-01	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00	1.058E+00
AG106	5.874E-15	6.816E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01	4.234E-01
AG107	1.093E-07	1.545E-07	1.961E-06	2.007E-06	2.052E-06	2.097E-06	2.142E-06	2.187E-06	2.232E-06
PD108	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01	2.047E-01
AG108	9.552E-13	9.666E-19	7.770E-19	7.728E-19	7.686E-19	7.644E-19	7.602E-19	7.561E-19	7.520E-19
AG108M	3.078E-10	3.061E-10	2.461E-10	2.447E-10	2.434E-10	2.421E-10	2.408E-10	2.394E-10	2.381E-10
CD108	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07	2.724E-07
AG109	8.224E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02	8.230E-02
AG109M	5.107E-08	1.294E-16	4.302E-26	2.493E-26	1.445E-26	8.381E-27	4.859E-27	2.818E-27	1.633E-27
CD109	2.261E-10	1.310E-10	4.355E-20	2.523E-20	1.463E-20	8.484E-21	4.920E-21	2.853E-21	1.644E-21
PD110	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02	7.494E-02
AG110	1.878E-08	2.972E-12	7.459E-30	2.765E-30	1.004E-30	4.518E-31	2.259E-31	8.203E-32	0.000E+00
AG110M	5.402E-04	1.961E-04	4.922E-22	1.825E-22	5.962E-23	2.981E-23	1.491E-23	0.000E+00	0.000E+00
CD110	3.243E-02	3.277E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02	3.297E-02

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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
AG111	3.630E-04	6.352E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	5.953E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02	5.989E-02
CD112	4.625E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02	4.628E-02
CD113	4.385E-04	4.452E-04	4.459E-04	4.460E-04	4.460E-04	4.460E-04	4.460E-04	4.460E-04	4.460E-04
CD113M	8.787E-04	8.380E-04	1.253E-04	1.195E-04	1.139E-04	1.086E-04	1.036E-04	9.880E-05	9.421E-05
IN113	9.476E-05	1.355E-04	8.475E-04	8.533E-04	8.589E-04	8.642E-04	8.692E-04	8.740E-04	8.786E-04
CD114	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02	8.345E-02
IN114	1.755E-11	3.835E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN114M	3.962E-07	2.384E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	6.664E-06	7.028E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06	7.030E-06
CD115M	1.216E-04	4.164E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	1.111E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02	1.130E-02
IN115M	5.122E-06	1.176E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN115	1.262E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03	1.265E-03
CD116	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02	4.075E-02
SN116	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02	2.657E-02
SN117	4.004E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02	4.005E-02
SN117M	1.819E-06	2.563E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02	4.477E-02
SN119	4.269E-02	4.278E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02	4.283E-02
SN119M	1.423E-04	5.063E-05	5.687E-23	2.847E-23	1.425E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN120	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02	4.486E-02
SN121M	2.155E-05	2.125E-05	1.220E-05	1.203E-05	1.187E-05	1.170E-05	1.154E-05	1.138E-05	1.123E-05
SB121	4.515E-02	4.519E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02	4.520E-02
SN122	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02	5.028E-02
TE122	2.238E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03	2.251E-03
SN123	1.474E-03	2.076E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB123	5.702E-02	5.829E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02	5.850E-02
TE123	2.198E-05	2.470E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05	2.507E-05
TE123M	3.090E-06	3.725E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN124	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02	7.859E-02
SB124	2.076E-04	3.096E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE124	1.566E-03	1.770E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03	1.773E-03
SN125	3.077E-04	1.209E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	5.871E-02	4.596E-02	2.066E-06	1.609E-06	1.252E-06	9.751E-07	7.593E-07	5.912E-07	4.603E-07
TE125	4.338E-02	5.657E-02	1.032E-01	1.032E-01	1.032E-01	1.032E-01	1.032E-01	1.032E-01	1.032E-01
TE125M	7.575E-04	6.419E-04	2.890E-08	2.250E-08	1.752E-08	1.364E-08	1.062E-08	8.269E-09	6.438E-09
SN126	1.900E-01	1.900E-01	1.899E-01	1.899E-01	1.899E-01	1.899E-01	1.899E-01	1.899E-01	1.899E-01
SB126	3.619E-05	9.027E-09	9.024E-09	9.024E-09	9.024E-09	9.024E-09	9.024E-09	9.024E-09	9.024E-09
SB126M	1.478E-08	6.863E-11	6.861E-11	6.861E-11	6.861E-11	6.861E-11	6.861E-11	6.861E-11	6.861E-11
TE126	4.547E-03	4.585E-03	4.637E-03	4.639E-03	4.640E-03	4.641E-03	4.642E-03	4.644E-03	4.645E-03
TE127	1.288E-04	1.759E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	4.938E-03	5.024E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	3.994E-01	4.053E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01	4.058E-01
XE127	3.721E-09	3.557E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE128	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00	1.066E+00
XE128	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02	1.685E-02
TE129	6.927E-05	3.569E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	7.102E-03	3.811E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	1.835E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00	1.843E+00
XE129	6.480E-05	6.500E-05	6.826E-05	6.834E-05	6.842E-05	6.850E-05	6.858E-05	6.866E-05	6.874E-05
XE129M	1.213E-07	2.187E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00	4.096E+00
XE130	8.569E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02	8.578E-02
I131	4.926E-02	1.070E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	6.011E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00	6.062E+00
XE131M	7.973E-04	1.451E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.364E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01	1.367E+01
CS132	9.291E-06	9.682E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	1.342E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05	1.360E-05
XE133	7.367E-02	9.963E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	1.678E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01	1.687E+01
XE134	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01	2.149E+01
CS134	1.124E+00	8.031E-01	1.161E-06	8.299E-07	5.930E-07	4.237E-07	3.027E-07	2.163E-07	1.545E-07
BA134	6.001E-01	9.210E-01	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00	1.724E+00
CS135	9.090E+00	9.096E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00	9.095E+00
BA135	2.738E-03	2.742E-03	2.851E-03	2.854E-03	2.857E-03	2.859E-03	2.862E-03	2.865E-03	2.868E-03
XE136	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01	2.756E+01
CS136	6.042E-03	2.450E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	2.349E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01	2.410E-01
BA136M	2.709E-10	1.099E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	1.651E+01	1.614E+01	6.404E+00	6.257E+00	6.114E+00	5.975E+00	5.838E+00	5.705E+00	5.575E+00
BA137	9.727E-01	1.350E+00	1.108E+01	1.123E+01	1.137E+01	1.151E+01	1.165E+01	1.178E+01	1.191E+01
BA137M	2.527E-06	2.469E-06	9.797E-07	9.573E-07	9.354E-07	9.141E-07	8.932E-07	8.728E-07	8.529E-07
BA138	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01	1.959E+01
LA138	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04	1.370E-04
LA139	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01	1.856E+01

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sbwzr6.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/08/02 at 19:13:23

	1826.0D	1.0YR	41.0YR	42.0YR	43.0YR	44.0YR	45.0YR	46.0YR	47.0YR
BA140	1.798E-01	4.548E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.504E-02	6.858E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	1.816E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01	1.836E+01
CE141	4.339E-01	1.811E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR141	1.663E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01	1.707E+01
CE142	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01	1.742E+01
ND142	2.736E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01	2.741E-01
PR143	1.798E-01	1.577E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	1.373E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01	1.393E+01
CE144	3.589E+00	1.473E+00	4.968E-16	2.039E-16	8.367E-17	3.434E-17	1.409E-17	5.783E-18	2.373E-18
PR144	1.520E-04	6.218E-05	2.098E-20	8.608E-21	3.533E-21	1.450E-21	5.950E-22	2.442E-22	1.002E-22
PR144M	7.579E-07	3.109E-07	1.049E-22	4.303E-23	1.766E-23	7.248E-24	2.974E-24	1.221E-24	5.010E-25
ND144	1.638E+01	1.850E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01	1.997E+01
ND145	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01	1.095E+01
ND146	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00	9.987E+00
PM146	4.960E-05	4.372E-05	2.828E-07	2.493E-07	2.198E-07	1.937E-07	1.708E-07	1.506E-07	1.327E-07
SM146	8.176E-05	8.394E-05	1.000E-04	1.000E-04	1.000E-04	1.000E-04	1.001E-04	1.001E-04	1.001E-04
ND147	6.040E-02	6.922E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	2.102E+00	1.661E+00	4.270E-05	3.279E-05	2.517E-05	1.933E-05	1.484E-05	1.140E-05	8.750E-06
SM147	1.853E+00	2.355E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00	4.016E+00
ND148	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00	5.199E+00
PM148	1.273E-02	2.501E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM148M	1.569E-02	3.414E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM148	2.311E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00	2.339E+00
SM149	2.812E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02	3.714E-02
ND150	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00	2.023E+00
SM150	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00	3.651E+00
EU150	4.537E-09	4.450E-09	2.060E-09	2.021E-09	1.982E-09	1.944E-09	1.907E-09	1.871E-09	1.835E-09
SM151	1.636E-01	1.636E-01	1.203E-01	1.193E-01	1.184E-01	1.175E-01	1.166E-01	1.157E-01	1.148E-01
EU151	2.742E-04	1.539E-03	4.493E-02	4.585E-02	4.677E-02	4.768E-02	4.858E-02	4.947E-02	5.036E-02
SM152	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00	1.478E+00
EU152	1.218E-03	1.157E-03	1.507E-04	1.432E-04	1.361E-04	1.293E-04	1.229E-04	1.168E-04	1.110E-04
GD152	1.111E-03	1.128E-03	1.409E-03	1.411E-03	1.413E-03	1.415E-03	1.416E-03	1.418E-03	1.420E-03
EU153	1.120E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00	1.126E+00
GD153	4.329E-05	1.521E-05	1.022E-23	1.022E-23	1.022E-23	1.022E-23	1.022E-23	1.022E-23	1.022E-23
SM154	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01	2.463E-01
EU154	2.588E-01	2.387E-01	9.502E-03	8.766E-03	8.088E-03	7.461E-03	6.883E-03	6.350E-03	5.859E-03
GD154	2.826E-02	4.830E-02	2.775E-01	2.783E-01	2.790E-01	2.796E-01	2.802E-01	2.807E-01	2.812E-01
EU155	7.979E-02	6.938E-02	2.589E-04	2.251E-04	1.957E-04	1.702E-04	1.480E-04	1.287E-04	1.119E-04
GD155	1.034E-03	1.144E-02	8.057E-02	8.060E-02	8.063E-02	8.065E-02	8.068E-02	8.070E-02	8.071E-02
EU156	8.598E-03	4.949E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	2.687E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01	2.773E-01
GD157	2.483E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04	2.690E-04
GD158	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02	4.818E-02
TB159	4.519E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03	4.524E-03
GD160	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03	1.757E-03
TB160	7.859E-05	2.369E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	3.786E-04	4.548E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04	4.571E-04
TB161	3.523E-06	4.555E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	3.769E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04	3.804E-04
DY162	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04	3.008E-04
DY163	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04	2.031E-04
DY164	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05	3.788E-05
HO165	6.662E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05	6.663E-05
HO166M	4.628E-07	4.625E-07	4.520E-07	4.517E-07	4.514E-07	4.512E-07	4.509E-07	4.507E-07	4.504E-07
ER166	1.514E-05	1.519E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05	1.521E-05
ER167	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06	2.061E-06
ER168	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06	2.843E-06
ER169	5.081E-10	1.021E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	1.408E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08	1.458E-08
ER170	2.803E-12	4.181E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12	4.405E-12
TM170	1.098E-09	1.532E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB170	1.875E-09	2.818E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09	2.971E-09
TM171	5.745E-11	4.004E-11	2.143E-17	1.493E-17	1.041E-17	7.255E-18	5.056E-18	3.524E-18	2.456E-18
YB171	6.068E-11	7.809E-11	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10	1.181E-10
YB172	2.427E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12	2.436E-12

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reducesb.out

Nuclide	Calculated g/L	Normalized to Cs-137
H 2	4.417E-08	5.52E-08
HE 3	3.332E-12	4.16E-12
B 10	7.734E-14	9.67E-14
B 11	2.181E-05	2.73E-05
C 12	5.363E-02	6.70E-02
C 13	7.331E-04	9.16E-04
N 14	6.913E-02	8.64E-02
N 15	2.654E-04	3.32E-04
O 16	4.162E+00	5.20E+00
O 17	1.669E-03	2.09E-03
O 18	8.345E-03	1.04E-02
F 19	4.215E-09	5.27E-09
NE 20	3.891E-14	4.86E-14
NE 21	3.038E-13	3.80E-13
NE 22	4.386E-11	5.48E-11
NA 23	3.427E-12	4.28E-12
MG 24	1.364E-07	1.70E-07
MG 25	4.910E-07	6.14E-07
MG 26	2.162E-07	2.70E-07
AL 27	6.963E-02	8.70E-02
SI 28	6.228E-02	7.78E-02
SI 29	3.156E-03	3.94E-03
SI 30	2.095E-03	2.62E-03
SI 32	1.021E-14	1.28E-14
P 31	3.042E-03	3.80E-03
P 32	6.149E-19	7.69E-19
S 32	1.928E-03	2.41E-03
S 34	8.538E-05	1.07E-04
CL 37	6.914E-14	8.64E-14
AR 38	5.507E-19	6.88E-19
AR 39	7.935E-22	9.92E-22
AR 40	7.726E-14	9.66E-14
AR 42	7.600E-23	9.50E-23
K 39	4.959E-23	6.20E-23
K 41	2.479E-15	3.10E-15
K 42	3.249E-27	4.06E-27
CA 42	4.304E-17	5.38E-17
CA 43	5.816E-09	7.27E-09
CA 44	4.436E-08	5.54E-08
CA 45	1.745E-21	2.18E-21
CA 46	5.280E-09	6.60E-09
SC 45	9.175E-10	1.15E-09
SC 46	7.250E-28	9.06E-28
TI 46	2.779E-03	3.47E-03
TI 47	2.534E-03	3.17E-03
TI 48	2.539E-02	3.17E-02
TI 49	2.182E-03	2.73E-03
TI 50	1.891E-03	2.36E-03
V 50	2.906E-05	3.63E-05
V 51	3.322E-03	4.15E-03
CR 50	2.036E-01	2.54E-01

Appendix D-3

reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
CR 52	3.978E+00	4.97E+00
CR 53	4.527E-01	5.66E-01
CR 54	1.213E-01	1.52E-01
MN 54	2.345E-11	2.93E-11
MN 55	1.060E-03	1.33E-03
FE 54	5.774E-01	7.22E-01
FE 55	3.331E-06	4.16E-06
FE 56	8.968E+00	1.12E+01
FE 57	2.237E-01	2.80E-01
FE 58	2.929E-02	3.66E-02
CO 58	7.770E-26	9.71E-26
CO 59	2.578E-04	3.22E-04
CO 60	8.339E-07	1.04E-06
NI 58	2.135E+00	2.67E+00
NI 59	6.501E-03	8.13E-03
NI 60	8.188E-01	1.02E+00
NI 61	3.722E-02	4.65E-02
NI 62	1.114E-01	1.39E-01
NI 63	1.010E-03	1.26E-03
NI 64	2.857E-02	3.57E-02
CU 63	2.109E-04	2.64E-04
CU 65	3.584E-05	4.48E-05
ZN 64	1.977E-08	2.47E-08
ZN 65	1.042E-19	1.30E-19
MO 94	8.220E-06	1.03E-05
RU 98	8.286E-18	1.04E-17
IN113M	2.247E-22	2.81E-22
SN112	5.190E-01	6.49E-01
SN113	3.741E-19	4.68E-19
YB172	1.902E-11	2.38E-11
YB173	1.183E-11	1.48E-11
YB174	5.418E-13	6.77E-13
LU175	4.477E-04	5.60E-04
LU176	1.092E-05	1.36E-05
LU177	4.625E-22	5.78E-22
LU177M	4.646E-20	5.81E-20
HF174	6.022E-04	7.53E-04
HF175	5.392E-26	6.74E-26
HF176	2.704E-02	3.38E-02
HF177	9.052E-03	1.13E-02
HF178	1.615E-01	2.02E-01
HF179	2.123E-01	2.65E-01
HF180	2.794E-01	3.49E-01
HF182	1.466E-05	1.83E-05
TA181	3.327E-02	4.16E-02
TA182	5.128E-13	6.41E-13
W182	4.552E-03	5.69E-03
W183	4.726E-03	5.91E-03
W184	2.855E-04	3.57E-04
W185	5.982E-27	7.48E-27
W186	4.600E-09	5.75E-09

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
W188	8.451E-35	1.06E-34
RE185	5.593E-07	6.99E-07
RE187	1.887E-10	2.36E-10
RE188	8.621E-37	1.08E-36
OS186	6.896E-08	8.62E-08
OS187	6.196E-20	7.74E-20
OS188	6.072E-12	7.59E-12
OS189	4.217E-14	5.27E-14
OS190	1.491E-15	1.86E-15
OS192	3.382E-20	4.23E-20
OS194	3.543E-28	4.43E-28
IR191	3.703E-18	4.63E-18
IR192	2.438E-25	3.05E-25
IR192M	2.892E-22	3.61E-22
IR193	4.522E-20	5.65E-20
IR194	1.290E-31	1.61E-31
PT192	6.724E-19	8.40E-19
PT193	1.395E-21	1.74E-21
PT194	2.386E-21	2.98E-21
PT195	1.555E-27	1.94E-27
HE 4	3.940E-04	4.92E-04
TL206	1.245E-30	1.56E-30
TL207	1.936E-16	2.42E-16
TL208	1.486E-14	1.86E-14
TL209	1.096E-20	1.37E-20
PB206	1.042E-11	1.30E-11
PB207	1.961E-10	2.45E-10
PB208	1.052E-07	1.31E-07
PB209	4.568E-17	5.71E-17
PB210	3.217E-11	4.02E-11
PB211	1.498E-15	1.87E-15
PB212	8.764E-12	1.10E-11
PB214	2.427E-16	3.03E-16
BI208	6.795E-20	8.49E-20
BI209	1.447E-12	1.81E-12
BI210M	4.798E-19	6.00E-19
BI210	1.980E-14	2.48E-14
BI211	8.836E-17	1.10E-16
BI212	8.313E-13	1.04E-12
BI213	1.073E-17	1.34E-17
BI214	1.802E-16	2.25E-16
PO210	5.205E-13	6.50E-13
PO211	1.084E-21	1.35E-21
PO212	4.398E-23	5.50E-23
PO213	1.610E-26	2.01E-26
PO214	2.479E-23	3.10E-23
PO215	1.254E-21	1.57E-21
PO216	3.497E-17	4.37E-17
PO218	2.815E-17	3.52E-17
AT217	1.290E-22	1.61E-22
RN219	2.842E-18	3.55E-18

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
RN220	1.320E-14	1.65E-14
RN222	5.175E-14	6.47E-14
FR221	1.171E-18	1.46E-18
FR223	1.316E-17	1.64E-17
RA223	7.218E-13	9.02E-13
RA224	7.644E-11	9.55E-11
RA225	5.294E-15	6.62E-15
RA226	8.050E-09	1.01E-08
RA228	2.560E-15	3.20E-15
AC225	3.577E-15	4.47E-15
AC227	5.099E-10	6.37E-10
AC228	2.672E-19	3.34E-19
TH227	1.186E-12	1.48E-12
TH228	1.480E-08	1.85E-08
TH229	9.757E-10	1.22E-09
TH230	4.814E-05	6.02E-05
TH231	2.614E-10	3.27E-10
TH232	7.894E-06	9.87E-06
TH234	1.988E-10	2.48E-10
PA231	2.007E-06	2.51E-06
PA233	1.762E-08	2.20E-08
PA234M	6.703E-15	8.38E-15
PA234	2.994E-15	3.74E-15
U232	5.591E-07	6.99E-07
U233	8.158E-06	1.02E-05
U234	4.868E-01	6.08E-01
U235	6.428E+01	8.03E+01
U236	9.280E+00	1.16E+01
U237	5.584E-11	6.98E-11
U238	1.369E+01	1.71E+01
U240	2.935E-19	3.67E-19
NP235	2.327E-14	2.91E-14
NP236	2.897E-07	3.62E-07
NP237	5.188E-01	6.48E-01
NP238	1.460E-13	1.82E-13
NP239	4.499E-11	5.62E-11
NP240M	2.568E-21	3.21E-21
PU236	3.552E-09	4.44E-09
PU238	6.076E-02	7.59E-02
PU239	2.996E-01	3.74E-01
PU240	1.709E-02	2.14E-02
PU241	1.804E-03	2.25E-03
PU242	7.993E-04	9.99E-04
PU243	4.437E-22	5.55E-22
PU244	1.535E-08	1.92E-08
PU246	2.246E-28	2.81E-28
AM241	6.825E-03	8.53E-03
AM242M	7.786E-07	9.73E-07
AM242	9.314E-12	1.16E-11
AM243	5.234E-05	6.54E-05
AM245	4.883E-30	6.10E-30

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
AM246	3.593E-31	4.49E-31
CM242	1.886E-09	2.36E-09
CM243	3.319E-08	4.15E-08
CM244	1.410E-06	1.76E-06
CM245	9.272E-08	1.16E-07
CM246	3.403E-09	4.25E-09
CM247	1.244E-11	1.55E-11
CM248	2.868E-13	3.58E-13
CM250	5.347E-22	6.68E-22
BK249	1.269E-21	1.59E-21
BK250	3.322E-30	4.15E-30
CF249	1.712E-15	2.14E-15
CF250	6.803E-17	8.50E-17
CF251	6.889E-17	8.61E-17
CF252	1.055E-19	1.32E-19
ES254	3.631E-27	4.54E-27
SF250	3.509E-11	4.39E-11
H 3	1.360E-05	1.70E-05
LI 6	3.333E-07	4.17E-07
LI 7	1.286E-08	1.61E-08
BE 9	2.593E-07	3.24E-07
BE 10	1.702E-07	2.13E-07
C 14	1.844E-04	2.30E-04
ZN 66	6.045E-08	7.56E-08
ZN 67	3.052E-11	3.81E-11
ZN 68	3.269E-07	4.09E-07
GA 69	5.050E-10	6.31E-10
ZN 70	1.115E-06	1.39E-06
GE 70	1.449E-12	1.81E-12
GA 71	1.177E-09	1.47E-09
GE 72	1.146E-05	1.43E-05
GE 73	3.793E-05	4.74E-05
GE 74	9.762E-05	1.22E-04
AS 75	2.258E-04	2.82E-04
GE 76	6.710E-04	8.39E-04
SE 76	3.454E-06	4.32E-06
SE 77	1.463E-03	1.83E-03
SE 78	3.122E-03	3.90E-03
SE 79	7.746E-03	9.68E-03
BR 79	2.400E-06	3.00E-06
SE 80	1.860E-02	2.32E-02
KR 80	9.214E-08	1.15E-07
BR 81	3.122E-02	3.90E-02
KR 81	2.918E-09	3.65E-09
SE 82	5.006E-02	6.26E-02
KR 82	6.326E-04	7.91E-04
KR 83	7.140E-02	8.92E-02
KR 84	1.699E-01	2.12E-01
KR 85	7.423E-03	9.28E-03
RB 85	1.913E-01	2.39E-01
KR 86	3.176E-01	3.97E-01

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
SR 86	3.576E-04	4.47E-04
RB 87	4.107E-01	5.13E-01
SR 87	2.169E-05	2.71E-05
SR 88	5.942E-01	7.43E-01
Y 89	7.802E-01	9.75E-01
SR 90	4.813E-01	6.02E-01
Y 90	1.207E-04	1.51E-04
ZR 90	1.754E+03	2.19E+03
ZR 91	3.825E+02	4.78E+02
ZR 92	5.865E+02	7.33E+02
ZR 93	2.116E+00	2.64E+00
NB 93	1.013E+00	1.27E+00
NB 93M	1.309E-05	1.64E-05
ZR 94	5.932E+02	7.41E+02
NB 94	9.719E-03	1.21E-02
ZR 95	7.700E-26	9.62E-26
NB 95	4.431E-26	5.54E-26
NB 95M	3.076E-29	3.84E-29
MO 95	1.272E+00	1.59E+00
ZR 96	9.631E+01	1.20E+02
MO 96	3.023E-02	3.78E-02
MO 97	1.317E+00	1.65E+00
MO 98	1.051E+00	1.31E+00
TC 98	3.673E-06	4.59E-06
TC 99	1.026E+00	1.28E+00
RU 99	9.751E-05	1.22E-04
MO100	1.155E+00	1.44E+00
RU100	7.349E-02	9.18E-02
RU101	9.262E-01	1.16E+00
RU102	8.155E-01	1.02E+00
RH102	2.968E-09	3.71E-09
RH103	4.751E-01	5.94E-01
RU104	3.665E-01	4.58E-01
PD104	1.236E-01	1.55E-01
PD105	1.886E-01	2.36E-01
RU106	8.957E-08	1.12E-07
RH106	8.418E-14	1.05E-13
PD106	9.951E-02	1.24E-01
PD107	3.971E-02	4.96E-02
AG107	1.229E-07	1.54E-07
PD108	1.980E-02	2.47E-02
AG108	6.568E-20	8.21E-20
AG108M	2.080E-11	2.60E-11
CD108	3.236E-08	4.04E-08
AG109	8.779E-03	1.10E-02
AG109M	9.652E-22	1.21E-21
CD109	9.771E-16	1.22E-15
PD110	7.480E-03	9.35E-03
AG110	1.673E-20	2.09E-20
AG110M	1.103E-12	1.38E-12
CD110	2.455E-03	3.07E-03

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
CD111	5.965E-03	7.46E-03
CD112	4.651E-03	5.81E-03
CD113	7.464E-04	9.33E-04
CD113M	2.589E-05	3.24E-05
IN113	5.414E-03	6.77E-03
CD114	7.802E-03	9.75E-03
SN114	3.518E-01	4.40E-01
IN115	1.963E-03	2.45E-03
SN115	1.822E-01	2.28E-01
CD116	4.145E-03	5.18E-03
SN116	7.801E+00	9.75E+00
SN117	4.183E+00	5.23E+00
SN118	1.307E+01	1.63E+01
SN119	4.705E+00	5.88E+00
SN119M	2.231E-10	2.79E-10
SN120	1.764E+01	2.20E+01
SN121M	6.413E-05	8.02E-05
SB121	2.041E-02	2.55E-02
SN122	2.508E+00	3.13E+00
TE122	8.493E-04	1.06E-03
SN123	7.913E-18	9.89E-18
SB123	7.459E-03	9.32E-03
TE123	8.864E-06	1.11E-05
TE123M	2.665E-21	3.33E-21
SN124	3.121E+00	3.90E+00
TE124	1.770E-04	2.21E-04
SB125	1.172E-04	1.46E-04
TE125	2.899E-02	3.62E-02
TE125M	1.639E-06	2.05E-06
SN126	1.791E-02	2.24E-02
SB126	8.509E-10	1.06E-09
SB126M	6.470E-12	8.09E-12
TE126	5.585E-04	6.98E-04
TE127	1.165E-22	1.46E-22
TE127M	3.329E-20	4.16E-20
I127	3.819E-02	4.77E-02
TE128	9.668E-02	1.21E-01
XE128	1.184E-03	1.48E-03
I129	1.675E-01	2.09E-01
XE129	8.545E-06	1.07E-05
TE130	3.644E-01	4.55E-01
XE130	5.607E-03	7.01E-03
XE131	5.715E-01	7.14E-01
XE132	1.173E+00	1.47E+00
BA132	7.984E-07	9.98E-07
CS133	1.517E+00	1.90E+00
XE134	1.896E+00	2.37E+00
CS134	1.099E-04	1.37E-04
BA134	1.218E-01	1.52E-01
CS135	6.282E-01	7.85E-01
BA135	1.592E-04	1.99E-04

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
XE136	2.601E+00	3.25E+00
BA136	1.496E-02	1.87E-02
CS137	8.002E-01	1.00E+00
BA137	7.385E-01	9.23E-01
BA137M	1.224E-07	1.53E-07
BA138	1.722E+00	2.15E+00
LA138	1.228E-05	1.53E-05
LA139	1.635E+00	2.04E+00
CE140	1.623E+00	2.03E+00
PR141	1.508E+00	1.88E+00
CE142	1.533E+00	1.92E+00
ND142	1.720E-02	2.15E-02
ND143	1.298E+00	1.62E+00
CE144	5.011E-08	6.26E-08
PR144	2.116E-12	2.64E-12
PR144M	1.058E-14	1.32E-14
ND144	1.685E+00	2.11E+00
ND145	9.768E-01	1.22E+00
ND146	8.627E-01	1.08E+00
PM146	2.665E-07	3.33E-07
SM146	6.598E-06	8.25E-06
PM147	8.694E-04	1.09E-03
SM147	4.003E-01	5.00E-01
ND148	4.614E-01	5.77E-01
SM148	1.549E-01	1.94E-01
SM149	1.730E-02	2.16E-02
ND150	1.788E-01	2.23E-01
SM150	3.173E-01	3.97E-01
EU150	2.959E-10	3.70E-10
SM151	1.642E-02	2.05E-02
EU151	3.931E-03	4.91E-03
SM152	1.296E-01	1.62E-01
EU152	2.331E-05	2.91E-05
GD152	7.926E-05	9.91E-05
EU153	9.269E-02	1.16E-01
GD153	5.301E-14	6.63E-14
SM154	2.242E-02	2.80E-02
EU154	2.880E-03	3.60E-03
GD154	1.848E-02	2.31E-02
EU155	2.893E-04	3.62E-04
GD155	6.939E-03	8.67E-03
GD156	2.024E-02	2.53E-02
GD157	1.957E-04	2.45E-04
GD158	4.288E-03	5.36E-03
TB159	4.306E-04	5.38E-04
GD160	1.724E-04	2.15E-04
TB160	4.576E-26	5.72E-26
DY160	3.421E-05	4.28E-05
DY161	4.305E-05	5.38E-05
DY162	3.063E-05	3.83E-05
DY163	1.835E-05	2.29E-05

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reducesb.out (continued)

Nuclide	Calculated g/L	Normalized to Cs-137
DY164	4.476E-06	5.59E-06
HO165	5.522E-06	6.90E-06
HO166M	3.181E-08	3.98E-08
ER166	1.583E-06	1.98E-06
ER167	3.926E-07	4.91E-07
ER168	2.481E-07	3.10E-07
TM169	1.063E-09	1.33E-09
ER170	2.722E-13	3.40E-13
TM170	1.936E-24	2.42E-24
YB170	1.838E-10	2.30E-10
TM171	3.572E-15	4.47E-15
YB171	7.096E-12	8.87E-12

Appendix D-4

Source Listing of Program EXTRACTS

```
      PROGRAM EXTRACTS

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/19/02


!            This program extracts the grams of each radionuclide
!            from file REDUCESB.OUT and sums the mass of radionuclides
!            that are listed more than once in the file.  It also
!            adjusts the results to analytical results, when analytical
!            measurements are available

      CHARACTER (LEN=1) :: DUMMY
      CHARACTER (LEN=7) :: DESC, NAME, NUCLIDE(600)

      INTEGER NUM(600)

      REAL :: DATA(600)

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER_E', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='REDUCESB.OUT', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='EXTRACTS.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'EXTRACTS.OUT -- sodium bearing waste')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NUMBER
 1000 FORMAT(5X,A7, 5X, I6)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUM(LAST) = NUMBER
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,600
         DATA(l) = 0.
      END DO

!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ PAST THE FIRST 4 LINES OF INPUT

   35 DO  J=1,4
         READ(2,120) DUMMY
  120    FORMAT(A1)
```

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Source Listing of Program EXTRACTS (continued)

```
      END DO

      WRITE(6,605)
  605 FORMAT(/,6X,'Number',6X,'g/L       Nuclide')


!-------- READ RADIONUCLIDE INVENTORIES

   50 READ(2,200,END=80) DESC, VALUE
  200 FORMAT(A7,5X,1PE10.3)

!-------- ADD MASS FROM MULTIPLE ENTRIES WHEN FOUND

      DO  J=1,LAST
         IF(DESC == NUCLIDE(J)) THEN
            DATA(J) = DATA(J) + VALUE
         END IF

      END DO

      GO TO 50

!-------- CHANGE CALCULATED MASS TO MEASURED MASS WHEN ANALYTICAL
!         MEASUREMENTS ARE AVAILABLE -- TAKEN FROM FILE 185DECAY.INP

   80 DO I=1,LAST
         IF(NUM(I) == 270600) DATA(I) = 7.77E-05            ! Co 60
         IF(NUM(I) == 280630) DATA(I) = 6.59E-04            ! Ni 63
         IF(NUM(I) == 380900) DATA(I) = 5.25E-01            ! Sr 90
         IF(NUM(I) == 390900) DATA(I) = 1.32E-04            !  Y 90
         IF(NUM(I) == 430990) DATA(I) = 7.31E-01            ! Tc 99
         IF(NUM(I) == 441060) DATA(I) = 1.13E-05            ! Ru106
         IF(NUM(I) == 451060) DATA(I) = 1.06E-11            ! Rh196
         IF(NUM(I) == 511250) DATA(I) = 5.51E-05            ! Sb125
         IF(NUM(I) == 531290) DATA(I) = 3.375-01            !  I129
         IF(NUM(I) == 551340) DATA(I) = 1.10E-04            ! Cs134
         IF(NUM(I) == 581440) DATA(I) = 2.24E-05            ! Ce144
         IF(NUM(I) == 591440) DATA(I) = 9.47E-10            ! Pr144
         IF(NUM(I) == 591441) DATA(I) = 1.06E-14            ! Pr144m
         IF(NUM(I) == 631540) DATA(I) = 1.11E-03            ! Eu154
         IF(NUM(I) == 922320) DATA(I) = 1.05E-07            !  U232
         IF(NUM(I) == 922330) DATA(I) = 1.53E-06            !  U233
         IF(NUM(I) == 922340) DATA(I) = 1.59E-01            !  U234
         IF(NUM(I) == 922350) DATA(I) = 1.20E+01            !  U235
         IF(NUM(I) == 922360) DATA(I) = 6.37E-01            !  U236
         IF(NUM(I) == 922360) DATA(I) = 1.044E-11           !  U237
         IF(NUM(I) == 922380) DATA(I) = 7.61E+01            !  U238
         IF(NUM(I) == 922400) DATA(I) = 5.49E-20            !  U240
         IF(NUM(I) == 932350) DATA(I) = 2.31E-13            ! Np235
         IF(NUM(I) == 932360) DATA(I) = 2.88E-10            ! Np236
         IF(NUM(I) == 932380) DATA(I) = 1.45E-12            ! Np238
         IF(NUM(I) == 932370) DATA(I) = 5.14E+00            ! Np237
         IF(NUM(I) == 932390) DATA(I) = 4.47E-10            ! Np239
         IF(NUM(I) == 932401) DATA(I) = 2.55E-21            ! Np240m
```

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Source Listing of Program EXTRACTS (continued)

```
          IF(NUM(I) == 942360) DATA(I) = 2.19E-08            ! Pu236
          IF(NUM(I) == 942380) DATA(I) = 2.84E-02            ! Pu238
          IF(NUM(I) == 942390) DATA(I) = 1.08E+00            ! Pu239
          IF(NUM(I) == 942400) DATA(I) = 5.50E-02            ! Pu240
          IF(NUM(I) == 942410) DATA(I) = 4.02E-03            ! Pu241
          IF(NUM(I) == 942420) DATA(I) = 2.56E-03            ! Pu242
          IF(NUM(I) == 942430) DATA(I) = 1.37E-21            ! Pu243
          IF(NUM(I) == 942440) DATA(I) = 4.72E-08            ! Pu244
          IF(NUM(I) == 952410) DATA(I) = 1.73E-02            ! Am241
          IF(NUM(I) == 952421) DATA(I) = 1.98E-06            ! Am242m
          IF(NUM(I) == 952420) DATA(I) = 2.36E-11            ! Am242
          IF(NUM(I) == 952430) DATA(I) = 1.33E-04            ! Am243
          IF(NUM(I) == 952450) DATA(I) = 1.24E-29            ! Am245
          IF(NUM(I) == 962420) DATA(I) = 4.773E-9            ! Cm242
          IF(NUM(I) == 962430) DATA(I) = 7.70E-07            ! Cm243
          IF(NUM(I) == 962440) DATA(I) = 3.27E-05            ! Cm244
          IF(NUM(I) == 962450) DATA(I) = 2.15E-06            ! Cm245
          IF(NUM(I) == 962460) DATA(I) = 7.92E-08            ! Cm246
          IF(NUM(I) == 962470) DATA(I) = 2.89E-10            ! Cm247
          IF(NUM(I) == 962480) DATA(I) = 6.72E-12            ! Cm248
          IF(NUM(I) == 962500) DATA(I) = 1.241E-20           ! Cm250
          IF(NUM(I) == 972490) DATA(I) = 3.901E-21           ! Bk249
          IF(NUM(I) == 982490) DATA(I) = 5.27E-15            ! Cf249
          IF(NUM(I) == 982500) DATA(I) = 2.09E-16            ! Cf250
          IF(NUM(I) == 982510) DATA(I) = 2.13E-16            ! Cf251
          IF(NUM(I) == 982520) DATA(I) = 3.25E-19            ! Cf252
       END DO

!-------- Normalize rusults to Cs-137 mass of 1.15E-02 g

       DO  J=1,LAST
          IF(DATA(J) /= 0.) THEN
             WRITE(6,620) NUM(J), DATA(J), NUCLIDE(J)
  620        FORMAT(6X,I6,2X,1PE10.3,4X,A7)
          ENDIF

       END DO

       GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM EXTRACTS
```

See Appendix B-4, pages 4-11, for a listing of file MASTER_E.

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EXTRACTS.OUT -- sodium bearing waste

Number	g/L	Nuclide
10012	4.417E-08	H 2
20030	3.332E-12	HE 3
50100	7.734E-14	B 10
50110	2.181E-05	B 11
60120	5.363E-02	C 12
60130	7.331E-04	C 13
70140	6.913E-02	N 14
70150	2.654E-04	N 15
80160	4.162E+00	O 16
80170	1.669E-03	O 17
80180	8.345E-03	O 18
90190	4.215E-09	F 19
100200	3.891E-14	NE 20
100210	3.038E-13	NE 21
100220	4.386E-11	NE 22
110230	3.427E-12	NA 23
120240	1.364E-07	MG 24
120250	4.910E-07	MG 25
120260	2.162E-07	MG 26
130270	6.963E-02	AL 27
140280	6.228E-02	SI 28
140290	3.156E-03	SI 29
140300	2.095E-03	SI 30
140320	1.021E-14	SI 32
150310	3.042E-03	P 31
150320	6.149E-19	P 32
160340	8.538E-05	S 34
170370	6.914E-14	CL 37
180380	5.507E-19	AR 38
180390	7.935E-22	AR 39
180400	7.726E-14	AR 40
180420	7.600E-23	AR 42
190410	2.479E-15	K 41
190420	3.249E-27	K 42
200420	4.304E-17	CA 42
200430	5.816E-09	CA 43
200440	4.436E-08	CA 44
200450	1.745E-21	CA 45
200460	5.280E-09	CA 46
210450	9.175E-10	SC 45
210460	7.250E-28	SC 46
220460	2.779E-03	TI 46
220470	2.534E-03	TI 47
220480	2.539E-02	TI 48
220490	2.182E-03	TI 49
220500	1.891E-03	TI 50
230500	2.906E-05	V 50
230510	3.322E-03	V 51
240500	2.036E-01	CR 50
240520	3.978E+00	CR 52
240530	4.527E-01	CR 53
240540	1.213E-01	CR 54

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
250540	2.345E-11	MN 54
250550	1.060E-03	MN 55
260540	5.774E-01	FE 54
260550	3.331E-06	FE 55
260560	8.968E+00	FE 56
260570	2.237E-01	FE 57
260580	2.929E-02	FE 58
270580	7.770E-26	CO 58
270590	2.578E-04	CO 59
270600	7.770E-05	CO 60
280580	2.135E+00	NI 58
280590	6.501E-03	NI 59
280600	8.188E-01	NI 60
280610	3.722E-02	NI 61
280620	1.114E-01	NI 62
280630	6.590E-04	NI 63
280640	2.857E-02	NI 64
290630	2.109E-04	CU 63
290650	3.584E-05	CU 65
300640	1.977E-08	ZN 64
300650	1.042E-19	ZN 65
420940	8.220E-06	MO 94
440980	8.286E-18	RU 98
491131	2.247E-22	IN113M
501120	5.190E-01	SN112
501130	3.741E-19	SN113
701730	1.183E-11	YB173
701740	5.418E-13	YB174
711750	4.477E-04	LU175
711760	1.092E-05	LU176
711770	4.625E-22	LU177
711771	4.646E-20	LU177M
721740	6.022E-04	HF174
721750	5.392E-26	HF175
721760	2.704E-02	HF176
721770	9.052E-03	HF177
721780	1.615E-01	HF178
721790	2.123E-01	HF179
721800	2.794E-01	HF180
721820	1.466E-05	HF182
731810	3.327E-02	TA181
731820	5.128E-13	TA182
741820	4.552E-03	W182
741830	4.726E-03	W183
741840	2.855E-04	W184
741850	5.982E-27	W185
741860	4.600E-09	W186
741880	8.451E-35	W188
751850	5.593E-07	RE185
751870	1.887E-10	RE187
751880	8.621E-37	RE188
761860	6.896E-08	OS186

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
761880	6.072E-12	OS188
761890	4.217E-14	OS189
761900	1.491E-15	OS190
20040	3.940E-04	HE 4
812060	1.245E-30	TL206
812070	1.936E-16	TL207
812080	1.486E-14	TL208
812090	1.096E-20	TL209
822060	1.042E-11	PB206
822070	1.961E-10	PB207
822080	1.052E-07	PB208
822090	4.568E-17	PB209
822100	3.217E-11	PB210
822110	1.498E-15	PB211
822120	8.764E-12	PB212
822140	2.427E-16	PB214
832080	6.795E-20	BI208
832090	1.447E-12	BI209
832101	4.798E-19	BI210M
832100	1.980E-14	BI210
832110	8.836E-17	BI211
832120	8.313E-13	BI212
832130	1.073E-17	BI213
832140	1.802E-16	BI214
842100	5.205E-13	PO210
842110	1.084E-21	PO211
842120	4.398E-23	PO212
842130	1.610E-26	PO213
842140	2.479E-23	PO214
842150	1.254E-21	PO215
842160	3.497E-17	PO216
842180	2.815E-17	PO218
852170	1.290E-22	AT217
862190	2.842E-18	RN219
862200	1.320E-14	RN220
862220	5.175E-14	RN222
872210	1.171E-18	FR221
872230	1.316E-17	FR223
882230	7.218E-13	RA223
882240	7.644E-11	RA224
882250	5.294E-15	RA225
882260	8.050E-09	RA226
882280	2.560E-15	RA228
892250	3.577E-15	AC225
892270	5.099E-10	AC227
892280	2.672E-19	AC228
902270	1.186E-12	TH227
902280	1.480E-08	TH228
902290	9.757E-10	TH229
902300	4.814E-05	TH230
902310	2.614E-10	TH231
902320	7.894E-06	TH232

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
902340	1.988E-10	TH234
912310	2.007E-06	PA231
912330	1.762E-08	PA233
912341	6.703E-15	PA234M
912340	2.994E-15	PA234
922320	1.050E-07	U232
922330	1.530E-06	U233
922340	1.590E-01	U234
922350	1.200E+01	U235
922360	1.044E-11	U236
922370	5.584E-11	U237
922380	7.610E+01	U238
922400	5.490E-20	U240
932350	2.310E-13	NP235
932360	2.880E-10	NP236
932370	5.140E+00	NP237
932380	1.450E-12	NP238
932390	4.470E-10	NP239
932401	2.550E-21	NP240M
942360	2.190E-08	PU236
942380	2.840E-02	PU238
942390	1.080E+00	PU239
942400	5.500E-02	PU240
942410	4.020E-03	PU241
942420	2.560E-03	PU242
942430	1.370E-21	PU243
942440	4.720E-08	PU244
952410	1.730E-02	AM241
952421	1.980E-06	AM242M
952420	2.360E-11	AM242
952430	1.330E-04	AM243
952450	1.240E-29	AM245
962420	4.773E-09	CM242
962430	7.700E-07	CM243
962440	3.270E-05	CM244
962450	2.150E-06	CM245
962460	7.920E-08	CM246
962470	2.890E-10	CM247
962480	6.720E-12	CM248
962500	1.241E-20	CM250
972490	3.901E-21	BK249
982490	5.270E-15	CF249
982500	2.090E-16	CF250
982510	2.130E-16	CF251
982520	3.250E-19	CF252
10030	1.360E-05	H 3
30060	3.333E-07	LI 6
30070	1.286E-08	LI 7
40090	2.593E-07	BE 9
40100	1.702E-07	BE 10
60140	1.844E-04	C 14
300660	6.045E-08	ZN 66

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
300670	3.052E-11	ZN 67
300680	3.269E-07	ZN 68
310690	5.050E-10	GA 69
300700	1.115E-06	ZN 70
320700	1.449E-12	GE 70
310710	1.177E-09	GA 71
320720	1.146E-05	GE 72
320730	3.793E-05	GE 73
320740	9.762E-05	GE 74
330750	2.258E-04	AS 75
320760	6.710E-04	GE 76
340760	3.454E-06	SE 76
340770	1.463E-03	SE 77
340780	3.122E-03	SE 78
340790	7.746E-03	SE 79
350790	2.400E-06	BR 79
340800	1.860E-02	SE 80
360800	9.214E-08	KR 80
350810	3.122E-02	BR 81
360810	2.918E-09	KR 81
340820	5.006E-02	SE 82
360820	6.326E-04	KR 82
360830	7.140E-02	KR 83
360840	1.699E-01	KR 84
360850	7.423E-03	KR 85
370850	1.913E-01	RB 85
360860	3.176E-01	KR 86
380860	3.576E-04	SR 86
370870	4.107E-01	RB 87
380870	2.169E-05	SR 87
380880	5.942E-01	SR 88
390890	7.802E-01	Y 89
380900	5.250E-01	SR 90
390900	1.320E-04	Y 90
400900	1.754E+03	ZR 90
400910	3.825E+02	ZR 91
400920	5.865E+02	ZR 92
400930	2.116E+00	ZR 93
410930	1.013E+00	NB 93
410931	1.309E-05	NB 93M
400940	5.932E+02	ZR 94
410940	9.719E-03	NB 94
400950	7.700E-26	ZR 95
410950	4.431E-26	NB 95
410951	3.076E-29	NB 95M
420950	1.272E+00	MO 95
400960	9.631E+01	ZR 96
420960	3.023E-02	MO 96
420970	1.317E+00	MO 97
420980	1.051E+00	MO 98
430980	3.673E-06	TC 98
430990	7.310E-01	TC 99

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
440990	9.751E-05	RU 99
421000	1.155E+00	MO100
441000	7.349E-02	RU100
441010	9.262E-01	RU101
441020	8.155E-01	RU102
451020	2.968E-09	RH102
451030	4.751E-01	RH103
441040	3.665E-01	RU104
461040	1.236E-01	PD104
461050	1.886E-01	PD105
441060	1.130E-05	RU106
451060	1.060E-11	RH106
461060	9.951E-02	PD106
461070	3.971E-02	PD107
471070	1.229E-07	AG107
461080	1.980E-02	PD108
471080	6.568E-20	AG108
471081	2.080E-11	AG108M
481080	3.236E-08	CD108
471090	8.779E-03	AG109
471091	9.652E-22	AG109M
481090	9.771E-16	CD109
461100	7.480E-03	PD110
471100	1.673E-20	AG110
471101	1.103E-12	AG110M
481100	2.455E-03	CD110
481110	5.965E-03	CD111
481120	4.651E-03	CD112
481130	7.464E-04	CD113
481131	2.589E-05	CD113M
491130	5.414E-03	IN113
481140	7.802E-03	CD114
501140	3.518E-01	SN114
491150	1.963E-03	IN115
501150	1.822E-01	SN115
481160	4.145E-03	CD116
501160	7.801E+00	SN116
501170	4.183E+00	SN117
501180	1.307E+01	SN118
501190	4.705E+00	SN119
501191	2.231E-10	SN119M
501200	1.764E+01	SN120
501211	6.413E-05	SN121M
511210	2.041E-02	SB121
501220	2.508E+00	SN122
521220	8.493E-04	TE122
501230	7.913E-18	SN123
511230	7.459E-03	SB123
521230	8.864E-06	TE123
521231	2.665E-21	TE123M
501240	3.121E+00	SN124
521240	1.770E-04	TE124

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
511250	5.510E-05	SB125
521250	2.899E-02	TE125
521251	1.639E-06	TE125M
501260	1.791E-02	SN126
511260	8.509E-10	SB126
511261	6.470E-12	SB126M
521260	5.585E-04	TE126
521270	1.165E-22	TE127
521271	3.329E-20	TE127M
531270	3.819E-02	I127
521280	9.668E-02	TE128
541280	1.184E-03	XE128
531290	2.375E+00	I129
541290	8.545E-06	XE129
521300	3.644E-01	TE130
541300	5.607E-03	XE130
541310	5.715E-01	XE131
541320	1.173E+00	XE132
561320	7.984E-07	BA132
551330	1.517E+00	CS133
541340	1.896E+00	XE134
551340	1.100E-04	CS134
561340	1.218E-01	BA134
551350	6.282E-01	CS135
561350	1.592E-04	BA135
541360	2.601E+00	XE136
561360	1.496E-02	BA136
551370	8.002E-01	CS137
561370	7.385E-01	BA137
561371	1.224E-07	BA137M
561380	1.722E+00	BA138
571380	1.228E-05	LA138
571390	1.635E+00	LA139
581400	1.623E+00	CE140
591410	1.508E+00	PR141
581420	1.533E+00	CE142
601420	1.720E-02	ND142
601430	1.298E+00	ND143
581440	2.240E-05	CE144
591440	9.470E-10	PR144
591441	1.060E-14	PR144M
601440	1.685E+00	ND144
601450	9.768E-01	ND145
601460	8.627E-01	ND146
611460	2.665E-07	PM146
621460	6.598E-06	SM146
611470	8.694E-04	PM147
621470	4.003E-01	SM147
601480	4.614E-01	ND148
621480	1.549E-01	SM148
621490	1.730E-02	SM149
601500	1.788E-01	ND150

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EXTRACTS.OUT -- sodium bearing waste (continued)

Number	g/L	Nuclide
621500	3.173E-01	SM150
631500	2.959E-10	EU150
621510	1.642E-02	SM151
631510	3.931E-03	EU151
621520	1.296E-01	SM152
631520	2.331E-05	EU152
641520	7.926E-05	GD152
631530	9.269E-02	EU153
641530	5.301E-14	GD153
621540	2.242E-02	SM154
631540	1.110E-03	EU154
641540	1.848E-02	GD154
631550	2.893E-04	EU155
641550	6.939E-03	GD155
641560	2.024E-02	GD156
641570	1.957E-04	GD157
641580	4.288E-03	GD158
651590	4.306E-04	TB159
641600	1.724E-04	GD160
651600	4.576E-26	TB160
661600	3.421E-05	DY160
661610	4.305E-05	DY161
661620	3.063E-05	DY162
661630	1.835E-05	DY163
661640	4.476E-06	DY164
671650	5.522E-06	HO165
671661	3.181E-08	HO166M
681660	1.583E-06	ER166
681670	3.926E-07	ER167
681680	2.481E-07	ER168
691690	1.063E-09	TM169
681700	2.722E-13	ER170
691700	1.936E-24	TM170
701700	1.838E-10	YB170
691710	3.572E-15	TM171
701710	7.096E-12	YB171
701720	1.902E-11	YB172

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File SBW_RUN1.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     Sodium Bearing Waste (SBW)
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     Final Activity in mCi/L rather than Ci
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                mCi/L
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC       1.58  1   2   5   0
  DEC       4.08  2   3   5   0
  DEC       5.08  3   4   5   0
  DEC      12.08  4   5   5   0
  DEC      14.08  5   6   5   0
  DEC      18.08  6   7   5   0
  DEC      24.08  7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   10012 4.417E-08  20030 3.332E-12  50100 7.734E-14 0 0.
  1   50110 2.181E-05  60120 5.363E-02  60130 7.331E-04 0 0.
  1   70140 6.913E-02  70150 2.654E-04  80160 4.162E+00 0 0.
  1   80170 1.669E-03  80180 8.345E-03  90190 4.215E-09 0 0.
  1  100200 3.891E-14 100210 3.038E-13 100220 4.386E-11 0 0.
  1  110230 3.427E-12 120240 1.364E-07 120250 4.910E-07 0 0.
  1  120260 2.162E-07 130270 6.963E-02 140280 6.228E-02 0 0.
  1  140290 3.156E-03 140300 2.095E-03 140320 1.021E-14 0 0.
  1  150310 3.042E-03 150320 6.149E-19 160340 8.538E-05 0 0.
  1  170370 6.914E-14 180380 5.507E-19 180390 7.935E-22 0 0.
  1  180400 7.726E-14 180420 7.600E-23 190410 2.479E-15 0 0.
  1  190420 3.249E-27 200420 4.304E-17 200430 5.816E-09 0 0.
  1  200440 4.436E-08 200450 1.745E-21 200460 5.280E-09 0 0.
  1  210450 9.175E-10 210460 7.250E-28 220460 2.779E-03 0 0.
  1  220470 2.534E-03 220480 2.539E-02 220490 2.182E-03 0 0.
  1  220500 1.891E-03 230500 2.906E-05 230510 3.322E-03 0 0.
  1  240500 2.036E-01 240520 3.978E+00 240530 4.527E-01 0 0.
  1  240540 1.213E-01 250540 2.345E-11 250550 1.060E-03 0 0.
  1  260540 5.774E-01 260550 3.331E-06 260560 8.968E+00 0 0.
  1  260570 2.237E-01 260580 2.929E-02 270580 7.770E-26 0 0.
  1  270590 2.578E-04 270600 7.770E-05 280580 2.135E+00 0 0.
  1  280590 6.501E-03 280600 8.188E-01 280610 3.722E-02 0 0.
  1  280620 1.114E-01 280630 6.590E-04 280640 2.857E-02 0 0.
  1  290630 2.109E-04 290650 3.584E-05 300640 1.977E-08 0 0.
  1  300650 1.042E-19 420940 8.220E-06 440980 8.286E-18 0 0.
  1  491131 2.247E-22 501120 5.190E-01 501130 3.741E-19 0 0.
  1  701730 1.183E-11 701740 5.418E-13 711750 4.477E-04 0 0.
  1  711760 1.092E-05 711770 4.625E-22 711771 4.646E-20 0 0.
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File SBW_RUN1.INP (continued)

```
1  721740 6.022E-04 721750 5.392E-26 721760 2.704E-02 0 0.
1  721770 9.052E-03 721780 1.615E-01 721790 2.123E-01 0 0.
1  721800 2.794E-01 721820 1.466E-05 731810 3.327E-02 0 0.
1  731820 5.128E-13 741820 4.552E-03 741830 4.726E-03 0 0.
1  741840 2.855E-04 741850 5.982E-27 741860 4.600E-09 0 0.
1  741880 8.451E-35 751850 5.593E-07 751870 1.887E-10 0 0.
1  751880 8.621E-37 761860 6.896E-08 761880 6.072E-12 0 0.
1  761890 4.217E-14 761900 1.491E-15      0 0.        0 0.
2  812060 1.245E-30 812070 1.930E-16 812080 1.480E-14 0 0.
2  812090 1.100E-20 822060 1.042E-11 822070 1.961E-10 0 0.
2  822080 1.052E-07 822090 4.500E-17 822100 3.210E-11 0 0.
2  822110 1.500E-15 822120 8.760E-12 822140 2.430E-16 0 0.
2  832080 6.795E-20 832090 1.447E-12 832101 4.800E-19 0 0.
2  832100 1.980E-14 832110 8.836E-17 832120 8.310E-13 0 0.
2  832130 1.070E-17 832140 1.800E-16 842100 5.200E-13 0 0.
2  842110 1.084E-21 842120 4.398E-23 842130 1.610E-26 0 0.
2  842140 2.479E-23 842150 1.254E-21 842160 3.400E-17 0 0.
2  842180 2.810E-17 852170 1.290E-22 862190 2.842E-18 0 0.
2  862200 1.320E-14 862220 5.170E-14 872210 1.170E-18 0 0.
2  872230 1.320E-17 882230 7.210E-13 882240 7.560E-11 0 0.
2  882250 5.290E-15 882260 8.050E-09 882280 2.200E-15 0 0.
2  892250 3.580E-15 892270 5.100E-10 892280 2.670E-19 0 0.
2  902270 1.190E-12 902280 1.480E-08 902290 9.760E-10 0 0.
2  902300 4.810E-05 902310 2.610E-10 902320 7.890E-06 0 0.
2  902340 1.990E-10 912310 2.280E-06 912330 1.760E-08 0 0.
2  912341 6.700E-15 912340 2.990E-15 922320 1.050E-07 0 0.
2  922330 1.530E-06 922340 1.590E-01 922350 1.200E+01 0 0.
2  922360 6.370E-01 922370 1.044E-11 922380 7.610E+01 0 0.
2  922400 5.490E-20 932350 2.310E-13 932360 2.880E-07 0 0.
2  932370 5.140E+00 932380 1.450E-12 932390 4.470E-10 0 0.
2  932401 2.550E-21 942360 2.190E-08 942380 2.840E-02 0 0.
2  942390 1.080E+00 942400 5.500E-02 942410 4.020E-03 0 0.
2  942420 2.560E-03 942430 1.370E-21 942440 4.720E-08 0 0.
2  942460 6.918E-28 952410 1.730E-02 952421 1.980E-06 0 0.
2  952420 2.360E-11 952430 1.330E-04 952450 1.240E-29 0 0.
2  952460 9.126E-31 962420 4.773E-09 962430 7.700E-07 0 0.
2  962440 3.270E-05 962450 2.150E-06 962460 7.920E-08 0 0.
2  962470 2.890E-10 962480 6.720E-12 962500 1.241E-20 0 0.
2  972490 3.909E-21 972500 1.023E-29 982490 5.270E-15 0 0.
2  982500 2.090E-16 982510 2.130E-16 982520 3.250E-19 0 0.
2  992540 1.118E-26      0 0.000E+00      0 0.000E+00 0 0.
3   10030 1.880E-06  30060 3.333E-07  30070 1.286E-08 0 0.
3   40090 2.478E-08  40100 1.660E-07  60140 3.330E-08 0 0.
3  300660 9.786E-11 300670 4.265E-12 300680 3.269E-07 0 0.
3  310690 5.050E-10 320700 1.449E-12 310710 1.177E-09 0 0.
3  320720 1.146E-05 320730 3.793E-05 320740 9.762E-05 0 0.
3  330750 2.258E-04 320760 6.710E-04 340760 3.454E-06 0 0.
3  340770 1.463E-03 340780 3.122E-03 340790 7.750E-03 0 0.
3  350790 2.400E-06 340800 1.860E-02 360800 9.214E-08 0 0.
3  350810 3.122E-02 360810 2.918E-09 340820 5.006E-02 0 0.
3  360820 6.326E-04 360830 7.140E-02 360840 1.699E-01 0 0.
3  360850 7.423E-03 370850 1.913E-01 360860 3.176E-01 0 0.
3  380860 3.576E-04 370870 4.140E-01 380870 1.534E-06 0 0.
3  380880 5.923E-01 390890 7.800E-01 380900 5.260E-01 0 0.
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File SBW_RUN1.INP (continued)

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  3  390900 1.320E-04 400900 4.644E-01 400910 9.744E-01 0 0.
  3  400920 1.014E+00 400930 1.090E+00 410930 7.499E-06 0 0.
  3  410931 6.950E-06 400940 5.284E-03 410940 7.520E-03 0 0.
  3  400950 7.548E-26 410950 4.266E-26 410951 2.990E-29 0 0.
  3  420950 1.093E+00 400960 1.108E+00 420960 2.510E-02 0 0.
  3  420970 1.045E+00 420980 1.050E+00 430980 3.670E-06 0 0.
  3  430990 7.310E-01 440990 9.751E-05 421000 1.155E+00 0 0.
  3  441000 7.349E-02 441010 9.262E-01 441020 8.155E-01 0 0.
  3  451020 2.970E-09 451030 4.751E-01 441040 3.665E-01 0 0.
  3  461040 1.236E-01 461050 1.886E-01 441060 1.130E-05 0 0.
  3  451060 1.060E-11 461060 9.951E-02 461070 3.970E-02 0 0.
  3  471070 1.229E-07 461080 1.980E-02 471080 6.570E-20 0 0.
  3  471081 2.080E-11 481080 3.236E-08 471090 8.779E-03 0 0.
  3  471091 9.649E-22 481090 9.760E-16 461100 7.480E-03 0 0.
  3  471100 1.670E-20 471101 1.100E-12 481100 2.455E-03 0 0.
  3  481110 5.965E-03 481120 4.651E-03 481130 7.464E-04 0 0.
  3  481131 2.410E-05 491130 6.667E-05 481140 7.779E-03 0 0.
  3  501140 4.008E-07 491150 2.000E-02 501150 1.314E-04 0 0.
  3  481160 4.145E-03 501160 1.919E-03 501170 4.076E-03 0 0.
  3  501180 4.507E-03 501190 4.335E-03 501191 2.630E-13 0 0.
  3  501200 4.529E-03 501211 1.500E-06 511210 4.582E-03 0 0.
  3  501220 5.051E-03 521220 1.669E-04 501230 2.013E-18 0 0.
  3  511230 5.827E-03 521230 1.630E-06 521231 4.235E-22 0 0.
  3  501240 7.689E-03 521240 1.373E-04 511250 5.510E-05 0 0.
  3  521250 9.946E-03 521251 4.310E-07 501260 1.790E-02 0 0.
  3  511260 8.510E-10 511261 6.470E-12 521260 4.364E-04 0 0.
  3  521270 1.165E-22 521271 3.329E-20 531270 3.819E-02 0 0.
  3  521280 9.668E-02 541280 1.184E-03 531290 3.735E-01 0 0.
  3  541290 8.545E-06 521300 3.644E-01 541300 5.607E-03 0 0.
  3  541310 5.715E-01 541320 1.173E+00 561320 7.984E-07 0 0.
  3  551330 1.517E+00 541340 1.896E+00 551340 1.100E-04 0 0.
  3  561340 1.218E-01 551350 9.230E-01 561350 1.592E-04 0 0.
  3  541360 2.601E+00 561360 1.496E-02 551370 8.060E-01 0 0.
  3  561370 7.459E-01 561371 1.230E-07 561380 1.722E+00 0 0.
  3  571380 1.230E-05 571390 1.635E+00 581400 1.623E+00 0 0.
  3  591410 1.508E+00 581420 1.540E+00 601420 1.720E-02 0 0.
  3  601430 1.298E+00 581440 2.240E-05 591440 9.470E-10 0 0.
  3  591441 1.060E-14 601440 1.680E+00 601450 9.768E-01 0 0.
  3  601460 8.627E-01 611460 2.680E-07 621460 9.700E-06 0 0.
  3  611470 8.690E-04 621470 4.000E-01 601480 4.614E-01 0 0.
  3  621480 1.550E-01 621490 1.730E-02 601500 1.788E-01 0 0.
  3  621500 3.173E-01 631500 2.960E-10 621510 1.640E-02 0 0.
  3  631510 3.931E-03 621520 1.296E-01 631520 2.330E-05 0 0.
  3  641520 7.920E-05 631530 9.269E-02 641530 5.290E-14 0 0.
  3  621540 2.242E-02 631540 1.110E-03 641540 1.848E-02 0 0.
  3  631550 8.880E-04 641550 6.939E-03 641560 2.024E-02 0 0.
  3  641570 1.957E-04 641580 4.288E-03 651590 4.306E-04 0 0.
  3  641600 1.724E-04 651600 4.576E-26 661600 3.421E-05 0 0.
  3  661610 4.305E-05 661620 3.063E-05 661630 1.835E-05 0 0.
  3  661640 4.476E-06 671650 5.522E-06 671661 3.180E-08 0 0.
  3  681660 1.583E-06 681670 3.926E-07 681680 2.481E-07 0 0.
  3  691690 1.063E-09 681700 2.722E-13 691700 1.936E-24 0 0.
  3  701700 1.838E-10 691710 3.570E-15 701710 7.096E-12 0 0.
  3  701720 1.385E-13      0 0.000E+00      0 0.000E+00 0 0.
  0
```

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File SBW_RUN1.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy sbw_run1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbw_run1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out sbw_run1.u6 >nul
copy tape13.out+tape11.out sbw_run1.u11 >nul
ren tape7.out sbw_run1.pch
ren tape15.out sbw_run1.dbg
ren tape16.out sbw_run1.vxs
ren tape50.out sbw_run1.ech
rem  cleanup files
del tape*.inp
del tape*.out
del sbw_run1.pch
del sbw_run1.dbg
del sbw_run1.vxs
del sbw_run1.ech
del sbw_run1.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed ***************************
echo ************************************************************************
echo on
```

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sbw_run1.ci
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mCi/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
SI 32	1.756E-13	1.753E-13	1.748E-13	1.746E-13	1.733E-13	1.729E-13	1.722E-13	1.711E-13
P 32	1.755E-13	1.753E-13	1.748E-13	1.746E-13	1.733E-13	1.730E-13	1.722E-13	1.711E-13
AR 39	2.705E-20	2.705E-20	2.688E-20	2.688E-20	2.639E-20	2.626E-20	2.599E-20	2.558E-20
AR 42	1.961E-20	1.961E-20	1.961E-20	1.961E-20	1.673E-20	1.673E-20	1.532E-20	1.339E-20
K 42	0.000E+00	1.961E-20	1.961E-20	1.961E-20	1.693E-20	1.673E-20	1.538E-20	1.351E-20
CA 45	3.108E-17	2.615E-18	4.466E-21	4.466E-21	8.453E-26	8.453E-26	8.453E-26	7.565E-30
V 50	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18
MN 54	1.815E-07	5.047E-08	6.659E-09	2.962E-09	1.020E-11	2.017E-12	7.896E-14	6.115E-16
FE 55	8.331E-03	5.467E-03	2.807E-03	2.150E-03	3.327E-04	1.952E-04	6.720E-05	1.357E-05
CO 60	8.789E-02	7.140E-02	5.139E-02	4.506E-02	1.794E-02	1.379E-02	8.149E-03	3.702E-03
NI 59	4.926E-04	4.926E-04	4.926E-04	4.926E-04	4.925E-04	4.925E-04	4.925E-04	4.925E-04
NI 63	4.066E-02	4.018E-02	3.943E-02	3.914E-02	3.713E-02	3.657E-02	3.549E-02	3.392E-02
ZN 65	8.587E-16	1.665E-16	1.240E-17	4.371E-18	3.051E-21	3.051E-21	3.051E-21	3.051E-21
IN113M	3.760E-15	1.164E-16	5.628E-19	6.240E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN113	3.757E-15	1.162E-16	5.625E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LU176	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13
LU177	5.087E-17	3.852E-18	6.477E-20	1.023E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LU177M	2.212E-16	1.672E-17	2.278E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09
TA182	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09
RE187	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18
TL206	0.000E+00	2.714E-22	2.714E-22	2.714E-22	2.714E-22	2.714E-22	2.714E-22	2.714E-22
TL207	3.677E-08	4.037E-08	4.563E-08	4.767E-08	6.056E-08	6.395E-08	7.021E-08	7.872E-08
TL208	4.360E-06	2.835E-06	1.664E-06	1.428E-06	9.180E-07	8.882E-07	8.463E-07	7.983E-07
TL209	4.500E-12	4.574E-12	4.887E-12	5.072E-12	7.285E-12	8.211E-12	1.046E-11	1.480E-11
PB209	2.046E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
PB210	2.452E-09	2.731E-09	3.212E-09	3.417E-09	5.043E-09	5.567E-09	6.689E-09	8.549E-09
PB211	3.704E-08	4.048E-08	4.576E-08	4.780E-08	6.073E-08	6.413E-08	7.041E-08	7.894E-08
PB212	1.218E-05	7.891E-06	4.631E-06	3.974E-06	2.555E-06	2.472E-06	2.355E-06	2.222E-06
PB214	7.970E-09	8.625E-09	9.694E-09	1.013E-08	1.327E-08	1.420E-08	1.611E-08	1.909E-08
BI208	3.175E-22	3.175E-22	3.175E-22	3.175E-22	3.175E-22	3.175E-22	3.175E-22	3.175E-22
BI210M	2.725E-22	2.725E-22	2.725E-22	2.725E-22	2.725E-22	2.725E-22	2.725E-22	2.725E-22
BI210	2.458E-09	2.733E-09	3.213E-09	3.419E-09	5.045E-09	5.570E-09	6.692E-09	8.553E-09
BI211	3.698E-08	4.048E-08	4.576E-08	4.780E-08	6.073E-08	6.413E-08	7.041E-08	7.894E-08
BI212	1.218E-05	7.891E-06	4.631E-06	3.974E-06	2.555E-06	2.472E-06	2.355E-06	2.222E-06
BI213	2.070E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
BI214	7.951E-09	8.625E-09	9.694E-09	1.013E-08	1.327E-08	1.420E-08	1.611E-08	1.909E-08
PO210	2.337E-09	2.608E-09	3.082E-09	3.267E-09	5.045E-09	5.381E-09	6.695E-09	8.553E-09
PO211	1.035E-10	1.134E-10	1.281E-10	1.338E-10	1.701E-10	1.796E-10	1.971E-10	2.210E-10
PO212	7.805E-06	5.056E-06	2.967E-06	2.546E-06	1.637E-06	1.584E-06	1.509E-06	1.424E-06
PO213	0.000E+00	2.072E-10	2.214E-10	2.298E-10	3.300E-10	3.719E-10	4.737E-10	6.703E-10
PO214	7.958E-09	8.623E-09	9.692E-09	1.013E-08	1.327E-08	1.420E-08	1.611E-08	1.908E-08
PO215	3.698E-08	4.048E-08	4.576E-08	4.780E-08	6.073E-08	6.413E-08	7.041E-08	7.894E-08
PO216	1.184E-05	7.891E-06	4.631E-06	3.974E-06	2.555E-06	2.472E-06	2.355E-06	2.222E-06
PO218	7.950E-09	8.626E-09	9.696E-09	1.013E-08	1.327E-08	1.421E-08	1.612E-08	1.909E-08
AT217	2.077E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
RN219	3.699E-08	4.048E-08	4.576E-08	4.780E-08	6.073E-08	6.413E-08	7.041E-08	7.894E-08
RN220	1.218E-05	7.891E-06	4.631E-06	3.974E-06	2.555E-06	2.472E-06	2.355E-06	2.222E-06
RN222	7.955E-09	8.626E-09	9.696E-09	1.013E-08	1.327E-08	1.421E-08	1.612E-08	1.909E-08
FR221	2.075E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
FR223	5.108E-10	5.575E-10	6.303E-10	6.582E-10	8.369E-10	8.831E-10	9.699E-10	1.088E-09
RA223	3.694E-08	4.048E-08	4.576E-08	4.780E-08	6.073E-08	6.413E-08	7.041E-08	7.894E-08
RA224	1.205E-05	7.891E-06	4.631E-06	3.974E-06	2.555E-06	2.472E-06	2.355E-06	2.222E-06
RA225	2.075E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
RA226	7.962E-09	8.626E-09	9.696E-09	1.013E-08	1.327E-08	1.421E-08	1.612E-08	1.909E-08
RA228	5.151E-13	5.682E-13	6.373E-13	6.607E-13	7.757E-13	7.975E-13	8.318E-13	8.676E-13
AC225	2.078E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
AC227	3.690E-08	4.040E-08	4.567E-08	4.770E-08	6.065E-08	6.399E-08	7.028E-08	7.881E-08
AC228	5.989E-13	5.682E-13	6.374E-13	6.607E-13	7.758E-13	7.976E-13	8.319E-13	8.676E-13
TH227	3.659E-08	3.993E-08	4.513E-08	4.714E-08	5.990E-08	6.324E-08	6.944E-08	7.786E-08
TH228	1.214E-05	7.855E-06	4.615E-06	3.958E-06	2.553E-06	2.466E-06	2.352E-06	2.220E-06
TH229	2.077E-10	2.118E-10	2.263E-10	2.348E-10	3.373E-10	3.801E-10	4.842E-10	6.851E-10
TH230	9.713E-07	9.855E-07	1.008E-06	1.017E-06	1.080E-06	1.098E-06	1.135E-06	1.190E-06
TH231	1.388E-04	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05
TH232	8.657E-13	8.689E-13	8.740E-13	8.760E-13	8.902E-13	8.943E-13	9.024E-13	9.147E-13

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sbw_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mCi/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
TH234	4.610E-06	2.559E-05	2.559E-05	2.560E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05
PA231	1.077E-07	1.086E-07	1.100E-07	1.105E-07	1.144E-07	1.155E-07	1.176E-07	1.209E-07
PA233	3.654E-04	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03
PA234M	4.603E-06	2.559E-05	2.559E-05	2.560E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05
PA234	5.979E-09	3.327E-08	3.327E-08	3.327E-08	3.327E-08	3.327E-08	3.327E-08	3.327E-08
U232	2.248E-06	2.360E-06	2.445E-06	2.458E-06	2.403E-06	2.367E-06	2.287E-06	2.162E-06
U233	1.482E-08	4.003E-08	8.135E-08	9.889E-08	2.098E-07	2.432E-07	3.067E-07	4.018E-07
U234	9.939E-04	9.961E-04	9.994E-04	1.001E-03	1.010E-03	1.012E-03	1.017E-03	1.024E-03
U235	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05	2.595E-05
U236	4.123E-05	4.123E-05	4.123E-05	4.123E-05	4.123E-05	4.123E-05	4.124E-05	4.124E-05
U237	8.525E-07	9.419E-06	8.351E-06	7.959E-06	5.682E-06	5.161E-06	4.257E-06	3.189E-06
U238	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05
U240	5.086E-14	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13
NP235	3.242E-10	1.181E-10	2.389E-11	1.261E-11	1.436E-13	4.000E-14	3.102E-15	6.697E-17
NP236	3.795E-09	3.795E-09	3.795E-09	3.795E-09	3.795E-09	3.795E-09	3.795E-09	3.795E-09
NP237	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03	3.625E-03
NP238	3.760E-07	9.556E-08	9.448E-08	9.405E-08	9.110E-08	9.027E-08	8.864E-08	8.625E-08
NP239	1.037E-04	2.652E-05	2.651E-05	2.651E-05	2.649E-05	2.649E-05	2.648E-05	2.646E-05
NP240M	2.701E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13
PU236	1.164E-05	7.928E-06	4.317E-06	3.386E-06	6.176E-07	3.799E-07	1.439E-07	3.372E-08
PU238	4.864E-01	4.804E-01	4.710E-01	4.673E-01	4.421E-01	4.352E-01	4.217E-01	4.021E-01
PU239	6.716E-02	6.716E-02	6.715E-02	6.715E-02	6.714E-02	6.713E-02	6.713E-02	6.711E-02
PU240	1.254E-02	1.254E-02	1.253E-02	1.253E-02	1.252E-02	1.252E-02	1.252E-02	1.251E-02
PU241	4.143E-01	3.840E-01	3.404E-01	3.244E-01	2.316E-01	2.104E-01	1.735E-01	1.300E-01
PU242	9.778E-06	9.778E-06	9.778E-06	9.778E-06	9.778E-06	9.778E-06	9.778E-06	9.778E-06
PU243	3.567E-15	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14
PU244	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13
PU246	0.000E+00	2.551E-22	2.551E-22	2.551E-22	2.551E-22	2.551E-22	2.551E-22	2.551E-22
AM241	5.940E-02	6.026E-02	6.146E-02	6.190E-02	6.428E-02	6.478E-02	6.559E-02	6.641E-02
AM242M	1.925E-05	1.911E-05	1.890E-05	1.881E-05	1.822E-05	1.805E-05	1.773E-05	1.725E-05
AM242	1.909E-05	1.902E-05	1.880E-05	1.872E-05	1.813E-05	1.796E-05	1.764E-05	1.716E-05
AM243	2.652E-05	2.652E-05	2.651E-05	2.651E-05	2.649E-05	2.649E-05	2.648E-05	2.646E-05
AM245	0.000E+00	2.663E-23	3.627E-24	1.828E-24	7.194E-27	0.000E+00	0.000E+00	0.000E+00
AM246	0.000E+00	2.551E-22	2.551E-22	2.551E-22	2.551E-22	2.551E-22	2.551E-22	2.551E-22
CM242	1.579E-05	1.575E-05	1.558E-05	1.550E-05	1.499E-05	1.488E-05	1.462E-05	1.419E-05
CM243	3.976E-05	3.827E-05	3.601E-05	3.514E-05	2.964E-05	2.823E-05	2.562E-05	2.214E-05
CM244	2.647E-03	2.491E-03	2.264E-03	2.179E-03	1.667E-03	1.544E-03	1.325E-03	1.053E-03
CM245	3.693E-07	3.692E-07	3.692E-07	3.691E-07	3.689E-07	3.689E-07	3.688E-07	3.686E-07
CM246	2.434E-08	2.433E-08	2.432E-08	2.432E-08	2.430E-08	2.429E-08	2.427E-08	2.425E-08
CM247	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14
CM248	2.858E-14	2.858E-14	2.858E-14	2.858E-14	2.858E-14	2.858E-14	2.858E-14	2.858E-14
CM250	1.020E-21	1.020E-21	1.020E-21	1.020E-21	1.020E-21	1.020E-21	1.020E-21	1.020E-21
BK249	6.408E-18	1.807E-18	2.415E-19	1.260E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BK250	0.000E+00	1.428E-22	1.428E-22	1.428E-22	1.428E-22	1.428E-22	1.428E-22	1.428E-22
CF249	2.160E-14	2.153E-14	2.142E-14	2.138E-14	2.109E-14	2.100E-14	2.084E-14	2.059E-14
CF250	2.286E-14	2.102E-14	1.841E-14	1.746E-14	1.205E-14	1.084E-14	8.769E-15	6.381E-15
CF251	3.380E-16	3.375E-16	3.369E-16	3.366E-16	3.348E-16	3.343E-16	3.333E-16	3.317E-16
CF252	1.748E-16	1.154E-16	5.984E-17	4.600E-17	7.307E-18	4.322E-18	1.504E-18	3.169E-19
H 3	1.815E-02	1.661E-02	1.443E-02	1.365E-02	9.213E-03	8.234E-03	6.578E-03	4.697E-03
BE 10	3.711E-09	3.711E-09	3.711E-09	3.711E-09	3.711E-09	3.711E-09	3.711E-09	3.711E-09
C 14	1.485E-07	1.485E-07	1.484E-07	1.484E-07	1.483E-07	1.482E-07	1.482E-07	1.481E-07
SE 79	5.401E-04	5.401E-04	5.401E-04	5.401E-04	5.400E-04	5.400E-04	5.400E-04	5.400E-04
KR 81	6.139E-11	6.139E-11	6.139E-11	6.139E-11	6.139E-11	6.139E-11	6.139E-11	6.139E-11
KR 85	2.914E+00	2.631E+00	2.238E+00	2.098E+00	1.334E+00	1.172E+00	9.051E-01	6.141E-01
RB 87	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08
SR 90	7.178E+01	6.913E+01	6.513E+01	6.360E+01	5.384E+01	5.134E+01	4.668E+01	4.046E+01
Y 90	7.185E+01	6.915E+01	6.515E+01	6.362E+01	5.385E+01	5.135E+01	4.669E+01	4.047E+01
ZR 93	2.740E-03	2.740E-03	2.740E-03	2.740E-03	2.740E-03	2.740E-03	2.740E-03	2.740E-03
NB 93M	1.965E-03	2.015E-03	2.085E-03	2.111E-03	2.258E-03	2.292E-03	2.349E-03	2.416E-03
NB 94	1.409E-03	1.409E-03	1.409E-03	1.409E-03	1.409E-03	1.409E-03	1.409E-03	1.408E-03
TC 98	3.190E-09	3.190E-09	3.190E-09	3.190E-09	3.190E-09	3.190E-09	3.190E-09	3.190E-09
TC 99	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02	1.240E-02
RH102	3.591E-06	2.462E-06	1.354E-06	1.066E-06	2.001E-07	1.241E-07	4.769E-08	1.137E-08
RU106	3.782E-02	1.276E-02	2.287E-03	1.150E-03	9.337E-06	2.360E-06	1.508E-07	2.435E-09
RH106	3.775E-02	1.276E-02	2.287E-03	1.150E-03	9.337E-06	2.360E-06	1.508E-07	2.435E-09

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sbw_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mCi/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
PD107	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.043E-05
AG108	4.828E-11	4.785E-11	4.721E-11	4.695E-11	4.519E-11	4.470E-11	4.373E-11	4.232E-11
AG108M	5.423E-10	5.377E-10	5.304E-10	5.275E-10	5.077E-10	5.022E-10	4.914E-10	4.756E-10
AG109M	2.523E-12	1.065E-12	2.721E-13	1.577E-13	3.460E-15	1.162E-15	1.310E-16	4.961E-18
CD109	2.521E-12	1.065E-12	2.721E-13	1.577E-13	3.460E-15	1.162E-15	1.310E-16	4.941E-18
AG110	6.965E-11	1.403E-11	1.114E-12	4.045E-13	3.364E-16	4.434E-17	7.706E-19	2.105E-21
AG110M	5.228E-09	1.055E-09	8.377E-11	3.041E-11	2.529E-14	3.334E-15	5.790E-17	1.583E-19
CD113M	5.228E-03	4.850E-03	4.307E-03	4.107E-03	2.945E-03	2.678E-03	2.215E-03	1.665E-03
IN115	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13
SN119M	1.178E-09	2.303E-10	1.739E-11	6.190E-12	4.472E-15	5.663E-16	9.119E-18	0.000E+00
SN121M	8.872E-05	8.680E-05	8.384E-05	8.269E-05	7.504E-05	7.298E-05	6.904E-05	6.353E-05
SN123	1.655E-14	7.479E-16	5.633E-18	7.685E-19	8.453E-25	8.453E-25	3.327E-28	2.598E-33
TE123	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16
TE123M	3.758E-18	1.755E-19	5.242E-20	5.883E-20	2.180E-26	2.180E-26	4.607E-30	1.416E-35
SB125	5.692E-02	3.833E-02	2.050E-02	1.596E-02	2.769E-03	1.679E-03	6.170E-04	1.375E-04
TE125M	7.766E-03	9.346E-03	5.003E-03	3.895E-03	6.757E-04	4.097E-04	1.505E-04	3.354E-05
SN126	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04
SB126	7.118E-05	7.113E-05	7.112E-05	7.112E-05	7.112E-05	7.112E-05	7.112E-05	7.111E-05
SB126M	5.084E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04	5.080E-04
TE127	3.076E-16	7.898E-18	2.376E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	3.141E-16	8.063E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05
CS134	1.424E-01	8.371E-02	3.613E-02	2.581E-02	2.454E-03	1.253E-03	3.265E-04	4.345E-05
CS135	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03
CS137	7.014E+01	6.763E+01	6.383E+01	6.237E+01	5.306E+01	5.066E+01	4.619E+01	4.021E+01
BA137M	6.619E+01	6.397E+01	6.038E+01	5.900E+01	5.019E+01	4.793E+01	4.369E+01	3.804E+01
LA138	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13
CE142	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08
CE144	7.149E-02	1.750E-02	1.888E-03	7.750E-04	1.522E-06	2.563E-07	7.270E-09	3.473E-11
PR144	7.158E-02	1.750E-02	1.888E-03	7.750E-04	1.522E-06	2.563E-07	7.270E-09	3.473E-11
PR144M	1.923E-06	2.100E-04	2.266E-05	9.300E-06	1.826E-08	3.076E-09	8.724E-11	4.168E-13
ND144	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12
PM146	1.194E-04	9.781E-05	7.138E-05	6.293E-05	2.604E-05	2.024E-05	1.223E-05	5.740E-06
SM146	3.395E-10	3.401E-10	3.408E-10	3.411E-10	3.422E-10	3.423E-10	3.426E-10	3.428E-10
PM147	8.059E-01	5.309E-01	2.742E-01	2.106E-01	3.313E-02	1.953E-02	6.787E-03	1.391E-03
SM147	9.094E-09	9.101E-09	9.107E-09	9.109E-09	9.113E-09	9.114E-09	9.114E-09	9.114E-09
SM148	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14
SM149	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15
EU150	1.960E-08	1.902E-08	1.812E-08	1.778E-08	1.554E-08	1.495E-08	1.384E-08	1.233E-08
SM151	4.316E-01	4.264E-01	4.183E-01	4.151E-01	3.933E-01	3.873E-01	3.755E-01	3.586E-01
EU152	4.031E-03	3.719E-03	3.274E-03	3.112E-03	2.178E-03	1.967E-03	1.604E-03	1.181E-03
GD152	1.726E-15	1.737E-15	1.752E-15	1.758E-15	1.791E-15	1.798E-15	1.811E-15	1.826E-15
GD153	1.866E-10	3.574E-11	2.614E-12	9.184E-13	6.065E-16	7.489E-17	1.115E-18	0.000E+00
EU154	2.997E-01	2.639E-01	2.157E-01	1.990E-01	1.132E-01	9.636E-02	6.981E-02	4.304E-02
EU155	4.132E-01	3.313E-01	2.336E-01	2.031E-01	7.636E-02	5.774E-02	3.301E-02	1.427E-02
HO166M	5.709E-08	5.704E-08	5.696E-08	5.693E-08	5.670E-08	5.663E-08	5.650E-08	5.630E-08
TM170	1.157E-20	1.157E-20	1.157E-20	1.157E-20	1.196E-26	1.196E-26	4.545E-30	3.366E-35
TM171	3.889E-12	2.198E-12	8.915E-13	6.214E-13	4.964E-14	2.411E-14	5.690E-15	6.522E-16

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Source Listing of Program ROUNDSB1

```
      PROGRAM ROUNDSB1

!-------- WRITTEN BY D.R. WENZEL

!           To round output from file sbw_2095.ci to 2 places
!           of accuracy and to convert from mCi/L to Ci/L

      CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
      CHARACTER (LEN=10) :: BLANK, ZERO(7)
      CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
      CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
      CHARACTER (LEN=96) :: BUFFER2
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9)
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      EQUIVALENCE (BUFFER2, BUFFER3(1))
      EQUIVALENCE (ZERO(1), BUFFER3(27))

      REAL :: DATA(175,7), VALUE(7)

      DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='SBW_RUN1.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='ROUNDSB1.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'ROUNDSB1.OUT (Ci/L)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NAME2
 1000 FORMAT(A12, 5X, A24)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUCLIDE2(LAST) = NAME2
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,175
         DO K=1,7
            DATA(l,K) = 0.
         END DO

      END DO
```

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Source Listing of Program ROUNDSB1 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'1999Jul   2002Jan   ', &
              '2003Jan   2010Jan   2012Jan   2016Jan   2022Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,175
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7

!-------- Multiply fy .001 to convert from mCi/L to Ci/L

                DATA(J,K) = VALUE(K) * .001
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO
```

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Source Listing of Program ROUNDSB1 (continued)

```
      GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDSB1
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

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ROUNDSB1.OUT (Ci/L)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	1.7E-05	1.4E-05	1.4E-05	9.2E-06	8.2E-06	6.6E-06	4.7E-06
Be-10	1.600E+06	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
C-14	5.729E+03	yr	1.5E-10	1.5E-10	1.5E-10	1.5E-10	1.5E-10	1.5E-10	1.5E-10
Fe-55	2.600E+00	yr	5.5E-06	2.8E-06	2.2E-06	3.3E-07	2.0E-07	6.7E-08	1.4E-08
Ni-59	8.000E+04	yr	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07
Co-60	5.270E+00	yr	7.1E-05	5.1E-05	4.5E-05	1.8E-05	1.4E-05	8.1E-06	3.7E-06
Ni-63	9.200E+01	yr	4.0E-05	3.9E-05	3.9E-05	3.7E-05	3.7E-05	3.5E-05	3.4E-05
Se-79	6.496E+04	yr	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07
Rb-87	4.696E+10	yr	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11
Sr-90	2.912E+01	yr	6.9E-02	6.5E-02	6.4E-02	5.4E-02	5.1E-02	4.7E-02	4.0E-02
Y-90	6.400E+01	h	6.9E-02	6.5E-02	6.4E-02	5.4E-02	5.1E-02	4.7E-02	4.0E-02
Zr-93	1.530E+06	yr	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06
Nb-93m	1.360E+01	yr	2.0E-06	2.1E-06	2.1E-06	2.3E-06	2.3E-06	2.3E-06	2.4E-06
Nb-94	2.030E+04	yr	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06
Tc-98	4.199E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Tc-99	2.130E+05	yr	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
Ru-102	1.059E+03	d	2.5E-09	1.4E-09	1.1E-09	2.0E-10	1.2E-10	4.8E-11	1.1E-11
Ru-106	3.682E+02	d	1.3E-05	2.3E-06	1.2E-06	9.3E-09	2.4E-09	1.5E-10	2.4E-12
Rh-106	2.990E+01	s	1.3E-05	2.3E-06	1.2E-06	9.3E-09	2.4E-09	1.5E-10	2.4E-12
Pd-107	6.496E+06	yr	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Ag-108	2.370E+00	m	4.8E-14	4.7E-14	4.7E-14	4.5E-14	4.5E-14	4.4E-14	4.2E-14
Ag-108m	1.270E+02	yr	5.4E-13	5.3E-13	5.3E-13	5.1E-13	5.0E-13	4.9E-13	4.8E-13
Ag-109m	3.960E+01	s	1.1E-15	2.7E-16	1.6E-16	3.5E-18	1.2E-18	1.3E-19	5.0E-21
Cd-109	4.640E+02	d	1.1E-15	2.7E-16	1.6E-16	3.5E-18	1.2E-18	1.3E-19	4.9E-21
Ag-110	2.460E+01	s	1.4E-14	1.1E-15	4.0E-16	3.4E-19	4.4E-20	7.7E-22	2.1E-24
Ag-110m	2.499E+02	d	1.1E-12	8.4E-14	3.0E-14	2.5E-17	3.3E-18	5.8E-20	1.6E-22
Cd-113m	1.459E+01	yr	4.9E-06	4.3E-06	4.1E-06	2.9E-06	2.7E-06	2.2E-06	1.7E-06
In-115	4.997E+14	yr	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16
Sn-119m	2.450E+02	d	2.3E-13	1.7E-14	6.2E-15	4.5E-18	5.7E-19	9.1E-21	
Sn-121m	4.997E+01	yr	8.7E-08	8.4E-08	8.3E-08	7.5E-08	7.3E-08	6.9E-08	6.4E-08
Te-123	1.000E+13	yr	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19
Sb-125	2.770E+00	yr	3.8E-05	2.1E-05	1.6E-05	2.8E-06	1.7E-06	6.2E-07	1.4E-07
Te-125m	5.800E+01	d	9.3E-06	5.0E-06	3.9E-06	6.8E-07	4.1E-07	1.5E-07	3.4E-08
Sn-126	1.000E+05	yr	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07
Sb-126	1.240E+01	d	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08
Sb-126m	1.900E+01	m	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.1E-07
I-129	1.570E+07	yr	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08
Cs-134	2.062E+00	yr	8.4E-05	3.6E-05	2.6E-05	2.5E-06	1.3E-06	3.3E-07	4.3E-08
Cs-135	2.300E+06	yr	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Cs-137	3.000E+01	yr	6.8E-02	6.4E-02	6.2E-02	5.3E-02	5.1E-02	4.6E-02	4.0E-02
Ba-137m	2.552E+00	m	6.4E-02	6.0E-02	5.9E-02	5.0E-02	4.8E-02	4.4E-02	3.8E-02
La-138	1.350E+11	yr	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16
Ce-142	1.049E+11	yr	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11
Ce-144	2.843E+02	d	1.8E-05	1.9E-06	7.8E-07	1.5E-09	2.6E-10	7.3E-12	3.5E-14
Pr-144	1.728E+01	m	1.8E-05	1.9E-06	7.8E-07	1.5E-09	2.6E-10	7.3E-12	3.5E-14
Pr-144m	7.200E+00	m	2.1E-07	2.3E-08	9.3E-09	1.8E-11	3.1E-12	8.7E-14	4.2E-16
Nd-144	2.099E+15	yr	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15
Pm-146	5.500E+00	yr	9.8E-08	7.1E-08	6.3E-08	2.6E-08	2.0E-08	1.2E-08	5.7E-09
Sm-146	7.000E+07	yr	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13
Pm-147	2.623E+00	yr	5.3E-04	2.7E-04	2.1E-04	3.3E-05	2.0E-05	6.8E-06	1.4E-06
Sm-147	1.070E+11	yr	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12
Sm-148	8.001E+15	yr	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17
Sm-149	9.994E+15	yr	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18
Eu-150	3.600E+01	yr	1.9E-11	1.8E-11	1.8E-11	1.6E-11	1.5E-11	1.4E-11	1.2E-11
Sm-151	8.999E+01	yr	4.3E-04	4.2E-04	4.2E-04	3.9E-04	3.9E-04	3.8E-04	3.6E-04
Eu-152	1.360E+01	yr	3.7E-06	3.3E-06	3.1E-06	2.2E-06	2.0E-06	1.6E-06	1.2E-06
Gd-152	1.080E+14	yr	1.7E-18	1.8E-18	1.8E-18	1.8E-18	1.8E-18	1.8E-18	1.8E-18
Gd-153	2.420E+02	d	3.6E-14	2.6E-15	9.2E-16	6.1E-19	7.5E-20	1.1E-21	
Eu-154	8.600E+00	yr	2.6E-04	2.2E-04	2.0E-04	1.1E-04	9.6E-05	7.0E-05	4.3E-05
Eu-155	4.959E+00	yr	3.3E-04	2.3E-04	2.0E-04	7.6E-05	5.8E-05	3.3E-05	1.4E-05
Ho-166m	1.200E+03	yr	5.7E-11	5.7E-11	5.7E-11	5.7E-11	5.7E-11	5.7E-11	5.6E-11
Tm-171	1.920E+00	yr	2.2E-15	8.9E-16	6.2E-16	5.0E-17	2.4E-17	5.7E-18	6.5E-19
Tl-207	4.770E+00	m	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Tl-208	3.070E+00	m	2.8E-09	1.7E-09	1.4E-09	9.2E-10	8.9E-10	8.5E-10	8.0E-10
Tl-209	2.200E+00	m	4.6E-15	4.9E-15	5.1E-15	7.3E-15	8.2E-15	1.0E-14	1.5E-14

Appendix D-6
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ROUNDSB1.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pb-209	3.300E+00	h	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Pb-210	2.230E+01	yr	2.7E-12	3.2E-12	3.4E-12	5.0E-12	5.6E-12	6.7E-12	8.5E-12
Pb-211	3.610E+01	m	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Pb-212	1.064E+01	h	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Pb-214	2.680E+01	m	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Bi-210m	3.000E+06	yr	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25
Bi-210	5.012E+00	d	2.7E-12	3.2E-12	3.4E-12	5.0E-12	5.6E-12	6.7E-12	8.6E-12
Bi-211	2.130E+00	m	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Bi-212	6.055E+01	m	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Bi-213	4.565E+01	m	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Bi-214	1.990E+01	m	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Po-210	1.384E+02	d	2.6E-12	3.1E-12	3.3E-12	5.0E-12	5.4E-12	6.7E-12	8.6E-12
Po-211	5.600E-01	s	1.1E-13	1.3E-13	1.3E-13	1.7E-13	1.8E-13	2.0E-13	2.2E-13
Po-212	3.000E-07	s	5.1E-09	3.0E-09	2.5E-09	1.6E-09	1.6E-09	1.5E-09	1.4E-09
Po-213	4.200E-06	s	2.1E-13	2.2E-13	2.3E-13	3.3E-13	3.7E-13	4.7E-13	6.7E-13
Po-214	1.643E-04	s	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Po-215	1.780E-03	s	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Po-216	1.500E-01	s	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Po-218	3.050E+00	m	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
At-217	3.230E-02	s	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Rn-219	3.960E+00	s	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Rn-220	5.560E+01	s	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Rn-222	3.824E+00	d	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Fr-221	4.800E+00	m	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Fr-223	2.180E+01	m	5.6E-13	6.3E-13	6.6E-13	8.4E-13	8.8E-13	9.7E-13	1.1E-12
Ra-223	1.143E+01	d	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Ra-224	3.660E+00	d	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Ra-225	1.480E+01	d	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Ra-226	1.600E+03	yr	8.6E-12	9.7E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Ra-228	6.700E+00	yr	5.7E-16	6.4E-16	6.6E-16	7.8E-16	8.0E-16	8.3E-16	8.7E-16
Ac-225	1.000E+01	d	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Ac-227	2.177E+01	yr	4.0E-11	4.6E-11	4.8E-11	6.1E-11	6.4E-11	7.0E-11	7.9E-11
Ac-228	6.131E+00	h	5.7E-16	6.4E-16	6.6E-16	7.8E-16	8.0E-16	8.3E-16	8.7E-16
Th-227	1.872E+01	d	4.0E-11	4.5E-11	4.7E-11	6.0E-11	6.3E-11	6.9E-11	7.8E-11
Th-228	1.913E+00	yr	7.9E-09	4.6E-09	4.0E-09	2.6E-09	2.5E-09	2.4E-09	2.2E-09
Th-229	7.339E+03	yr	2.1E-13	2.3E-13	2.3E-13	3.4E-13	3.8E-13	4.8E-13	6.9E-13
Th-230	7.700E+04	yr	9.9E-10	1.0E-09	1.0E-09	1.1E-09	1.1E-09	1.1E-09	1.2E-09
Th-231	2.552E+01	h	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Th-232	1.405E+10	yr	8.7E-16	8.7E-16	8.8E-16	8.9E-16	8.9E-16	9.0E-16	9.1E-16
Th-234	2.410E+01	d	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-231	3.277E+04	yr	1.1E-10	1.1E-10	1.1E-10	1.1E-10	1.2E-10	1.2E-10	1.2E-10
Pa-233	2.700E+01	d	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Pa-234m	1.170E+00	m	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-234	6.700E+00	h	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11
U-232	7.200E+01	yr	2.4E-09	2.4E-09	2.5E-09	2.4E-09	2.4E-09	2.3E-09	2.2E-09
U-233	1.585E+05	yr	4.0E-11	8.1E-11	9.9E-11	2.1E-10	2.4E-10	3.1E-10	4.0E-10
U-234	2.445E+05	yr	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06	1.0E-06
U-235	7.038E+08	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
U-236	2.341E+07	yr	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.1E-08
U-237	6.750E+00	d	9.4E-09	8.4E-09	8.0E-09	5.7E-09	5.2E-09	4.3E-09	3.2E-09
U-238	4.468E+09	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
U-240	1.410E+01	h	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Np-236	1.150E+05	yr	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12
Np-237	2.140E+06	yr	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Np-238	2.117E+00	d	9.6E-11	9.4E-11	9.4E-11	9.1E-11	9.0E-11	8.9E-11	8.6E-11
Np-239	2.355E+00	d	2.7E-08	2.7E-08	2.7E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Np-240m	7.400E+00	m	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Pu-236	2.851E+00	yr	7.9E-09	4.3E-09	3.4E-09	6.2E-10	3.8E-10	1.4E-10	3.4E-11
Pu-238	8.774E+01	yr	4.8E-04	4.7E-04	4.7E-04	4.4E-04	4.4E-04	4.2E-04	4.0E-04
Pu-239	2.406E+04	yr	6.7E-05	6.7E-05	6.7E-05	6.7E-05	6.7E-05	6.7E-05	6.7E-05
Pu-240	6.537E+03	yr	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
Pu-241	1.440E+01	yr	3.8E-04	3.4E-04	3.2E-04	2.3E-04	2.1E-04	1.7E-04	1.3E-04
Pu-242	3.869E+05	yr	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09
Pu-243	4.956E+00	h	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Pu-244	8.261E+07	yr	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16

Appendix D-6
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ROUNDSB1.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Am-241	4.322E+02	yr	6.0E-05	6.1E-05	6.2E-05	6.4E-05	6.5E-05	6.6E-05	6.6E-05
Am-242m	1.520E+02	yr	1.9E-08	1.9E-08	1.9E-08	1.8E-08	1.8E-08	1.8E-08	1.7E-08
Am-242	1.602E+01	h	1.9E-08	1.9E-08	1.9E-08	1.8E-08	1.8E-08	1.8E-08	1.7E-08
Am-243	7.380E+03	yr	2.7E-08	2.7E-08	2.7E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Cm-242	1.632E+02	d	1.6E-08	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.5E-08	1.4E-08
Cm-243	2.850E+01	yr	3.8E-08	3.6E-08	3.5E-08	3.0E-08	2.8E-08	2.6E-08	2.2E-08
Cm-244	1.811E+01	yr	2.5E-06	2.3E-06	2.2E-06	1.7E-06	1.5E-06	1.3E-06	1.1E-06
Cm-245	8.499E+03	yr	3.7E-10	3.7E-10	3.7E-10	3.7E-10	3.7E-10	3.7E-10	3.7E-10
Cm-246	4.731E+03	yr	2.4E-11	2.4E-11	2.4E-11	2.4E-11	2.4E-11	2.4E-11	2.4E-11
Cm-247	1.560E+07	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Cm-248	3.391E+05	yr	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17
Cf-249	3.505E+02	yr	2.2E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17	2.1E-17
Cf-250	1.308E+01	yr	2.1E-17	1.8E-17	1.7E-17	1.2E-17	1.1E-17	8.8E-18	6.4E-18
Cf-251	8.980E+02	yr	3.4E-19	3.4E-19	3.4E-19	3.3E-19	3.3E-19	3.3E-19	3.3E-19
Cf-252	2.638E+00	yr	1.2E-19	6.0E-20	4.6E-20	7.3E-21	4.3E-21	1.5E-21	3.2E-22
Ca-45	1.630E+02	d	2.6E-21	4.5E-24	4.5E-24	8.5E-29	8.5E-29	8.5E-29	7.6E-33
V-50	4.000E+16	yr	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21
Mn-54	3.125E+02	d	5.0E-11	6.7E-12	3.0E-12	1.0E-14	2.0E-15	7.9E-17	6.1E-19
Fe-55	2.600E+00	yr	5.5E-06	2.8E-06	2.2E-06	3.3E-07	2.0E-07	6.7E-08	1.4E-08
Lu-176	3.000E+10	yr	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16
Lu-177	6.709E+00	d	3.9E-21	6.5E-23	1.0E-23				
Hf-182	9.000E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Ta-182	1.150E+02	d	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Re-187	5.000E+10	yr	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21

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sbw_run1.g
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
HE 3	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12
B 10	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14
B 11	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05
C 12	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02
C 13	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04
N 14	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02
N 15	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04
O 16	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00
O 17	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03
O 18	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03
F 19	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09
NE 20	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14
NE 21	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13
NE 22	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11
NA 23	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12
MG 24	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07
MG 25	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07
MG 26	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07
AL 27	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02
SI 28	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02
SI 29	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03
SI 30	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03
SI 32	1.021E-14	1.019E-14	1.017E-14	1.015E-14	1.008E-14	1.006E-14	1.002E-14	9.951E-15
P 31	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03
P 32	6.149E-19	6.140E-19	6.123E-19	6.117E-19	6.071E-19	6.058E-19	6.033E-19	5.994E-19
S 32	0.000E+00	1.719E-17	4.433E-17	5.516E-17	1.307E-16	1.522E-16	1.950E-16	2.589E-16
S 34	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05
CL 37	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14
AR 38	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19
AR 39	7.935E-22	7.935E-22	7.884E-22	7.884E-22	7.742E-22	7.702E-22	7.622E-22	7.505E-22
AR 40	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14
AR 42	7.600E-23	7.600E-23	7.600E-23	7.600E-23	6.483E-23	6.483E-23	5.938E-23	5.190E-23
K 41	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15
K 42	0.000E+00	3.248E-27	3.248E-27	3.248E-27	2.804E-27	2.770E-27	2.547E-27	2.237E-27
CA 42	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17
CA 43	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09
CA 44	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08
CA 45	1.745E-21	1.468E-22	2.507E-25	2.507E-25	4.745E-30	4.745E-30	4.745E-30	4.247E-34
CA 46	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09
SC 45	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10
TI 46	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03
TI 47	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03
TI 48	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02
TI 49	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03
TI 50	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03
V 50	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05
V 51	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03
CR 50	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01
CR 52	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00
CR 53	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01
CR 54	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01
MN 54	2.345E-11	6.520E-12	8.602E-13	3.826E-13	1.317E-15	2.606E-16	1.020E-17	7.899E-20
MN 55	1.060E-03	1.061E-03	1.062E-03	1.062E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03
FE 54	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01
FE 55	3.331E-06	2.186E-06	1.123E-06	8.598E-07	1.330E-07	7.805E-08	2.687E-08	5.427E-09
FE 56	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00
FE 57	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01
FE 58	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02
CO 59	2.578E-04	2.579E-04	2.580E-04	2.581E-04	2.585E-04	2.586E-04	2.588E-04	2.592E-04
CO 60	7.770E-05	6.312E-05	4.543E-05	3.983E-05	1.586E-05	1.219E-05	7.205E-06	3.272E-06
NI 58	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00
NI 59	6.501E-03	6.501E-03	6.501E-03	6.501E-03	6.500E-03	6.500E-03	6.500E-03	6.500E-03
NI 60	8.188E-01	8.188E-01	8.188E-01	8.188E-01	8.189E-01	8.189E-01	8.189E-01	8.189E-01
NI 61	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02
NI 62	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01

Appendix D-7
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sbw_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
NI 63	6.590E-04	6.512E-04	6.391E-04	6.343E-04	6.017E-04	5.927E-04	5.751E-04	5.497E-04
NI 64	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02
CU 63	2.109E-04	2.187E-04	2.308E-04	2.356E-04	2.682E-04	2.772E-04	2.948E-04	3.202E-04
CU 65	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05
ZN 64	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08
ZN 65	1.042E-19	2.020E-20	1.504E-21	5.304E-22	3.703E-25	3.703E-25	3.703E-25	3.703E-25
MO 94	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06
RU 98	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18
IN113	0.000E+00	3.627E-19	3.743E-19	3.743E-19	3.743E-19	3.743E-19	3.743E-19	3.743E-19
IN113M	2.247E-22	6.955E-24	3.363E-26	3.729E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN112	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01
SN113	3.741E-19	1.157E-20	5.601E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB173	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11
YB174	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13
LU175	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04
LU176	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05
LU177	4.625E-22	3.502E-23	5.889E-25	9.301E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LU177M	4.646E-20	3.511E-21	4.785E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF174	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04
HF176	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02
HF177	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03
HF178	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01
HF179	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01
HF180	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01
HF182	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05
TA181	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02
TA182	5.128E-13	5.129E-13	5.129E-13	5.129E-13	5.129E-13	5.129E-13	5.129E-13	5.129E-13
W182	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03
W183	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03
W184	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04
W186	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09
RE185	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07
RE187	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10
OS186	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08
OS187	0.000E+00	4.133E-21	1.067E-20	1.329E-20	3.160E-20	3.683E-20	4.730E-20	6.299E-20
OS188	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12
OS189	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14
OS190	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15
HE 4	0.000E+00	7.721E-06	1.980E-05	2.459E-05	5.738E-05	6.651E-05	8.448E-05	1.107E-04
TL206	0.000E+00	1.245E-30	1.245E-30	1.245E-30	1.245E-30	1.245E-30	1.245E-30	1.245E-30
TL207	1.930E-16	2.119E-16	2.395E-16	2.502E-16	3.179E-16	3.357E-16	3.686E-16	4.132E-16
TL208	1.480E-14	9.624E-15	5.649E-15	4.848E-15	3.116E-15	3.015E-15	2.873E-15	2.710E-15
TL209	1.100E-20	1.118E-20	1.195E-20	1.240E-20	1.781E-20	2.007E-20	2.556E-20	3.617E-20
PB206	1.042E-11	1.200E-11	1.486E-11	1.614E-11	2.777E-11	3.193E-11	4.160E-11	5.974E-11
PB207	1.961E-10	2.206E-10	2.637E-10	2.824E-10	4.350E-10	4.850E-10	5.929E-10	7.726E-10
PB208	1.052E-07	1.115E-07	1.175E-07	1.193E-07	1.277E-07	1.298E-07	1.337E-07	1.392E-07
PB209	4.500E-17	4.659E-17	4.977E-17	5.166E-17	7.419E-17	8.363E-17	1.065E-16	1.507E-16
PB210	3.210E-11	3.576E-11	4.205E-11	4.473E-11	6.603E-11	7.289E-11	8.758E-11	1.119E-10
PB211	1.500E-15	1.639E-15	1.853E-15	1.936E-15	2.459E-15	2.597E-15	2.851E-15	3.197E-15
PB212	8.760E-12	5.677E-12	3.332E-12	2.859E-12	1.838E-12	1.778E-12	1.695E-12	1.598E-12
PB214	2.430E-16	2.630E-16	2.956E-16	3.088E-16	4.046E-16	4.331E-16	4.912E-16	5.819E-16
BI208	6.795E-20	6.795E-20	6.795E-20	6.795E-20	6.795E-20	6.795E-20	6.795E-20	6.795E-20
BI209	1.447E-12	1.581E-12	1.802E-12	1.895E-12	2.687E-12	2.976E-12	3.671E-12	5.078E-12
BI210M	4.800E-19	4.800E-19	4.800E-19	4.800E-19	4.800E-19	4.800E-19	4.800E-19	4.800E-19
BI210	1.980E-14	2.202E-14	2.589E-14	2.754E-14	4.064E-14	4.487E-14	5.391E-14	6.890E-14
BI211	8.836E-17	9.672E-17	1.093E-16	1.142E-16	1.451E-16	1.532E-16	1.682E-16	1.886E-16
BI212	8.310E-13	5.385E-13	3.160E-13	2.712E-13	1.743E-13	1.687E-13	1.607E-13	1.516E-13
BI213	1.070E-17	1.095E-17	1.170E-17	1.214E-17	1.743E-17	1.965E-17	2.503E-17	3.541E-17
BI214	1.800E-16	1.953E-16	2.195E-16	2.293E-16	3.005E-16	3.216E-16	3.648E-16	4.321E-16
PO210	5.200E-13	5.803E-13	6.859E-13	7.271E-13	1.123E-12	1.197E-12	1.490E-12	1.903E-12
PO211	1.084E-21	1.187E-21	1.341E-21	1.401E-21	1.780E-21	1.880E-21	2.064E-21	2.314E-21
PO212	4.398E-23	2.849E-23	1.672E-23	1.435E-23	9.224E-24	8.925E-24	8.504E-24	8.022E-24
PO213	0.000E+00	1.642E-26	1.755E-26	1.821E-26	2.615E-26	2.948E-26	3.755E-26	5.313E-26
PO214	2.479E-23	2.686E-23	3.019E-23	3.155E-23	4.134E-23	4.424E-23	5.018E-23	5.945E-23

Appendix D-7
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sbw_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
PO215	1.254E-21	1.373E-21	1.552E-21	1.621E-21	2.059E-21	2.174E-21	2.387E-21	2.677E-21
PO216	3.400E-17	2.265E-17	1.329E-17	1.141E-17	7.334E-18	7.097E-18	6.762E-18	6.378E-18
PO218	2.810E-17	3.049E-17	3.427E-17	3.581E-17	4.692E-17	5.022E-17	5.696E-17	6.748E-17
AT217	1.290E-22	1.315E-22	1.405E-22	1.458E-22	2.094E-22	2.361E-22	3.007E-22	4.254E-22
RN219	2.842E-18	3.111E-18	3.516E-18	3.673E-18	4.667E-18	4.927E-18	5.410E-18	6.066E-18
RN220	1.320E-14	8.552E-15	5.019E-15	4.307E-15	2.769E-15	2.679E-15	2.553E-15	2.408E-15
RN222	5.170E-14	5.606E-14	6.301E-14	6.584E-14	8.627E-14	9.233E-14	1.047E-13	1.241E-13
FR221	1.170E-18	1.194E-18	1.276E-18	1.324E-18	1.902E-18	2.144E-18	2.730E-18	3.863E-18
FR223	1.320E-17	1.441E-17	1.629E-17	1.701E-17	2.163E-17	2.282E-17	2.506E-17	2.811E-17
RA223	7.210E-13	7.902E-13	8.932E-13	9.330E-13	1.185E-12	1.252E-12	1.374E-12	1.541E-12
RA224	7.560E-11	4.952E-11	2.906E-11	2.494E-11	1.603E-11	1.551E-11	1.478E-11	1.394E-11
RA225	5.290E-15	5.400E-15	5.769E-15	5.987E-15	8.599E-15	9.693E-15	1.235E-14	1.747E-14
RA226	8.050E-09	8.721E-09	9.803E-09	1.024E-08	1.342E-08	1.436E-08	1.629E-08	1.930E-08
RA228	2.200E-15	2.427E-15	2.722E-15	2.822E-15	3.313E-15	3.406E-15	3.553E-15	3.706E-15
AC225	3.580E-15	3.648E-15	3.897E-15	4.045E-15	5.809E-15	6.548E-15	8.339E-15	1.180E-14
AC227	5.100E-10	5.583E-10	6.312E-10	6.591E-10	8.381E-10	8.843E-10	9.712E-10	1.089E-09
AC228	2.670E-19	2.533E-19	2.842E-19	2.946E-19	3.459E-19	3.556E-19	3.709E-19	3.868E-19
TH227	1.190E-12	1.298E-12	1.468E-12	1.533E-12	1.948E-12	2.057E-12	2.258E-12	2.532E-12
TH228	1.480E-08	9.579E-09	5.628E-09	4.826E-09	3.114E-09	3.007E-09	2.869E-09	2.708E-09
TH229	9.760E-10	9.951E-10	1.063E-09	1.103E-09	1.585E-09	1.786E-09	2.275E-09	3.219E-09
TH230	4.810E-05	4.880E-05	4.991E-05	5.036E-05	5.349E-05	5.439E-05	5.620E-05	5.892E-05
TH231	2.610E-10	4.879E-11	4.879E-11	4.879E-11	4.879E-11	4.879E-11	4.879E-11	4.880E-11
TH232	7.890E-06	7.919E-06	7.966E-06	7.984E-06	8.114E-06	8.151E-06	8.225E-06	8.336E-06
TH234	1.990E-10	1.105E-09	1.105E-09	1.105E-09	1.105E-09	1.105E-09	1.105E-09	1.105E-09
PA231	2.280E-06	2.299E-06	2.328E-06	2.339E-06	2.420E-06	2.443E-06	2.490E-06	2.559E-06
PA233	1.760E-08	1.746E-07	1.746E-07	1.746E-07	1.746E-07	1.746E-07	1.746E-07	1.746E-07
PA234M	6.700E-15	3.725E-14	3.725E-14	3.725E-14	3.725E-14	3.725E-14	3.725E-14	3.725E-14
PA234	2.990E-15	1.664E-14	1.664E-14	1.664E-14	1.664E-14	1.664E-14	1.664E-14	1.664E-14
U232	1.050E-07	1.102E-07	1.142E-07	1.148E-07	1.122E-07	1.105E-07	1.068E-07	1.010E-07
U233	1.530E-06	4.134E-06	8.400E-06	1.021E-05	2.167E-05	2.512E-05	3.167E-05	4.149E-05
U234	1.590E-01	1.593E-01	1.599E-01	1.601E-01	1.615E-01	1.619E-01	1.627E-01	1.638E-01
U235	1.200E+01	1.200E+01	1.200E+01	1.200E+01	1.200E+01	1.200E+01	1.200E+01	1.200E+01
U236	6.370E-01	6.370E-01	6.370E-01	6.370E-01	6.371E-01	6.371E-01	6.371E-01	6.371E-01
U237	1.044E-11	1.154E-10	1.023E-10	9.747E-11	6.958E-11	6.320E-11	5.213E-11	3.905E-11
U238	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01
U240	5.490E-20	9.028E-19	9.028E-19	9.028E-19	9.028E-19	9.028E-19	9.028E-19	9.028E-19
NP235	2.310E-13	8.414E-14	1.702E-14	8.982E-15	1.023E-16	2.850E-17	2.210E-18	4.772E-20
NP236	2.880E-07	2.880E-07	2.880E-07	2.880E-07	2.880E-07	2.880E-07	2.880E-07	2.880E-07
NP237	5.140E+00	5.140E+00	5.140E+00	5.140E+00	5.140E+00	5.140E+00	5.140E+00	5.141E+00
NP238	1.450E-12	3.686E-13	3.644E-13	3.627E-13	3.513E-13	3.482E-13	3.419E-13	3.326E-13
NP239	4.470E-10	1.143E-10	1.143E-10	1.142E-10	1.142E-10	1.141E-10	1.141E-10	1.140E-10
NP240M	2.550E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21
PU236	2.190E-08	1.491E-08	8.122E-09	6.369E-09	1.162E-09	7.147E-10	2.707E-10	6.343E-11
PU238	2.840E-02	2.805E-02	2.750E-02	2.728E-02	2.582E-02	2.541E-02	2.462E-02	2.348E-02
PU239	1.080E+00	1.080E+00	1.080E+00	1.080E+00	1.080E+00	1.080E+00	1.079E+00	1.079E+00
PU240	5.500E-02	5.499E-02	5.498E-02	5.498E-02	5.494E-02	5.493E-02	5.491E-02	5.488E-02
PU241	4.020E-03	3.726E-03	3.303E-03	3.148E-03	2.247E-03	2.041E-03	1.684E-03	1.261E-03
PU242	2.560E-03	2.560E-03	2.560E-03	2.560E-03	2.560E-03	2.560E-03	2.560E-03	2.560E-03
PU243	1.370E-21	1.030E-20	1.030E-20	1.030E-20	1.030E-20	1.030E-20	1.030E-20	1.030E-20
PU244	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08
PU246	0.000E+00	5.212E-27	5.212E-27	5.212E-27	5.212E-27	5.212E-27	5.212E-27	5.212E-27
AM241	1.730E-02	1.755E-02	1.790E-02	1.803E-02	1.872E-02	1.887E-02	1.910E-02	1.934E-02
AM242M	1.980E-06	1.966E-06	1.944E-06	1.935E-06	1.874E-06	1.857E-06	1.823E-06	1.774E-06
AM242	2.360E-11	2.351E-11	2.325E-11	2.314E-11	2.242E-11	2.221E-11	2.181E-11	2.122E-11
AM243	1.330E-04	1.330E-04	1.329E-04	1.329E-04	1.328E-04	1.328E-04	1.328E-04	1.327E-04
AM245	0.000E+00	4.308E-30	5.868E-31	2.957E-31	1.164E-33	0.000E+00	0.000E+00	0.000E+00
AM246	0.000E+00	8.340E-30	8.340E-30	8.340E-30	8.340E-30	8.340E-30	8.340E-30	8.340E-30
CM242	4.773E-09	4.760E-09	4.710E-09	4.687E-09	4.532E-09	4.499E-09	4.420E-09	4.291E-09
CM243	7.700E-07	7.410E-07	6.973E-07	6.805E-07	5.740E-07	5.467E-07	4.960E-07	4.287E-07
CM244	3.270E-05	3.078E-05	2.797E-05	2.692E-05	2.059E-05	1.908E-05	1.637E-05	1.301E-05
CM245	2.150E-06	2.150E-06	2.149E-06	2.149E-06	2.148E-06	2.148E-06	2.147E-06	2.146E-06
CM246	7.920E-08	7.918E-08	7.915E-08	7.914E-08	7.906E-08	7.904E-08	7.899E-08	7.892E-08
CM247	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10
CM248	6.720E-12	6.720E-12	6.720E-12	6.720E-12	6.720E-12	6.720E-12	6.720E-12	6.720E-12
CM250	1.241E-20	1.241E-20	1.241E-20	1.241E-20	1.241E-20	1.241E-20	1.241E-20	1.241E-20

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sbw_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
BK249	3.909E-21	1.102E-21	1.473E-22	7.688E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BK250	0.000E+00	3.670E-29	3.670E-29	3.670E-29	3.670E-29	3.670E-29	3.670E-29	3.670E-29
CF249	5.270E-15	5.254E-15	5.228E-15	5.217E-15	5.146E-15	5.125E-15	5.085E-15	5.025E-15
CF250	2.090E-16	1.922E-16	1.684E-16	1.597E-16	1.102E-16	9.911E-17	8.018E-17	5.834E-17
CF251	2.130E-16	2.127E-16	2.123E-16	2.122E-16	2.110E-16	2.107E-16	2.100E-16	2.091E-16
CF252	3.250E-19	2.146E-19	1.112E-19	8.551E-20	1.358E-20	8.034E-21	2.796E-21	5.890E-22
SF250	0.000E+00	3.865E-12	9.649E-12	1.186E-11	2.580E-11	2.935E-11	3.597E-11	4.484E-11
H 3	1.880E-06	1.720E-06	1.495E-06	1.414E-06	9.543E-07	8.530E-07	6.814E-07	4.866E-07
LI 6	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07
LI 7	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08
BE 9	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08
BE 10	1.660E-07	1.660E-07	1.660E-07	1.660E-07	1.660E-07	1.660E-07	1.660E-07	1.660E-07
C 14	3.330E-08	3.329E-08	3.328E-08	3.328E-08	3.325E-08	3.324E-08	3.323E-08	3.320E-08
ZN 66	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11
ZN 67	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12
ZN 68	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07
GA 69	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10
GE 70	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12
GA 71	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09
GE 72	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05
GE 73	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05
GE 74	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05
AS 75	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04
GE 76	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04
SE 76	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06
SE 77	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03
SE 78	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03
SE 79	7.750E-03	7.750E-03	7.750E-03	7.750E-03	7.749E-03	7.749E-03	7.749E-03	7.748E-03
BR 79	2.400E-06	2.531E-06	2.737E-06	2.820E-06	3.399E-06	3.564E-06	3.895E-06	4.391E-06
SE 80	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02
KR 80	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08
BR 81	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02
KR 81	2.918E-09	2.918E-09	2.918E-09	2.918E-09	2.918E-09	2.918E-09	2.918E-09	2.918E-09
SE 82	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02
KR 82	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04
KR 83	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02
KR 84	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01
KR 85	7.423E-03	6.702E-03	5.702E-03	5.345E-03	3.399E-03	2.987E-03	2.306E-03	1.565E-03
RB 85	1.913E-01	1.920E-01	1.930E-01	1.934E-01	1.953E-01	1.957E-01	1.964E-01	1.972E-01
KR 86	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01
SR 86	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04
RB 87	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01
SR 87	1.534E-06	1.534E-06	1.534E-06	1.534E-06	1.534E-06	1.534E-06	1.534E-06	1.534E-06
SR 88	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01
Y 89	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01
SR 90	5.260E-01	5.066E-01	4.773E-01	4.661E-01	3.946E-01	3.762E-01	3.421E-01	2.965E-01
Y 90	1.320E-04	1.270E-04	1.197E-04	1.169E-04	9.894E-05	9.434E-05	8.578E-05	7.436E-05
ZR 90	4.644E-01	4.838E-01	5.131E-01	5.243E-01	5.959E-01	6.142E-01	6.484E-01	6.939E-01
ZR 91	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01
ZR 92	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00
ZR 93	1.090E+00	1.090E+00	1.090E+00	1.090E+00	1.090E+00	1.090E+00	1.090E+00	1.090E+00
NB 93	7.499E-06	8.105E-06	9.090E-06	9.493E-06	1.243E-05	1.330E-05	1.507E-05	1.780E-05
NB 93M	6.950E-06	7.124E-06	7.373E-06	7.464E-06	7.987E-06	8.105E-06	8.308E-06	8.544E-06
ZR 94	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03
NB 94	7.520E-03	7.520E-03	7.519E-03	7.519E-03	7.517E-03	7.516E-03	7.515E-03	7.514E-03
MO 95	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00
ZR 96	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00
MO 96	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02
MO 97	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00
MO 98	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00
TC 98	3.670E-06	3.670E-06	3.670E-06	3.670E-06	3.670E-06	3.670E-06	3.670E-06	3.670E-06
TC 99	7.310E-01	7.310E-01	7.310E-01	7.310E-01	7.310E-01	7.310E-01	7.310E-01	7.309E-01
RU 99	9.751E-05	1.013E-04	1.072E-04	1.096E-04	1.262E-04	1.310E-04	1.405E-04	1.548E-04
MO100	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00

Appendix D-7
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sbw_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
RU100	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02
RU101	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01
RU102	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01
RH102	2.970E-09	2.036E-09	1.120E-09	8.819E-10	1.655E-10	1.026E-10	3.944E-11	9.401E-12
RH103	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01
RU104	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01
PD104	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01
PD105	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01
RU106	1.130E-05	3.813E-06	6.833E-07	3.435E-07	2.789E-09	7.051E-10	4.505E-11	7.275E-13
RH106	1.060E-11	3.584E-12	6.423E-13	3.229E-13	2.622E-15	6.627E-16	4.234E-17	6.838E-19
PD106	9.951E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02
PD107	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02
AG107	1.229E-07	1.296E-07	1.402E-07	1.444E-07	1.741E-07	1.825E-07	1.995E-07	2.249E-07
PD108	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02
AG108	6.570E-20	6.511E-20	6.423E-20	6.388E-20	6.149E-20	6.082E-20	5.951E-20	5.759E-20
AG108M	2.080E-11	2.062E-11	2.034E-11	2.023E-11	1.947E-11	1.926E-11	1.885E-11	1.824E-11
CD108	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08
AG109	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03
AG109M	9.649E-22	4.071E-22	1.041E-22	6.030E-23	1.323E-24	4.443E-25	5.010E-26	1.897E-27
CD109	9.760E-16	4.121E-16	1.054E-16	6.105E-17	1.340E-18	4.498E-19	5.072E-20	1.913E-21
PD110	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03
AG110	1.670E-20	3.363E-21	2.671E-22	9.698E-23	8.065E-26	1.063E-26	1.847E-28	5.047E-31
AG110M	1.100E-12	2.219E-13	1.763E-14	6.400E-15	5.322E-18	7.016E-19	1.218E-20	3.330E-23
CD110	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03
CD111	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03
CD112	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03
CD113	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04
CD113M	2.410E-05	2.236E-05	1.985E-05	1.893E-05	1.358E-05	1.235E-05	1.021E-05	7.676E-06
IN113	6.667E-05	6.841E-05	7.091E-05	7.183E-05	7.718E-05	7.841E-05	8.055E-05	8.308E-05
CD114	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03
SN114	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07
IN115	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02
SN115	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04
CD116	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03
SN116	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03
SN117	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03
SN118	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03
SN119	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03
SN119M	2.630E-13	5.140E-14	3.882E-15	1.382E-15	9.982E-19	1.264E-19	2.035E-21	0.000E+00
SN120	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03
SN121M	1.500E-06	1.467E-06	1.417E-06	1.398E-06	1.269E-06	1.234E-06	1.167E-06	1.074E-06
SB121	4.582E-03	4.582E-03	4.582E-03	4.582E-03	4.582E-03	4.582E-03	4.582E-03	4.582E-03
SN122	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03
TE122	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04
SN123	2.013E-18	9.096E-20	6.851E-22	9.347E-23	1.028E-28	1.028E-28	4.047E-32	3.160E-37
SB123	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03
TE123	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06
TE123M	4.235E-22	1.978E-23	5.907E-24	6.629E-24	2.456E-30	2.456E-30	5.191E-34	1.595E-39
SN124	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03
TE124	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04
SB125	5.510E-05	3.711E-05	1.985E-05	1.545E-05	2.681E-06	1.625E-06	5.973E-07	1.331E-07
TE125	9.946E-03	9.964E-03	9.981E-03	9.986E-03	9.999E-03	1.000E-02	1.000E-02	1.000E-02
TE125M	4.310E-07	5.187E-07	2.776E-07	2.162E-07	3.750E-08	2.274E-08	8.355E-09	1.861E-09
SN126	1.790E-02	1.790E-02	1.790E-02	1.790E-02	1.790E-02	1.790E-02	1.790E-02	1.790E-02
SB126	8.510E-10	8.504E-10	8.504E-10	8.504E-10	8.503E-10	8.503E-10	8.503E-10	8.503E-10
SB126M	6.470E-12	6.466E-12	6.466E-12	6.466E-12	6.465E-12	6.465E-12	6.465E-12	6.465E-12
TE126	4.364E-04	4.366E-04	4.369E-04	4.370E-04	4.379E-04	4.381E-04	4.386E-04	4.394E-04
TE127	1.165E-22	2.991E-24	8.998E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE127M	3.329E-20	8.545E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I127	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02
TE128	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02
XE128	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03
I129	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01
XE129	8.545E-06	8.571E-06	8.612E-06	8.629E-06	8.744E-06	8.777E-06	8.843E-06	8.942E-06
TE130	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01

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sbw_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

	mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
XE130	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03
XE131	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01
XE132	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00
BA132	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07
CS133	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00
XE134	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00
CS134	1.100E-04	6.467E-05	2.791E-05	1.994E-05	1.896E-06	9.678E-07	2.523E-07	3.356E-08
BA134	1.218E-01	1.218E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01
CS135	9.230E-01	9.230E-01	9.230E-01	9.230E-01	9.230E-01	9.230E-01	9.230E-01	9.230E-01
BA135	1.592E-04	1.596E-04	1.603E-04	1.606E-04	1.626E-04	1.631E-04	1.642E-04	1.659E-04
XE136	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00
BA136	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02
CS137	8.060E-01	7.771E-01	7.335E-01	7.167E-01	6.097E-01	5.822E-01	5.308E-01	4.621E-01
BA137	7.459E-01	7.748E-01	8.184E-01	8.352E-01	9.422E-01	9.697E-01	1.021E+00	1.090E+00
BA137M	1.230E-07	1.189E-07	1.122E-07	1.097E-07	9.328E-08	8.906E-08	8.120E-08	7.069E-08
BA138	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00
LA138	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05
LA139	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00
CE140	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00
PR141	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00
CE142	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00
ND142	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02
ND143	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00
CE144	2.240E-05	5.484E-06	5.917E-07	2.428E-07	4.768E-10	8.031E-11	2.278E-12	1.088E-14
PR144	9.470E-10	2.316E-10	2.498E-11	1.025E-11	2.013E-14	3.391E-15	9.619E-17	4.596E-19
PR144M	1.060E-14	1.158E-12	1.249E-13	5.126E-14	1.007E-16	1.695E-17	4.809E-19	2.297E-21
ND144	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00
ND145	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01
ND146	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01
PM146	2.680E-07	2.196E-07	1.603E-07	1.413E-07	5.847E-08	4.545E-08	2.745E-08	1.289E-08
SM146	9.700E-06	9.718E-06	9.740E-06	9.747E-06	9.778E-06	9.782E-06	9.789E-06	9.794E-06
PM147	8.690E-04	5.724E-04	2.957E-04	2.270E-04	3.572E-05	2.106E-05	7.318E-06	1.500E-06
SM147	4.000E-01	4.003E-01	4.006E-01	4.006E-01	4.008E-01	4.008E-01	4.009E-01	4.009E-01
ND148	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01
SM148	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01
SM149	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02
ND150	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01
SM150	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01
EU150	2.960E-10	2.871E-10	2.736E-10	2.684E-10	2.346E-10	2.257E-10	2.090E-10	1.862E-10
SM151	1.640E-02	1.620E-02	1.589E-02	1.577E-02	1.494E-02	1.471E-02	1.427E-02	1.362E-02
EU151	3.931E-03	4.129E-03	4.438E-03	4.560E-03	5.388E-03	5.616E-03	6.063E-03	6.707E-03
SM152	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01
EU152	2.330E-05	2.150E-05	1.893E-05	1.799E-05	1.259E-05	1.137E-05	9.272E-06	6.829E-06
GD152	7.920E-05	7.970E-05	8.042E-05	8.068E-05	8.218E-05	8.252E-05	8.311E-05	8.379E-05
EU153	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02
GD153	5.290E-14	1.013E-14	7.410E-16	2.603E-16	1.719E-19	2.123E-20	3.162E-22	0.000E+00
SM154	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02
EU154	1.110E-03	9.773E-04	7.989E-04	7.371E-04	4.193E-04	3.568E-04	2.585E-04	1.594E-04
GD154	1.848E-02	1.861E-02	1.879E-02	1.885E-02	1.917E-02	1.923E-02	1.933E-02	1.943E-02
EU155	8.880E-04	7.120E-04	5.021E-04	4.366E-04	1.641E-04	1.241E-04	7.095E-05	3.067E-05
GD155	6.939E-03	7.115E-03	7.325E-03	7.390E-03	7.663E-03	7.703E-03	7.756E-03	7.796E-03
GD156	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02
GD157	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04
GD158	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03
TB159	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04
GD160	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04
DY160	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05
DY161	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05
DY162	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05
DY163	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05
DY164	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06
HO165	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06
HO166M	3.180E-08	3.177E-08	3.173E-08	3.171E-08	3.158E-08	3.154E-08	3.147E-08	3.136E-08
ER166	1.583E-06	1.583E-06	1.583E-06	1.583E-06	1.583E-06	1.583E-06	1.583E-06	1.583E-06
ER167	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07

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sbw_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

mg/L	1.6YR	4.1YR	5.1YR	12.1YR	14.1YR	18.1YR	24.1YR
ER168	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07
TM169	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09
ER170	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13
TM170	1.936E-24	1.936E-24	1.936E-24	1.936E-24	2.002E-30	2.002E-30	7.606E-34	5.633E-39
YB170	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10
TM171	3.570E-15	2.018E-15	8.184E-16	5.704E-16	4.557E-17	2.214E-17	5.223E-18	5.987E-19
YB171	7.096E-12	7.098E-12	7.099E-12	7.099E-12	7.100E-12	7.100E-12	7.100E-12	7.100E-12
YB172	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13

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Source Listing of Program ELESBW1

```
      PROGRAM ELESBW1

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/19/02

!            To sum the mg/mL of SBW, convert to g/L and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='SBW_RUN1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='SBW_RUN1.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'SBW_RUN1.ELE    g/L')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Page 2 of 5

Source Listing of Program ELESBW1 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'1999Jul   2002Jan   2003Jan   2010' &
            'Jan   2012Jan   2016Jan   2022Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7

!--------- Multiply by .001 to convert from mg to g

         TOTAL(J) = TOTAL(J) + OLD(J) * .001
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
```

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Source Listing of Program ELESBW1 (continued)

```
  630  FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
       GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELESBW1
```

See Appendix A-4, pages 4 of 9, for a listing of file SYMBOL.

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SBW_RUN1.ELE g/L
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	1.7E-09	1.5E-09	1.4E-09	9.5E-10	8.5E-10	6.8E-10	4.9E-10
He	7.7E-09	2.0E-08	2.5E-08	5.7E-08	6.7E-08	8.4E-08	1.1E-07
Li	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Be	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10
B	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08
C	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05
N	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05
O	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03
F	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12
Ne	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14
Na	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15
Mg	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10
Si	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05
P	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06
S	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08
Cl	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17
Ar	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17
K	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18
Ca	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11
Sc	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13
Ti	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05
V	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06
Mn	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Fe	2.2E-09	1.1E-09	8.6E-10	1.3E-10	7.8E-11	2.7E-11	5.4E-12
Co	3.2E-07	3.0E-07	3.0E-07	2.7E-07	2.7E-07	2.7E-07	2.6E-07
Ni	7.2E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.0E-06
Cu	2.5E-07	2.7E-07	2.7E-07	3.0E-07	3.1E-07	3.3E-07	3.6E-07
Zn	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Ga	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
Ge	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07
As	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07
Se	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05
Br	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05
Kr	5.7E-04	5.7E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04
Rb	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04
Sr	1.1E-03	1.1E-03	1.1E-03	9.9E-04	9.7E-04	9.3E-04	8.9E-04
Y	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04
Zr	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Nb	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06	7.5E-06
Mo	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Tc	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04
Ru	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Rh	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Pd	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Ag	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06
Cd	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
In	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05
Sn	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
Sb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Te	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04
I	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
Xe	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03

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SBW_RUN1.ELE g/L (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:11

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Cs	3.2E-03	3.2E-03	3.2E-03	3.0E-03	3.0E-03	3.0E-03	2.9E-03
Ba	2.6E-03	2.7E-03	2.7E-03	2.8E-03	2.8E-03	2.9E-03	2.9E-03
La	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Ce	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03
Pr	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03
Nd	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03
Pm	5.7E-07	3.0E-07	2.3E-07	3.6E-08	2.1E-08	7.3E-09	1.5E-09
Sm	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Eu	9.9E-05	9.8E-05	9.8E-05	9.9E-05	9.9E-05	9.9E-05	1.0E-04
Gd	5.1E-05	5.1E-05	5.1E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05
Tb	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07
Dy	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07
Ho	5.6E-09	5.6E-09	5.6E-09	5.6E-09	5.6E-09	5.6E-09	5.6E-09
Er	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09
Tm	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12
Yb	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13
Lu	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07
Hf	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04
Ta	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05
W	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
Re	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10
Os	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11
Tl	9.8E-18	5.9E-18	5.1E-18	3.4E-18	3.4E-18	3.2E-18	3.1E-18
Pb	1.1E-10	1.2E-10	1.2E-10	1.3E-10	1.3E-10	1.3E-10	1.4E-10
Bi	2.1E-15	2.1E-15	2.2E-15	2.9E-15	3.2E-15	3.9E-15	5.3E-15
Po	5.8E-16	6.9E-16	7.3E-16	1.1E-15	1.2E-15	1.5E-15	1.9E-15
At	1.3E-25	1.4E-25	1.5E-25	2.1E-25	2.4E-25	3.0E-25	4.3E-25
Rn	6.5E-17	6.8E-17	7.0E-17	8.9E-17	9.5E-17	1.1E-16	1.3E-16
Fr	1.6E-20	1.8E-20	1.8E-20	2.4E-20	2.5E-20	2.8E-20	3.2E-20
Ra	8.8E-12	9.8E-12	1.0E-11	1.3E-11	1.4E-11	1.6E-11	1.9E-11
Ac	5.6E-13	6.3E-13	6.6E-13	8.4E-13	8.8E-13	9.7E-13	1.1E-12
Th	5.7E-08	5.8E-08	5.8E-08	6.2E-08	6.3E-08	6.4E-08	6.7E-08
Pa	2.5E-09	2.5E-09	2.5E-09	2.6E-09	2.6E-09	2.7E-09	2.7E-09
U	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02
Np	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.1E-03
Pu	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03	1.2E-03
Am	1.8E-05	1.8E-05	1.8E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
Cm	3.4E-08	3.1E-08	3.0E-08	2.3E-08	2.2E-08	1.9E-08	1.6E-08
Bk	1.1E-24	1.5E-25	7.7E-26	3.7E-32	3.7E-32	3.7E-32	3.7E-32
Cf	5.7E-18	5.6E-18	5.6E-18	5.5E-18	5.4E-18	5.4E-18	5.3E-18
Total	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**

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File SBW_RUN2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91)
  BAS     Sodium Bearing Waste (SBW)
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  204  908  909   9   50  0  4  0
  TIT     Final Activity in mCi/L rather than Ci
  PHO     101  102  103  10
  INP     -1   1  -1  -1  1  1
  MOV     -1   1   0   1.0
  HED      1                                                  mCi/L
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC      34.08  1   2   5   0
  DEC      44.08  2   3   5   0
  DEC     118.08  3   4   5   0
  DEC     402.08  4   5   5   0
  DEC    1018.08  5   6   5   0
  DEC    1112.08  6   7   5   0
  DEC   10002.08  7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   10012 4.417E-08  20030 3.332E-12  50100 7.734E-14 0 0.
  1   50110 2.181E-05  60120 5.363E-02  60130 7.331E-04 0 0.
  1   70140 6.913E-02  70150 2.654E-04  80160 4.162E+00 0 0.
  1   80170 1.669E-03  80180 8.345E-03  90190 4.215E-09 0 0.
  1  100200 3.891E-14 100210 3.038E-13 100220 4.386E-11 0 0.
  1  110230 3.427E-12 120240 1.364E-07 120250 4.910E-07 0 0.
  1  120260 2.162E-07 130270 6.963E-02 140280 6.228E-02 0 0.
  1  140290 3.156E-03 140300 2.095E-03 140320 1.021E-14 0 0.
  1  150310 3.042E-03 150320 6.149E-19 160340 8.538E-05 0 0.
  1  170370 6.914E-14 180380 5.507E-19 180390 7.935E-22 0 0.
  1  180400 7.726E-14 180420 7.600E-23 190410 2.479E-15 0 0.
  1  190420 3.249E-27 200420 4.304E-17 200430 5.816E-09 0 0.
  1  200440 4.436E-08 200450 1.745E-21 200460 5.280E-09 0 0.
  1  210450 9.175E-10 210460 7.250E-28 220460 2.779E-03 0 0.
  1  220470 2.534E-03 220480 2.539E-02 220490 2.182E-03 0 0.
  1  220500 1.891E-03 230500 2.906E-05 230510 3.322E-03 0 0.
  1  240500 2.036E-01 240520 3.978E+00 240530 4.527E-01 0 0.
  1  240540 1.213E-01 250540 2.345E-11 250550 1.060E-03 0 0.
  1  260540 5.774E-01 260550 3.331E-06 260560 8.968E+00 0 0.
  1  260570 2.237E-01 260580 2.929E-02 270580 7.770E-26 0 0.
  1  270590 2.578E-04 270600 7.770E-05 280580 2.135E+00 0 0.
  1  280590 6.501E-03 280600 8.188E-01 280610 3.722E-02 0 0.
  1  280620 1.114E-01 280630 6.590E-04 280640 2.857E-02 0 0.
  1  290630 2.109E-04 290650 3.584E-05 300640 1.977E-08 0 0.
  1  300650 1.042E-19 420940 8.220E-06 440980 8.286E-18 0 0.
  1  491131 2.247E-22 501120 5.190E-01 501130 3.741E-19 0 0.
  1  701730 1.183E-11 701740 5.418E-13 711750 4.477E-04 0 0.
  1  711760 1.092E-05 711770 4.625E-22 711771 4.646E-20 0 0.
```

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File SBW_RUN2.INP (continued)

```
1  721740 6.022E-04 721750 5.392E-26 721760 2.704E-02 0 0.
1  721770 9.052E-03 721780 1.615E-01 721790 2.123E-01 0 0.
1  721800 2.794E-01 721820 1.466E-05 731810 3.327E-02 0 0.
1  731820 5.128E-13 741820 4.552E-03 741830 4.726E-03 0 0.
1  741840 2.855E-04 741850 5.982E-27 741860 4.600E-09 0 0.
1  741880 8.451E-35 751850 5.593E-07 751870 1.887E-10 0 0.
1  751880 8.621E-37 761860 6.896E-08 761880 6.072E-12 0 0.
1  761890 4.217E-14 761900 1.491E-15      0 0.        0 0.
2  812060 1.245E-30 812070 1.930E-16 812080 1.480E-14 0 0.
2  812090 1.100E-20 822060 1.042E-11 822070 1.961E-10 0 0.
2  822080 1.052E-07 822090 4.500E-17 822100 3.210E-11 0 0.
2  822110 1.500E-15 822120 8.760E-12 822140 2.430E-16 0 0.
2  832080 6.795E-20 832090 1.447E-12 832101 4.800E-19 0 0.
2  832100 1.980E-14 832110 8.836E-17 832120 8.310E-13 0 0.
2  832130 1.070E-17 832140 1.800E-16 842100 5.200E-13 0 0.
2  842110 1.084E-21 842120 4.398E-23 842130 1.610E-26 0 0.
2  842140 2.479E-23 842150 1.254E-21 842160 3.400E-17 0 0.
2  842180 2.810E-17 852170 1.290E-22 862190 2.842E-18 0 0.
2  862200 1.320E-14 862220 5.170E-14 872210 1.170E-18 0 0.
2  872230 1.320E-17 882230 7.210E-13 882240 7.560E-11 0 0.
2  882250 5.290E-15 882260 8.050E-09 882280 2.200E-15 0 0.
2  892250 3.580E-15 892270 5.100E-10 892280 2.670E-19 0 0.
2  902270 1.190E-12 902280 1.480E-08 902290 9.760E-10 0 0.
2  902300 4.810E-05 902310 2.610E-10 902320 7.890E-06 0 0.
2  902340 1.990E-10 912310 2.280E-06 912330 1.760E-08 0 0.
2  912341 6.700E-15 912340 2.990E-15 922320 1.050E-07 0 0.
2  922330 1.530E-06 922340 1.590E-01 922350 1.200E+01 0 0.
2  922360 6.370E-01 922370 1.044E-11 922380 7.610E+01 0 0.
2  922400 5.490E-20 932350 2.310E-13 932360 2.880E-07 0 0.
2  932370 5.140E+00 932380 1.450E-12 932390 4.470E-10 0 0.
2  932401 2.550E-21 942360 2.190E-08 942380 2.840E-02 0 0.
2  942390 1.080E+00 942400 5.500E-02 942410 4.020E-03 0 0.
2  942420 2.560E-03 942430 1.370E-21 942440 4.720E-08 0 0.
2  942460 6.918E-28 952410 1.730E-02 952421 1.980E-06 0 0.
2  952420 2.360E-11 952430 1.330E-04 952450 1.240E-29 0 0.
2  952460 9.126E-31 962420 4.773E-09 962430 7.700E-07 0 0.
2  962440 3.270E-05 962450 2.150E-06 962460 7.920E-08 0 0.
2  962470 2.890E-10 962480 6.720E-12 962500 1.241E-20 0 0.
2  972490 3.909E-21 972500 1.023E-29 982490 5.270E-15 0 0.
2  982500 2.090E-16 982510 2.130E-16 982520 3.250E-19 0 0.
2  992540 1.118E-26      0 0.000E+00      0 0.000E+00 0 0.
3   10030 1.880E-06  30060 3.333E-07  30070 1.286E-08 0 0.
3   40090 2.478E-08  40100 1.660E-07  60140 3.330E-08 0 0.
3  300660 9.786E-11 300670 4.265E-12 300680 3.269E-07 0 0.
3  310690 5.050E-10 320700 1.449E-12 310710 1.177E-09 0 0.
3  320720 1.146E-05 320730 3.793E-05 320740 9.762E-05 0 0.
3  330750 2.258E-04 320760 6.710E-04 340760 3.454E-06 0 0.
3  340770 1.463E-03 340780 3.122E-03 340790 7.750E-03 0 0.
3  350790 2.400E-06 340800 1.860E-02 360800 9.214E-08 0 0.
3  350810 3.122E-02 360810 2.918E-09 340820 5.006E-02 0 0.
3  360820 6.326E-04 360830 7.140E-02 360840 1.699E-01 0 0.
3  360850 7.423E-03 370850 1.913E-01 360860 3.176E-01 0 0.
3  380860 3.576E-04 370870 4.140E-01 380870 1.534E-06 0 0.
3  380880 5.923E-01 390890 7.800E-01 380900 5.260E-01 0 0.
```

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File SBW_RUN2.INP (continued)

```
  3  390900 1.320E-04 400900 4.644E-01 400910 9.744E-01 0 0.
  3  400920 1.014E+00 400930 1.090E+00 410930 7.499E-06 0 0.
  3  410931 6.950E-06 400940 5.284E-03 410940 7.520E-03 0 0.
  3  400950 7.548E-26 410950 4.266E-26 410951 2.990E-29 0 0.
  3  420950 1.093E+00 400960 1.108E+00 420960 2.510E-02 0 0.
  3  420970 1.045E+00 420980 1.050E+00 430980 3.670E-06 0 0.
  3  430990 7.310E-01 440990 9.751E-05 421000 1.155E+00 0 0.
  3  441000 7.349E-02 441010 9.262E-01 441020 8.155E-01 0 0.
  3  451020 2.970E-09 451030 4.751E-01 441040 3.665E-01 0 0.
  3  461040 1.236E-01 461050 1.886E-01 441060 1.130E-05 0 0.
  3  451060 1.060E-11 461060 9.951E-02 461070 3.970E-02 0 0.
  3  471070 1.229E-07 461080 1.980E-02 471080 6.570E-20 0 0.
  3  471081 2.080E-11 481080 3.236E-08 471090 8.779E-03 0 0.
  3  471091 9.649E-22 481090 9.760E-16 461100 7.480E-03 0 0.
  3  471100 1.670E-20 471101 1.100E-12 481100 2.455E-03 0 0.
  3  481110 5.965E-03 481120 4.651E-03 481130 7.464E-04 0 0.
  3  481131 2.410E-05 491130 6.667E-05 481140 7.779E-03 0 0.
  3  501140 4.008E-07 491150 2.000E-02 501150 1.314E-04 0 0.
  3  481160 4.145E-03 501160 1.919E-03 501170 4.076E-03 0 0.
  3  501180 4.507E-03 501190 4.335E-03 501191 2.630E-13 0 0.
  3  501200 4.529E-03 501211 1.500E-06 511210 4.582E-03 0 0.
  3  501220 5.051E-03 521220 1.669E-04 501230 2.013E-18 0 0.
  3  511230 5.827E-03 521230 1.630E-06 521231 4.235E-22 0 0.
  3  501240 7.689E-03 521240 1.373E-04 511250 5.510E-05 0 0.
  3  521250 9.946E-03 521251 4.310E-07 501260 1.790E-02 0 0.
  3  511260 8.510E-10 511261 6.470E-12 521260 4.364E-04 0 0.
  3  521270 1.165E-22 521271 3.329E-20 531270 3.819E-02 0 0.
  3  521280 9.668E-02 541280 1.184E-03 531290 3.735E-01 0 0.
  3  541290 8.545E-06 521300 3.644E-01 541300 5.607E-03 0 0.
  3  541310 5.715E-01 541320 1.173E+00 561320 7.984E-07 0 0.
  3  551330 1.517E+00 541340 1.896E+00 551340 1.100E-04 0 0.
  3  561340 1.218E-01 551350 9.230E-01 561350 1.592E-04 0 0.
  3  541360 2.601E+00 561360 1.496E-02 551370 8.060E-01 0 0.
  3  561370 7.459E-01 561371 1.230E-07 561380 1.722E+00 0 0.
  3  571380 1.230E-05 571390 1.635E+00 581400 1.623E+00 0 0.
  3  591410 1.508E+00 581420 1.540E+00 601420 1.720E-02 0 0.
  3  601430 1.298E+00 581440 2.240E-05 591440 9.470E-10 0 0.
  3  591441 1.060E-14 601440 1.680E+00 601450 9.768E-01 0 0.
  3  601460 8.627E-01 611460 2.680E-07 621460 9.700E-06 0 0.
  3  611470 8.690E-04 621470 4.000E-01 601480 4.614E-01 0 0.
  3  621480 1.550E-01 621490 1.730E-02 601500 1.788E-01 0 0.
  3  621500 3.173E-01 631500 2.960E-10 621510 1.640E-02 0 0.
  3  631510 3.931E-03 621520 1.296E-01 631520 2.330E-05 0 0.
  3  641520 7.920E-05 631530 9.269E-02 641530 5.290E-14 0 0.
  3  621540 2.242E-02 631540 1.110E-03 641540 1.848E-02 0 0.
  3  631550 8.880E-04 641550 6.939E-03 641560 2.024E-02 0 0.
  3  641570 1.957E-04 641580 4.288E-03 651590 4.306E-04 0 0.
  3  641600 1.724E-04 651600 4.576E-26 661600 3.421E-05 0 0.
  3  661610 4.305E-05 661620 3.063E-05 661630 1.835E-05 0 0.
  3  661640 4.476E-06 671650 5.522E-06 671661 3.180E-08 0 0.
  3  681660 1.583E-06 681670 3.926E-07 681680 2.481E-07 0 0.
  3  691690 1.063E-09 681700 2.722E-13 691700 1.936E-24 0 0.
  3  701700 1.838E-10 691710 3.570E-15 701710 7.096E-12 0 0.
  3  701720 1.385E-13      0 0.000E+00      0 0.000E+00 0 0.
  0
```

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File SBW_RUN2.BAT

```
echo off
echo **                                                                  **
echo **                            O R I G E N 2                         **
echo **                                                                  **
copy sbw_run2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy sbw_run2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\atr.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
rem  combine and save files from run
copy tape12.out+tape6.out sbw_run2.u6 >nul
copy tape13.out+tape11.out sbw_run2.u11 >nul
ren tape7.out sbw_run2.pch
ren tape15.out sbw_run2.dbg
ren tape16.out sbw_run2.vxs
ren tape50.out sbw_run2.ech
rem  cleanup files
del tape*.inp
del tape*.out
del sbw_run2.pch
del sbw_run2.dbg
del sbw_run2.vxs
del sbw_run2.ech
del sbw_run2.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed **************************
echo ************************************************************************
echo on
```

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sbw_run2.ci
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mCi/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
SI 32	1.756E-13	1.693E-13	1.675E-13	1.548E-13	1.143E-13	5.928E-14	5.363E-14	4.095E-18
P 32	1.755E-13	1.693E-13	1.675E-13	1.548E-13	1.143E-13	5.929E-14	5.363E-14	4.095E-18
AR 39	2.705E-20	2.468E-20	2.404E-20	1.989E-20	9.600E-21	2.003E-21	1.518E-21	1.709E-31
AR 42	1.961E-20	9.399E-21	7.424E-21	2.012E-21	4.859E-22	1.168E-27	1.168E-27	0.000E+00
K 42	0.000E+00	9.586E-21	7.618E-21	2.012E-21	4.859E-22	1.168E-27	1.168E-27	0.000E+00
V 50	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18	5.197E-18
MN 54	1.815E-07	1.854E-19	5.619E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 55	8.331E-03	9.438E-07	6.563E-08	1.775E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 60	8.789E-02	9.934E-04	2.666E-04	1.580E-08	9.448E-25	0.000E+00	0.000E+00	0.000E+00
NI 59	4.926E-04	4.925E-04	4.924E-04	4.921E-04	4.909E-04	4.883E-04	4.879E-04	4.517E-04
NI 63	4.066E-02	3.146E-02	2.917E-02	1.671E-02	1.966E-03	1.897E-05	9.341E-06	0.000E+00
ZN 65	8.587E-16	3.701E-31	1.147E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LU176	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13	7.397E-13
HF182	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.198E-09
TA182	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.201E-09	3.198E-09
RE187	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18	7.218E-18
TL206	0.000E+00	2.714E-22	2.714E-22	2.714E-22	2.714E-22	2.713E-22	2.713E-22	2.708E-22
TL207	3.677E-08	9.084E-08	1.013E-07	1.534E-07	3.260E-07	6.574E-07	6.916E-07	5.081E-06
TL208	4.360E-06	7.254E-07	6.589E-07	3.232E-07	2.110E-08	1.780E-10	1.456E-10	1.234E-10
TL209	4.500E-12	2.421E-11	3.711E-11	2.324E-10	2.597E-09	1.627E-08	1.935E-08	1.193E-06
PB209	2.046E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
PB210	2.452E-09	1.209E-08	1.615E-08	5.981E-08	4.863E-07	2.327E-06	2.583E-06	7.805E-05
PB211	3.704E-08	9.110E-08	1.016E-07	1.539E-07	3.269E-07	6.593E-07	6.936E-07	5.096E-06
PB212	1.218E-05	2.019E-06	1.834E-06	8.994E-07	5.873E-08	4.955E-10	4.052E-10	3.435E-10
PB214	7.970E-09	2.435E-08	2.999E-08	8.369E-08	4.864E-07	2.327E-06	2.709E-06	7.806E-05
BI208	3.175E-22	3.175E-22	3.175E-22	3.175E-22	3.173E-22	3.170E-22	3.170E-22	3.116E-22
BI210M	2.725E-22	2.725E-22	2.725E-22	2.725E-22	2.725E-22	2.724E-22	2.724E-22	2.719E-22
BI210	2.458E-09	1.209E-08	1.615E-08	5.981E-08	4.863E-07	2.327E-06	2.583E-06	7.805E-05
BI211	3.698E-08	9.110E-08	1.016E-07	1.539E-07	3.269E-07	6.593E-07	6.936E-07	5.096E-06
BI212	1.218E-05	2.019E-06	1.834E-06	8.994E-07	5.873E-08	4.955E-10	4.052E-10	3.435E-10
BI213	2.070E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
BI214	7.951E-09	2.435E-08	2.999E-08	8.369E-08	4.864E-07	2.327E-06	2.709E-06	7.806E-05
PO210	2.337E-09	1.209E-08	1.615E-08	5.981E-08	4.863E-07	2.327E-06	2.583E-06	7.805E-05
PO211	1.035E-10	2.551E-10	2.846E-10	4.308E-10	9.152E-10	1.846E-09	1.942E-09	1.427E-08
PO212	7.805E-06	1.293E-06	1.175E-06	5.763E-07	3.763E-08	3.175E-10	2.596E-10	2.201E-10
PO213	0.000E+00	1.097E-09	1.681E-09	1.053E-08	1.176E-07	7.368E-07	8.763E-07	5.406E-05
PO214	7.958E-09	2.434E-08	2.998E-08	8.367E-08	4.863E-07	2.327E-06	2.709E-06	7.805E-05
PO215	3.698E-08	9.110E-08	1.016E-07	1.539E-07	3.269E-07	6.593E-07	6.936E-07	5.096E-06
PO216	1.184E-05	2.019E-06	1.834E-06	8.994E-07	5.873E-08	4.955E-10	4.052E-10	3.435E-10
PO218	7.950E-09	2.435E-08	2.999E-08	8.371E-08	4.864E-07	2.328E-06	2.710E-06	7.808E-05
AT217	2.077E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
RN219	3.699E-08	9.110E-08	1.016E-07	1.539E-07	3.269E-07	6.593E-07	6.936E-07	5.096E-06
RN220	1.218E-05	2.019E-06	1.834E-06	8.994E-07	5.873E-08	4.955E-10	4.052E-10	3.435E-10
RN222	7.955E-09	2.435E-08	2.999E-08	8.371E-08	4.864E-07	2.328E-06	2.710E-06	7.808E-05
FR221	2.075E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
FR223	5.108E-10	1.257E-09	1.400E-09	2.123E-09	4.511E-09	9.098E-09	9.570E-09	7.032E-08
RA223	3.694E-08	9.110E-08	1.016E-07	1.539E-07	3.269E-07	6.593E-07	6.936E-07	5.096E-06
RA224	1.205E-05	2.019E-06	1.834E-06	8.994E-07	5.873E-08	4.955E-10	4.052E-10	3.435E-10
RA225	2.075E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
RA226	7.962E-09	2.435E-08	2.999E-08	8.371E-08	4.864E-07	2.328E-06	2.710E-06	7.808E-05
RA228	5.151E-13	9.056E-13	9.322E-13	1.106E-12	1.685E-12	2.946E-12	3.139E-12	2.187E-11
AC225	2.078E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
AC227	3.690E-08	9.107E-08	1.015E-07	1.538E-07	3.269E-07	6.593E-07	6.935E-07	5.096E-06
AC228	5.989E-13	9.056E-13	9.323E-13	1.106E-12	1.685E-12	2.946E-12	3.139E-12	2.187E-11
TH227	3.659E-08	8.984E-08	1.002E-07	1.517E-07	3.224E-07	6.502E-07	6.840E-07	5.025E-06
TH228	1.214E-05	2.019E-06	1.834E-06	8.994E-07	5.873E-08	4.955E-10	4.052E-10	3.435E-10
TH229	2.077E-10	1.121E-09	1.718E-09	1.076E-08	1.202E-07	7.530E-07	8.957E-07	5.525E-05
TH230	9.713E-07	1.282E-06	1.376E-06	2.091E-06	4.997E-06	1.141E-05	1.239E-05	9.991E-05
TH231	1.388E-04	2.595E-05	2.595E-05	2.596E-05	2.598E-05	2.602E-05	2.602E-05	2.652E-05
TH232	8.657E-13	9.350E-13	9.553E-13	1.106E-12	1.685E-12	2.946E-12	3.138E-12	2.187E-11
TH234	4.610E-06	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05
PA231	1.077E-07	1.264E-07	1.318E-07	1.722E-07	3.267E-07	6.591E-07	7.095E-07	5.095E-06
PA233	3.654E-04	3.625E-03	3.626E-03	3.627E-03	3.631E-03	3.635E-03	3.636E-03	3.628E-03
PA234M	4.603E-06	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05
PA234	5.979E-09	3.327E-08	3.327E-08	3.327E-08	3.327E-08	3.327E-08	3.327E-08	3.327E-08

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sbw_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mCi/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
U232	2.248E-06	1.965E-06	1.785E-06	8.755E-07	5.717E-08	4.884E-10	3.965E-10	3.216E-10
U233	1.482E-08	5.535E-07	7.120E-07	1.885E-06	6.387E-06	1.615E-05	1.763E-05	1.555E-04
U234	9.939E-04	1.035E-03	1.045E-03	1.099E-03	1.160E-03	1.165E-03	1.165E-03	1.137E-03
U235	2.595E-05	2.595E-05	2.595E-05	2.596E-05	2.598E-05	2.602E-05	2.602E-05	2.652E-05
U236	4.123E-05	4.124E-05	4.125E-05	4.127E-05	4.137E-05	4.159E-05	4.162E-05	4.351E-05
U237	8.525E-07	1.970E-06	1.218E-06	3.456E-08	8.811E-12	8.341E-12	8.277E-12	4.009E-12
U238	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05	2.559E-05
U240	5.086E-14	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.363E-13
NP235	3.242E-10	1.122E-19	1.170E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	3.795E-09	3.795E-09	3.794E-09	3.793E-09	3.786E-09	3.772E-09	3.770E-09	3.573E-09
NP237	3.625E-03	3.625E-03	3.626E-03	3.627E-03	3.631E-03	3.635E-03	3.636E-03	3.628E-03
NP238	3.760E-07	8.240E-08	7.873E-08	5.618E-08	1.539E-08	9.274E-10	6.041E-10	1.499E-27
NP239	1.037E-04	2.644E-05	2.641E-05	2.623E-05	2.554E-05	2.411E-05	2.389E-05	1.037E-05
NP240M	2.701E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.364E-13	8.363E-13
PU236	1.164E-05	3.276E-09	5.995E-10	3.413E-10	3.408E-10	3.395E-10	3.393E-10	3.216E-10
PU238	4.864E-01	3.716E-01	3.434E-01	1.914E-01	2.031E-02	1.567E-04	7.465E-05	5.887E-25
PU239	6.716E-02	6.709E-02	6.708E-02	6.693E-02	6.639E-02	6.522E-02	6.504E-02	5.035E-02
PU240	1.254E-02	1.250E-02	1.249E-02	1.239E-02	1.202E-02	1.126E-02	1.115E-02	4.344E-03
PU241	4.143E-01	8.032E-02	4.963E-02	1.409E-03	3.596E-07	3.404E-07	3.378E-07	1.636E-07
PU242	9.778E-06	9.778E-06	9.778E-06	9.777E-06	9.772E-06	9.762E-06	9.760E-06	9.606E-06
PU243	3.567E-15	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.681E-14
PU244	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.375E-13	8.374E-13
PU246	0.000E+00	2.551E-22	2.551E-22	2.543E-22	2.515E-22	2.454E-22	2.444E-22	1.715E-22
AM241	5.940E-02	6.699E-02	6.694E-02	6.092E-02	3.866E-02	1.440E-02	1.238E-02	1.716E-07
AM242M	1.925E-05	1.648E-05	1.575E-05	1.124E-05	3.077E-06	1.855E-07	1.208E-07	2.997E-25
AM242	1.909E-05	1.640E-05	1.567E-05	1.118E-05	3.062E-06	1.845E-07	1.202E-07	2.982E-25
AM243	2.652E-05	2.644E-05	2.641E-05	2.623E-05	2.554E-05	2.411E-05	2.389E-05	1.037E-05
AM245	0.000E+00	1.825E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM246	0.000E+00	2.551E-22	2.551E-22	2.543E-22	2.515E-22	2.454E-22	2.444E-22	1.715E-22
CM242	1.579E-05	1.356E-05	1.296E-05	9.246E-06	2.532E-06	1.526E-07	9.942E-08	2.474E-25
CM243	3.976E-05	1.736E-05	1.361E-05	2.251E-06	2.242E-09	6.986E-16	7.102E-17	0.000E+00
CM244	2.647E-03	7.181E-04	4.898E-04	2.883E-05	5.484E-10	3.160E-20	1.658E-21	0.000E+00
CM245	3.693E-07	3.683E-07	3.680E-07	3.658E-07	3.574E-07	3.399E-07	3.373E-07	1.633E-07
CM246	2.434E-08	2.422E-08	2.418E-08	2.392E-08	2.295E-08	2.097E-08	2.068E-08	5.622E-09
CM247	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.682E-14	2.681E-14
CM248	2.858E-14	2.858E-14	2.858E-14	2.858E-14	2.856E-14	2.852E-14	2.852E-14	2.800E-14
CM250	1.020E-21	1.020E-21	1.020E-21	1.017E-21	1.006E-21	9.811E-22	9.775E-22	6.854E-22
BK249	6.408E-18	1.252E-29	4.592E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BK250	0.000E+00	1.428E-22	1.428E-22	1.424E-22	1.408E-22	1.374E-22	1.368E-22	9.603E-23
CF249	2.160E-14	2.019E-14	1.979E-14	1.710E-14	9.751E-15	2.884E-15	2.395E-15	5.537E-23
CF250	2.286E-14	3.756E-15	2.211E-15	4.382E-17	1.536E-22	1.374E-22	1.374E-22	9.603E-23
CF251	3.380E-16	3.292E-16	3.267E-16	3.085E-16	2.478E-16	1.540E-16	1.432E-16	1.497E-19
CF252	1.748E-16	2.258E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
H 3	1.815E-02	2.680E-03	1.529E-03	2.401E-05	2.866E-12	2.760E-27	2.760E-27	0.000E+00
BE 10	3.711E-09	3.711E-09	3.711E-09	3.711E-09	3.710E-09	3.709E-09	3.709E-09	3.695E-09
C 14	1.485E-07	1.479E-07	1.477E-07	1.464E-07	1.414E-07	1.313E-07	1.298E-07	4.427E-08
SE 79	5.401E-04	5.399E-04	5.399E-04	5.394E-04	5.378E-04	5.343E-04	5.337E-04	4.854E-04
KR 81	6.139E-11	6.138E-11	6.138E-11	6.137E-11	6.131E-11	6.119E-11	6.117E-11	5.940E-11
KR 85	2.914E+00	3.217E-01	1.685E-01	1.408E-03	1.492E-11	7.512E-29	7.512E-29	0.000E+00
RB 87	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08	3.624E-08
SR 90	7.178E+01	3.189E+01	2.514E+01	4.319E+00	4.984E-03	2.138E-09	2.282E-10	0.000E+00
Y 90	7.185E+01	3.190E+01	2.514E+01	4.320E+00	5.009E-03	2.138E-09	2.282E-10	0.000E+00
ZR 93	2.740E-03	2.740E-03	2.740E-03	2.740E-03	2.739E-03	2.739E-03	2.739E-03	2.728E-03
NB 93M	1.965E-03	2.491E-03	2.535E-03	2.601E-03	2.602E-03	2.602E-03	2.602E-03	2.591E-03
NB 94	1.409E-03	1.408E-03	1.407E-03	1.404E-03	1.390E-03	1.361E-03	1.357E-03	1.002E-03
TC 98	3.190E-09	3.190E-09	3.190E-09	3.190E-09	3.190E-09	3.189E-09	3.189E-09	3.185E-09
TC 99	1.240E-02	1.240E-02	1.240E-02	1.239E-02	1.238E-02	1.236E-02	1.235E-02	1.200E-02
RH102	3.591E-06	1.041E-09	9.540E-11	1.987E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RU106	3.782E-02	2.512E-12	2.591E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	3.775E-02	2.512E-12	2.592E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.043E-05	2.042E-05	2.041E-05
AG108	4.828E-11	4.008E-11	3.795E-11	2.534E-11	5.378E-12	1.865E-13	1.116E-13	1.112E-34
AG108M	5.423E-10	4.503E-10	4.264E-10	2.847E-10	6.043E-11	2.095E-12	1.254E-12	1.065E-33
AG109M	2.523E-12	2.118E-20	9.335E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	2.521E-12	2.118E-20	9.335E-21	2.722E-38	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbw_run2.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mCi/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
AG110	6.965E-11	7.025E-26	2.796E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110M	5.228E-09	5.282E-24	2.102E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD113M	5.228E-03	1.036E-03	6.439E-04	1.914E-05	2.642E-11	5.147E-24	5.147E-24	0.000E+00
IN115	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13	1.245E-13
SN119M	1.178E-09	6.001E-25	1.954E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN121M	8.872E-05	5.530E-05	4.814E-05	1.725E-05	3.357E-07	6.534E-11	1.774E-11	0.000E+00
TE123	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16	4.739E-16
SB125	5.692E-02	1.126E-05	9.217E-07	8.360E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125M	7.766E-03	2.746E-06	2.249E-07	2.040E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	5.080E-04	5.079E-04	5.079E-04	5.076E-04	5.066E-04	5.045E-04	5.041E-04	4.740E-04
SB126	7.118E-05	7.111E-05	7.111E-05	7.107E-05	7.093E-05	7.063E-05	7.058E-05	6.636E-05
SB126M	5.084E-04	5.079E-04	5.079E-04	5.076E-04	5.066E-04	5.045E-04	5.041E-04	4.740E-04
I129	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.596E-05	6.593E-05
CS134	1.424E-01	1.507E-06	5.225E-08	8.214E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS135	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.060E-03
CS137	7.014E+01	3.191E+01	2.533E+01	4.582E+00	6.443E-03	4.244E-09	4.836E-10	0.000E+00
BA137M	6.619E+01	3.019E+01	2.396E+01	4.335E+00	6.125E-03	4.015E-09	4.575E-10	0.000E+00
LA138	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13	2.361E-13
CE142	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08	3.697E-08
CE144	7.149E-02	4.700E-15	6.370E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144	7.158E-02	4.700E-15	6.370E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144M	1.923E-06	5.640E-17	7.644E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND144	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12	1.988E-12
PM146	1.194E-04	1.628E-06	4.616E-07	4.112E-11	1.175E-26	0.000E+00	0.000E+00	0.000E+00
SM146	3.395E-10	3.429E-10	3.429E-10	3.429E-10	3.429E-10	3.429E-10	3.429E-10	3.429E-10
PM147	8.059E-01	9.903E-05	7.052E-06	2.276E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	9.094E-09	9.114E-09	9.114E-09	9.114E-09	9.114E-09	9.114E-09	9.114E-09	9.114E-09
SM148	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14	4.681E-14
SM149	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15	4.155E-15
EU150	1.960E-08	1.017E-08	8.390E-09	2.018E-09	8.513E-12	6.014E-17	9.842E-18	0.000E+00
SM151	4.316E-01	3.320E-01	3.074E-01	1.738E-01	1.951E-02	1.697E-04	8.225E-05	0.000E+00
EU152	4.031E-03	7.097E-04	4.263E-04	9.815E-06	5.080E-12	1.179E-25	1.179E-25	0.000E+00
GD152	1.726E-15	1.842E-15	1.852E-15	1.867E-15	1.867E-15	1.867E-15	1.867E-15	1.867E-15
GD153	1.866E-10	6.135E-26	1.756E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
EU154	2.997E-01	1.922E-02	8.587E-03	2.205E-05	2.527E-15	6.931E-37	3.496E-40	0.000E+00
EU155	4.132E-01	3.527E-03	8.718E-04	2.809E-08	1.619E-25	0.000E+00	0.000E+00	0.000E+00
HO166M	5.709E-08	5.598E-08	5.566E-08	5.333E-08	4.526E-08	3.171E-08	3.003E-08	1.769E-10
TM171	3.889E-12	1.764E-17	4.667E-19	1.166E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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Source Listing of Program ROUNDSB2

```
      PROGRAM ROUNDSB2

!-------- WRITTEN BY D.R. WENZEL

!           To round output from file sbw_2095.ci to 2 places
!           of accuracy and to convert from mCi/L to Ci/L

      CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
      CHARACTER (LEN=10) :: BLANK, ZERO(7)
      CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
      CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
      CHARACTER (LEN=96) :: BUFFER2
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9)
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      EQUIVALENCE (BUFFER2, BUFFER3(1))
      EQUIVALENCE (ZERO(1), BUFFER3(27))

      REAL :: DATA(175,7), VALUE(7)

      DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='SBW_RUN2.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='ROUNDSB2.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'ROUNDSB2.OUT (Ci/L)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NAME2
 1000 FORMAT(A12, 5X, A24)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUCLIDE2(LAST) = NAME2
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,175
         DO K=1,7
            DATA(l,K) = 0.
         END DO

      END DO
```

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Source Listing of Program ROUNDSB2 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'2032Jan   2042Jan   ', &
              '2116Jan   2400Jan   3016Jan   3110Jan   12000Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,175
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7

!-------- Multiply fy .001 to convert from mCi/L to Ci/L

                DATA(J,K) = VALUE(K) * .001
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO
```

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Source Listing of Program ROUNDSB2 (continued)

```
      GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDSB2
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

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ROUNDSB2.OUT (Ci/L)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	2.7E-06	1.5E-06	2.4E-08	2.9E-15	2.8E-30	2.8E-30	
Be-10	1.600E+06	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
C-14	5.729E+03	yr	1.5E-10	1.5E-10	1.5E-10	1.4E-10	1.3E-10	1.3E-10	4.4E-11
Fe-55	2.600E+00	yr	9.4E-10	6.6E-11	1.8E-19				
Ni-59	8.000E+04	yr	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.9E-07	4.5E-07
Co-60	5.270E+00	yr	9.9E-07	2.7E-07	1.6E-11	9.4E-28			
Ni-63	9.200E+01	yr	3.1E-05	2.9E-05	1.7E-05	2.0E-06	1.9E-08	9.3E-09	
Se-79	6.496E+04	yr	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.3E-07	5.3E-07	4.9E-07
Rb-87	4.696E+10	yr	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11	3.6E-11
Sr-90	2.912E+01	yr	3.2E-02	2.5E-02	4.3E-03	5.0E-06	2.1E-12	2.3E-13	
Y-90	6.400E+01	h	3.2E-02	2.5E-02	4.3E-03	5.0E-06	2.1E-12	2.3E-13	
Zr-93	1.530E+06	yr	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06	2.7E-06
Nb-93m	1.360E+01	yr	2.5E-06	2.5E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06	2.6E-06
Nb-94	2.030E+04	yr	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.0E-06
Tc-98	4.199E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Tc-99	2.130E+05	yr	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05	1.2E-05
Ru-102	1.059E+03	d	1.0E-12	9.5E-14	2.0E-21				
Ru-106	3.682E+02	d							
Rh-106	2.990E+01	s							
Pd-107	6.496E+06	yr	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Ag-108	2.370E+00	m	4.0E-14	3.8E-14	2.5E-14	5.4E-15	1.9E-16	1.1E-16	1.1E-37
Ag-108m	1.270E+02	yr	4.5E-13	4.3E-13	2.8E-13	6.0E-14	2.1E-15	1.3E-15	1.1E-36
Ag-109m	3.960E+01	s	2.1E-23	9.3E-24					
Cd-109	4.640E+02	d	2.1E-23	9.3E-24	2.7E-41				
Ag-110	2.460E+01	s	7.0E-29	2.8E-33					
Ag-110m	2.499E+02	d	5.3E-27	2.1E-31					
Cd-113m	1.459E+01	yr	1.0E-06	6.4E-07	1.9E-08	2.6E-14	5.1E-27	5.1E-27	
In-115	4.997E+14	yr	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16	1.2E-16
Sn-119m	2.450E+02	d							
Sn-121m	4.997E+01	yr	5.5E-08	4.8E-08	1.7E-08	3.4E-10	6.5E-14	1.8E-14	
Te-123	1.000E+13	yr	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19	4.7E-19
Sb-125	2.770E+00	yr	1.1E-08	9.2E-10	8.4E-18				
Te-125m	5.800E+01	d	2.7E-09	2.2E-10	2.0E-18				
Sn-126	1.000E+05	yr	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.0E-07	5.0E-07	4.7E-07
Sb-126	1.240E+01	d	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	7.1E-08	6.6E-08
Sb-126m	1.900E+01	m	5.1E-07	5.1E-07	5.1E-07	5.1E-07	5.0E-07	5.0E-07	4.7E-07
I-129	1.570E+07	yr	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08	6.6E-08
Cs-134	2.062E+00	yr	1.5E-09	5.2E-11	8.2E-22				
Cs-135	2.300E+06	yr	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Cs-137	3.000E+01	yr	3.2E-02	2.5E-02	4.6E-03	6.4E-06	4.2E-12	4.8E-13	
Ba-137m	2.552E+00	m	3.0E-02	2.4E-02	4.3E-03	6.1E-06	4.0E-12	4.6E-13	
La-138	1.350E+11	yr	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16	2.4E-16
Ce-142	1.049E+11	yr	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11	3.7E-11
Ce-144	2.843E+02	d	4.7E-18	6.4E-22					
Pr-144	1.728E+01	m	4.7E-18	6.4E-22					
Pr-144m	7.200E+00	m	5.6E-20	7.6E-24					
Nd-144	2.099E+15	yr	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15	2.0E-15
Pm-146	5.500E+00	yr	1.6E-09	4.6E-10	4.1E-14	1.2E-29			
Sm-146	7.000E+07	yr	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13
Pm-147	2.623E+00	yr	9.9E-08	7.1E-09	2.3E-17				
Sm-147	1.070E+11	yr	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12	9.1E-12
Sm-148	8.001E+15	yr	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17	4.7E-17
Sm-149	9.994E+15	yr	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18	4.2E-18
Eu-150	3.600E+01	yr	1.0E-11	8.4E-12	2.0E-12	8.5E-15	6.0E-20	9.8E-21	
Sm-151	8.999E+01	yr	3.3E-04	3.1E-04	1.7E-04	2.0E-05	1.7E-07	8.2E-08	
Eu-152	1.360E+01	yr	7.1E-07	4.3E-07	9.8E-09	5.1E-15	1.2E-28	1.2E-28	
Gd-152	1.080E+14	yr	1.8E-18	1.9E-18	1.9E-18	1.9E-18	1.9E-18	1.9E-18	1.9E-18
Gd-153	2.420E+02	d							
Eu-154	8.600E+00	yr	1.9E-05	8.6E-06	2.2E-08	2.5E-18	6.9E-40	3.5E-43	
Eu-155	4.959E+00	yr	3.5E-06	8.7E-07	2.8E-11	1.6E-28			
Ho-166m	1.200E+03	yr	5.6E-11	5.6E-11	5.3E-11	4.5E-11	3.2E-11	3.0E-11	1.8E-13
Tm-171	1.920E+00	yr	1.8E-20	4.7E-22	1.2E-33				
Tl-207	4.770E+00	m	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Tl-208	3.070E+00	m	7.3E-10	6.6E-10	3.2E-10	2.1E-11	1.8E-13	1.5E-13	1.2E-13
Tl-209	2.200E+00	m	2.4E-14	3.7E-14	2.3E-13	2.6E-12	1.6E-11	1.9E-11	1.2E-09

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ROUNDSB2.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.300E+00	h	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Pb-210	2.230E+01	yr	1.2E-11	1.6E-11	6.0E-11	4.9E-10	2.3E-09	2.6E-09	7.8E-08
Pb-211	3.610E+01	m	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Pb-212	1.064E+01	h	2.0E-09	1.8E-09	9.0E-10	5.9E-11	5.0E-13	4.1E-13	3.4E-13
Pb-214	2.680E+01	m	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Bi-210m	3.000E+06	yr	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25	2.7E-25
Bi-210	5.012E+00	d	1.2E-11	1.6E-11	6.0E-11	4.9E-10	2.3E-09	2.6E-09	7.8E-08
Bi-211	2.130E+00	m	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Bi-212	6.055E+01	m	2.0E-09	1.8E-09	9.0E-10	5.9E-11	5.0E-13	4.1E-13	3.4E-13
Bi-213	4.565E+01	m	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Bi-214	1.990E+01	m	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Po-210	1.384E+02	d	1.2E-11	1.6E-11	6.0E-11	4.9E-10	2.3E-09	2.6E-09	7.8E-08
Po-211	5.600E-01	s	2.6E-13	2.8E-13	4.3E-13	9.2E-13	1.8E-12	1.9E-12	1.4E-11
Po-212	3.000E-07	s	1.3E-09	1.2E-09	5.8E-10	3.8E-11	3.2E-13	2.6E-13	2.2E-13
Po-213	4.200E-06	s	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.4E-10	8.8E-10	5.4E-08
Po-214	1.643E-04	s	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Po-215	1.780E-03	s	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Po-216	1.500E-01	s	2.0E-09	1.8E-09	9.0E-10	5.9E-11	5.0E-13	4.1E-13	3.4E-13
Po-218	3.050E+00	m	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
At-217	3.230E-02	s	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Rn-219	3.960E+00	s	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Rn-220	5.560E+01	s	2.0E-09	1.8E-09	9.0E-10	5.9E-11	5.0E-13	4.1E-13	3.4E-13
Rn-222	3.824E+00	d	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Fr-221	4.800E+00	m	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Fr-223	2.180E+01	m	1.3E-12	1.4E-12	2.1E-12	4.5E-12	9.1E-12	9.6E-12	7.0E-11
Ra-223	1.143E+01	d	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Ra-224	3.660E+00	d	2.0E-09	1.8E-09	9.0E-10	5.9E-11	5.0E-13	4.1E-13	3.4E-13
Ra-225	1.480E+01	d	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Ra-226	1.600E+03	yr	2.4E-11	3.0E-11	8.4E-11	4.9E-10	2.3E-09	2.7E-09	7.8E-08
Ra-228	6.700E+00	yr	9.1E-16	9.3E-16	1.1E-15	1.7E-15	2.9E-15	3.1E-15	2.2E-14
Ac-225	1.000E+01	d	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Ac-227	2.177E+01	yr	9.1E-11	1.0E-10	1.5E-10	3.3E-10	6.6E-10	6.9E-10	5.1E-09
Ac-228	6.131E+00	h	9.1E-16	9.3E-16	1.1E-15	1.7E-15	2.9E-15	3.1E-15	2.2E-14
Th-227	1.872E+01	d	9.0E-11	1.0E-10	1.5E-10	3.2E-10	6.5E-10	6.8E-10	5.0E-09
Th-228	1.913E+00	yr	2.0E-09	1.8E-09	9.0E-10	5.9E-11	5.0E-13	4.1E-13	3.4E-13
Th-229	7.339E+03	yr	1.1E-12	1.7E-12	1.1E-11	1.2E-10	7.5E-10	9.0E-10	5.5E-08
Th-230	7.700E+04	yr	1.3E-09	1.4E-09	2.1E-09	5.0E-09	1.1E-08	1.2E-08	1.0E-07
Th-231	2.552E+01	h	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.7E-08
Th-232	1.405E+10	yr	9.4E-16	9.6E-16	1.1E-15	1.7E-15	2.9E-15	3.1E-15	2.2E-14
Th-234	2.410E+01	d	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-231	3.277E+04	yr	1.3E-10	1.3E-10	1.7E-10	3.3E-10	6.6E-10	7.1E-10	5.1E-09
Pa-233	2.700E+01	d	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Pa-234m	1.170E+00	m	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
Pa-234	6.700E+00	h	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11	3.3E-11
U-232	7.200E+01	yr	2.0E-09	1.8E-09	8.8E-10	5.7E-11	4.9E-13	4.0E-13	3.2E-13
U-233	1.585E+05	yr	5.5E-10	7.1E-10	1.9E-09	6.4E-09	1.6E-08	1.8E-08	1.6E-07
U-234	2.445E+05	yr	1.0E-06	1.0E-06	1.1E-06	1.2E-06	1.2E-06	1.2E-06	1.1E-06
U-235	7.038E+08	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.7E-08
U-236	2.341E+07	yr	4.1E-08	4.1E-08	4.1E-08	4.1E-08	4.2E-08	4.2E-08	4.4E-08
U-237	6.750E+00	d	2.0E-09	1.2E-09	3.5E-11	8.8E-15	8.3E-15	8.3E-15	4.0E-15
U-238	4.468E+09	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.6E-08
U-240	1.410E+01	h	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Np-236	1.150E+05	yr	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.8E-12	3.6E-12
Np-237	2.140E+06	yr	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06	3.6E-06
Np-238	2.117E+00	d	8.2E-11	7.9E-11	5.6E-11	1.5E-11	9.3E-13	6.0E-13	1.5E-30
Np-239	2.355E+00	d	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.4E-08	2.4E-08	1.0E-08
Np-240m	7.400E+00	m	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16
Pu-236	2.851E+00	yr	3.3E-12	6.0E-13	3.4E-13	3.4E-13	3.4E-13	3.4E-13	3.2E-13
Pu-238	8.774E+01	yr	3.7E-04	3.4E-04	1.9E-04	2.0E-05	1.6E-07	7.5E-08	5.9E-28
Pu-239	2.406E+04	yr	6.7E-05	6.7E-05	6.7E-05	6.6E-05	6.5E-05	6.5E-05	5.0E-05
Pu-240	6.537E+03	yr	1.3E-05	1.2E-05	1.2E-05	1.2E-05	1.1E-05	1.1E-05	4.3E-06
Pu-241	1.440E+01	yr	8.0E-05	5.0E-05	1.4E-06	3.6E-10	3.4E-10	3.4E-10	1.6E-10
Pu-242	3.869E+05	yr	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.6E-09
Pu-243	4.956E+00	h	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Pu-244	8.261E+07	yr	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16	8.4E-16

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ROUNDSB2.OUT (Ci/L) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Am-241	4.322E+02	yr	6.7E-05	6.7E-05	6.1E-05	3.9E-05	1.4E-05	1.2E-05	1.7E-10
Am-242m	1.520E+02	yr	1.6E-08	1.6E-08	1.1E-08	3.1E-09	1.9E-10	1.2E-10	3.0E-28
Am-242	1.602E+01	h	1.6E-08	1.6E-08	1.1E-08	3.1E-09	1.8E-10	1.2E-10	3.0E-28
Am-243	7.380E+03	yr	2.6E-08	2.6E-08	2.6E-08	2.6E-08	2.4E-08	2.4E-08	1.0E-08
Cm-242	1.632E+02	d	1.4E-08	1.3E-08	9.2E-09	2.5E-09	1.5E-10	9.9E-11	2.5E-28
Cm-243	2.850E+01	yr	1.7E-08	1.4E-08	2.3E-09	2.2E-12	7.0E-19	7.1E-20	
Cm-244	1.811E+01	yr	7.2E-07	4.9E-07	2.9E-08	5.5E-13	3.2E-23	1.7E-24	
Cm-245	8.499E+03	yr	3.7E-10	3.7E-10	3.7E-10	3.6E-10	3.4E-10	3.4E-10	1.6E-10
Cm-246	4.731E+03	yr	2.4E-11	2.4E-11	2.4E-11	2.3E-11	2.1E-11	2.1E-11	5.6E-12
Cm-247	1.560E+07	yr	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17	2.7E-17
Cm-248	3.391E+05	yr	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.9E-17	2.8E-17
Cf-249	3.505E+02	yr	2.0E-17	2.0E-17	1.7E-17	9.8E-18	2.9E-18	2.4E-18	5.5E-26
Cf-250	1.308E+01	yr	3.8E-18	2.2E-18	4.4E-20	1.5E-25	1.4E-25	1.4E-25	9.6E-26
Cf-251	8.980E+02	yr	3.3E-19	3.3E-19	3.1E-19	2.5E-19	1.5E-19	1.4E-19	1.5E-22
Cf-252	2.638E+00	yr	2.3E-23						
Ca-45	1.630E+02	d							
V-50	4.000E+16	yr	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21	5.2E-21
Mn-54	3.125E+02	d	1.9E-22	5.6E-26					
Fe-55	2.600E+00	yr	9.4E-10	6.6E-11	1.8E-19				
Lu-176	3.000E+10	yr	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16	7.4E-16
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Ta-182	1.150E+02	d	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12	3.2E-12
Re-187	5.000E+10	yr	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21	7.2E-21

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sbw_run2.g
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mg/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
HE 3	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12	3.332E-12
B 10	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14	7.734E-14
B 11	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05	2.181E-05
C 12	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02	5.363E-02
C 13	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04	7.331E-04
N 14	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02	6.913E-02
N 15	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04	2.654E-04
O 16	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00	4.162E+00
O 17	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03	1.669E-03
O 18	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03	8.345E-03
F 19	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09	4.215E-09
NE 20	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14	3.891E-14
NE 21	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13	3.038E-13
NE 22	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11	4.386E-11
NA 23	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12	3.427E-12
MG 24	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07	1.364E-07
MG 25	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07	4.910E-07
MG 26	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07	2.162E-07
AL 27	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02	6.963E-02
SI 28	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02	6.228E-02
SI 29	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03	3.156E-03
SI 30	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03	2.095E-03
SI 32	1.021E-14	9.846E-15	9.741E-15	9.002E-15	6.650E-15	3.448E-15	3.119E-15	2.381E-19
P 31	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03	3.042E-03
P 32	6.149E-19	5.931E-19	5.868E-19	5.422E-19	4.006E-19	2.077E-19	1.879E-19	1.434E-23
S 32	0.000E+00	3.644E-16	4.689E-16	1.208E-15	3.560E-15	6.763E-15	7.092E-15	1.021E-14
S 34	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05	8.538E-05
CL 37	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14	6.914E-14
AR 38	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19	5.507E-19
AR 39	7.935E-22	7.238E-22	7.052E-22	5.835E-22	2.816E-22	5.876E-23	4.453E-23	5.013E-33
AR 40	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14	7.726E-14
AR 42	7.600E-23	3.642E-23	2.877E-23	7.797E-24	1.883E-24	4.525E-30	4.525E-30	0.000E+00
K 39	0.000E+00	6.968E-23	8.833E-23	2.100E-22	5.119E-22	7.347E-22	7.490E-22	7.935E-22
K 41	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15	2.479E-15
K 42	0.000E+00	1.587E-27	1.262E-27	3.332E-28	8.047E-29	1.934E-34	1.934E-34	0.000E+00
CA 42	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17	4.304E-17
CA 43	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09	5.816E-09
CA 44	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08	4.436E-08
CA 46	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09	5.280E-09
SC 45	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10	9.175E-10
TI 46	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03	2.779E-03
TI 47	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03	2.534E-03
TI 48	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02	2.539E-02
TI 49	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03	2.182E-03
TI 50	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03	1.891E-03
V 50	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05	2.906E-05
V 51	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03	3.322E-03
CR 50	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01	2.036E-01
CR 52	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00	3.978E+00
CR 53	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01	4.527E-01
CR 54	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01	1.213E-01
MN 54	2.345E-11	2.395E-23	7.259E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MN 55	1.060E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03
FE 54	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01	5.774E-01
FE 55	3.331E-06	3.774E-10	2.624E-11	7.099E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 56	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00	8.968E+00
FE 57	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01	2.237E-01
FE 58	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02	2.929E-02
CO 59	2.578E-04	2.597E-04	2.603E-04	2.644E-04	2.804E-04	3.149E-04	3.201E-04	7.975E-04
CO 60	7.770E-05	8.782E-07	2.357E-07	1.397E-11	8.353E-28	0.000E+00	0.000E+00	0.000E+00
NI 58	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00
NI 59	6.501E-03	6.499E-03	6.499E-03	6.494E-03	6.478E-03	6.444E-03	6.439E-03	5.961E-03
NI 60	8.188E-01	8.189E-01	8.189E-01	8.189E-01	8.189E-01	8.189E-01	8.189E-01	8.189E-01
NI 61	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02	3.722E-02
NI 62	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01	1.114E-01
NI 63	6.590E-04	5.098E-04	4.728E-04	2.707E-04	3.186E-05	3.074E-07	1.514E-07	0.000E+00

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sbw_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mg/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
NI 64	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02	2.857E-02
CU 63	2.109E-04	3.601E-04	3.971E-04	5.992E-04	8.380E-04	8.696E-04	8.697E-04	8.699E-04
CU 65	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05	3.584E-05
ZN 64	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08	1.977E-08
ZN 65	1.042E-19	4.490E-35	1.392E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06	8.220E-06
RU 98	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18	8.286E-18
IN113	0.000E+00	3.743E-19	3.743E-19	3.743E-19	3.743E-19	3.743E-19	3.743E-19	3.743E-19
SN112	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01	5.190E-01
YB173	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11	1.183E-11
YB174	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13	5.418E-13
LU175	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04	4.477E-04
LU176	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05	1.092E-05
HF174	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04	6.022E-04
HF176	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02	2.704E-02
HF177	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03	9.052E-03
HF178	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01	1.615E-01
HF179	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01	2.123E-01
HF180	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01	2.794E-01
HF182	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.466E-05	1.465E-05
TA181	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02	3.327E-02
TA182	5.128E-13	5.129E-13	5.129E-13	5.129E-13	5.128E-13	5.128E-13	5.128E-13	5.125E-13
W182	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03	4.552E-03
W183	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03	4.726E-03
W184	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04	2.855E-04
W186	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09	4.600E-09
RE185	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07	5.593E-07
RE187	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10	1.887E-10
OS186	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08	6.896E-08
OS187	0.000E+00	8.915E-20	1.153E-19	3.089E-19	1.052E-18	2.663E-18	2.909E-18	2.616E-17
OS188	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12	6.072E-12
OS189	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14	4.217E-14
OS190	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15	1.491E-15
HE 4	0.000E+00	1.525E-04	1.919E-04	4.264E-04	8.866E-04	1.417E-03	1.486E-03	6.368E-03
TL206	0.000E+00	1.245E-30	1.245E-30	1.245E-30	1.245E-30	1.245E-30	1.245E-30	1.243E-30
TL207	1.930E-16	4.768E-16	5.320E-16	8.054E-16	1.711E-15	3.451E-15	3.630E-15	2.667E-14
TL208	1.480E-14	2.462E-15	2.237E-15	1.097E-15	7.163E-17	6.043E-19	4.942E-19	4.189E-19
TL209	1.100E-20	5.918E-20	9.071E-20	5.681E-19	6.348E-18	3.976E-17	4.729E-17	2.917E-15
PB206	1.042E-11	1.010E-10	1.572E-10	1.225E-09	2.817E-08	3.404E-07	4.319E-07	1.329E-04
PB207	1.961E-10	1.114E-09	1.501E-09	5.358E-09	3.259E-08	1.524E-07	1.778E-07	1.072E-05
PB208	1.052E-07	1.485E-07	1.562E-07	1.954E-07	2.306E-07	2.331E-07	2.332E-07	2.344E-07
PB209	4.500E-17	2.466E-16	3.780E-16	2.367E-15	2.645E-14	1.657E-13	1.970E-13	1.215E-11
PB210	3.210E-11	1.583E-10	2.114E-10	7.831E-10	6.367E-09	3.047E-08	3.382E-08	1.022E-06
PB211	1.500E-15	3.689E-15	4.115E-15	6.230E-15	1.324E-14	2.670E-14	2.808E-14	2.063E-13
PB212	8.760E-12	1.452E-12	1.319E-12	6.471E-13	4.225E-14	3.565E-16	2.915E-16	2.471E-16
PB214	2.430E-16	7.423E-16	9.143E-16	2.552E-15	1.483E-14	7.096E-14	8.260E-14	2.380E-12
BI208	6.795E-20	6.795E-20	6.795E-20	6.795E-20	6.791E-20	6.783E-20	6.783E-20	6.670E-20
BI209	1.447E-12	8.614E-12	1.430E-11	1.809E-10	6.585E-09	1.045E-07	1.358E-07	8.045E-05
BI210M	4.800E-19	4.800E-19	4.800E-19	4.800E-19	4.800E-19	4.799E-19	4.799E-19	4.789E-19
BI210	1.980E-14	9.743E-14	1.301E-13	4.818E-13	3.918E-12	1.875E-11	2.081E-11	6.288E-10
BI211	8.836E-17	2.177E-16	2.428E-16	3.676E-16	7.810E-16	1.575E-15	1.657E-15	1.217E-14
BI212	8.310E-13	1.378E-13	1.251E-13	6.138E-14	4.008E-15	3.381E-17	2.765E-17	2.344E-17
BI213	1.070E-17	5.794E-17	8.881E-17	5.562E-16	6.215E-15	3.892E-14	4.630E-14	2.856E-12
BI214	1.800E-16	5.512E-16	6.789E-16	1.895E-15	1.101E-14	5.269E-14	6.133E-14	1.767E-12
PO210	5.200E-13	2.691E-12	3.594E-12	1.331E-11	1.082E-10	5.178E-10	5.748E-10	1.737E-08
PO211	1.084E-21	2.670E-21	2.979E-21	4.510E-21	9.582E-21	1.933E-20	2.033E-20	1.494E-19
PO212	4.398E-23	7.289E-24	6.621E-24	3.247E-24	2.120E-25	1.789E-27	1.463E-27	1.240E-27
PO213	0.000E+00	8.693E-26	1.332E-25	8.345E-25	9.325E-24	5.840E-23	6.946E-23	4.285E-21
PO214	2.479E-23	7.583E-23	9.340E-23	2.607E-22	1.515E-21	7.248E-21	8.438E-21	2.431E-19
PO215	1.254E-21	3.089E-21	3.446E-21	5.217E-21	1.108E-20	2.235E-20	2.352E-20	1.728E-19
PO216	3.400E-17	5.795E-18	5.264E-18	2.582E-18	1.686E-19	1.422E-21	1.163E-21	9.860E-22
PO218	2.810E-17	8.608E-17	1.060E-16	2.959E-16	1.719E-15	8.228E-15	9.578E-15	2.760E-13
AT217	1.290E-22	6.961E-22	1.067E-21	6.683E-21	7.467E-20	4.676E-19	5.562E-19	3.431E-17
RN219	2.842E-18	7.000E-18	7.809E-18	1.182E-17	2.512E-17	5.066E-17	5.329E-17	3.915E-16
RN220	1.320E-14	2.188E-15	1.987E-15	9.748E-16	6.365E-17	5.370E-19	4.391E-19	3.722E-19

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sbw_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mg/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
RN222	5.170E-14	1.583E-13	1.949E-13	5.440E-13	3.161E-12	1.513E-11	1.761E-11	5.074E-10
FR221	1.170E-18	6.321E-18	9.689E-18	6.068E-17	6.781E-16	4.246E-15	5.051E-15	3.116E-13
FR223	1.320E-17	3.248E-17	3.619E-17	5.487E-17	1.166E-16	2.351E-16	2.473E-16	1.817E-15
RA223	7.210E-13	1.778E-12	1.984E-12	3.003E-12	6.380E-12	1.287E-11	1.354E-11	9.946E-11
RA224	7.560E-11	1.267E-11	1.151E-11	5.644E-12	3.686E-13	3.109E-15	2.543E-15	2.155E-15
RA225	5.290E-15	2.858E-14	4.381E-14	2.744E-13	3.066E-12	1.920E-11	2.284E-11	1.409E-09
RA226	8.050E-09	2.462E-08	3.032E-08	8.463E-08	4.918E-07	2.353E-06	2.740E-06	7.894E-05
RA228	2.200E-15	3.868E-15	3.982E-15	4.726E-15	7.197E-15	1.258E-14	1.341E-14	9.341E-14
AC225	3.580E-15	1.931E-14	2.959E-14	1.853E-13	2.071E-12	1.297E-11	1.543E-11	9.517E-10
AC227	5.100E-10	1.259E-09	1.402E-09	2.126E-09	4.517E-09	9.111E-09	9.583E-09	7.042E-08
AC228	2.670E-19	4.037E-19	4.156E-19	4.933E-19	7.512E-19	1.313E-18	1.399E-18	9.750E-18
TH227	1.190E-12	2.922E-12	3.260E-12	4.935E-12	1.048E-11	2.115E-11	2.224E-11	1.634E-10
TH228	1.480E-08	2.462E-09	2.236E-09	1.097E-09	7.162E-11	6.043E-13	4.941E-13	4.189E-13
TH229	9.760E-10	5.267E-09	8.073E-09	5.057E-08	5.650E-07	3.538E-06	4.209E-06	2.596E-04
TH230	4.810E-05	6.351E-05	6.814E-05	1.035E-04	2.474E-04	5.650E-04	6.133E-04	4.948E-03
TH231	2.610E-10	4.880E-11	4.880E-11	4.881E-11	4.884E-11	4.892E-11	4.893E-11	4.987E-11
TH232	7.890E-06	8.522E-06	8.707E-06	1.008E-05	1.536E-05	2.685E-05	2.860E-05	1.993E-04
TH234	1.990E-10	1.105E-09	1.105E-09	1.105E-09	1.105E-09	1.105E-09	1.105E-09	1.105E-09
PA231	2.280E-06	2.674E-06	2.790E-06	3.645E-06	6.915E-06	1.395E-05	1.501E-05	1.078E-04
PA233	1.760E-08	1.746E-07	1.746E-07	1.747E-07	1.749E-07	1.751E-07	1.751E-07	1.747E-07
PA234M	6.700E-15	3.725E-14	3.725E-14	3.725E-14	3.725E-14	3.725E-14	3.725E-14	3.725E-14
PA234	2.990E-15	1.664E-14	1.664E-14	1.664E-14	1.664E-14	1.664E-14	1.664E-14	1.664E-14
U232	1.050E-07	9.177E-08	8.336E-08	4.089E-08	2.670E-09	2.281E-11	1.852E-11	1.502E-11
U233	1.530E-06	5.716E-05	7.352E-05	1.947E-04	6.596E-04	1.667E-03	1.821E-03	1.606E-02
U234	1.590E-01	1.656E-01	1.672E-01	1.759E-01	1.856E-01	1.864E-01	1.864E-01	1.818E-01
U235	1.200E+01	1.200E+01	1.200E+01	1.200E+01	1.201E+01	1.203E+01	1.203E+01	1.227E+01
U236	6.370E-01	6.372E-01	6.373E-01	6.377E-01	6.393E-01	6.425E-01	6.430E-01	6.722E-01
U237	1.044E-11	2.413E-11	1.491E-11	4.232E-13	1.079E-16	1.021E-16	1.014E-16	4.909E-17
U238	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01	7.610E+01
U240	5.490E-20	9.028E-19	9.028E-19	9.028E-19	9.028E-19	9.028E-19	9.028E-19	9.027E-19
NP235	2.310E-13	7.993E-23	8.338E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NP236	2.880E-07	2.879E-07	2.879E-07	2.878E-07	2.873E-07	2.862E-07	2.861E-07	2.712E-07
NP237	5.140E+00	5.141E+00	5.141E+00	5.143E+00	5.149E+00	5.155E+00	5.156E+00	5.144E+00
NP238	1.450E-12	3.178E-13	3.036E-13	2.167E-13	5.935E-14	3.577E-15	2.330E-15	5.780E-33
NP239	4.470E-10	1.139E-10	1.138E-10	1.130E-10	1.101E-10	1.039E-10	1.030E-10	4.467E-11
NP240M	2.550E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21	7.897E-21	7.896E-21
PU236	2.190E-08	6.163E-12	1.128E-12	6.422E-13	6.411E-13	6.387E-13	6.383E-13	6.050E-13
PU238	2.840E-02	2.170E-02	2.005E-02	1.117E-02	1.186E-03	9.151E-06	4.359E-06	3.437E-26
PU239	1.080E+00	1.079E+00	1.079E+00	1.076E+00	1.068E+00	1.049E+00	1.046E+00	8.097E-01
PU240	5.500E-02	5.482E-02	5.477E-02	5.435E-02	5.274E-02	4.940E-02	4.891E-02	1.906E-02
PU241	4.020E-03	7.794E-04	4.816E-04	1.367E-05	3.489E-09	3.303E-09	3.278E-09	1.588E-09
PU242	2.560E-03	2.560E-03	2.560E-03	2.560E-03	2.558E-03	2.556E-03	2.555E-03	2.515E-03
PU243	1.370E-21	1.030E-20	1.030E-20	1.030E-20	1.030E-20	1.030E-20	1.030E-20	1.030E-20
PU244	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08	4.720E-08
PU246	0.000E+00	5.212E-27	5.212E-27	5.197E-27	5.138E-27	5.013E-27	4.993E-27	3.504E-27
AM241	1.730E-02	1.951E-02	1.950E-02	1.774E-02	1.126E-02	4.193E-03	3.606E-03	4.997E-08
AM242M	1.980E-06	1.695E-06	1.619E-06	1.156E-06	3.165E-07	1.908E-08	1.243E-08	3.083E-26
AM242	2.360E-11	2.028E-11	1.937E-11	1.382E-11	3.786E-12	2.282E-13	1.486E-13	3.688E-31
AM243	1.330E-04	1.326E-04	1.325E-04	1.315E-04	1.281E-04	1.209E-04	1.198E-04	5.198E-05
AM245	0.000E+00	2.953E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM246	0.000E+00	8.340E-30	8.340E-30	8.315E-30	8.221E-30	8.022E-30	7.989E-30	5.607E-30
CM242	4.773E-09	4.100E-09	3.917E-09	2.795E-09	7.656E-10	4.614E-11	3.006E-11	7.478E-29
CM243	7.700E-07	3.361E-07	2.636E-07	4.358E-08	4.342E-11	1.353E-17	1.375E-18	0.000E+00
CM244	3.270E-05	8.873E-06	6.051E-06	3.563E-07	6.776E-12	3.904E-22	2.048E-23	0.000E+00
CM245	2.150E-06	2.144E-06	2.142E-06	2.129E-06	2.081E-06	1.979E-06	1.964E-06	9.510E-07
CM246	7.920E-08	7.881E-08	7.869E-08	7.784E-08	7.467E-08	6.823E-08	6.729E-08	1.829E-08
CM247	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.890E-10	2.889E-10
CM248	6.720E-12	6.720E-12	6.719E-12	6.718E-12	6.714E-12	6.706E-12	6.705E-12	6.584E-12
CM250	1.241E-20	1.241E-20	1.241E-20	1.237E-20	1.223E-20	1.193E-20	1.189E-20	8.336E-21
BK249	3.909E-21	7.640E-33	2.801E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BK250	0.000E+00	3.670E-29	3.670E-29	3.660E-29	3.618E-29	3.530E-29	3.516E-29	2.468E-29
CF249	5.270E-15	4.927E-15	4.830E-15	4.172E-15	2.379E-15	7.036E-16	5.843E-16	1.351E-23
CF250	2.090E-16	3.434E-17	2.022E-17	4.007E-19	1.404E-24	1.256E-24	1.256E-24	8.781E-25
CF251	2.130E-16	2.075E-16	2.059E-16	1.944E-16	1.562E-16	9.708E-17	9.028E-17	9.438E-20
CF252	3.250E-19	4.197E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SF250	0.000E+00	5.738E-11	6.784E-11	1.178E-10	2.318E-10	4.296E-10	4.585E-10	2.316E-09

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sbw_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

	mg/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
H 3	1.880E-06	2.776E-07	1.583E-07	2.487E-09	2.969E-16	2.859E-31	2.859E-31	0.000E+00
LI 6	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07	3.333E-07
LI 7	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08	1.286E-08
BE 9	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08	2.478E-08
BE 10	1.660E-07	1.660E-07	1.660E-07	1.660E-07	1.660E-07	1.659E-07	1.659E-07	1.653E-07
C 14	3.330E-08	3.316E-08	3.312E-08	3.283E-08	3.172E-08	2.944E-08	2.911E-08	9.929E-09
ZN 66	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11	9.786E-11
ZN 67	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12	4.265E-12
ZN 68	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07	3.269E-07
GA 69	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10	5.050E-10
GE 70	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12	1.449E-12
GA 71	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09	1.177E-09
GE 72	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05	1.146E-05
GE 73	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05	3.793E-05
GE 74	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05	9.762E-05
AS 75	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04	2.258E-04
GE 76	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04	6.710E-04
SE 76	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06	3.454E-06
SE 77	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03	1.463E-03
SE 78	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03	3.122E-03
SE 79	7.750E-03	7.747E-03	7.746E-03	7.740E-03	7.717E-03	7.666E-03	7.659E-03	6.965E-03
BR 79	2.400E-06	5.218E-06	6.044E-06	1.216E-05	3.558E-05	8.613E-05	9.382E-05	7.869E-04
SE 80	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02	1.860E-02
KR 80	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08	9.214E-08
BR 81	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02	3.122E-02
KR 81	2.918E-09	2.918E-09	2.918E-09	2.917E-09	2.914E-09	2.908E-09	2.907E-09	2.823E-09
SE 82	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02	5.006E-02
KR 82	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04	6.326E-04
KR 83	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02	7.140E-02
KR 84	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01	1.699E-01
KR 85	7.423E-03	8.196E-04	4.293E-04	3.587E-06	3.800E-14	1.914E-31	1.914E-31	0.000E+00
RB 85	1.913E-01	1.979E-01	1.983E-01	1.987E-01	1.987E-01	1.987E-01	1.987E-01	1.987E-01
KR 86	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01	3.176E-01
SR 86	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04	3.576E-04
RB 87	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01	4.140E-01
SR 87	1.534E-06	1.534E-06	1.534E-06	1.535E-06	1.536E-06	1.540E-06	1.541E-06	1.595E-06
SR 88	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01	5.923E-01
Y 89	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01	7.800E-01
SR 90	5.260E-01	2.337E-01	1.842E-01	3.165E-02	3.652E-05	1.566E-11	1.672E-12	0.000E+00
Y 90	1.320E-04	5.861E-05	4.620E-05	7.937E-06	9.203E-09	3.928E-15	4.193E-16	0.000E+00
ZR 90	4.644E-01	7.568E-01	8.063E-01	9.589E-01	9.905E-01	9.905E-01	9.905E-01	9.905E-01
ZR 91	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01	9.744E-01
ZR 92	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00	1.014E+00
ZR 93	1.090E+00	1.090E+00	1.090E+00	1.090E+00	1.090E+00	1.089E+00	1.089E+00	1.085E+00
NB 93	7.499E-06	2.247E-05	2.725E-05	6.356E-05	2.038E-04	5.079E-04	5.543E-04	4.934E-03
NB 93M	6.950E-06	8.808E-06	8.967E-06	9.199E-06	9.204E-06	9.201E-06	9.201E-06	9.164E-06
ZR 94	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03	5.284E-03
NB 94	7.520E-03	7.511E-03	7.509E-03	7.490E-03	7.417E-03	7.263E-03	7.240E-03	5.344E-03
MO 95	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00	1.093E+00
ZR 96	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00	1.108E+00
MO 96	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02	2.510E-02
MO 97	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00	1.045E+00
MO 98	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00	1.050E+00
TC 98	3.670E-06	3.670E-06	3.670E-06	3.670E-06	3.670E-06	3.669E-06	3.669E-06	3.664E-06
TC 99	7.310E-01	7.309E-01	7.309E-01	7.307E-01	7.300E-01	7.286E-01	7.284E-01	7.076E-01
RU 99	9.751E-05	1.786E-04	2.024E-04	3.783E-04	1.053E-03	2.515E-03	2.738E-03	2.351E-02
MO100	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00	1.155E+00
RU100	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02	7.349E-02
RU101	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01	9.262E-01
RU102	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01	8.155E-01
RH102	2.970E-09	8.613E-13	7.890E-14	1.643E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01	4.751E-01
RU104	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01	3.665E-01
PD104	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01	1.236E-01
PD105	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01	1.886E-01
RU106	1.130E-05	7.505E-16	7.740E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

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sbw_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

mg/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
RH106	1.060E-11	7.055E-22	7.279E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD106	9.951E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02
PD107	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.970E-02	3.966E-02
AG107	1.229E-07	2.673E-07	3.096E-07	6.231E-07	1.826E-06	4.435E-06	4.834E-06	4.247E-05
PD108	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02	1.980E-02
AG108	6.570E-20	5.453E-20	5.164E-20	3.448E-20	7.318E-21	2.537E-22	1.519E-22	1.513E-43
AG108M	2.080E-11	1.727E-11	1.635E-11	1.092E-11	2.318E-12	8.035E-14	4.811E-14	4.084E-35
CD108	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08	3.236E-08
AG109	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03	8.779E-03
AG109M	9.649E-22	8.100E-30	3.570E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	9.760E-16	8.200E-24	3.614E-24	1.054E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD110	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03	7.480E-03
AG110	1.670E-20	1.684E-35	6.704E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110M	1.100E-12	1.111E-27	4.424E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD110	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03	2.455E-03
CD111	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03	5.965E-03
CD112	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03	4.651E-03
CD113	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04	7.464E-04
CD113M	2.410E-05	4.773E-06	2.968E-06	8.822E-08	1.218E-13	2.372E-26	2.372E-26	0.000E+00
IN113	6.667E-05	8.598E-05	8.778E-05	9.066E-05	9.075E-05	9.075E-05	9.075E-05	9.075E-05
CD114	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03	7.779E-03
SN114	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07	4.008E-07
IN115	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02	2.000E-02
SN115	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04	1.314E-04
CD116	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03	4.145E-03
SN116	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03	1.919E-03
SN117	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03	4.076E-03
SN118	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03	4.507E-03
SN119	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03	4.335E-03
SN119M	2.630E-13	1.340E-28	4.361E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN120	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03	4.529E-03
SN121M	1.500E-06	9.350E-07	8.139E-07	2.916E-07	5.675E-09	1.105E-12	2.999E-13	0.000E+00
SB121	4.582E-03	4.583E-03	4.583E-03	4.583E-03	4.583E-03	4.584E-03	4.584E-03	4.584E-03
SN122	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03	5.051E-03
TE122	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04	1.669E-04
SB123	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03	5.827E-03
TE123	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06	1.630E-06
SN124	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03	7.689E-03
TE124	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04	1.373E-04
SB125	5.510E-05	1.090E-08	8.923E-10	8.093E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125	9.946E-03	1.000E-02	1.000E-02	1.000E-02	1.000E-02	1.000E-02	1.000E-02	1.000E-02
TE125M	4.310E-07	1.524E-10	1.248E-11	1.132E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	1.790E-02	1.790E-02	1.789E-02	1.789E-02	1.785E-02	1.777E-02	1.776E-02	1.670E-02
SB126	8.510E-10	8.502E-10	8.502E-10	8.497E-10	8.481E-10	8.444E-10	8.439E-10	7.935E-10
SB126M	6.470E-12	6.464E-12	6.464E-12	6.460E-12	6.448E-12	6.420E-12	6.416E-12	6.033E-12
TE126	4.364E-04	4.406E-04	4.419E-04	4.510E-04	4.862E-04	5.623E-04	5.738E-04	1.635E-03
I127	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02	3.819E-02
TE128	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02	9.668E-02
XE128	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03	1.184E-03
I129	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.735E-01	3.733E-01
XE129	8.545E-06	9.107E-06	9.272E-06	1.049E-05	1.518E-05	2.533E-05	2.688E-05	1.735E-04
TE130	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01	3.644E-01
XE130	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03	5.607E-03
XE131	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01	5.715E-01
XE132	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00	1.173E+00
BA132	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07	7.984E-07
CS133	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00	1.517E+00
XE134	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00	1.896E+00
CS134	1.100E-04	1.164E-09	4.037E-11	6.346E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA134	1.218E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01	1.219E-01
CS135	9.230E-01	9.230E-01	9.230E-01	9.230E-01	9.229E-01	9.227E-01	9.227E-01	9.202E-01
BA135	1.592E-04	1.687E-04	1.715E-04	1.920E-04	2.710E-04	4.424E-04	4.685E-04	2.937E-03
XE136	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00	2.601E+00
BA136	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02	1.496E-02
CS137	8.060E-01	3.667E-01	2.911E-01	5.266E-02	7.404E-05	4.877E-11	5.557E-12	0.000E+00
BA137	7.459E-01	1.185E+00	1.261E+00	1.499E+00	1.552E+00	1.552E+00	1.552E+00	1.552E+00

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sbw_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

mg/L	34.1YR	44.1YR	118.1YR	402.1YR	1018.1YR	1112.1YR	1.0E+04YR
BA137M	1.230E-07	5.611E-08	4.453E-08	8.056E-09	1.138E-11	7.461E-18	8.502E-19	0.000E+00
BA138	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00	1.722E+00
LA138	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05	1.230E-05
LA139	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00	1.635E+00
CE140	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00	1.623E+00
PR141	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00	1.508E+00
CE142	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00	1.540E+00
ND142	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02	1.720E-02
ND143	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00	1.298E+00
CE144	2.240E-05	1.473E-18	1.996E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144	9.470E-10	6.219E-23	8.428E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144M	1.060E-14	3.109E-25	4.213E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND144	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00	1.680E+00
ND145	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01	9.768E-01
ND146	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01	8.627E-01
PM146	2.680E-07	3.654E-09	1.036E-09	9.232E-14	2.637E-29	0.000E+00	0.000E+00	0.000E+00
SM146	9.700E-06	9.798E-06	9.799E-06	9.799E-06	9.799E-06	9.799E-06	9.799E-06	9.798E-06
PM147	8.690E-04	1.068E-07	7.604E-09	2.454E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	4.000E-01	4.009E-01	4.009E-01	4.009E-01	4.009E-01	4.009E-01	4.009E-01	4.009E-01
ND148	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01	4.614E-01
SM148	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01	1.550E-01
SM149	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02	1.730E-02
ND150	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01	1.788E-01
SM150	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01	3.173E-01
EU150	2.960E-10	1.536E-10	1.267E-10	3.047E-11	1.285E-13	9.080E-19	1.486E-19	0.000E+00
SM151	1.640E-02	1.261E-02	1.168E-02	6.605E-03	7.411E-04	6.446E-06	3.125E-06	0.000E+00
EU151	3.931E-03	7.717E-03	8.652E-03	1.373E-02	1.959E-02	2.032E-02	2.033E-02	2.033E-02
SM152	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01	1.296E-01
EU152	2.330E-05	4.102E-06	2.464E-06	5.673E-08	2.937E-14	6.815E-28	6.815E-28	0.000E+00
GD152	7.920E-05	8.455E-05	8.500E-05	8.568E-05	8.569E-05	8.569E-05	8.569E-05	8.569E-05
EU153	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02	9.269E-02
GD153	5.290E-14	1.739E-29	4.979E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM154	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02	2.242E-02
EU154	1.110E-03	7.119E-05	3.180E-05	8.165E-08	9.357E-18	2.567E-39	1.295E-42	0.000E+00
GD154	1.848E-02	1.952E-02	1.956E-02	1.959E-02	1.959E-02	1.959E-02	1.959E-02	1.959E-02
EU155	8.880E-04	7.581E-06	1.874E-06	6.036E-11	3.480E-28	0.000E+00	0.000E+00	0.000E+00
GD155	6.939E-03	7.819E-03	7.825E-03	7.827E-03	7.827E-03	7.827E-03	7.827E-03	7.827E-03
GD156	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02	2.024E-02
GD157	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04	1.957E-04
GD158	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03	4.288E-03
TB159	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04	4.306E-04
GD160	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04	1.724E-04
DY160	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05	3.421E-05
DY161	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05	4.305E-05
DY162	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05	3.063E-05
DY163	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05	1.835E-05
DY164	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06	4.476E-06
HO165	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06	5.522E-06
HO166M	3.180E-08	3.118E-08	3.100E-08	2.970E-08	2.521E-08	1.766E-08	1.673E-08	9.850E-11
ER166	1.583E-06	1.584E-06	1.584E-06	1.585E-06	1.590E-06	1.597E-06	1.598E-06	1.615E-06
ER167	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07	3.926E-07
ER168	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07	2.481E-07
TM169	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09	1.063E-09
ER170	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13	2.722E-13
YB170	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10	1.838E-10
TM171	3.570E-15	1.619E-20	4.284E-22	1.070E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB171	7.096E-12	7.100E-12	7.100E-12	7.100E-12	7.100E-12	7.100E-12	7.100E-12	7.100E-12
YB172	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13	1.385E-13

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Source Listing of Program ELESBW2

```
      PROGRAM ELESBW2

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/19/02

!            To sum the mg/mL of SBW, convert to g/L and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='SBW_RUN2.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='SBW_RUN2.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'SBW_RUN2.ELE    g/L')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Source Listing of Program ELESBW2 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'2032Jan   2042Jan   2116Jan   2400' &
            'Jan   3016Jan   3110Jan   12000Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7

!--------- Multiply by .001 to convert from mg to g

         TOTAL(J) = TOTAL(J) + OLD(J) * .001
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
```

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Source Listing of Program ELESBW2 (continued)

```
  630  FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
       GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELESBW2
```

See Appendix A-4, Pages 4-5, for a listing of file SYMBOL.

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SBW_RUN2.ELE g/L
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	2.8E-10	1.6E-10	2.5E-12	3.0E-19	2.9E-34	2.9E-34	0.0E+00
He	1.5E-07	1.9E-07	4.3E-07	8.9E-07	1.4E-06	1.5E-06	6.4E-06
Li	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Be	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10	1.9E-10
B	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08	2.2E-08
C	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05	5.4E-05
N	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05	6.9E-05
O	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03	4.2E-03
F	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12	4.2E-12
Ne	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14	4.4E-14
Na	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15	3.4E-15
Mg	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10	8.4E-10
Si	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05	6.8E-05
P	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06	3.0E-06
S	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08	8.5E-08
Cl	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17	6.9E-17
Ar	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17	7.7E-17
K	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18	2.5E-18
Ca	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11	5.5E-11
Sc	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13	9.2E-13
Ti	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05	3.5E-05
V	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06	3.4E-06
Mn	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06	1.1E-06
Fe	3.8E-13	2.6E-14	7.1E-23	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	2.6E-07	2.6E-07	2.6E-07	2.8E-07	3.1E-07	3.2E-07	8.0E-07
Ni	7.0E-06	7.0E-06	6.8E-06	6.5E-06	6.4E-06	6.4E-06	6.0E-06
Cu	4.0E-07	4.3E-07	6.4E-07	8.7E-07	9.1E-07	9.1E-07	9.1E-07
Zn	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10	3.5E-10
Ga	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12	1.7E-12
Ge	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07	8.2E-07
As	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07	2.3E-07
Se	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.1E-05	8.0E-05
Br	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.1E-05	3.2E-05
Kr	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04	5.6E-04
Rb	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04	6.1E-04
Sr	8.3E-04	7.8E-04	6.2E-04	5.9E-04	5.9E-04	5.9E-04	5.9E-04
Y	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04	7.8E-04
Zr	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03
Nb	7.5E-06	7.5E-06	7.6E-06	7.6E-06	7.8E-06	7.8E-06	1.0E-05
Mo	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03	4.4E-03
Tc	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.3E-04	7.1E-04
Ru	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03	2.2E-03
Rh	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Pd	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04	4.8E-04
Ag	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06	8.8E-06
Cd	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
In	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05	2.0E-05
Sn	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05	1.7E-05
Sb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Te	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04
I	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04	4.1E-04
Xe	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03	6.2E-03

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SBW_RUN2.ELE g/L (continued)
ORIGEN2 V2.1 (8-1-91), Run on 09/19/02 at 13:57:17

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Cs	2.8E-03	2.7E-03	2.5E-03	2.4E-03	2.4E-03	2.4E-03	2.4E-03
Ba	3.0E-03	3.1E-03	3.4E-03	3.4E-03	3.4E-03	3.4E-03	3.4E-03
La	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03	1.6E-03
Ce	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03	3.2E-03
Pr	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03	1.5E-03
Nd	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03	5.5E-03
Pm	1.1E-10	8.6E-12	9.2E-17	2.6E-32	0.0E+00	0.0E+00	0.0E+00
Sm	1.1E-03	1.1E-03	1.0E-03	1.0E-03	1.0E-03	1.0E-03	1.0E-03
Eu	1.0E-04	1.0E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04	1.1E-04
Gd	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05
Tb	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07	4.3E-07
Dy	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07	1.3E-07
Ho	5.6E-09	5.6E-09	5.6E-09	5.5E-09	5.5E-09	5.5E-09	5.5E-09
Er	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.2E-09	2.3E-09
Tm	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12	1.1E-12
Yb	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13	2.0E-13
Lu	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07	4.6E-07
Hf	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04	6.9E-04
Ta	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05	3.3E-05
W	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
Re	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10	5.6E-10
Os	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11	6.9E-11
Tl	2.9E-18	2.8E-18	1.9E-18	1.8E-18	3.5E-18	3.7E-18	3.0E-17
Pb	1.5E-10	1.6E-10	2.0E-10	3.0E-10	7.6E-10	8.8E-10	1.4E-07
Bi	8.9E-15	1.5E-14	1.8E-13	6.6E-12	1.0E-10	1.4E-10	8.0E-08
Po	2.7E-15	3.6E-15	1.3E-14	1.1E-13	5.2E-13	5.7E-13	1.7E-11
At	7.0E-25	1.1E-24	6.7E-24	7.5E-23	4.7E-22	5.6E-22	3.4E-20
Rn	1.6E-16	2.0E-16	5.4E-16	3.2E-15	1.5E-14	1.8E-14	5.1E-13
Fr	3.9E-20	4.6E-20	1.2E-19	7.9E-19	4.5E-18	5.3E-18	3.1E-16
Ra	2.5E-11	3.0E-11	8.5E-11	4.9E-10	2.4E-09	2.7E-09	7.9E-08
Ac	1.3E-12	1.4E-12	2.1E-12	4.5E-12	9.1E-12	9.6E-12	7.1E-11
Th	7.2E-08	7.7E-08	1.1E-07	2.6E-07	6.0E-07	6.5E-07	5.4E-06
Pa	2.8E-09	3.0E-09	3.8E-09	7.1E-09	1.4E-08	1.5E-08	1.1E-07
U	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02	8.9E-02
Np	5.1E-03	5.1E-03	5.1E-03	5.1E-03	5.2E-03	5.2E-03	5.1E-03
Pu	1.2E-03	1.2E-03	1.1E-03	1.1E-03	1.1E-03	1.1E-03	8.3E-04
Am	2.0E-05	2.0E-05	1.8E-05	1.1E-05	4.3E-06	3.7E-06	5.2E-08
Cm	1.1E-08	8.5E-09	2.6E-09	2.2E-09	2.0E-09	2.0E-09	9.7E-10
Bk	3.7E-32	3.7E-32	3.7E-32	3.6E-32	3.5E-32	3.5E-32	2.5E-32
Cf	5.2E-18	5.1E-18	4.4E-18	2.5E-18	8.0E-19	6.7E-19	9.4E-23
Total	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**	**1.4E-01**

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Cladding materials for zirconium fuel as provided by M. D. Staiger

		wt%	Kg	grams element/ gram U235
IN-1091	Zircaloy 2		3.60E+01	
ASTM p 9	Zr	9.80E+01	3.53E+01	6.12E+01
Perry's	Hf	2.00E-02	7.20E-03	1.25E-02
ASTM p 9	Fe	1.50E-01	5.40E-02	9.37E-02
IN-1091	Sn	1.56E+00	5.60E-01	9.71E-01
ASTM p 9	Ni	5.00E-02	1.80E-02	3.12E-02
ASTM p 23	O	1.20E-01	4.32E-02	7.49E-02
ASTM p 9	Cr	1.00E-01	3.60E-02	6.24E-02
ASTM p 59	Nb	1.00E-02	3.60E-03	6.24E-03
ASTM p 60	N	2.00E-03	7.20E-04	1.25E-03
ASTM p 61	C	1.50E-03	5.40E-04	9.37E-04
ASTM p 62	Ta	1.00E-03	3.60E-04	6.24E-04
ASTM p 63	Al	2.00E-03	7.20E-04	1.25E-03
ASTM p 64	Ti	1.00E-03	3.60E-04	6.24E-04
IN-1091	U total		6.20E-01	
IN-1091	U235	9.30E+01	5.77E-01	
	U238	7.00E+00	4.34E-02	7.53E-02

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References for information on cladding materials for zirconium fuel

Zircaloy 2	Report IN-1091, First Zirconium Alloyed Fuel Reprocessing Campaign Using Soluble Nuclear Poison, G. F. Offutt et al, March 1968. p 9
Zr	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 9
Hf	Perry' Chemical Engineering Handbook, 4th Edition, 1963, McGraw-Hill, R. H. Perry et al, p 23-47
Fe	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 9
Sn	Report IN-1091, First Zirconium Alloyed Fuel Reprocessing Campaign Using Soluble Nuclear Poison, G. F. Offutt et al, March 1968, P. 9
Ni	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 9
O	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 23
Cr	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 9
Nb	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
N	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
Cr	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
Ta	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
Al	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
Ti	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
U total	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
U-235	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
U-238	ASTM Manual on Zirconium and Hafnium, STP 639, American Society for Testing Materials, J. H. Schemel, 1977, p. 59
	Report IN-1091, First Zirconium Alloyed Fuel Reprocessing Campaign Using Soluble Nuclear Poison, G. F. Offutt et al, March 1968, P. 9
	Report IN-1091, First Zirconium Alloyed Fuel Reprocessing Campaign Using Soluble Nuclear Poison, G. F. Offutt et al, March 1968, P. 9

	Report IN-1091, First Zirconium Alloyed Fuel Reprocessing Campaign Using Soluble Nuclear Poison, G. F. Offutt et al, March 1968, P. 9

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Calculation of Carbon Nuclides

Number	Nuclide	Fraction	g/kg U-235
60120	C-12	.989	.92669
60130	C-13	.011	.01031
		Totals 1.000	.937

Calculation of Nitrogen Nuclides

Number	Nuclide	Fraction	g/kg U-235
70140	N-14	.9963	1.2454
70150	N-15	.0037	.00463
		Totals 1.000	1.25

Calculation of Oxygen Nuclides

Number	Nuclide	Fraction	g/kg U-235
80160	O-16	.9976	74.720
80170	O-17	.0004	.02996
80180	O-18	.0020	.14980
		Totals 1.000	74.9

Calculation of Chromium Nuclides

Number	Nuclide	Fraction	g/kg U-235
240500	Cr-50	.04345	2.7113
250520	Cr-52	.8379	52.285
250530	Cr-53	.095	5.9280
250540	Cr-54	.02365	1.4758
		Totals 1.000	62.4

Calculation of Aluminum Nuclides

Number	Nuclide	Fraction	g/kg U-235
130270	Al-27	1.00	1.25

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Calculation of Titanium Nuclides

Number	Nuclide	Fraction	g/kg U-235
220460	Ti-46	.080	.04992
220470	Ti-47	.073	.04555
220480	Ti-48	.738	.46051
220490	Ti-49	.055	.03432
220500	Ti-50	.054	.03370
		Totals 1.000	.624

Calculation of Iron Nuclides

Number	Nuclide	Fraction	g/kg U-235
260540	Fe-54	.059	5.5283
260560	Fe-56	.9172	85.942
260570	Fe-57	.021	1.9677
260580	Fe-58	.0028	.26236
		Totals 1.000	93.7

Calculation of Nickel Nuclides

Number	Nuclide	Fraction	g/kg U-235
280580	Ni-58	.6827	21.300
280600	Ni-60	.2610	8.1432
280610	Ni-61	.0113	.35256
280620	Ni-62	.0359	1.1201
280640	Ni-64	.0091	.28392
		Totals 1.000	31.2

Calculation of Zirconium Nuclides

Number	Nuclide	Fraction	g/kg U-235
400900	Zr-90	.5146	31494.
400910	Zr-91	.1122	6866.6
400920	Zr-92	.1715	10496.
400940	Zr-94	.1738	10637.
400960	Zr-96	.028	1713.6
		Totals 1.000	61200.

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Calculation of Niobium Nuclides

Number	Nuclide	Fraction	g/kg U-235
410930	Nb-93	1.00	6.24

Calculation of Tin Nuclides

Number	Nuclide	Fraction	g/kg U-235
501120	Sn-112	.0097	9.4187
501140	Sn-114	.0065	6.3115
501150	Sn-115	.0036	3.4956
501160	Sn-116	.1453	141.09
501170	Sn-117	.0768	74.753
501180	Sn-118	.2422	235.18
501190	Sn-119	.0858	83.312
501200	Sn-120	.3259	316.45
501220	Sn-122	.0463	44.957
501240	Sn-124	.0579	56.221
		Totals 1.000	971.

Calculation of Hafnium Nuclides

Number	Nuclide	Fraction	g/kg U-235
721740	Hf-174	.00162	.02025
721760	Hf-176	.05206	.65075
721770	Hf-177	.18606	2.3258
721780	Hf-178	.27297	3.4121
721790	Hf-179	.13620	1.7036
721800	Hf-180	.35100	4.3875
		Totals 1.000	12.5

Calculation of Tantalum Nuclides

Number	Nuclide	Fraction	g/kg U-235
731800	Ta-180	.00012	.00007
731810	Ta-181	.99988	.62393
		Totals 1.00000	.624

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File zr1.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 KG FUEL
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                CHARGE
  BUP
  IRP     100.0   .2577   1   2   4 2
  IRP     150.0   .2577   2   3   4 0
  IRP     200.0   .2577   3   4   4 0
  IRP     300.0   .2577   4   5   4 0
  IRP     365.25  .2577   5   6   4 0
  BUP
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  MOV        6    1   0  1.0
  DEC      1.0    1   2   5   4
  DEC      5.0    2   3   5   0
  DEC      6.0    3   4   5   0
  DEC      7.0    4   5   5   0
  DEC      8.0    5   6   5   0
  DEC      9.0    6   7   5   0
  DEC     10.0    7   8   5   0
  DEC     11.0    8   9   5   0
  OUT      -9    1     -1    0
  OUT       9    1     -1    0
  END
  2   922350  1000.0 922360  .4366  922380  8.6636       0    0.0   FUEL 97%
  1    60120  .92669  60130 .01031       0 .0           0     .0    C
  1    70140  1.2454  70150 .00463       0 .0           0     .0    N
  1    80160  74.720  80170 .02996   80180 0.1498       0     .0    O
  1   130270  1.2500      0 .0           0 .0           0     .0    Al
  1   220460  .04992 220470 .04555  220480 .46051  220490 .03432    Ti
  1   220500  .03370      0 .0           0 .0           0     .0
  1   240500  2.7113 240520 52.285  240530 5.9280  240540 1.4758    Cr
  1   260540  5.5283 260560 85.942  260570 1.9677  260580 .26236    Fe
  1   280580  21.300 280600 8.1432  280610 .35256  280620 1.1201    Ni
  1   280640  .28392      0 .0           0 .0           0     .0
  1   400900  31494. 400910 6866.6  400920 10496.  400940 10637.    Zr
  1   400960  1713.6      0 .0           0 .0           0     .0
  1   410930  6.2400      0 .0           0 .0           0     .0    Nb
  1   501120  9.4187 501140 6.3115  501150 3.4956  501160 141.09    Sn
```

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File zr1.INP (continued)

```
1   501170  74.573 501180 235.18  501190 83.312  501200 316.45
1   501220  44.957 501240 56.221       0 .0           0 .0
1   721740  .02025 721760 .65075  721770 2.3258  721780 3.4121    Hf
1   721790  1.7036 721800 4.3875       0 .0           0 .0
0
```

File zr1.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy zr1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy zr1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out zr1.u6 >nul
copy tape13.out+tape11.out zr1.u11 >nul
ren tape7.out zr1.pch
ren tape15.out zr1.dbg
ren tape16.out zr1.vxs
ren tape50.out zr1.ech
rem  cleanup files
del tape*.inp
del tape*.out
del zr11.pch
del zr11.dbg
del zr11.vxs
del zr11.ech
del zr11.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 ***********************
echo ********************** Execution Completed ****************************
echo ************************************************************************
echo on
```

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zr1.ci
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
H 3	2.729E-09	2.580E-09	2.061E-09	1.949E-09	1.842E-09	1.742E-09	1.647E-09	1.557E-09	1.472E-09
BE 10	2.226E-10	2.226E-10	2.226E-10	2.226E-10	2.226E-10	2.226E-10	2.226E-10	2.226E-10	2.226E-10
C 14	2.073E-03	2.072E-03	2.071E-03	2.071E-03	2.071E-03	2.071E-03	2.070E-03	2.070E-03	2.070E-03
SI 32	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28
P 32	0.000E+00	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28	1.039E-28
AR 39	2.705E-22	2.705E-22	2.705E-22	2.705E-22	2.705E-22	2.705E-22	2.705E-22	2.705E-22	2.705E-22
AR 42	4.038E-21	4.038E-21	4.038E-21	4.038E-21	4.038E-21	4.038E-21	4.038E-21	4.038E-21	4.038E-21
K 42	2.385E-13	4.039E-21	4.039E-21	4.039E-21	4.039E-21	4.039E-21	4.039E-21	4.039E-21	4.039E-21
CA 45	2.091E-05	4.423E-06	8.857E-09	1.873E-09	3.962E-10	8.379E-11	1.772E-11	3.748E-12	7.927E-13
SC 46	3.335E-03	1.625E-04	9.172E-10	4.471E-11	2.179E-12	1.062E-13	5.176E-15	2.523E-16	1.236E-17
V 50	5.787E-18	5.787E-18	5.787E-18	5.787E-18	5.787E-18	5.787E-18	5.787E-18	5.787E-18	5.787E-18
CR 51	8.810E+01	9.481E-03	1.271E-18	1.368E-22	1.472E-26	1.584E-30	1.704E-34	1.982E-38	0.000E+00
MN 54	9.272E-01	4.124E-01	1.614E-02	7.179E-03	3.193E-03	1.420E-03	6.318E-04	2.810E-04	1.250E-04
FE 55	5.489E+00	4.204E+00	1.447E+00	1.109E+00	8.492E-01	6.505E-01	4.983E-01	3.817E-01	2.923E-01
FE 59	6.073E-01	2.189E-03	3.687E-13	1.329E-15	4.905E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	7.561E+00	2.114E-01	1.291E-07	3.610E-09	1.009E-10	2.821E-12	7.887E-14	2.205E-15	6.157E-17
CO 60	9.507E-03	8.335E-03	4.925E-03	4.318E-03	3.786E-03	3.319E-03	2.910E-03	2.552E-03	2.237E-03
NI 59	1.296E-03	1.296E-03	1.296E-03	1.296E-03	1.296E-03	1.296E-03	1.296E-03	1.296E-03	1.296E-03
NI 63	1.876E-01	1.862E-01	1.807E-01	1.793E-01	1.780E-01	1.766E-01	1.753E-01	1.740E-01	1.727E-01
ZN 65	5.029E-10	1.781E-10	2.800E-12	9.915E-13	3.511E-13	1.243E-13	4.402E-14	1.559E-14	5.520E-15
SR 89	2.132E+00	1.417E-02	2.766E-11	1.839E-13	1.223E-15	8.290E-18	2.080E-19	0.000E+00	0.000E+00
SR 90	4.892E-06	4.777E-06	4.343E-06	4.241E-06	4.141E-06	4.044E-06	3.949E-06	3.856E-06	3.765E-06
Y 90	8.140E+01	4.778E-06	4.344E-06	4.242E-06	4.142E-06	4.045E-06	3.950E-06	3.857E-06	3.766E-06
Y 91	5.443E+00	7.188E-02	2.185E-09	2.885E-11	3.810E-13	5.031E-15	6.625E-17	1.014E-18	0.000E+00
ZR 93	6.487E-03	6.487E-03	6.487E-03	6.487E-03	6.487E-03	6.487E-03	6.487E-03	6.487E-03	6.487E-03
ZR 95	2.533E+03	4.844E+01	6.475E-06	1.238E-07	2.367E-09	4.527E-11	8.656E-13	1.655E-14	3.164E-16
NB 92	2.597E-02	3.912E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93M	1.514E-04	4.500E-04	1.504E-03	1.735E-03	1.955E-03	2.164E-03	2.363E-03	2.551E-03	2.731E-03
NB 94	1.065E-03	1.065E-03	1.065E-03	1.065E-03	1.065E-03	1.065E-03	1.065E-03	1.065E-03	1.065E-03
NB 95	2.440E+03	1.089E+02	1.438E-05	2.845E-07	5.446E-09	1.041E-10	1.991E-12	3.808E-14	7.281E-16
NB 95M	1.823E+01	3.593E-01	4.803E-08	9.185E-10	1.756E-11	3.358E-13	6.421E-15	1.228E-16	2.348E-18
TC 98	1.285E-17	1.285E-17	1.285E-17	1.285E-17	1.285E-17	1.285E-17	1.285E-17	1.285E-17	1.285E-17
TC 99	1.052E-09	1.089E-09	1.089E-09	1.089E-09	1.089E-09	1.089E-09	1.089E-09	1.089E-09	1.089E-09
RU103	1.798E-16	2.067E-19	1.316E-30	1.316E-30	1.316E-30	1.316E-30	1.316E-30	1.316E-30	1.316E-30
CD115M	2.516E-06	8.618E-09	1.184E-18	1.405E-19	1.020E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN113M	4.212E+01	4.670E+00	7.053E-04	7.819E-05	8.668E-06	9.609E-07	1.065E-07	1.181E-08	1.309E-09
IN114	1.140E+00	2.256E-03	2.957E-12	1.780E-14	1.071E-16	6.438E-19	1.121E-19	1.228E-19	1.345E-19
IN114M	3.918E-01	2.358E-03	3.090E-12	1.859E-14	1.118E-16	5.944E-19	1.172E-19	1.283E-19	1.405E-19
IN115	2.582E-18	2.582E-18	2.582E-18	2.582E-18	2.582E-18	2.582E-18	2.582E-18	2.582E-18	2.582E-18
SN113	4.210E+01	4.667E+00	7.049E-04	7.814E-05	8.663E-06	9.603E-07	1.065E-07	1.180E-08	1.308E-09
SN117M	3.631E+02	5.117E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN119M	2.357E+02	8.387E+01	1.345E+00	4.785E-01	1.703E-01	6.059E-02	2.156E-02	7.673E-03	2.730E-03
SN121M	1.307E-02	1.289E-02	1.220E-02	1.203E-02	1.186E-02	1.170E-02	1.154E-02	1.138E-02	1.122E-02
SN123	1.532E+01	2.158E+00	8.493E-04	1.196E-04	1.685E-05	2.373E-06	3.343E-07	4.709E-08	6.632E-09
SN125	1.230E+02	4.834E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB124	5.053E-02	7.533E-04	3.723E-11	5.551E-13	8.276E-15	1.234E-16	2.010E-18	0.000E+00	0.000E+00
SB125	4.337E+01	3.469E+01	1.275E+01	9.927E+00	7.729E+00	6.018E+00	4.686E+00	3.648E+00	2.841E+00
SB126	2.712E-01	3.658E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE123	1.339E-16	1.579E-16	1.611E-16	1.611E-16	1.611E-16	1.611E-16	1.611E-16	1.611E-16	1.611E-16
TE123M	8.319E-04	1.003E-04	2.120E-08	2.557E-09	3.083E-10	3.717E-11	4.482E-12	5.404E-13	6.515E-14
TE125M	7.777E+00	8.425E+00	3.111E+00	2.422E+00	1.886E+00	1.468E+00	1.143E+00	8.902E-01	6.931E-01
TE127	1.555E-04	5.880E-07	5.428E-11	5.320E-12	5.215E-13	5.112E-14	5.011E-15	4.912E-16	4.814E-17
TE127M	6.124E-06	6.003E-07	5.541E-11	5.432E-12	5.324E-13	5.219E-14	5.115E-15	5.014E-16	4.913E-17
TE129	2.749E-12	1.745E-17	1.420E-30	7.575E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	5.019E-14	2.681E-17	2.181E-30	1.165E-33	6.211E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I129	2.242E-20	2.274E-20	2.274E-20	2.274E-20	2.274E-20	2.274E-20	2.274E-20	2.274E-20	2.274E-20
I131	5.952E-20	1.259E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	5.191E-14	4.961E-17	4.141E-29	3.957E-32	3.783E-35	3.519E-38	0.000E+00	0.000E+00	0.000E+00
XE129M	1.019E-11	1.838E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131M	9.019E-18	5.178E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ER169	9.193E-17	1.847E-28	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM170	6.871E-19	5.283E-20	2.007E-23	2.007E-23	2.007E-23	2.007E-23	2.007E-23	2.007E-23	2.007E-23
TM171	8.701E-24	2.817E-23	2.817E-23	2.817E-23	2.817E-23	2.817E-23	2.817E-23	2.817E-23	2.817E-23
LU176	4.506E-13	4.506E-13	4.506E-13	4.506E-13	4.506E-13	4.506E-13	4.506E-13	4.506E-13	4.506E-13
LU177	7.800E-03	4.124E-07	5.997E-10	1.171E-10	2.286E-11	4.463E-12	8.715E-13	1.702E-13	3.323E-14
LU177M	9.185E-06	1.794E-06	2.607E-09	5.090E-10	9.940E-11	1.941E-11	3.790E-12	7.401E-13	1.445E-13
HF175	4.952E+00	1.331E-01	6.937E-08	1.864E-09	5.008E-11	1.346E-12	3.616E-14	9.716E-16	2.625E-17
HF181	5.574E+01	1.423E-01	6.019E-12	1.538E-14	3.916E-17	2.376E-19	0.000E+00	0.000E+00	0.000E+00
HF182	4.319E-09	4.319E-09	4.319E-09	4.319E-09	4.319E-09	4.319E-09	4.319E-09	4.319E-09	4.319E-09
TA182	4.139E+01	4.579E+00	6.861E-04	7.592E-05	8.403E-06	9.335E-07	1.071E-07	1.569E-08	5.578E-09
TA183	2.901E+01	8.008E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W185	8.067E-05	2.771E-06	3.858E-12	1.325E-13	4.553E-15	1.563E-16	5.334E-18	2.496E-19	0.000E+00
W188	1.664E-13	4.334E-15	1.993E-21	1.993E-21	1.993E-21	1.993E-21	1.993E-21	1.993E-21	1.993E-21
RE187	1.545E-21	1.585E-21	1.585E-21	1.585E-21	1.585E-21	1.585E-21	1.585E-21	1.585E-21	1.585E-21
RE188	3.366E-12	4.378E-15	2.013E-21	1.993E-21	1.993E-21	1.993E-21	1.993E-21	1.993E-21	1.993E-21
OS191	1.140E-23	1.184E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix E-2
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zr1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
TL206	3.826E-25	3.826E-25	3.826E-25	3.826E-25	3.826E-25	3.826E-25	3.826E-25	3.826E-25	3.826E-25
TL207	5.020E-10	2.492E-09	2.157E-08	2.912E-08	3.766E-08	4.720E-08	5.771E-08	6.915E-08	8.151E-08
TL208	5.550E-08	2.046E-07	5.475E-07	5.933E-07	6.270E-07	6.522E-07	6.707E-07	6.838E-07	6.927E-07
TL209	1.052E-13	6.260E-14	2.019E-13	2.401E-13	2.798E-13	3.210E-13	3.637E-13	4.078E-13	4.535E-13
PB209	4.875E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
PB210	1.758E-14	2.373E-14	1.147E-13	1.753E-13	2.572E-13	3.636E-13	4.974E-13	6.615E-13	8.587E-13
PB211	5.034E-10	2.499E-09	2.163E-08	2.920E-08	3.777E-08	4.733E-08	5.787E-08	6.935E-08	8.173E-08
PB212	1.545E-07	5.694E-07	1.524E-06	1.651E-06	1.745E-06	1.815E-06	1.867E-06	1.903E-06	1.928E-06
PB214	1.905E-14	1.334E-13	1.756E-12	2.457E-12	3.278E-12	4.220E-12	5.284E-12	6.471E-12	7.780E-12
BI208	1.924E-25	1.924E-25	1.924E-25	1.924E-25	1.924E-25	1.924E-25	1.924E-25	1.924E-25	1.924E-25
BI210M	3.841E-25	3.841E-25	3.841E-25	3.841E-25	3.841E-25	3.841E-25	3.841E-25	3.841E-25	3.841E-25
BI210	1.760E-14	2.374E-14	1.147E-13	1.753E-13	2.573E-13	3.637E-13	4.976E-13	6.618E-13	8.591E-13
BI211	5.034E-10	2.499E-09	2.163E-08	2.920E-08	3.777E-08	4.733E-08	5.787E-08	6.935E-08	8.173E-08
BI212	1.545E-07	5.694E-07	1.524E-06	1.651E-06	1.745E-06	1.815E-06	1.867E-06	1.903E-06	1.928E-06
BI213	4.871E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
BI214	1.905E-14	1.334E-13	1.756E-12	2.457E-12	3.278E-12	4.220E-12	5.284E-12	6.471E-12	7.780E-12
PO210	5.194E-15	1.985E-14	1.148E-13	1.446E-13	2.109E-13	3.023E-13	4.197E-13	5.655E-13	7.425E-13
PO211	1.410E-12	6.998E-12	6.057E-11	8.175E-11	1.057E-10	1.325E-10	1.620E-10	1.942E-10	2.289E-10
PO212	9.896E-08	3.648E-07	9.764E-07	1.058E-06	1.118E-06	1.163E-06	1.196E-06	1.219E-06	1.235E-06
PO213	4.766E-12	2.835E-12	9.145E-12	1.088E-11	1.268E-11	1.454E-11	1.647E-11	1.847E-11	2.054E-11
PO214	1.895E-12	1.334E-13	1.755E-12	2.456E-12	3.278E-12	4.219E-12	5.283E-12	6.469E-12	7.779E-12
PO215	5.034E-10	2.499E-09	2.163E-08	2.920E-08	3.777E-08	4.733E-08	5.787E-08	6.935E-08	8.173E-08
PO216	1.545E-07	5.694E-07	1.524E-06	1.651E-06	1.745E-06	1.815E-06	1.867E-06	1.903E-06	1.928E-06
PO218	1.905E-14	1.334E-13	1.756E-12	2.457E-12	3.279E-12	4.221E-12	5.285E-12	6.472E-12	7.782E-12
AT217	4.871E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
RN218	1.876E-12	9.716E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	5.034E-10	2.499E-09	2.163E-08	2.920E-08	3.777E-08	4.733E-08	5.787E-08	6.935E-08	8.173E-08
RN220	1.545E-07	5.694E-07	1.524E-06	1.651E-06	1.745E-06	1.815E-06	1.867E-06	1.903E-06	1.928E-06
RN222	1.905E-14	1.334E-13	1.756E-12	2.457E-12	3.279E-12	4.221E-12	5.285E-12	6.472E-12	7.782E-12
FR221	4.871E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
FR223	8.753E-12	3.447E-11	2.985E-10	4.022E-10	5.203E-10	6.520E-10	7.972E-10	9.552E-10	1.126E-09
RA222	1.876E-12	9.716E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	5.034E-10	2.499E-09	2.163E-08	2.920E-08	3.777E-08	4.733E-08	5.787E-08	6.935E-08	8.173E-08
RA224	1.545E-07	5.694E-07	1.524E-06	1.651E-06	1.745E-06	1.815E-06	1.867E-06	1.903E-06	1.928E-06
RA225	5.404E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
RA226	1.905E-14	1.334E-13	1.756E-12	2.457E-12	3.279E-12	4.221E-12	5.285E-12	6.472E-12	7.782E-12
RA228	1.251E-15	8.286E-15	9.382E-14	1.269E-13	1.637E-13	2.039E-13	2.472E-13	2.933E-13	3.418E-13
AC225	4.871E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
AC227	6.343E-10	2.498E-09	2.163E-08	2.915E-08	3.770E-08	4.725E-08	5.777E-08	6.922E-08	8.158E-08
AC228	2.034E-09	8.287E-15	9.382E-14	1.269E-13	1.637E-13	2.039E-13	2.472E-13	2.933E-13	3.419E-13
TH226	1.876E-12	9.716E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	5.433E-10	2.465E-09	2.133E-08	2.879E-08	3.725E-08	4.668E-08	5.708E-08	6.839E-08	8.061E-08
TH228	1.540E-07	5.688E-07	1.523E-06	1.646E-06	1.739E-06	1.809E-06	1.860E-06	1.896E-06	1.921E-06
TH229	1.444E-12	2.898E-12	9.347E-12	1.112E-11	1.296E-11	1.486E-11	1.684E-11	1.888E-11	2.099E-11
TH230	1.312E-10	3.972E-10	1.483E-09	1.760E-09	2.039E-09	2.319E-09	2.603E-09	2.888E-09	3.175E-09
TH231	1.904E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03
TH232	3.650E-14	1.079E-13	3.938E-13	4.652E-13	5.367E-13	6.081E-13	6.796E-13	7.510E-13	8.225E-13
TH234	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06
PA231	3.971E-08	8.013E-08	2.413E-07	2.817E-07	3.221E-07	3.625E-07	4.029E-07	4.433E-07	4.837E-07
PA233	1.187E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04
PA234M	3.265E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06
PA234	3.611E-07	3.780E-09	3.780E-09	3.780E-09	3.780E-09	3.780E-09	3.780E-09	3.780E-09	3.780E-09
U230	1.876E-12	9.706E-18	8.801E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	1.418E-06	1.589E-06	1.908E-06	1.940E-06	1.961E-06	1.974E-06	1.979E-06	1.979E-06	1.976E-06
U233	1.502E-08	1.573E-08	1.835E-08	1.908E-08	1.981E-08	2.053E-08	2.126E-08	2.199E-08	2.271E-08
U234	2.943E-05	2.967E-05	3.063E-05	3.087E-05	3.110E-05	3.133E-05	3.156E-05	3.179E-05	3.201E-05
U235	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03	1.902E-03
U236	1.448E-03	1.448E-03	1.448E-03	1.448E-03	1.448E-03	1.448E-03	1.448E-03	1.448E-03	1.448E-03
U237	9.213E+02	1.315E-07	1.085E-07	1.034E-07	9.855E-08	9.392E-08	8.950E-08	8.530E-08	8.129E-08
U238	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06	2.908E-06
U240	1.086E-05	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17
NP235	3.486E-07	1.839E-07	1.426E-08	7.527E-09	3.972E-09	2.096E-09	1.106E-09	5.837E-10	3.080E-10
NP236	3.463E-10	3.463E-10	3.463E-10	3.463E-10	3.463E-10	3.463E-10	3.463E-10	3.463E-10	3.463E-10
NP237	1.422E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04	1.501E-04
NP238	3.379E+01	3.498E-10	3.435E-10	3.419E-10	3.404E-10	3.388E-10	3.373E-10	3.357E-10	3.342E-10
NP239	3.858E+01	3.874E-09	3.872E-09	3.872E-09	3.871E-09	3.871E-09	3.871E-09	3.870E-09	3.870E-09
NP240M	2.216E-03	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17	1.140E-17
PU236	1.983E-05	1.574E-05	5.952E-06	4.667E-06	3.660E-06	2.870E-06	2.251E-06	1.765E-06	1.384E-06
PU237	1.639E-05	6.359E-08	1.441E-17	1.955E-19	1.072E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	8.440E-02	8.595E-02	8.328E-02	8.263E-02	8.198E-02	8.133E-02	8.069E-02	8.006E-02	7.943E-02
PU239	8.962E-04	9.066E-04	9.065E-04	9.064E-04	9.064E-04	9.064E-04	9.064E-04	9.063E-04	9.063E-04
PU240	1.908E-04	1.908E-04	1.907E-04	1.907E-04	1.907E-04	1.907E-04	1.907E-04	1.906E-04	1.906E-04
PU241	5.627E-03	5.362E-03	4.423E-03	4.215E-03	4.017E-03	3.828E-03	3.649E-03	3.477E-03	3.314E-03
PU242	4.720E-09	4.720E-09	4.720E-09	4.720E-09	4.720E-09	4.720E-09	4.720E-09	4.720E-09	4.720E-09
PU243	1.842E-04	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21
PU244	1.141E-17	1.141E-17	1.141E-17	1.141E-17	1.141E-17	1.141E-17	1.141E-17	1.141E-17	1.141E-17

Appendix E-2
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zr1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
PU246	1.884E-16	1.385E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM241	2.424E-06	1.122E-05	4.234E-05	4.919E-05	5.570E-05	6.190E-05	6.779E-05	7.339E-05	7.871E-05
AM242M	7.028E-08	6.996E-08	6.870E-08	6.838E-08	6.807E-08	6.776E-08	6.745E-08	6.715E-08	6.684E-08
AM242	2.657E-04	6.961E-08	6.835E-08	6.804E-08	6.773E-08	6.742E-08	6.712E-08	6.681E-08	6.651E-08
AM243	3.860E-09	3.874E-09	3.872E-09	3.872E-09	3.871E-09	3.871E-09	3.871E-09	3.870E-09	3.870E-09
AM245	3.480E-12	3.717E-27	3.717E-27	3.717E-27	3.717E-27	3.717E-27	3.717E-27	3.717E-27	3.717E-27
AM246	1.884E-16	1.387E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM241	2.748E-12	2.426E-15	1.472E-27	1.300E-30	1.147E-33	1.012E-36	0.000E+00	0.000E+00	0.000E+00
CM242	5.920E-05	1.278E-05	8.235E-08	6.181E-08	5.725E-08	5.608E-08	5.564E-08	5.534E-08	5.508E-08
CM243	2.318E-09	2.262E-09	2.052E-09	2.003E-09	1.955E-09	1.908E-09	1.862E-09	1.817E-09	1.774E-09
CM244	3.394E-08	3.269E-08	2.805E-08	2.700E-08	2.599E-08	2.501E-08	2.407E-08	2.317E-08	2.230E-08
CM245	3.208E-13	3.208E-13	3.207E-13	3.207E-13	3.206E-13	3.206E-13	3.206E-13	3.206E-13	3.205E-13
CM246	4.962E-15	4.962E-15	4.959E-15	4.958E-15	4.957E-15	4.957E-15	4.956E-15	4.955E-15	4.954E-15
CM247	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21	1.188E-21
CM248	2.332E-22	2.332E-22	2.332E-22	2.332E-22	2.332E-22	2.332E-22	2.332E-22	2.332E-22	2.332E-22
CM250	9.372E-35	9.372E-35	9.372E-35	9.372E-35	9.372E-35	9.372E-35	9.372E-35	9.372E-35	9.372E-35
BK249	3.337E-23	2.563E-22	2.563E-22	2.563E-22	2.563E-22	2.563E-22	2.563E-22	2.563E-22	2.563E-22
CF250	8.494E-30	6.247E-28	6.247E-28	6.247E-28	6.247E-28	6.247E-28	6.247E-28	6.247E-28	6.247E-28
CF251	1.606E-35	2.830E-34	2.830E-34	2.830E-34	2.830E-34	2.830E-34	2.830E-34	2.830E-34	2.830E-34
H 3	1.295E+00	1.224E+00	9.781E-01	9.247E-01	8.742E-01	8.265E-01	7.814E-01	7.387E-01	6.984E-01
BE 10	8.406E-09	8.406E-09	8.406E-09	8.406E-09	8.406E-09	8.406E-09	8.406E-09	8.406E-09	8.406E-09
C 14	3.391E-07	3.390E-07	3.389E-07	3.388E-07	3.388E-07	3.387E-07	3.387E-07	3.387E-07	3.386E-07
SE 79	1.220E-03	1.220E-03	1.220E-03	1.220E-03	1.220E-03	1.220E-03	1.220E-03	1.220E-03	1.220E-03
KR 81	3.035E-11	3.035E-11	3.035E-11	3.035E-11	3.035E-11	3.035E-11	3.035E-11	3.035E-11	3.035E-11
KR 85	3.655E+01	3.429E+01	2.648E+01	2.482E+01	2.326E+01	2.181E+01	2.044E+01	1.916E+01	1.796E+01
RB 86	1.465E+00	1.873E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RB 87	8.202E-08	8.204E-08	8.204E-08	8.204E-08	8.204E-08	8.204E-08	8.204E-08	8.204E-08	8.204E-08
SR 89	1.023E+04	6.806E+01	1.329E-07	8.835E-10	5.872E-12	3.903E-14	2.593E-16	1.596E-18	0.000E+00
SR 90	2.905E+02	2.837E+02	2.579E+02	2.518E+02	2.459E+02	2.401E+02	2.345E+02	2.290E+02	2.236E+02
Y 90	2.935E+02	2.837E+02	2.580E+02	2.519E+02	2.460E+02	2.402E+02	2.345E+02	2.290E+02	2.236E+02
Y 91	1.239E+04	1.647E+02	5.008E-06	6.613E-08	8.732E-10	1.153E-11	1.523E-13	2.010E-15	2.647E-17
NB 92	1.569E-10	2.364E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	6.299E-03	6.309E-03	6.309E-03	6.309E-03	6.309E-03	6.309E-03	6.309E-03	6.309E-03	6.309E-03
NB 93M	1.511E-04	4.415E-04	1.465E-03	1.690E-03	1.904E-03	2.107E-03	2.301E-03	2.484E-03	2.658E-03
NB 94	6.383E-08	6.383E-08	6.382E-08	6.382E-08	6.382E-08	6.381E-08	6.381E-08	6.381E-08	6.381E-08
ZR 95	1.354E+04	2.589E+02	3.461E-05	6.617E-07	1.265E-08	2.419E-10	4.626E-12	8.846E-14	1.692E-15
NB 95	1.324E+04	5.823E+02	7.683E-05	1.520E-06	2.911E-08	5.566E-10	1.064E-11	2.035E-13	3.892E-15
NB 95M	9.777E+01	1.920E+00	2.567E-07	4.909E-09	9.387E-11	1.795E-12	3.432E-14	6.562E-16	1.255E-17
TC 98	1.018E-09	1.018E-09	1.018E-09	1.018E-09	1.018E-09	1.018E-09	1.018E-09	1.018E-09	1.018E-09
TC 99	4.120E-02	4.169E-02	4.169E-02	4.169E-02	4.169E-02	4.169E-02	4.169E-02	4.169E-02	4.169E-02
RH102	1.937E-04	1.525E-04	5.863E-05	4.617E-05	3.635E-05	2.862E-05	2.254E-05	1.775E-05	1.397E-05
RU103	6.764E+03	1.075E+01	6.844E-11	1.085E-13	1.729E-16	1.990E-19	1.487E-19	1.111E-19	0.000E+00
RH103M	6.094E+03	9.688E+00	6.170E-11	9.801E-14	1.558E-16	2.475E-19	1.339E-19	1.001E-19	1.592E-22
RU106	4.475E+02	2.250E+02	1.437E+01	7.226E+00	3.633E+00	1.827E+00	9.183E-01	4.617E-01	2.321E-01
RH106	4.764E+02	2.250E+02	1.437E+01	7.226E+00	3.633E+00	1.827E+00	9.183E-01	4.617E-01	2.321E-01
AG106	1.552E-11	1.800E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	4.430E-05	4.430E-05	4.430E-05	4.430E-05	4.430E-05	4.430E-05	4.430E-05	4.430E-05	4.430E-05
AG108	7.505E-05	9.384E-12	9.181E-12	9.131E-12	9.081E-12	9.032E-12	8.983E-12	8.934E-12	8.885E-12
AG108M	1.060E-10	1.054E-10	1.032E-10	1.026E-10	1.020E-10	1.015E-10	1.009E-10	1.004E-10	9.983E-11
AG109M	9.839E+01	1.889E-09	2.130E-10	1.234E-10	7.151E-11	4.144E-11	2.401E-11	1.392E-11	8.064E-12
CD109	3.259E-09	1.889E-09	2.130E-10	1.234E-10	7.151E-11	4.144E-11	2.401E-11	1.392E-11	8.064E-12
AG110	8.536E+00	7.266E-04	1.263E-05	4.584E-06	1.664E-06	6.043E-07	2.194E-07	7.966E-08	2.892E-08
AG110M	1.505E-01	5.463E-02	9.494E-04	3.447E-04	1.251E-04	4.544E-05	1.650E-05	5.989E-06	2.175E-06
AG111	5.637E+01	9.865E-14	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD113M	3.698E-02	3.528E-02	2.918E-02	2.782E-02	2.653E-02	2.530E-02	2.413E-02	2.301E-02	2.194E-02
IN114	4.297E-04	7.968E-07	1.044E-15	6.483E-18	1.988E-19	1.196E-21	0.000E+00	0.000E+00	0.000E+00
IN114M	1.384E-04	8.326E-07	1.091E-15	6.774E-18	2.077E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD115M	3.078E+00	1.054E-02	1.448E-12	4.956E-15	1.683E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	3.782E-14	3.897E-14	3.897E-14	3.897E-14	3.897E-14	3.897E-14	3.897E-14	3.897E-14	3.897E-14
IN115M	3.121E+01	7.408E-07	1.017E-16	3.483E-19	1.192E-21	4.049E-24	0.000E+00	0.000E+00	0.000E+00
SN117M	2.787E-03	3.928E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN119M	3.505E-01	1.247E-01	2.000E-03	7.116E-04	2.532E-04	9.011E-05	3.206E-05	1.141E-05	4.060E-06
SN121M	2.610E-04	2.574E-04	2.435E-04	2.401E-04	2.368E-04	2.335E-04	2.303E-04	2.272E-04	2.240E-04
SN123	1.051E+01	1.480E+00	5.827E-04	8.207E-05	1.156E-05	1.628E-06	2.293E-07	3.230E-08	4.550E-09
TE123	3.180E-17	3.748E-17	3.826E-17	3.826E-17	3.826E-17	3.826E-17	3.826E-17	3.826E-17	3.826E-17
TE123M	1.971E-04	2.377E-05	5.024E-09	6.058E-10	7.304E-11	8.807E-12	1.062E-12	1.280E-13	1.544E-14
SB124	2.857E-01	4.260E-03	2.105E-10	3.139E-12	4.680E-14	6.978E-16	1.047E-17	3.220E-19	0.000E+00
SN125	3.317E+01	1.304E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB125	1.868E+01	1.480E+01	5.438E+00	4.234E+00	3.297E+00	2.567E+00	1.999E+00	1.556E+00	1.212E+00
TE125M	3.391E+00	3.594E+00	1.327E+00	1.033E+00	8.044E-01	6.263E-01	4.876E-01	3.797E-01	2.956E-01
SN126	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03
SB126	2.308E+00	1.513E-04	1.513E-04	1.513E-04	1.513E-04	1.512E-04	1.512E-04	1.512E-04	1.512E-04
SB126M	1.082E+00	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03	1.080E-03
TE127	3.345E+02	4.243E+00	3.917E-04	3.839E-05	3.763E-06	3.689E-07	3.616E-08	3.544E-09	3.474E-10
TE127M	4.244E+01	4.332E+00	3.999E-04	3.920E-05	3.842E-06	3.766E-07	3.691E-08	3.618E-09	3.547E-10

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zr1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
XE127	9.738E-07	9.308E-10	7.768E-22	7.424E-25	7.096E-28	6.782E-31	6.482E-34	6.184E-37	0.000E+00
TE129	1.449E+03	7.639E-02	6.215E-15	3.319E-18	1.773E-21	9.467E-25	5.056E-28	2.700E-31	1.439E-34
TE129M	2.187E+02	1.174E-01	9.547E-15	5.099E-18	2.723E-21	1.454E-24	7.767E-28	4.148E-31	2.216E-34
I129	6.643E-05	6.777E-05	6.777E-05	6.777E-05	6.777E-05	6.777E-05	6.777E-05	6.777E-05	6.777E-05
XE129M	1.742E-04	3.142E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
I131	6.145E+03	1.335E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131M	6.843E+01	1.230E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS132	1.406E-01	1.465E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE133	1.436E+04	1.927E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS134	5.463E+01	3.904E+01	1.018E+01	7.270E+00	5.195E+00	3.712E+00	2.652E+00	1.895E+00	1.354E+00
CS135	2.451E-03	2.459E-03	2.459E-03	2.459E-03	2.459E-03	2.459E-03	2.459E-03	2.459E-03	2.459E-03
CS136	5.999E+01	2.432E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136M	9.886E+00	4.009E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	3.014E+02	2.945E+02	2.685E+02	2.624E+02	2.564E+02	2.505E+02	2.448E+02	2.392E+02	2.337E+02
BA137M	2.857E+02	2.786E+02	2.540E+02	2.482E+02	2.425E+02	2.370E+02	2.316E+02	2.263E+02	2.211E+02
LA138	6.243E-13	6.243E-13	6.243E-13	6.243E-13	6.243E-13	6.243E-13	6.243E-13	6.243E-13	6.243E-13
BA140	1.331E+04	3.367E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	1.342E+04	3.875E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE141	1.264E+04	5.275E+00	1.565E-13	6.496E-17	2.696E-20	1.119E-23	4.644E-27	1.928E-30	8.000E-34
CE142	8.381E-08	8.384E-08	8.384E-08	8.384E-08	8.384E-08	8.384E-08	8.384E-08	8.384E-08	8.384E-08
PR143	1.234E+04	1.080E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE144	6.883E+03	2.825E+03	8.013E+01	3.289E+01	1.350E+01	5.539E+00	2.273E+00	9.328E-01	3.828E-01
PR144	6.902E+03	2.825E+03	8.013E+01	3.289E+01	1.350E+01	5.539E+00	2.273E+00	9.329E-01	3.828E-01
PR144M	8.267E+01	3.390E+01	9.616E-01	3.946E-01	1.620E-01	6.646E-02	2.728E-02	1.119E-02	4.594E-03
ND144	1.424E-12	2.929E-12	3.947E-12	3.964E-12	3.971E-12	3.974E-12	3.976E-12	3.976E-12	3.976E-12
PM146	1.144E-03	1.009E-03	6.093E-04	5.371E-04	4.735E-04	4.175E-04	3.680E-04	3.245E-04	2.860E-04
SM146	2.109E-11	2.503E-11	3.664E-11	3.874E-11	4.058E-11	4.221E-11	4.365E-11	4.492E-11	4.603E-11
ND147	4.879E+03	5.592E-07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	9.983E+02	8.103E+02	2.816E+02	2.162E+02	1.660E+02	1.275E+02	9.788E+01	7.515E+01	5.770E+01
SM147	3.278E-09	9.286E-09	2.225E-08	2.385E-08	2.508E-08	2.603E-08	2.675E-08	2.731E-08	2.774E-08
PM148	5.274E+02	1.438E-02	3.220E-13	7.016E-16	1.526E-18	1.093E-20	2.626E-23	0.000E+00	0.000E+00
PM148M	1.174E+02	2.554E-01	5.717E-12	1.246E-14	2.701E-17	2.143E-19	0.000E+00	0.000E+00	0.000E+00
SM148	2.743E-14	3.005E-14	3.006E-14	3.006E-14	3.006E-14	3.006E-14	3.006E-14	3.006E-14	3.006E-14
SM149	1.073E-14	1.228E-14	1.228E-14	1.228E-14	1.228E-14	1.228E-14	1.228E-14	1.228E-14	1.228E-14
EU150	1.932E-08	1.895E-08	1.755E-08	1.721E-08	1.688E-08	1.656E-08	1.624E-08	1.593E-08	1.563E-08
SM151	3.784E+00	3.787E+00	3.672E+00	3.644E+00	3.616E+00	3.588E+00	3.561E+00	3.533E+00	3.506E+00
EU152	3.984E-02	3.787E-02	3.088E-02	2.935E-02	2.789E-02	2.650E-02	2.519E-02	2.394E-02	2.275E-02
GD152	1.574E-15	1.649E-15	1.894E-15	1.948E-15	1.999E-15	2.048E-15	2.094E-15	2.138E-15	2.180E-15
GD153	1.656E-03	5.819E-04	8.862E-06	3.113E-06	1.094E-06	3.842E-07	1.350E-07	4.742E-08	1.666E-08
EU154	1.737E+00	1.602E+00	1.161E+00	1.071E+00	9.879E-01	9.114E-01	8.408E-01	7.757E-01	7.156E-01
EU155	7.380E+00	6.418E+00	3.670E+00	3.191E+00	2.775E+00	2.413E+00	2.098E+00	1.824E+00	1.586E+00
EU156	7.190E+01	4.179E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TB160	6.790E-02	2.047E-03	1.692E-09	5.102E-11	1.538E-12	4.638E-14	1.398E-15	4.229E-17	1.340E-18
TB161	3.130E-01	4.048E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HO166M	1.202E-08	1.201E-08	1.198E-08	1.197E-08	1.197E-08	1.196E-08	1.195E-08	1.195E-08	1.194E-08
ER169	6.858E-07	1.378E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM170	7.947E-09	1.109E-09	4.216E-13	5.886E-14	8.217E-15	1.147E-15	1.602E-16	2.234E-17	3.141E-18
TM171	1.121E-11	7.816E-12	1.844E-12	1.285E-12	8.959E-13	6.244E-13	4.352E-13	3.033E-13	2.114E-13

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zr1.g
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
H 1	2.470E-04	2.470E-04	2.470E-04	2.470E-04	2.470E-04	2.470E-04	2.470E-04	2.470E-04	2.470E-04
H 2	1.541E-08	1.541E-08	1.541E-08	1.541E-08	1.541E-08	1.541E-08	1.541E-08	1.541E-08	1.541E-08
H 3	2.827E-13	2.673E-13	2.135E-13	2.019E-13	1.908E-13	1.804E-13	1.706E-13	1.613E-13	1.525E-13
HE 3	3.122E-15	1.855E-14	7.230E-14	8.395E-14	9.497E-14	1.054E-13	1.152E-13	1.245E-13	1.333E-13
HE 4	3.715E-04	3.715E-04	3.715E-04	3.715E-04	3.715E-04	3.715E-04	3.715E-04	3.715E-04	3.715E-04
LI 6	9.948E-12	9.948E-12	9.948E-12	9.948E-12	9.948E-12	9.948E-12	9.948E-12	9.948E-12	9.948E-12
LI 7	4.584E-15	4.584E-15	4.584E-15	4.584E-15	4.584E-15	4.584E-15	4.584E-15	4.584E-15	4.584E-15
BE 9	5.322E-07	5.322E-07	5.322E-07	5.322E-07	5.322E-07	5.322E-07	5.322E-07	5.322E-07	5.322E-07
BE 10	9.959E-09	9.959E-09	9.959E-09	9.959E-09	9.959E-09	9.959E-09	9.959E-09	9.959E-09	9.959E-09
B 10	2.564E-14	2.995E-14	4.721E-14	5.152E-14	5.584E-14	6.015E-14	6.447E-14	6.878E-14	7.310E-14
B 11	5.483E-05	5.483E-05	5.483E-05	5.483E-05	5.483E-05	5.483E-05	5.483E-05	5.483E-05	5.483E-05
C 12	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01	9.267E-01
C 13	1.065E-02	1.065E-02	1.065E-02	1.065E-02	1.065E-02	1.065E-02	1.065E-02	1.065E-02	1.065E-02
C 14	4.648E-04	4.648E-04	4.646E-04	4.645E-04	4.645E-04	4.644E-04	4.643E-04	4.643E-04	4.642E-04
N 14	1.245E+00	1.245E+00	1.245E+00	1.245E+00	1.245E+00	1.245E+00	1.245E+00	1.245E+00	1.245E+00
N 15	4.649E-03	4.649E-03	4.649E-03	4.649E-03	4.649E-03	4.649E-03	4.649E-03	4.649E-03	4.649E-03
O 16	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01	7.472E+01
O 17	2.996E-02	2.996E-02	2.996E-02	2.996E-02	2.996E-02	2.996E-02	2.996E-02	2.996E-02	2.996E-02
O 18	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01	1.498E-01
F 19	1.058E-08	1.058E-08	1.058E-08	1.058E-08	1.058E-08	1.058E-08	1.058E-08	1.058E-08	1.058E-08
NE 20	1.366E-14	1.366E-14	1.366E-14	1.366E-14	1.366E-14	1.366E-14	1.366E-14	1.366E-14	1.366E-14
NE 21	1.065E-13	1.065E-13	1.065E-13	1.065E-13	1.065E-13	1.065E-13	1.065E-13	1.065E-13	1.065E-13
NE 22	3.152E-17	3.152E-17	3.152E-17	3.152E-17	3.152E-17	3.152E-17	3.152E-17	3.152E-17	3.152E-17
NA 23	3.990E-22	3.990E-22	3.990E-22	3.990E-22	3.990E-22	3.990E-22	3.990E-22	3.990E-22	3.990E-22
MG 24	3.415E-07	3.424E-07	3.424E-07	3.424E-07	3.424E-07	3.424E-07	3.424E-07	3.424E-07	3.424E-07
MG 25	1.126E-11	1.126E-11	1.126E-11	1.126E-11	1.126E-11	1.126E-11	1.126E-11	1.126E-11	1.126E-11
MG 26	1.047E-15	1.047E-15	1.047E-15	1.047E-15	1.047E-15	1.047E-15	1.047E-15	1.047E-15	1.047E-15
AL 27	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00	1.250E+00
SI 28	6.035E-05	6.035E-05	6.035E-05	6.035E-05	6.035E-05	6.035E-05	6.035E-05	6.035E-05	6.035E-05
SI 29	1.001E-09	1.001E-09	1.001E-09	1.001E-09	1.001E-09	1.001E-09	1.001E-09	1.001E-09	1.001E-09
SI 30	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14	1.817E-14
SI 32	6.043E-30	6.043E-30	6.043E-30	6.043E-30	6.043E-30	6.043E-30	6.043E-30	6.043E-30	6.043E-30
P 31	1.079E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19	1.081E-19
P 32	0.000E+00	3.640E-34	3.640E-34	3.640E-34	3.640E-34	3.640E-34	3.640E-34	3.640E-34	3.640E-34
S 34	2.286E-31	5.399E-31	5.399E-31	5.399E-31	5.399E-31	5.399E-31	5.399E-31	5.399E-31	5.399E-31
CL 37	9.942E-19	9.942E-19	9.942E-19	9.942E-19	9.942E-19	9.942E-19	9.942E-19	9.942E-19	9.942E-19
AR 38	8.880E-24	8.889E-24	8.889E-24	8.889E-24	8.889E-24	8.889E-24	8.889E-24	8.889E-24	8.889E-24
AR 39	7.934E-24	7.934E-24	7.934E-24	7.934E-24	7.934E-24	7.934E-24	7.934E-24	7.934E-24	7.934E-24
AR 40	2.722E-14	2.722E-14	2.722E-14	2.722E-14	2.722E-14	2.722E-14	2.722E-14	2.722E-14	2.722E-14
AR 42	1.565E-23	1.565E-23	1.565E-23	1.565E-23	1.565E-23	1.565E-23	1.565E-23	1.565E-23	1.565E-23
K 41	8.629E-16	8.635E-16	8.635E-16	8.635E-16	8.635E-16	8.635E-16	8.635E-16	8.635E-16	8.635E-16
K 42	3.950E-20	6.688E-28	6.688E-28	6.688E-28	6.688E-28	6.688E-28	6.688E-28	6.688E-28	6.688E-28
CA 42	6.920E-18	6.960E-18	6.960E-18	6.960E-18	6.960E-18	6.960E-18	6.960E-18	6.960E-18	6.960E-18
CA 43	1.466E-08	1.466E-08	1.466E-08	1.466E-08	1.466E-08	1.466E-08	1.466E-08	1.466E-08	1.466E-08
CA 44	1.114E-07	1.114E-07	1.114E-07	1.114E-07	1.114E-07	1.114E-07	1.114E-07	1.114E-07	1.114E-07
CA 45	1.174E-09	2.483E-10	4.972E-13	1.052E-13	2.224E-14	4.704E-15	9.948E-16	2.104E-16	4.450E-17
CA 46	1.250E-08	1.250E-08	1.250E-08	1.250E-08	1.250E-08	1.250E-08	1.250E-08	1.250E-08	1.250E-08
SC 45	1.100E-09	2.026E-09	2.274E-09	2.274E-09	2.274E-09	2.274E-09	2.274E-09	2.274E-09	2.274E-09
SC 46	9.841E-08	4.796E-09	2.707E-14	1.319E-15	6.429E-17	3.134E-18	1.527E-19	7.445E-21	3.646E-22
TI 46	4.991E-02	4.991E-02	4.991E-02	4.991E-02	4.991E-02	4.991E-02	4.991E-02	4.991E-02	4.991E-02
TI 47	4.554E-02	4.554E-02	4.554E-02	4.554E-02	4.554E-02	4.554E-02	4.554E-02	4.554E-02	4.554E-02
TI 48	4.598E-01	4.598E-01	4.598E-01	4.598E-01	4.598E-01	4.598E-01	4.598E-01	4.598E-01	4.598E-01
TI 49	3.500E-02	3.500E-02	3.500E-02	3.500E-02	3.500E-02	3.500E-02	3.500E-02	3.500E-02	3.500E-02
TI 50	3.372E-02	3.372E-02	3.372E-02	3.372E-02	3.372E-02	3.372E-02	3.372E-02	3.372E-02	3.372E-02
V 50	3.236E-05	3.236E-05	3.236E-05	3.236E-05	3.236E-05	3.236E-05	3.236E-05	3.236E-05	3.236E-05
V 51	7.370E-03	8.323E-03	8.323E-03	8.323E-03	8.323E-03	8.323E-03	8.323E-03	8.323E-03	8.323E-03
CR 50	2.703E+00	2.703E+00	2.703E+00	2.703E+00	2.703E+00	2.703E+00	2.703E+00	2.703E+00	2.703E+00
CR 51	9.531E-04	1.026E-07	1.375E-23	1.480E-27	1.592E-31	1.713E-35	1.844E-39	2.144E-43	0.000E+00
CR 52	5.226E+01	5.226E+01	5.226E+01	5.226E+01	5.226E+01	5.226E+01	5.226E+01	5.226E+01	5.226E+01
CR 53	5.929E+00	5.929E+00	5.929E+00	5.929E+00	5.929E+00	5.929E+00	5.929E+00	5.929E+00	5.929E+00
CR 54	1.497E+00	1.497E+00	1.497E+00	1.497E+00	1.497E+00	1.497E+00	1.497E+00	1.497E+00	1.497E+00
MN 54	1.198E-04	5.327E-05	2.085E-06	9.274E-07	4.125E-07	1.835E-07	8.161E-08	3.630E-08	1.615E-08
MN 55	4.023E-04	9.159E-04	2.018E-03	2.154E-03	2.257E-03	2.337E-03	2.398E-03	2.444E-03	2.480E-03
FE 54	5.526E+00	5.526E+00	5.526E+00	5.526E+00	5.526E+00	5.526E+00	5.526E+00	5.526E+00	5.526E+00
FE 55	2.195E-03	1.681E-03	5.787E-04	4.433E-04	3.395E-04	2.601E-04	1.992E-04	1.526E-04	1.169E-04
FE 56	8.590E+01	8.590E+01	8.590E+01	8.590E+01	8.590E+01	8.590E+01	8.590E+01	8.590E+01	8.590E+01
FE 57	2.011E+00	2.011E+00	2.011E+00	2.011E+00	2.011E+00	2.011E+00	2.011E+00	2.011E+00	2.011E+00
FE 58	2.639E-01	2.641E-01	2.641E-01	2.641E-01	2.641E-01	2.641E-01	2.641E-01	2.641E-01	2.641E-01
FE 59	1.234E-05	4.448E-08	7.495E-18	2.701E-20	9.969E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 58	2.376E-04	6.643E-06	4.058E-12	1.134E-13	3.171E-15	8.865E-17	2.478E-18	6.928E-20	1.935E-21
CO 59	1.733E-04	1.858E-04	1.864E-04	1.866E-04	1.867E-04	1.869E-04	1.870E-04	1.872E-04	1.873E-04
CO 60	8.405E-06	7.369E-06	4.354E-06	3.818E-06	3.347E-06	2.935E-06	2.573E-06	2.256E-06	1.978E-06
NI 58	2.128E+01	2.128E+01	2.128E+01	2.128E+01	2.128E+01	2.128E+01	2.128E+01	2.128E+01	2.128E+01
NI 59	1.710E-02	1.710E-02	1.710E-02	1.710E-02	1.710E-02	1.710E-02	1.710E-02	1.710E-02	1.710E-02
NI 60	8.139E+00	8.139E+00	8.139E+00	8.139E+00	8.139E+00	8.139E+00	8.139E+00	8.139E+00	8.139E+00
NI 61	3.568E-01	3.568E-01	3.568E-01	3.568E-01	3.568E-01	3.568E-01	3.568E-01	3.568E-01	3.568E-01

Appendix E-2
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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
NI 62	1.117E+00	1.117E+00	1.117E+00	1.117E+00	1.117E+00	1.117E+00	1.117E+00	1.117E+00	1.117E+00
NI 63	3.040E-03	3.017E-03	2.928E-03	2.906E-03	2.884E-03	2.862E-03	2.841E-03	2.819E-03	2.798E-03
NI 64	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01	2.838E-01
CU 63	1.124E-05	3.406E-05	1.236E-04	1.456E-04	1.674E-04	1.891E-04	2.106E-04	2.319E-04	2.530E-04
CU 65	8.689E-05	8.693E-05	8.693E-05	8.693E-05	8.693E-05	8.693E-05	8.693E-05	8.693E-05	8.693E-05
ZN 64	1.433E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09
ZN 65	6.102E-14	2.161E-14	3.397E-16	1.203E-16	4.260E-17	1.509E-17	5.342E-18	1.892E-18	6.698E-19
ZN 66	2.130E-08	2.130E-08	2.130E-08	2.130E-08	2.130E-08	2.130E-08	2.130E-08	2.130E-08	2.130E-08
ZN 67	1.306E-12	1.307E-12	1.307E-12	1.307E-12	1.307E-12	1.307E-12	1.307E-12	1.307E-12	1.307E-12
ZN 68	7.123E-16	7.123E-16	7.123E-16	7.123E-16	7.123E-16	7.123E-16	7.123E-16	7.123E-16	7.123E-16
GA 69	4.960E-20	4.968E-20	4.968E-20	4.968E-20	4.968E-20	4.968E-20	4.968E-20	4.968E-20	4.968E-20
GA 71	0.000E+00	8.596E-41	8.596E-41	8.596E-41	8.596E-41	8.596E-41	8.596E-41	8.596E-41	8.596E-41
GE 70	1.278E-27	4.523E-27	4.523E-27	4.523E-27	4.523E-27	4.523E-27	4.523E-27	4.523E-27	4.523E-27
SR 87	5.206E-05	5.206E-05	5.206E-05	5.206E-05	5.206E-05	5.206E-05	5.206E-05	5.206E-05	5.206E-05
SR 88	4.734E-03	4.734E-03	4.734E-03	4.734E-03	4.734E-03	4.734E-03	4.734E-03	4.734E-03	4.734E-03
SR 89	7.335E-05	4.874E-07	9.517E-16	6.327E-18	4.207E-20	2.852E-22	7.155E-24	0.000E+00	0.000E+00
SR 90	3.585E-08	3.501E-08	3.183E-08	3.108E-08	3.035E-08	2.963E-08	2.894E-08	2.826E-08	2.759E-08
Y 89	2.834E-04	3.563E-04	3.567E-04	3.567E-04	3.567E-04	3.567E-04	3.567E-04	3.567E-04	3.567E-04
Y 90	1.496E-04	8.778E-12	7.981E-12	7.793E-12	7.610E-12	7.431E-12	7.256E-12	7.086E-12	6.919E-12
Y 91	2.218E-04	2.930E-06	8.906E-14	1.176E-15	1.553E-17	2.050E-19	2.700E-21	4.131E-23	0.000E+00
ZR 90	3.149E+04	3.149E+04	3.149E+04	3.149E+04	3.149E+04	3.149E+04	3.149E+04	3.149E+04	3.149E+04
ZR 91	6.864E+03	6.864E+03	6.864E+03	6.864E+03	6.864E+03	6.864E+03	6.864E+03	6.864E+03	6.864E+03
ZR 92	1.050E+04	1.050E+04	1.050E+04	1.050E+04	1.050E+04	1.050E+04	1.050E+04	1.050E+04	1.050E+04
ZR 93	2.581E+00	2.581E+00	2.581E+00	2.581E+00	2.581E+00	2.581E+00	2.581E+00	2.581E+00	2.581E+00
ZR 94	1.064E+04	1.064E+04	1.064E+04	1.064E+04	1.064E+04	1.064E+04	1.064E+04	1.064E+04	1.064E+04
ZR 95	1.179E-01	2.254E-03	3.013E-10	5.761E-12	1.102E-13	2.106E-15	4.028E-17	7.701E-19	1.472E-20
ZR 96	1.713E+03	1.713E+03	1.713E+03	1.713E+03	1.713E+03	1.713E+03	1.713E+03	1.713E+03	1.713E+03
NB 92	1.858E-07	2.800E-18	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 93	6.233E+00	6.233E+00	6.233E+00	6.233E+00	6.233E+00	6.233E+00	6.233E+00	6.233E+00	6.233E+00
NB 93M	5.353E-07	1.592E-06	5.317E-06	6.136E-06	6.914E-06	7.653E-06	8.356E-06	9.024E-06	9.658E-06
NB 94	5.684E-03	5.684E-03	5.683E-03	5.683E-03	5.682E-03	5.682E-03	5.682E-03	5.682E-03	5.682E-03
NB 95	6.237E-02	2.784E-03	3.675E-10	7.272E-12	1.392E-13	2.662E-15	5.091E-17	9.734E-19	1.861E-20
NB 95M	4.785E-05	9.430E-07	1.261E-13	2.410E-15	4.609E-17	8.813E-19	1.685E-20	3.222E-22	6.162E-24
MO 94	9.524E-08	2.893E-07	1.066E-06	1.260E-06	1.454E-06	1.648E-06	1.842E-06	2.036E-06	2.230E-06
MO 95	2.793E-01	4.546E-01	4.597E-01	4.597E-01	4.597E-01	4.597E-01	4.597E-01	4.597E-01	4.597E-01
MO 96	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03	1.038E-03
MO 97	6.852E-01	6.873E-01	6.873E-01	6.873E-01	6.873E-01	6.873E-01	6.873E-01	6.873E-01	6.873E-01
MO 98	5.301E-04	5.301E-04	5.301E-04	5.301E-04	5.301E-04	5.301E-04	5.301E-04	5.301E-04	5.301E-04
MO100	1.275E-11	1.275E-11	1.275E-11	1.275E-11	1.275E-11	1.275E-11	1.275E-11	1.275E-11	1.275E-11
TC 98	1.479E-14	1.479E-14	1.479E-14	1.479E-14	1.479E-14	1.479E-14	1.479E-14	1.479E-14	1.479E-14
TC 99	6.203E-08	6.421E-08	6.421E-08	6.421E-08	6.421E-08	6.421E-08	6.421E-08	6.421E-08	6.421E-08
RU 98	4.383E-22	2.880E-21	1.265E-20	1.509E-20	1.753E-20	1.997E-20	2.241E-20	2.485E-20	2.729E-20
RU 99	4.923E-14	2.582E-13	1.094E-12	1.303E-12	1.512E-12	1.721E-12	1.930E-12	2.139E-12	2.348E-12
RU100	3.259E-10	3.259E-10	3.259E-10	3.259E-10	3.259E-10	3.259E-10	3.259E-10	3.259E-10	3.259E-10
RU101	1.110E-13	1.110E-13	1.110E-13	1.110E-13	1.110E-13	1.110E-13	1.110E-13	1.110E-13	1.110E-13
RU102	1.228E-16	1.228E-16	1.228E-16	1.228E-16	1.228E-16	1.228E-16	1.228E-16	1.228E-16	1.228E-16
RU103	5.569E-21	6.402E-24	4.077E-35	4.077E-35	4.077E-35	4.077E-35	4.077E-35	4.077E-35	4.077E-35
RU104	9.213E-32	5.944E-31	5.944E-31	5.944E-31	5.944E-31	5.944E-31	5.944E-31	5.944E-31	5.944E-31
RH103	4.303E-22	9.857E-22	9.863E-22	9.863E-22	9.863E-22	9.863E-22	9.863E-22	9.863E-22	9.863E-22
PD104	2.039E-29	1.316E-28	1.316E-28	1.316E-28	1.316E-28	1.316E-28	1.316E-28	1.316E-28	1.316E-28
PD105	5.734E-33	3.850E-32	3.850E-32	3.850E-32	3.850E-32	3.850E-32	3.850E-32	3.850E-32	3.850E-32
PD106	1.148E-34	1.277E-34	1.277E-34	1.277E-34	1.277E-34	1.277E-34	1.277E-34	1.277E-34	1.277E-34
CD111	5.566E-08	5.566E-08	5.566E-08	5.566E-08	5.566E-08	5.566E-08	5.566E-08	5.566E-08	5.566E-08
CD112	4.671E-07	4.671E-07	4.671E-07	4.671E-07	4.671E-07	4.671E-07	4.671E-07	4.671E-07	4.671E-07
CD113	1.593E-08	1.593E-08	1.593E-08	1.593E-08	1.593E-08	1.593E-08	1.593E-08	1.593E-08	1.593E-08
CD114	6.703E-06	7.970E-06	7.977E-06	7.977E-06	7.977E-06	7.977E-06	7.977E-06	7.977E-06	7.977E-06
CD115M	9.878E-11	3.383E-13	4.646E-23	5.515E-24	4.005E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD116	3.357E-07	3.357E-07	3.357E-07	3.357E-07	3.357E-07	3.357E-07	3.357E-07	3.357E-07	3.357E-07
IN113	1.030E-02	1.403E-02	1.449E-02	1.449E-02	1.449E-02	1.449E-02	1.449E-02	1.449E-02	1.449E-02
IN113M	2.517E-06	2.791E-07	4.215E-11	4.673E-12	5.180E-13	5.743E-14	6.366E-15	7.057E-16	7.824E-17
IN114	8.282E-10	1.639E-12	2.148E-21	1.292E-23	7.775E-26	4.676E-28	8.143E-29	8.918E-29	9.766E-29
IN114M	1.693E-05	1.019E-07	1.335E-16	8.034E-19	4.831E-21	2.568E-23	5.063E-24	5.544E-24	6.072E-24
IN115	4.148E-07	4.149E-07	4.149E-07	4.149E-07	4.149E-07	4.149E-07	4.149E-07	4.149E-07	4.149E-07
SN112	9.404E+00	9.404E+00	9.404E+00	9.404E+00	9.404E+00	9.404E+00	9.404E+00	9.404E+00	9.404E+00
SN113	4.192E-03	4.647E-04	7.019E-08	7.781E-09	8.625E-10	9.562E-11	1.060E-11	1.175E-12	1.303E-13
SN114	6.311E+00	6.311E+00	6.311E+00	6.311E+00	6.311E+00	6.311E+00	6.311E+00	6.311E+00	6.311E+00
SN115	3.463E+00	3.463E+00	3.463E+00	3.463E+00	3.463E+00	3.463E+00	3.463E+00	3.463E+00	3.463E+00
SN116	1.409E+02	1.409E+02	1.409E+02	1.409E+02	1.409E+02	1.409E+02	1.409E+02	1.409E+02	1.409E+02
SN117	7.463E+01	7.464E+01	7.464E+01	7.464E+01	7.464E+01	7.464E+01	7.464E+01	7.464E+01	7.464E+01
SN117M	4.555E-03	6.418E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	2.351E+02	2.351E+02	2.351E+02	2.351E+02	2.351E+02	2.351E+02	2.351E+02	2.351E+02	2.351E+02
SN119	8.341E+01	8.344E+01	8.346E+01	8.346E+01	8.346E+01	8.346E+01	8.346E+01	8.346E+01	8.346E+01
SN119M	5.261E-02	1.872E-02	3.002E-04	1.068E-04	3.801E-05	1.353E-05	4.813E-06	1.713E-06	6.094E-07
SN120	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02	3.165E+02
SN121M	2.210E-04	2.180E-04	2.062E-04	2.034E-04	2.006E-04	1.978E-04	1.951E-04	1.924E-04	1.898E-04
SN122	4.495E+01	4.495E+01	4.495E+01	4.495E+01	4.495E+01	4.495E+01	4.495E+01	4.495E+01	4.495E+01

Appendix E-2
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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
SN123	1.863E-03	2.624E-04	1.033E-07	1.455E-08	2.049E-09	2.886E-10	4.066E-11	5.727E-12	8.066E-13
SN124	5.617E+01	5.617E+01	5.617E+01	5.617E+01	5.617E+01	5.617E+01	5.617E+01	5.617E+01	5.617E+01
SN125	1.135E-03	4.459E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB121	4.098E-02	4.118E-02	4.119E-02	4.119E-02	4.119E-02	4.120E-02	4.120E-02	4.120E-02	4.120E-02
SB123	2.317E-03	3.918E-03	4.181E-03	4.181E-03	4.181E-03	4.181E-03	4.181E-03	4.181E-03	4.181E-03
SB124	2.887E-06	4.305E-08	2.127E-15	3.172E-17	4.729E-19	7.053E-21	1.149E-22	0.000E+00	0.000E+00
SB125	4.199E-02	3.358E-02	1.234E-02	9.610E-03	7.483E-03	5.826E-03	4.536E-03	3.532E-03	2.750E-03
SB126	3.242E-06	4.374E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE122	2.448E-04	2.504E-04	2.504E-04	2.504E-04	2.504E-04	2.504E-04	2.504E-04	2.504E-04	2.504E-04
TE123	4.605E-07	5.429E-07	5.542E-07	5.542E-07	5.542E-07	5.542E-07	5.542E-07	5.542E-07	5.542E-07
TE123M	9.375E-08	1.130E-08	2.389E-12	2.881E-13	3.474E-14	4.188E-15	5.050E-16	6.089E-17	7.342E-18
TE124	3.794E-06	6.638E-06	6.681E-06	6.681E-06	6.681E-06	6.681E-06	6.681E-06	6.681E-06	6.681E-06
TE125	4.866E-03	1.438E-02	3.592E-02	3.869E-02	4.084E-02	4.252E-02	4.383E-02	4.485E-02	4.564E-02
TE125M	4.316E-04	4.676E-04	1.726E-04	1.344E-04	1.047E-04	8.149E-05	6.345E-05	4.940E-05	3.846E-05
TE126	3.672E-05	3.996E-05	3.996E-05	3.996E-05	3.996E-05	3.996E-05	3.996E-05	3.996E-05	3.996E-05
TE127	5.889E-11	2.227E-13	2.056E-17	2.015E-18	1.975E-19	1.936E-20	1.898E-21	1.860E-22	1.824E-23
TE127M	6.490E-10	6.361E-11	5.872E-15	5.756E-16	5.642E-17	5.531E-18	5.421E-19	5.314E-20	5.207E-21
TE128	2.508E-12	2.508E-12	2.508E-12	2.508E-12	2.508E-12	2.508E-12	2.508E-12	2.508E-12	2.508E-12
TE129	1.312E-19	8.329E-25	6.776E-38	3.615E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE129M	1.665E-18	8.895E-22	7.236E-35	3.865E-38	2.061E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	1.532E-22	1.532E-22	1.532E-22	1.532E-22	1.532E-22	1.532E-22	1.532E-22	1.532E-22	1.532E-22
I127	1.136E-08	1.200E-08	1.207E-08	1.207E-08	1.207E-08	1.207E-08	1.207E-08	1.207E-08	1.207E-08
I129	1.269E-16	1.287E-16	1.287E-16	1.287E-16	1.287E-16	1.287E-16	1.287E-16	1.287E-16	1.287E-16
I131	4.800E-25	1.015E-38	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE127	1.838E-18	1.756E-21	1.466E-33	1.401E-36	1.339E-39	1.246E-42	0.000E+00	0.000E+00	0.000E+00
XE128	2.748E-11	2.749E-11	2.749E-11	2.749E-11	2.749E-11	2.749E-11	2.749E-11	2.749E-11	2.749E-11
XE129	7.945E-15	8.025E-15	8.025E-15	8.025E-15	8.025E-15	8.025E-15	8.025E-15	8.025E-15	8.025E-15
XE129M	8.053E-17	1.452E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE130	2.339E-17	2.339E-17	2.339E-17	2.339E-17	2.339E-17	2.339E-17	2.339E-17	2.339E-17	2.339E-17
XE131	4.486E-21	4.595E-21	4.595E-21	4.595E-21	4.595E-21	4.595E-21	4.595E-21	4.595E-21	4.595E-21
XE131M	1.076E-22	6.179E-32	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	1.658E-31	3.042E-31	3.042E-31	3.042E-31	3.042E-31	3.042E-31	3.042E-31	3.042E-31	3.042E-31
XE134	2.773E-40	2.773E-40	2.773E-40	2.773E-40	2.773E-40	2.773E-40	2.773E-40	2.773E-40	2.773E-40
CS133	2.433E-37	1.095E-36	1.095E-36	1.095E-36	1.095E-36	1.095E-36	1.095E-36	1.095E-36	1.095E-36
ER166	4.117E-32	1.108E-31	1.108E-31	1.108E-31	1.108E-31	1.108E-31	1.108E-31	1.108E-31	1.108E-31
ER167	6.552E-42	2.761E-41	2.761E-41	2.761E-41	2.761E-41	2.761E-41	2.761E-41	2.761E-41	2.761E-41
ER169	1.118E-21	2.246E-33	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	8.112E-21	9.230E-21	9.230E-21	9.230E-21	9.230E-21	9.230E-21	9.230E-21	9.230E-21	9.230E-21
TM170	1.150E-22	8.841E-24	3.359E-27	3.359E-27	3.359E-27	3.359E-27	3.359E-27	3.359E-27	3.359E-27
TM171	7.987E-27	2.586E-26	2.586E-26	2.586E-26	2.586E-26	2.586E-26	2.586E-26	2.586E-26	2.586E-26
YB170	0.000E+00	1.060E-22	1.148E-22	1.148E-22	1.148E-22	1.148E-22	1.148E-22	1.148E-22	1.148E-22
YB172	5.686E-12	5.838E-12	5.838E-12	5.838E-12	5.838E-12	5.838E-12	5.838E-12	5.838E-12	5.838E-12
YB173	7.221E-13	7.256E-13	7.256E-13	7.256E-13	7.256E-13	7.256E-13	7.256E-13	7.256E-13	7.256E-13
YB174	3.679E-15	3.679E-15	3.679E-15	3.679E-15	3.679E-15	3.679E-15	3.679E-15	3.679E-15	3.679E-15
LU175	1.223E-03	1.675E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03	1.687E-03
LU176	6.652E-06	6.652E-06	6.652E-06	6.652E-06	6.652E-06	6.652E-06	6.652E-06	6.652E-06	6.652E-06
LU177	7.091E-08	3.750E-12	5.452E-15	1.064E-15	2.078E-16	4.058E-17	7.923E-18	1.547E-18	3.021E-19
LU177M	1.929E-09	3.767E-10	5.475E-13	1.069E-13	2.088E-14	4.076E-15	7.960E-16	1.554E-16	3.035E-17
HF174	1.855E-02	1.855E-02	1.855E-02	1.855E-02	1.855E-02	1.855E-02	1.855E-02	1.855E-02	1.855E-02
HF175	4.644E-04	1.248E-05	6.505E-12	1.748E-13	4.697E-15	1.262E-16	3.391E-18	9.111E-20	2.461E-21
HF176	6.245E-01	6.245E-01	6.245E-01	6.245E-01	6.245E-01	6.245E-01	6.245E-01	6.245E-01	6.245E-01
HF177	1.545E+00	1.545E+00	1.545E+00	1.545E+00	1.545E+00	1.545E+00	1.545E+00	1.545E+00	1.545E+00
HF178	3.817E+00	3.817E+00	3.817E+00	3.817E+00	3.817E+00	3.817E+00	3.817E+00	3.817E+00	3.817E+00
HF179	2.043E+00	2.043E+00	2.043E+00	2.043E+00	2.043E+00	2.043E+00	2.043E+00	2.043E+00	2.043E+00
HF180	4.439E+00	4.439E+00	4.439E+00	4.439E+00	4.439E+00	4.439E+00	4.439E+00	4.439E+00	4.439E+00
HF181	3.274E-03	8.361E-06	3.536E-16	9.033E-19	2.300E-21	1.396E-23	0.000E+00	0.000E+00	0.000E+00
HF182	1.978E-05	1.978E-05	1.978E-05	1.978E-05	1.978E-05	1.978E-05	1.978E-05	1.978E-05	1.978E-05
TA181	6.153E-01	6.186E-01	6.186E-01	6.186E-01	6.186E-01	6.186E-01	6.186E-01	6.186E-01	6.186E-01
TA182	6.632E-03	7.337E-04	1.099E-07	1.216E-08	1.346E-09	1.496E-10	1.716E-11	2.514E-12	8.937E-13
TA183	2.073E-04	5.721E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W182	1.054E-02	1.644E-02	1.717E-02	1.717E-02	1.717E-02	1.717E-02	1.717E-02	1.717E-02	1.717E-02
W183	7.037E-03	7.244E-03	7.244E-03	7.244E-03	7.244E-03	7.244E-03	7.244E-03	7.244E-03	7.244E-03
W184	5.405E-05	5.405E-05	5.405E-05	5.405E-05	5.405E-05	5.405E-05	5.405E-05	5.405E-05	5.405E-05
W185	8.580E-09	2.947E-10	4.103E-16	1.410E-17	4.842E-19	1.663E-20	5.673E-22	2.655E-23	0.000E+00
W186	8.036E-12	8.727E-12	8.727E-12	8.727E-12	8.727E-12	8.727E-12	8.727E-12	8.727E-12	8.727E-12
W188	1.662E-17	4.328E-19	1.990E-25	1.990E-25	1.990E-25	1.990E-25	1.990E-25	1.990E-25	1.990E-25
RE185	6.408E-09	1.469E-08	1.499E-08	1.499E-08	1.499E-08	1.499E-08	1.499E-08	1.499E-08	1.499E-08
RE187	4.038E-14	4.143E-14	4.143E-14	4.143E-14	4.143E-14	4.143E-14	4.143E-14	4.143E-14	4.143E-14
RE188	3.427E-18	4.458E-21	2.050E-27	2.030E-27	2.030E-27	2.030E-27	2.030E-27	2.030E-27	2.030E-27
OS186	1.162E-10	1.261E-10	1.261E-10	1.261E-10	1.261E-10	1.261E-10	1.261E-10	1.261E-10	1.261E-10
OS188	1.588E-16	1.785E-16	1.789E-16	1.789E-16	1.789E-16	1.789E-16	1.789E-16	1.789E-16	1.789E-16
OS189	1.424E-19	1.424E-19	1.424E-19	1.424E-19	1.424E-19	1.424E-19	1.424E-19	1.424E-19	1.424E-19
OS190	5.745E-22	5.745E-22	5.745E-22	5.745E-22	5.745E-22	5.745E-22	5.745E-22	5.745E-22	5.745E-22
OS191	2.569E-28	2.668E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IR191	0.000E+00	3.540E-27	3.540E-27	3.540E-27	3.540E-27	3.540E-27	3.540E-27	3.540E-27	3.540E-27

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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
HE 4	1.901E-07	8.954E-07	3.664E-06	4.344E-06	5.018E-06	5.688E-06	6.352E-06	7.012E-06	7.667E-06
TL206	1.755E-33	1.755E-33	1.755E-33	1.755E-33	1.755E-33	1.755E-33	1.755E-33	1.755E-33	1.755E-33
TL207	2.635E-18	1.308E-17	1.132E-16	1.528E-16	1.977E-16	2.478E-16	3.029E-16	3.630E-16	4.278E-16
TL208	1.884E-16	6.945E-16	1.859E-15	2.014E-15	2.128E-15	2.214E-15	2.277E-15	2.321E-15	2.352E-15
TL209	2.572E-22	1.530E-22	4.935E-22	5.869E-22	6.840E-22	7.847E-22	8.890E-22	9.969E-22	1.108E-21
PB206	4.184E-19	6.279E-18	8.459E-17	1.353E-16	2.064E-16	3.095E-16	4.549E-16	6.534E-16	9.172E-16
PB207	6.221E-14	6.064E-13	1.720E-11	2.719E-11	4.039E-11	5.720E-11	7.803E-11	1.032E-10	1.332E-10
PB208	1.537E-11	1.632E-10	1.973E-09	2.614E-09	3.299E-09	4.016E-09	4.758E-09	5.517E-09	6.289E-09
PB209	1.072E-18	6.375E-19	2.056E-18	2.446E-18	2.850E-18	3.270E-18	3.704E-18	4.154E-18	4.618E-18
PB210	2.302E-16	3.107E-16	1.502E-15	2.295E-15	3.367E-15	4.760E-15	6.512E-15	8.661E-15	1.124E-14
PB211	2.038E-17	1.012E-16	8.760E-16	1.182E-15	1.529E-15	1.917E-15	2.343E-15	2.808E-15	3.310E-15
PB212	1.111E-13	4.096E-13	1.096E-12	1.188E-12	1.255E-12	1.306E-12	1.343E-12	1.369E-12	1.387E-12
PB214	5.807E-22	4.066E-21	5.353E-20	7.491E-20	9.995E-20	1.287E-19	1.611E-19	1.973E-19	2.372E-19
BI208	4.119E-23	4.119E-23	4.119E-23	4.119E-23	4.119E-23	4.119E-23	4.119E-23	4.119E-23	4.119E-23
BI209	5.293E-16	1.527E-15	1.119E-14	1.530E-14	2.013E-14	2.573E-14	3.211E-14	3.930E-14	4.733E-14
BI210M	6.766E-22	6.766E-22	6.766E-22	6.766E-22	6.766E-22	6.766E-22	6.766E-22	6.766E-22	6.766E-22
BI210	1.418E-19	1.913E-19	9.245E-19	1.412E-18	2.073E-18	2.930E-18	4.009E-18	5.331E-18	6.921E-18
BI211	1.203E-18	5.971E-18	5.168E-17	6.976E-17	9.023E-17	1.131E-16	1.383E-16	1.657E-16	1.953E-16
BI212	1.054E-14	3.885E-14	1.040E-13	1.127E-13	1.191E-13	1.239E-13	1.274E-13	1.299E-13	1.316E-13
BI213	2.518E-19	1.498E-19	4.831E-19	5.746E-19	6.697E-19	7.682E-19	8.703E-19	9.760E-19	1.085E-18
BI214	4.312E-22	3.019E-21	3.975E-20	5.562E-20	7.422E-20	9.555E-20	1.196E-19	1.465E-19	1.761E-19
PO210	1.156E-18	4.417E-18	2.554E-17	3.218E-17	4.692E-17	6.727E-17	9.339E-17	1.258E-16	1.652E-16
PO211	1.476E-23	7.326E-23	6.341E-22	8.559E-22	1.107E-21	1.388E-21	1.696E-21	2.033E-21	2.396E-21
PO212	5.576E-25	2.056E-24	5.502E-24	5.962E-24	6.300E-24	6.553E-24	6.739E-24	6.871E-24	6.961E-24
PO213	3.778E-28	2.247E-28	7.248E-28	8.621E-28	1.005E-27	1.153E-27	1.306E-27	1.464E-27	1.628E-27
PO214	5.903E-27	4.154E-28	5.468E-27	7.652E-27	1.021E-26	1.314E-26	1.646E-26	2.015E-26	2.423E-26
PO215	1.707E-23	8.475E-23	7.335E-22	9.900E-22	1.281E-21	1.605E-21	1.962E-21	2.351E-21	2.771E-21
PO216	4.434E-19	1.634E-18	4.375E-18	4.740E-18	5.009E-18	5.211E-18	5.358E-18	5.463E-18	5.535E-18
PO218	6.734E-23	4.715E-22	6.207E-21	8.686E-21	1.159E-20	1.492E-20	1.868E-20	2.288E-20	2.751E-20
AT217	3.025E-24	1.800E-24	5.804E-24	6.904E-24	8.045E-24	9.230E-24	1.046E-23	1.173E-23	1.304E-23
RN218	1.268E-24	6.568E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RN219	3.868E-20	1.920E-19	1.662E-18	2.243E-18	2.902E-18	3.637E-18	4.447E-18	5.329E-18	6.280E-18
RN220	1.674E-16	6.171E-16	1.652E-15	1.790E-15	1.891E-15	1.967E-15	2.023E-15	2.063E-15	2.090E-15
RN222	1.238E-19	8.669E-19	1.141E-17	1.597E-17	2.131E-17	2.743E-17	3.435E-17	4.206E-17	5.057E-17
FR221	2.747E-20	1.634E-20	5.271E-20	6.269E-20	7.306E-20	8.381E-20	9.495E-20	1.065E-19	1.184E-19
FR223	2.262E-19	8.908E-19	7.713E-18	1.040E-17	1.345E-17	1.685E-17	2.060E-17	2.469E-17	2.909E-17
RA222	1.402E-21	7.262E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RA223	9.826E-15	4.878E-14	4.222E-13	5.699E-13	7.371E-13	9.239E-13	1.130E-12	1.354E-12	1.595E-12
RA224	9.693E-13	3.573E-12	9.563E-12	1.036E-11	1.095E-11	1.139E-11	1.171E-11	1.194E-11	1.210E-11
RA225	1.378E-16	7.389E-17	2.383E-16	2.834E-16	3.303E-16	3.789E-16	4.293E-16	4.814E-16	5.353E-16
RA226	1.926E-14	1.349E-13	1.775E-12	2.485E-12	3.315E-12	4.268E-12	5.343E-12	6.543E-12	7.868E-12
RA228	5.341E-18	3.539E-17	4.007E-16	5.419E-16	6.992E-16	8.710E-16	1.056E-15	1.253E-15	1.460E-15
AC225	8.390E-17	4.991E-17	1.610E-16	1.915E-16	2.231E-16	2.560E-16	2.900E-16	3.252E-16	3.616E-16
AC227	8.765E-12	3.452E-11	2.989E-10	4.028E-10	5.210E-10	6.530E-10	7.983E-10	9.566E-10	1.127E-09
AC228	9.068E-16	3.694E-21	4.183E-20	5.657E-20	7.299E-20	9.092E-20	1.102E-19	1.308E-19	1.524E-19
TH226	6.986E-20	3.619E-25	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TH227	1.767E-14	8.016E-14	6.938E-13	9.365E-13	1.211E-12	1.518E-12	1.856E-12	2.224E-12	2.622E-12
TH228	1.878E-10	6.937E-10	1.858E-09	2.007E-09	2.121E-09	2.206E-09	2.268E-09	2.313E-09	2.343E-09
TH229	6.784E-12	1.362E-11	4.392E-11	5.224E-11	6.088E-11	6.984E-11	7.912E-11	8.873E-11	9.865E-11
TH230	6.497E-09	1.967E-08	7.343E-08	8.714E-08	1.009E-07	1.149E-07	1.289E-07	1.430E-07	1.572E-07
TH231	3.581E-09	3.577E-09	3.577E-09	3.577E-09	3.577E-09	3.577E-09	3.577E-09	3.577E-09	3.577E-09
TH232	3.326E-07	9.839E-07	3.589E-06	4.240E-06	4.891E-06	5.543E-06	6.194E-06	6.845E-06	7.496E-06
TH234	1.255E-10	1.255E-10	1.255E-10	1.255E-10	1.255E-10	1.255E-10	1.255E-10	1.255E-10	1.255E-10
PA231	8.404E-07	1.696E-06	5.106E-06	5.961E-06	6.816E-06	7.671E-06	8.526E-06	9.381E-06	1.024E-05
PA233	5.715E-09	7.230E-09	7.230E-09	7.230E-09	7.230E-09	7.230E-09	7.230E-09	7.230E-09	7.230E-09
PA234M	4.752E-15	4.232E-15	4.232E-15	4.232E-15	4.232E-15	4.232E-15	4.232E-15	4.232E-15	4.232E-15
PA234	1.806E-13	1.890E-15	1.890E-15	1.890E-15	1.890E-15	1.890E-15	1.890E-15	1.890E-15	1.890E-15
U230	6.869E-17	3.554E-22	3.223E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U232	6.621E-08	7.421E-08	8.911E-08	9.062E-08	9.161E-08	9.218E-08	9.244E-08	9.245E-08	9.226E-08
U233	1.551E-06	1.624E-06	1.895E-06	1.970E-06	2.045E-06	2.120E-06	2.195E-06	2.270E-06	2.345E-06
U234	4.707E-03	4.747E-03	4.900E-03	4.938E-03	4.975E-03	5.012E-03	5.049E-03	5.085E-03	5.121E-03
U235	8.797E+02	8.797E+02	8.797E+02	8.797E+02	8.797E+02	8.797E+02	8.797E+02	8.797E+02	8.797E+02
U236	2.238E+01	2.238E+01	2.238E+01	2.238E+01	2.238E+01	2.238E+01	2.238E+01	2.238E+01	2.238E+01
U237	1.128E-02	1.611E-12	1.329E-12	1.266E-12	1.207E-12	1.150E-12	1.096E-12	1.045E-12	9.955E-13
U238	8.645E+00	8.645E+00	8.645E+00	8.645E+00	8.645E+00	8.645E+00	8.645E+00	8.645E+00	8.645E+00
U240	1.172E-11	1.230E-23	1.230E-23	1.230E-23	1.230E-23	1.230E-23	1.230E-23	1.230E-23	1.230E-23
NP235	2.484E-10	1.311E-10	1.016E-11	5.363E-12	2.830E-12	1.494E-12	7.881E-13	4.159E-13	2.195E-13
NP236	2.628E-08	2.628E-08	2.628E-08	2.628E-08	2.628E-08	2.628E-08	2.628E-08	2.628E-08	2.628E-08
NP237	2.016E-01	2.129E-01	2.129E-01	2.129E-01	2.129E-01	2.129E-01	2.129E-01	2.129E-01	2.129E-01
NP238	1.303E-04	1.349E-15	1.325E-15	1.319E-15	1.313E-15	1.307E-15	1.301E-15	1.295E-15	1.289E-15
NP239	1.663E-04	1.669E-14	1.669E-14	1.668E-14	1.668E-14	1.668E-14	1.668E-14	1.668E-14	1.668E-14
NP240M	2.093E-11	1.076E-25	1.076E-25	1.076E-25	1.076E-25	1.076E-25	1.076E-25	1.076E-25	1.076E-25
PU236	3.730E-08	2.961E-08	1.120E-08	8.781E-09	6.886E-09	5.400E-09	4.234E-09	3.320E-09	2.604E-09
PU237	1.356E-09	5.261E-12	1.192E-21	1.618E-23	8.871E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	4.928E-03	5.019E-03	4.863E-03	4.825E-03	4.787E-03	4.749E-03	4.712E-03	4.674E-03	4.638E-03
PU239	1.441E-02	1.458E-02	1.458E-02	1.458E-02	1.458E-02	1.458E-02	1.458E-02	1.457E-02	1.457E-02

Appendix E-2
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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
PU240	8.372E-04	8.371E-04	8.367E-04	8.366E-04	8.366E-04	8.365E-04	8.364E-04	8.363E-04	8.362E-04
PU241	5.460E-05	5.203E-05	4.292E-05	4.090E-05	3.898E-05	3.715E-05	3.540E-05	3.374E-05	3.215E-05
PU242	1.236E-06	1.236E-06	1.236E-06	1.236E-06	1.236E-06	1.236E-06	1.236E-06	1.236E-06	1.236E-06
PU243	7.074E-11	4.563E-28	4.563E-28	4.563E-28	4.563E-28	4.563E-28	4.563E-28	4.563E-28	4.563E-28
PU244	6.431E-13	6.432E-13	6.432E-13	6.432E-13	6.432E-13	6.432E-13	6.432E-13	6.432E-13	6.432E-13
PU246	3.850E-21	2.830E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AM241	7.059E-07	3.269E-06	1.233E-05	1.433E-05	1.622E-05	1.803E-05	1.974E-05	2.137E-05	2.292E-05
AM242M	7.229E-09	7.196E-09	7.066E-09	7.034E-09	7.002E-09	6.970E-09	6.938E-09	6.906E-09	6.875E-09
AM242	3.285E-10	8.608E-14	8.452E-14	8.414E-14	8.375E-14	8.337E-14	8.299E-14	8.262E-14	8.224E-14
AM243	1.936E-08	1.942E-08	1.942E-08	1.941E-08	1.941E-08	1.941E-08	1.941E-08	1.941E-08	1.941E-08
AM245	5.630E-19	6.013E-34	6.013E-34	6.013E-34	6.013E-34	6.013E-34	6.013E-34	6.013E-34	6.013E-34
AM246	6.161E-24	4.535E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CM241	1.825E-16	1.611E-19	9.780E-32	8.632E-35	7.619E-38	6.720E-41	0.000E+00	0.000E+00	0.000E+00
CM242	1.790E-08	3.865E-09	2.490E-11	1.869E-11	1.731E-11	1.696E-11	1.682E-11	1.673E-11	1.665E-11
CM243	4.488E-11	4.381E-11	3.974E-11	3.879E-11	3.786E-11	3.695E-11	3.606E-11	3.519E-11	3.435E-11
CM244	4.193E-10	4.039E-10	3.466E-10	3.336E-10	3.210E-10	3.090E-10	2.974E-10	2.862E-10	2.755E-10
CM245	1.868E-12	1.868E-12	1.867E-12	1.867E-12	1.867E-12	1.867E-12	1.866E-12	1.866E-12	1.866E-12
CM246	1.615E-14	1.615E-14	1.614E-14	1.613E-14	1.613E-14	1.613E-14	1.613E-14	1.612E-14	1.612E-14
CM247	1.280E-17	1.280E-17	1.280E-17	1.280E-17	1.280E-17	1.280E-17	1.280E-17	1.280E-17	1.280E-17
CM248	5.482E-20	5.482E-20	5.482E-20	5.482E-20	5.482E-20	5.482E-20	5.482E-20	5.482E-20	5.482E-20
CM250	1.140E-33	1.140E-33	1.140E-33	1.140E-33	1.140E-33	1.140E-33	1.140E-33	1.140E-33	1.140E-33
BK249	2.036E-26	1.564E-25	1.564E-25	1.564E-25	1.564E-25	1.564E-25	1.564E-25	1.564E-25	1.564E-25
CF250	7.767E-32	5.712E-30	5.712E-30	5.712E-30	5.712E-30	5.712E-30	5.712E-30	5.712E-30	5.712E-30
CF251	1.012E-35	1.784E-34	1.784E-34	1.784E-34	1.784E-34	1.784E-34	1.784E-34	1.784E-34	1.784E-34
SF250	2.455E-14	1.111E-13	4.476E-13	5.302E-13	6.121E-13	6.935E-13	7.744E-13	8.546E-13	9.343E-13
H 3	1.341E-04	1.268E-04	1.013E-04	9.578E-05	9.056E-05	8.561E-05	8.094E-05	7.652E-05	7.235E-05
LI 6	1.151E-06	1.151E-06	1.151E-06	1.151E-06	1.151E-06	1.151E-06	1.151E-06	1.151E-06	1.151E-06
LI 7	2.925E-08	2.925E-08	2.925E-08	2.925E-08	2.925E-08	2.925E-08	2.925E-08	2.925E-08	2.925E-08
BE 9	5.640E-08	5.640E-08	5.640E-08	5.640E-08	5.640E-08	5.640E-08	5.640E-08	5.640E-08	5.640E-08
BE 10	3.761E-07	3.761E-07	3.761E-07	3.761E-07	3.761E-07	3.761E-07	3.761E-07	3.761E-07	3.761E-07
C 14	7.604E-08	7.603E-08	7.600E-08	7.599E-08	7.598E-08	7.597E-08	7.596E-08	7.595E-08	7.594E-08
ZN 66	1.497E-10	1.497E-10	1.497E-10	1.497E-10	1.497E-10	1.497E-10	1.497E-10	1.497E-10	1.497E-10
ZN 67	6.614E-12	6.614E-12	6.614E-12	6.614E-12	6.614E-12	6.614E-12	6.614E-12	6.614E-12	6.614E-12
ZN 68	1.177E-06	1.177E-06	1.177E-06	1.177E-06	1.177E-06	1.177E-06	1.177E-06	1.177E-06	1.177E-06
GA 69	3.497E-10	3.499E-10	3.499E-10	3.499E-10	3.499E-10	3.499E-10	3.499E-10	3.499E-10	3.499E-10
ZN 70	4.009E-06	4.009E-06	4.009E-06	4.009E-06	4.009E-06	4.009E-06	4.009E-06	4.009E-06	4.009E-06
GE 70	1.527E-13	1.527E-13	1.527E-13	1.527E-13	1.527E-13	1.527E-13	1.527E-13	1.527E-13	1.527E-13
GA 71	1.728E-09	1.728E-09	1.728E-09	1.728E-09	1.728E-09	1.728E-09	1.728E-09	1.728E-09	1.728E-09
GE 72	2.079E-05	2.100E-05	2.100E-05	2.100E-05	2.100E-05	2.100E-05	2.100E-05	2.100E-05	2.100E-05
GE 73	7.549E-05	7.555E-05	7.555E-05	7.555E-05	7.555E-05	7.555E-05	7.555E-05	7.555E-05	7.555E-05
GE 74	1.980E-04	1.980E-04	1.980E-04	1.980E-04	1.980E-04	1.980E-04	1.980E-04	1.980E-04	1.980E-04
AS 75	4.858E-04	4.859E-04	4.859E-04	4.859E-04	4.859E-04	4.859E-04	4.859E-04	4.859E-04	4.859E-04
GE 76	1.458E-03	1.458E-03	1.458E-03	1.458E-03	1.458E-03	1.458E-03	1.458E-03	1.458E-03	1.458E-03
SE 76	1.237E-06	1.248E-06	1.248E-06	1.248E-06	1.248E-06	1.248E-06	1.248E-06	1.248E-06	1.248E-06
SE 77	3.256E-03	3.278E-03	3.278E-03	3.278E-03	3.278E-03	3.278E-03	3.278E-03	3.278E-03	3.278E-03
SE 78	6.768E-03	6.772E-03	6.772E-03	6.772E-03	6.772E-03	6.772E-03	6.772E-03	6.772E-03	6.772E-03
SE 79	1.751E-02	1.751E-02	1.751E-02	1.751E-02	1.751E-02	1.750E-02	1.750E-02	1.750E-02	1.750E-02
BR 79	9.400E-08	2.808E-07	1.028E-06	1.215E-06	1.402E-06	1.588E-06	1.775E-06	1.962E-06	2.149E-06
SE 80	4.209E-02	4.209E-02	4.209E-02	4.209E-02	4.209E-02	4.209E-02	4.209E-02	4.209E-02	4.209E-02
KR 80	2.058E-07	2.059E-07	2.059E-07	2.059E-07	2.059E-07	2.059E-07	2.059E-07	2.059E-07	2.059E-07
BR 81	7.204E-02	7.205E-02	7.205E-02	7.205E-02	7.205E-02	7.205E-02	7.205E-02	7.205E-02	7.205E-02
KR 81	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09	1.442E-09
SE 82	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01	1.140E-01
KR 82	2.904E-04	2.937E-04	2.937E-04	2.937E-04	2.937E-04	2.937E-04	2.937E-04	2.937E-04	2.937E-04
KR 83	1.824E-01	1.826E-01	1.826E-01	1.826E-01	1.826E-01	1.826E-01	1.826E-01	1.826E-01	1.826E-01
KR 84	3.663E-01	3.663E-01	3.663E-01	3.663E-01	3.663E-01	3.663E-01	3.663E-01	3.663E-01	3.663E-01
KR 85	9.313E-02	8.736E-02	6.745E-02	6.323E-02	5.927E-02	5.556E-02	5.208E-02	4.882E-02	4.576E-02
RB 85	3.594E-01	3.655E-01	3.854E-01	3.897E-01	3.936E-01	3.973E-01	4.008E-01	4.041E-01	4.071E-01
KR 86	7.238E-01	7.238E-01	7.238E-01	7.238E-01	7.238E-01	7.238E-01	7.238E-01	7.238E-01	7.238E-01
RB 86	1.799E-05	2.301E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SR 86	1.232E-04	1.412E-04	1.412E-04	1.412E-04	1.412E-04	1.412E-04	1.412E-04	1.412E-04	1.412E-04
RB 87	9.370E-01	9.372E-01	9.372E-01	9.372E-01	9.372E-01	9.372E-01	9.372E-01	9.372E-01	9.372E-01
SR 87	1.328E-06	1.328E-06	1.328E-06	1.328E-06	1.328E-06	1.328E-06	1.328E-06	1.328E-06	1.328E-06
SR 88	1.349E+00	1.350E+00	1.350E+00	1.350E+00	1.350E+00	1.350E+00	1.350E+00	1.350E+00	1.350E+00
SR 89	3.521E-01	2.341E-03	4.572E-12	3.039E-14	2.020E-16	1.343E-18	8.922E-21	5.490E-23	0.000E+00
Y 89	1.429E+00	1.779E+00	1.781E+00	1.781E+00	1.781E+00	1.781E+00	1.781E+00	1.781E+00	1.781E+00
SR 90	2.129E+00	2.079E+00	1.890E+00	1.846E+00	1.802E+00	1.760E+00	1.718E+00	1.678E+00	1.638E+00
Y 90	5.393E-04	5.213E-04	4.740E-04	4.628E-04	4.519E-04	4.413E-04	4.309E-04	4.208E-04	4.109E-04
ZR 90	2.854E-02	7.864E-02	2.675E-01	3.119E-01	3.554E-01	3.978E-01	4.392E-01	4.796E-01	5.191E-01
Y 91	5.049E-01	6.715E-03	2.041E-10	2.695E-12	3.559E-14	4.699E-16	6.205E-18	8.194E-20	1.079E-21
ZR 91	1.717E+00	2.218E+00	2.225E+00	2.225E+00	2.225E+00	2.225E+00	2.225E+00	2.225E+00	2.225E+00
ZR 92	2.307E+00	2.309E+00	2.309E+00	2.309E+00	2.309E+00	2.309E+00	2.309E+00	2.309E+00	2.309E+00
NB 92	1.123E-15	1.691E-26	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	2.506E+00	2.510E+00	2.510E+00	2.510E+00	2.510E+00	2.510E+00	2.510E+00	2.510E+00	2.510E+00
NB 93	4.099E-08	1.515E-07	1.079E-06	1.420E-06	1.801E-06	2.220E-06	2.674E-06	3.162E-06	3.683E-06

Appendix E-2
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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
NB 93M	5.345E-07	1.561E-06	5.183E-06	5.978E-06	6.735E-06	7.453E-06	8.136E-06	8.785E-06	9.402E-06
ZR 94	2.454E+00	2.454E+00	2.454E+00	2.454E+00	2.454E+00	2.454E+00	2.454E+00	2.454E+00	2.454E+00
NB 94	3.406E-07	3.405E-07	3.405E-07	3.405E-07	3.405E-07	3.405E-07	3.404E-07	3.404E-07	3.404E-07
ZR 95	6.299E-01	1.205E-02	1.610E-09	3.079E-11	5.887E-13	1.126E-14	2.153E-16	4.116E-18	7.871E-20
NB 95	3.386E-01	1.488E-02	1.964E-09	3.886E-11	7.441E-13	1.423E-14	2.721E-16	5.203E-18	9.948E-20
NB 95M	2.566E-04	5.040E-06	6.738E-13	1.288E-14	2.463E-16	4.711E-18	9.007E-20	1.722E-21	3.293E-23
MO 95	1.572E+00	2.515E+00	2.541E+00	2.541E+00	2.541E+00	2.541E+00	2.541E+00	2.541E+00	2.541E+00
ZR 96	2.526E+00	2.526E+00	2.526E+00	2.526E+00	2.526E+00	2.526E+00	2.526E+00	2.526E+00	2.526E+00
MO 96	6.151E-03	6.154E-03	6.154E-03	6.154E-03	6.154E-03	6.154E-03	6.154E-03	6.154E-03	6.154E-03
MO 97	2.377E+00	2.384E+00	2.384E+00	2.384E+00	2.384E+00	2.384E+00	2.384E+00	2.384E+00	2.384E+00
MO 98	2.394E+00	2.394E+00	2.394E+00	2.394E+00	2.394E+00	2.394E+00	2.394E+00	2.394E+00	2.394E+00
TC 98	1.171E-06	1.171E-06	1.171E-06	1.171E-06	1.171E-06	1.171E-06	1.171E-06	1.171E-06	1.171E-06
TC 99	2.430E+00	2.458E+00	2.458E+00	2.458E+00	2.458E+00	2.458E+00	2.458E+00	2.458E+00	2.458E+00
RU 99	3.957E-06	1.196E-05	4.396E-05	5.196E-05	5.996E-05	6.795E-05	7.595E-05	8.395E-05	9.195E-05
MO100	2.631E+00	2.631E+00	2.631E+00	2.631E+00	2.631E+00	2.631E+00	2.631E+00	2.631E+00	2.631E+00
RU100	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02	2.580E-02
RU101	2.139E+00	2.139E+00	2.139E+00	2.139E+00	2.139E+00	2.139E+00	2.139E+00	2.139E+00	2.139E+00
RU102	1.814E+00	1.814E+00	1.814E+00	1.814E+00	1.814E+00	1.814E+00	1.814E+00	1.814E+00	1.814E+00
RH102	1.602E-07	1.262E-07	4.849E-08	3.818E-08	3.007E-08	2.367E-08	1.864E-08	1.468E-08	1.156E-08
RU103	2.095E-01	3.329E-04	2.120E-15	3.361E-18	5.354E-21	6.165E-24	4.607E-24	3.442E-24	0.000E+00
RH103	1.102E+00	1.311E+00	1.312E+00	1.312E+00	1.312E+00	1.312E+00	1.312E+00	1.312E+00	1.312E+00
RH103M	1.872E-04	2.977E-07	1.896E-18	3.012E-21	4.788E-24	7.606E-27	4.116E-27	3.076E-27	4.891E-30
RU104	8.225E-01	8.225E-01	8.225E-01	8.225E-01	8.225E-01	8.225E-01	8.225E-01	8.225E-01	8.225E-01
PD104	4.526E-02	4.526E-02	4.526E-02	4.526E-02	4.526E-02	4.526E-02	4.526E-02	4.526E-02	4.526E-02
PD105	4.430E-01	4.459E-01	4.459E-01	4.459E-01	4.459E-01	4.459E-01	4.459E-01	4.459E-01	4.459E-01
RU106	1.337E-01	6.721E-02	4.294E-03	2.159E-03	1.085E-03	5.457E-04	2.743E-04	1.379E-04	6.934E-05
RH106	1.338E-07	6.317E-08	4.036E-09	2.029E-09	1.020E-09	5.129E-10	2.579E-10	1.296E-10	6.518E-11
PD106	6.146E-02	1.279E-01	1.908E-01	1.930E-01	1.941E-01	1.946E-01	1.949E-01	1.950E-01	1.951E-01
AG106	1.070E-16	1.242E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD107	8.609E-02	8.610E-02	8.610E-02	8.610E-02	8.610E-02	8.610E-02	8.610E-02	8.610E-02	8.610E-02
AG107	4.580E-09	1.377E-08	5.051E-08	5.970E-08	6.889E-08	7.807E-08	8.726E-08	9.645E-08	1.056E-07
PD108	4.127E-02	4.127E-02	4.127E-02	4.127E-02	4.127E-02	4.127E-02	4.127E-02	4.127E-02	4.127E-02
AG108	1.021E-13	1.277E-20	1.249E-20	1.242E-20	1.236E-20	1.229E-20	1.222E-20	1.216E-20	1.209E-20
AG108M	4.066E-12	4.044E-12	3.956E-12	3.935E-12	3.913E-12	3.892E-12	3.871E-12	3.850E-12	3.829E-12
CD108	7.495E-09	7.495E-09	7.495E-09	7.495E-09	7.495E-09	7.495E-09	7.495E-09	7.495E-09	7.495E-09
AG109	1.970E-02	1.975E-02	1.975E-02	1.975E-02	1.975E-02	1.975E-02	1.975E-02	1.975E-02	1.975E-02
AG109M	3.763E-08	7.223E-19	8.145E-20	4.720E-20	2.735E-20	1.585E-20	9.184E-21	5.322E-21	3.084E-21
CD109	1.262E-12	7.312E-13	8.245E-14	4.778E-14	2.769E-14	1.604E-14	9.298E-15	5.388E-15	3.122E-15
PD110	1.498E-02	1.498E-02	1.498E-02	1.498E-02	1.498E-02	1.498E-02	1.498E-02	1.498E-02	1.498E-02
AG110	2.047E-09	1.742E-13	3.027E-15	1.099E-15	3.991E-16	1.449E-16	5.260E-17	1.910E-17	6.934E-18
AG110M	3.166E-05	1.150E-05	1.998E-07	7.253E-08	2.633E-08	9.561E-09	3.471E-09	1.260E-09	4.576E-10
CD110	8.974E-04	9.176E-04	9.289E-04	9.290E-04	9.291E-04	9.291E-04	9.291E-04	9.291E-04	9.291E-04
AG111	3.569E-04	6.245E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD111	1.182E-02	1.218E-02	1.218E-02	1.218E-02	1.218E-02	1.218E-02	1.218E-02	1.218E-02	1.218E-02
CD112	8.962E-03	8.995E-03	8.995E-03	8.995E-03	8.995E-03	8.995E-03	8.995E-03	8.995E-03	8.995E-03
CD113	9.495E-04	9.562E-04	9.562E-04	9.562E-04	9.562E-04	9.562E-04	9.562E-04	9.562E-04	9.562E-04
CD113M	1.705E-04	1.626E-04	1.345E-04	1.283E-04	1.223E-04	1.166E-04	1.112E-04	1.061E-04	1.011E-04
IN113	4.021E-06	1.193E-05	4.005E-05	4.628E-05	5.223E-05	5.790E-05	6.330E-05	6.846E-05	7.337E-05
CD114	1.589E-02	1.589E-02	1.589E-02	1.589E-02	1.589E-02	1.589E-02	1.589E-02	1.589E-02	1.589E-02
IN114	3.120E-13	5.787E-16	7.585E-25	4.708E-27	1.444E-28	8.688E-31	0.000E+00	0.000E+00	0.000E+00
IN114M	5.979E-09	3.598E-11	4.716E-20	2.927E-22	8.977E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN114	2.883E-08	3.432E-08	3.436E-08	3.436E-08	3.436E-08	3.436E-08	3.436E-08	3.436E-08	3.436E-08
CD115M	1.208E-04	4.138E-07	5.683E-17	1.946E-19	6.608E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
IN115	6.077E-03	6.261E-03	6.262E-03	6.262E-03	6.262E-03	6.262E-03	6.262E-03	6.262E-03	6.262E-03
IN115M	4.923E-06	1.168E-13	1.605E-23	5.494E-26	1.881E-28	6.387E-31	0.000E+00	0.000E+00	0.000E+00
SN115	2.563E-04	2.587E-04	2.587E-04	2.587E-04	2.587E-04	2.587E-04	2.587E-04	2.587E-04	2.587E-04
CD116	8.167E-03	8.167E-03	8.167E-03	8.167E-03	8.167E-03	8.167E-03	8.167E-03	8.167E-03	8.167E-03
SN116	1.207E-03	1.207E-03	1.207E-03	1.207E-03	1.207E-03	1.207E-03	1.207E-03	1.207E-03	1.207E-03
SN117	8.033E-03	8.040E-03	8.040E-03	8.040E-03	8.040E-03	8.040E-03	8.040E-03	8.040E-03	8.040E-03
SN117M	3.496E-08	4.927E-16	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN118	8.944E-03	8.945E-03	8.945E-03	8.945E-03	8.945E-03	8.945E-03	8.945E-03	8.945E-03	8.945E-03
SN119	8.491E-03	8.542E-03	8.569E-03	8.570E-03	8.570E-03	8.570E-03	8.570E-03	8.570E-03	8.570E-03
SN119M	7.823E-05	2.784E-05	4.464E-07	1.588E-07	5.652E-08	2.011E-08	7.157E-09	2.547E-09	9.063E-10
SN120	8.969E-03	8.969E-03	8.969E-03	8.969E-03	8.969E-03	8.969E-03	8.969E-03	8.969E-03	8.969E-03
SN121M	4.412E-06	4.351E-06	4.116E-06	4.060E-06	4.004E-06	3.949E-06	3.894E-06	3.840E-06	3.788E-06
SB121	9.412E-03	9.453E-03	9.453E-03	9.453E-03	9.453E-03	9.453E-03	9.454E-03	9.454E-03	9.454E-03
SN122	1.006E-02	1.006E-02	1.006E-02	1.006E-02	1.006E-02	1.006E-02	1.006E-02	1.006E-02	1.006E-02
TE122	5.748E-05	5.876E-05	5.876E-05	5.876E-05	5.876E-05	5.876E-05	5.876E-05	5.876E-05	5.876E-05
SN123	1.278E-03	1.800E-04	7.087E-08	9.982E-09	1.406E-09	1.980E-10	2.789E-11	3.929E-12	5.534E-13
SB123	1.074E-02	1.184E-02	1.202E-02	1.202E-02	1.202E-02	1.202E-02	1.202E-02	1.202E-02	1.202E-02
TE123	1.094E-07	1.289E-07	1.316E-07	1.316E-07	1.316E-07	1.316E-07	1.316E-07	1.316E-07	1.316E-07
TE123M	2.221E-08	2.679E-09	5.661E-13	6.826E-14	8.231E-15	9.924E-16	1.197E-16	1.443E-17	1.740E-18
SN124	1.579E-02	1.579E-02	1.579E-02	1.579E-02	1.579E-02	1.579E-02	1.579E-02	1.579E-02	1.579E-02
SB124	1.633E-05	2.434E-07	1.203E-14	1.794E-16	2.674E-18	3.987E-20	5.982E-22	1.840E-23	0.000E+00
TE124	2.997E-05	4.605E-05	4.630E-05	4.630E-05	4.630E-05	4.630E-05	4.630E-05	4.630E-05	4.630E-05
SN125	3.060E-04	1.202E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix E-2
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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
SB125	1.809E-02	1.432E-02	5.265E-03	4.099E-03	3.192E-03	2.485E-03	1.935E-03	1.506E-03	1.173E-03
TE125	2.155E-03	6.217E-03	1.540E-02	1.658E-02	1.750E-02	1.822E-02	1.878E-02	1.921E-02	1.955E-02
TE125M	1.882E-04	1.995E-04	7.364E-05	5.733E-05	4.464E-05	3.476E-05	2.706E-05	2.107E-05	1.641E-05
SN126	3.807E-02	3.807E-02	3.806E-02	3.806E-02	3.806E-02	3.806E-02	3.806E-02	3.806E-02	3.806E-02
SB126	2.759E-05	1.809E-09	1.808E-09	1.808E-09	1.808E-09	1.808E-09	1.808E-09	1.808E-09	1.808E-09
SB126M	1.377E-08	1.375E-11	1.375E-11	1.375E-11	1.375E-11	1.375E-11	1.375E-11	1.375E-11	1.375E-11
TE126	7.582E-04	7.860E-04	7.871E-04	7.873E-04	7.876E-04	7.879E-04	7.881E-04	7.884E-04	7.887E-04
TE127	1.267E-04	1.607E-06	1.483E-10	1.454E-11	1.425E-12	1.397E-13	1.369E-14	1.342E-15	1.316E-16
TE127M	4.497E-03	4.591E-04	4.238E-08	4.154E-09	4.072E-10	3.991E-11	3.912E-12	3.834E-13	3.759E-14
I127	7.849E-02	8.395E-02	8.441E-02	8.441E-02	8.441E-02	8.441E-02	8.441E-02	8.441E-02	8.441E-02
XE127	3.447E-11	3.295E-14	2.750E-26	2.628E-29	2.512E-32	2.401E-35	2.295E-38	2.189E-41	0.000E+00
TE128	2.134E-01	2.135E-01	2.135E-01	2.135E-01	2.135E-01	2.135E-01	2.135E-01	2.135E-01	2.135E-01
XE128	4.071E-04	4.071E-04	4.071E-04	4.071E-04	4.071E-04	4.071E-04	4.071E-04	4.071E-04	4.071E-04
TE129	6.917E-05	3.646E-09	2.966E-22	1.584E-25	8.461E-29	4.519E-32	2.413E-35	1.289E-38	6.869E-42
TE129M	7.256E-03	3.894E-06	3.168E-19	1.692E-22	9.036E-26	4.826E-29	2.577E-32	1.376E-35	7.351E-39
I129	3.761E-01	3.837E-01	3.837E-01	3.837E-01	3.837E-01	3.837E-01	3.837E-01	3.837E-01	3.837E-01
XE129	3.527E-07	3.710E-07	4.388E-07	4.557E-07	4.726E-07	4.896E-07	5.065E-07	5.235E-07	5.404E-07
XE129M	1.376E-09	2.482E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE130	8.208E-01	8.208E-01	8.208E-01	8.208E-01	8.208E-01	8.208E-01	8.208E-01	8.208E-01	8.208E-01
XE130	2.244E-03	2.253E-03	2.253E-03	2.253E-03	2.253E-03	2.253E-03	2.253E-03	2.253E-03	2.253E-03
I131	4.955E-02	1.076E-15	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE131	1.479E+00	1.530E+00	1.530E+00	1.530E+00	1.530E+00	1.530E+00	1.530E+00	1.530E+00	1.530E+00
XE131M	8.164E-04	1.468E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
XE132	2.393E+00	2.424E+00	2.424E+00	2.424E+00	2.424E+00	2.424E+00	2.424E+00	2.424E+00	2.424E+00
CS132	9.200E-07	9.588E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA132	3.356E-07	3.540E-07	3.540E-07	3.540E-07	3.540E-07	3.540E-07	3.540E-07	3.540E-07	3.540E-07
XE133	7.670E-02	1.029E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS133	3.615E+00	3.705E+00	3.705E+00	3.705E+00	3.705E+00	3.705E+00	3.705E+00	3.705E+00	3.705E+00
XE134	4.304E+00	4.305E+00	4.305E+00	4.305E+00	4.305E+00	4.305E+00	4.305E+00	4.305E+00	4.305E+00
CS134	4.221E-02	3.016E-02	7.861E-03	5.617E-03	4.013E-03	2.867E-03	2.049E-03	1.464E-03	1.046E-03
BA134	4.709E-03	1.676E-02	3.906E-02	4.130E-02	4.291E-02	4.405E-02	4.487E-02	4.546E-02	4.587E-02
CS135	2.128E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00	2.135E+00
BA135	3.133E-06	3.780E-06	6.354E-06	6.997E-06	7.641E-06	8.284E-06	8.928E-06	9.571E-06	1.021E-05
XE136	5.219E+00	5.219E+00	5.219E+00	5.219E+00	5.219E+00	5.219E+00	5.219E+00	5.219E+00	5.219E+00
CS136	8.183E-04	3.318E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA136	9.343E-03	1.016E-02	1.016E-02	1.016E-02	1.016E-02	1.016E-02	1.016E-02	1.016E-02	1.016E-02
BA136M	3.669E-11	1.488E-19	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CS137	3.463E+00	3.384E+00	3.086E+00	3.015E+00	2.946E+00	2.879E+00	2.813E+00	2.749E+00	2.686E+00
BA137	4.049E-02	1.196E-01	4.184E-01	4.888E-01	5.577E-01	6.250E-01	6.907E-01	7.550E-01	8.178E-01
BA137M	5.309E-07	5.178E-07	4.720E-07	4.613E-07	4.507E-07	4.404E-07	4.304E-07	4.205E-07	4.109E-07
BA138	3.924E+00	3.925E+00	3.925E+00	3.925E+00	3.925E+00	3.925E+00	3.925E+00	3.925E+00	3.925E+00
LA138	3.252E-05	3.252E-05	3.252E-05	3.252E-05	3.252E-05	3.252E-05	3.252E-05	3.252E-05	3.252E-05
LA139	3.746E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00
BA140	1.825E-01	4.615E-10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
LA140	2.410E-02	6.959E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CE140	3.541E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00	3.747E+00
CE141	4.436E-01	1.851E-04	5.492E-18	2.280E-21	9.461E-25	3.927E-28	1.630E-31	6.764E-35	2.807E-38
PR141	3.023E+00	3.469E+00	3.469E+00	3.469E+00	3.469E+00	3.469E+00	3.469E+00	3.469E+00	3.469E+00
CE142	3.491E+00	3.492E+00	3.492E+00	3.492E+00	3.492E+00	3.492E+00	3.492E+00	3.492E+00	3.492E+00
ND142	5.629E-03	5.670E-03	5.670E-03	5.670E-03	5.670E-03	5.670E-03	5.670E-03	5.670E-03	5.670E-03
PR143	1.832E-01	1.603E-09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND143	3.243E+00	3.445E+00	3.445E+00	3.445E+00	3.445E+00	3.445E+00	3.445E+00	3.445E+00	3.445E+00
CE144	2.157E+00	8.852E-01	2.511E-02	1.030E-02	4.229E-03	1.736E-03	7.122E-04	2.923E-04	1.200E-04
PR144	9.131E-05	3.738E-05	1.060E-06	4.351E-07	1.786E-07	7.328E-08	3.007E-08	1.234E-08	5.065E-09
PR144M	4.557E-07	1.868E-07	5.300E-09	2.175E-09	8.926E-10	3.663E-10	1.503E-10	6.170E-11	2.532E-11
ND144	1.203E+00	2.475E+00	3.335E+00	3.350E+00	3.356E+00	3.358E+00	3.359E+00	3.360E+00	3.360E+00
ND145	2.343E+00	2.346E+00	2.346E+00	2.346E+00	2.346E+00	2.346E+00	2.346E+00	2.346E+00	2.346E+00
ND146	1.840E+00	1.840E+00	1.840E+00	1.840E+00	1.840E+00	1.840E+00	1.840E+00	1.840E+00	1.840E+00
PM146	2.569E-06	2.265E-06	1.368E-06	1.206E-06	1.063E-06	9.373E-07	8.263E-07	7.285E-07	6.422E-07
SM146	6.026E-07	7.152E-07	1.047E-06	1.107E-06	1.160E-06	1.206E-06	1.247E-06	1.284E-06	1.315E-06
ND147	6.073E-02	6.959E-12	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PM147	1.076E+00	8.738E-01	3.037E-01	2.332E-01	1.790E-01	1.375E-01	1.055E-01	8.104E-02	6.222E-02
SM147	1.442E-01	4.084E-01	9.785E-01	1.049E+00	1.103E+00	1.145E+00	1.177E+00	1.201E+00	1.220E+00
ND148	1.047E+00	1.047E+00	1.047E+00	1.047E+00	1.047E+00	1.047E+00	1.047E+00	1.047E+00	1.047E+00
PM148	3.209E-03	8.751E-08	1.959E-18	4.269E-21	9.288E-24	6.651E-26	1.598E-28	0.000E+00	0.000E+00
PM148M	5.492E-03	1.195E-05	2.675E-16	5.829E-19	1.264E-21	1.003E-23	0.000E+00	0.000E+00	0.000E+00
SM148	9.081E-02	9.950E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02	9.952E-02
SM149	4.470E-02	5.114E-02	5.114E-02	5.114E-02	5.114E-02	5.114E-02	5.114E-02	5.114E-02	5.114E-02
ND150	4.074E-01	4.074E-01	4.074E-01	4.074E-01	4.074E-01	4.074E-01	4.074E-01	4.074E-01	4.074E-01
SM150	6.475E-01	6.475E-01	6.475E-01	6.475E-01	6.475E-01	6.475E-01	6.475E-01	6.475E-01	6.475E-01
EU150	2.917E-10	2.861E-10	2.649E-10	2.599E-10	2.549E-10	2.500E-10	2.453E-10	2.406E-10	2.360E-10
SM151	1.438E-01	1.439E-01	1.395E-01	1.385E-01	1.374E-01	1.363E-01	1.353E-01	1.343E-01	1.332E-01
EU151	3.509E-04	1.463E-03	5.829E-03	6.899E-03	7.962E-03	9.016E-03	1.006E-02	1.110E-02	1.213E-02
SM152	2.841E-01	2.841E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01	2.842E-01
EU152	2.303E-04	2.189E-04	1.785E-04	1.696E-04	1.612E-04	1.532E-04	1.456E-04	1.384E-04	1.315E-04
GD152	7.226E-05	7.569E-05	8.694E-05	8.941E-05	9.176E-05	9.399E-05	9.611E-05	9.813E-05	1.000E-04

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zr1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/07/02 at 21:37:51

	365.3D	1.0YR	5.0YR	6.0YR	7.0YR	8.0YR	9.0YR	10.0YR	11.0YR
EU153	1.197E-01	1.209E-01	1.209E-01	1.209E-01	1.209E-01	1.209E-01	1.209E-01	1.209E-01	1.209E-01
GD153	4.695E-07	1.649E-07	2.512E-09	8.825E-10	3.100E-10	1.089E-10	3.826E-11	1.344E-11	4.722E-12
SM154	4.933E-02	4.933E-02	4.933E-02	4.933E-02	4.933E-02	4.933E-02	4.933E-02	4.933E-02	4.933E-02
EU154	6.431E-03	5.933E-03	4.298E-03	3.965E-03	3.658E-03	3.375E-03	3.114E-03	2.872E-03	2.650E-03
GD154	1.684E-04	6.663E-04	2.301E-03	2.634E-03	2.941E-03	3.225E-03	3.486E-03	3.727E-03	3.949E-03
EU155	1.586E-02	1.379E-02	7.887E-03	6.858E-03	5.963E-03	5.186E-03	4.509E-03	3.921E-03	3.410E-03
GD155	3.419E-04	2.411E-03	8.319E-03	9.348E-03	1.024E-02	1.102E-02	1.170E-02	1.228E-02	1.280E-02
EU156	1.304E-03	7.579E-11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
GD156	1.637E-02	1.769E-02	1.769E-02	1.769E-02	1.769E-02	1.769E-02	1.769E-02	1.769E-02	1.769E-02
GD157	2.205E-04	2.337E-04	2.337E-04	2.337E-04	2.337E-04	2.337E-04	2.337E-04	2.337E-04	2.337E-04
GD158	7.675E-03	7.675E-03	7.675E-03	7.675E-03	7.675E-03	7.675E-03	7.675E-03	7.675E-03	7.675E-03
TB159	8.780E-04	8.808E-04	8.808E-04	8.808E-04	8.808E-04	8.808E-04	8.808E-04	8.808E-04	8.808E-04
GD160	3.517E-04	3.517E-04	3.517E-04	3.517E-04	3.517E-04	3.517E-04	3.517E-04	3.517E-04	3.517E-04
TB160	6.013E-06	1.813E-07	1.498E-13	4.518E-15	1.362E-16	4.107E-18	1.238E-19	3.745E-21	1.186E-22
DY160	8.103E-06	1.394E-05	1.412E-05	1.412E-05	1.412E-05	1.412E-05	1.412E-05	1.412E-05	1.412E-05
TB161	2.670E-06	3.452E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY161	8.802E-05	9.069E-05	9.069E-05	9.069E-05	9.069E-05	9.069E-05	9.069E-05	9.069E-05	9.069E-05
DY162	4.999E-05	4.999E-05	4.999E-05	4.999E-05	4.999E-05	4.999E-05	4.999E-05	4.999E-05	4.999E-05
DY163	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05	1.801E-05
DY164	5.568E-06	5.569E-06	5.569E-06	5.569E-06	5.569E-06	5.569E-06	5.569E-06	5.569E-06	5.569E-06
HO165	4.149E-06	4.151E-06	4.151E-06	4.151E-06	4.151E-06	4.151E-06	4.151E-06	4.151E-06	4.151E-06
HO166M	6.693E-09	6.689E-09	6.673E-09	6.670E-09	6.666E-09	6.662E-09	6.658E-09	6.654E-09	6.650E-09
ER166	1.523E-06	1.550E-06	1.550E-06	1.550E-06	1.550E-06	1.550E-06	1.550E-06	1.550E-06	1.550E-06
ER167	7.766E-07	7.766E-07	7.766E-07	7.766E-07	7.766E-07	7.766E-07	7.766E-07	7.766E-07	7.766E-07
ER168	1.075E-07	1.075E-07	1.075E-07	1.075E-07	1.075E-07	1.075E-07	1.075E-07	1.075E-07	1.075E-07
ER169	8.340E-12	1.676E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TM169	7.075E-11	7.909E-11	7.909E-11	7.909E-11	7.909E-11	7.909E-11	7.909E-11	7.909E-11	7.909E-11
ER170	7.856E-16	2.456E-15	2.727E-15	2.727E-15	2.727E-15	2.727E-15	2.727E-15	2.727E-15	2.727E-15
TM170	1.330E-12	1.857E-13	7.054E-17	9.849E-18	1.375E-18	1.920E-19	2.681E-20	3.738E-21	5.256E-22
YB170	5.359E-13	1.678E-12	1.864E-12	1.864E-12	1.864E-12	1.864E-12	1.864E-12	1.864E-12	1.864E-12
TM171	1.029E-14	7.175E-15	1.693E-15	1.180E-15	8.224E-16	5.732E-16	3.995E-16	2.784E-16	1.941E-16
YB171	2.194E-15	5.313E-15	1.080E-14	1.131E-14	1.167E-14	1.192E-14	1.209E-14	1.221E-14	1.229E-14
YB172	1.986E-17	2.062E-17	2.062E-17	2.062E-17	2.062E-17	2.062E-17	2.062E-17	2.062E-17	2.062E-17

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Source Listing of Program REDUCEZR

```
      PROGRAM REDUCEZR

!-------- WRITTEN BY D.R. WENZEL

!            To calculate activity in Ci for calcine bin set 2, Bin #7
!            ICPP WTF Studies

       CHARACTER (LEN=1) :: ORGLINE1(111)
       CHARACTER (LEN=11) :: DESC1
       CHARACTER (LEN=111) :: BUFFER1
       LOGICAL FLAG
       REAL :: VALUE1(9)
       REAL :: ZR1(9)
       REAL :: RED1(9)

!--------Following data statements assume fuel 2 years old when
!        processed

!      AGE OF FUEL            5     6     7     8     9    10    11
!      PROCESSING YEAR       74    73    72    71    70    69    68
       DATA ZR1 /0.,   0.,   0.,   0.,   0., 100.,   0.,   0.,   0./
       DATA RED1 /1.,   1.,   1.,  1. ,   1.,  1. ,  1. ,   1.,   1./


!-------- OPEN INPUT AND OUTPUT FILES

       OPEN(1,FILE ='ZR1.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)
       OPEN(2,FILE ='ZR1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
       OPEN(6,FILE ='REDUCEZR.CI', STATUS='UNKNOWN', ERR = 920)
       OPEN(7,FILE ='REDUCEZR.G', STATUS='UNKNOWN', ERR = 920)

       FLAG = .FALSE.
   10  IF(FLAG) THEN
          II = 1
          JJ = 6
          WRITE(JJ,600)
  600     FORMAT(2x,'REDUCEZR.CI -- Output in Ci nuclide/g calcine',/)
       ELSE
          II = 2
          JJ = 7
          WRITE(JJ,610)
  610     FORMAT(2x,'REDUCEZR.G -- Output in g nuclide/g calcine',/)
       ENDIF

       WRITE(JJ,620)
  620  FORMAT(14X,'Cs-137 Normalized to',/,12X,'1.89E-3 Ci',  &
             6X,'1.0 Ci',/,12X,'---------      ---------',/)

!-------- Normalize to Staples Cs-137 data in ICP-1189

       CORZR = 7.545E-8

!-------- READ PAST FIRST LINE
```

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Source Listing of Program REDUCEZR (continued)

```
      READ(II,300) ORGLINE1
  300 FORMAT(111A1)

!-------- READ PAST SECOND LINE

      READ(II,300) ORGLINE1

!-------- READ PAST THIRD LINE

      READ(II,300) ORGLINE1

!-------- START DATA SUMMATION PROCESS

   40 READ(II,300,END=999) ORGLINE1
      WRITE(BUFFER1,300) ORGLINE1
      READ(BUFFER1,400) DESC1, (VALUE1(i),I=1,9)
  400 FORMAT(A11,9(1X,E9.4))

      SUM = 0.
      DO   J=1,7
         K = 10 - J
         SUM = SUM * RED1(K)
         SUM = SUM + VALUE1(K) * ZR1(K) * CORZR
      END DO

      IF(SUM == 0.) GO TO 40
      E = SUM / 1.89E-3
      WRITE(JJ,401) DESC1,SUM,E
  401 FORMAT(A11,1PE10.3, 5X,E10.3)
      GO TO 40

!-------- ERROR STATEMENTS

  900 WRITE(JJ,9000)
 9000 FORMAT(2X,'ERROR IN OPENING FILE ')
      GO TO 999

  920 WRITE(JJ,9020)
 9020 FORMAT(2X,'ERROR IN OPENING FILE 6')

!-------- PROGRAM END

  999 CONTINUE
      IF(.NOT. FLAG) THEN
         FLAG = .TRUE.
         GO TO 10
      ENDIF

      END PROGRAM REDUCEZR
```

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REDUCEZR.CI -- Output in Ci nuclide/g calcine

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
H 3	1.314E-14	6.954E-12
BE 10	1.680E-15	8.886E-13
C 14	1.563E-08	8.268E-06
SI 32	7.839E-34	4.148E-31
P 32	7.839E-34	4.148E-31
AR 39	2.041E-27	1.080E-24
AR 42	3.047E-26	1.612E-23
K 42	3.047E-26	1.612E-23
CA 45	6.322E-16	3.345E-13
SC 46	8.013E-19	4.240E-16
V 50	4.366E-23	2.310E-20
CR 51	1.195E-35	6.323E-33
MN 54	1.071E-08	5.669E-06
FE 55	4.908E-06	2.597E-03
CO 58	2.128E-17	1.126E-14
CO 60	2.504E-08	1.325E-05
NI 59	9.778E-09	5.174E-06
NI 63	1.332E-06	7.050E-04
ZN 65	9.378E-19	4.962E-16
SR 89	6.255E-23	3.309E-20
SR 90	3.051E-11	1.614E-08
Y 90	3.052E-11	1.615E-08
Y 91	3.796E-20	2.008E-17
ZR 93	4.894E-08	2.590E-05
ZR 95	3.416E-16	1.807E-13
NB 93M	1.633E-08	8.639E-06
NB 94	8.035E-09	4.252E-06
NB 95	7.854E-16	4.156E-13
NB 95M	2.534E-18	1.341E-15
TC 98	9.695E-23	5.130E-20
TC 99	8.217E-15	4.347E-12
RU103	9.929E-36	5.254E-33
IN113M	7.250E-12	3.836E-09
IN114	4.857E-24	2.570E-21
IN114M	4.485E-24	2.373E-21
IN115	1.948E-23	1.031E-20
SN113	7.245E-12	3.834E-09
SN119M	4.572E-07	2.419E-04
SN121M	8.828E-08	4.671E-05
SN123	1.790E-11	9.473E-09
SB124	9.311E-22	4.926E-19
SB125	4.541E-05	2.402E-02
TE123	1.215E-21	6.431E-19
TE123M	2.804E-16	1.484E-13
TE125M	1.108E-05	5.860E-03
TE127	3.857E-19	2.041E-16
TE127M	3.938E-19	2.083E-16
I129	1.716E-25	9.078E-23
XE127	2.648E-43	1.401E-40
TM170	1.514E-28	8.012E-26

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REDUCEZR.CI -- Output in Ci nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
TM171	2.125E-28	1.125E-25
LU176	3.400E-18	1.799E-15
LU177	3.367E-17	1.782E-14
LU177M	1.464E-16	7.749E-14
HF175	1.016E-17	5.373E-15
HF181	1.793E-24	9.485E-22
HF182	3.259E-14	1.724E-11
TA182	7.043E-12	3.727E-09
W185	1.179E-21	6.240E-19
W188	1.504E-26	7.956E-24
RE187	1.196E-26	6.327E-24
RE188	1.504E-26	7.956E-24
TL206	2.887E-30	1.527E-27
TL207	3.561E-13	1.884E-10
TL208	4.921E-12	2.604E-09
TL209	2.422E-18	1.281E-15
PB209	1.121E-16	5.932E-14
PB210	2.743E-18	1.452E-15
PB211	3.571E-13	1.889E-10
PB212	1.369E-11	7.246E-09
PB214	3.184E-17	1.685E-14
BI208	1.452E-30	7.681E-28
BI210M	2.898E-30	1.533E-27
BI210	2.744E-18	1.452E-15
BI211	3.571E-13	1.889E-10
BI212	1.369E-11	7.246E-09
BI213	1.121E-16	5.932E-14
BI214	3.184E-17	1.685E-14
PO210	2.281E-18	1.207E-15
PO211	9.997E-16	5.289E-13
PO212	8.775E-12	4.643E-09
PO213	1.097E-16	5.804E-14
PO214	3.183E-17	1.684E-14
PO215	3.571E-13	1.889E-10
PO216	1.369E-11	7.246E-09
PO218	3.185E-17	1.685E-14
AT217	1.121E-16	5.932E-14
RN219	3.571E-13	1.889E-10
RN220	1.369E-11	7.246E-09
RN222	3.185E-17	1.685E-14
FR221	1.121E-16	5.932E-14
FR223	4.919E-15	2.603E-12
RA223	3.571E-13	1.889E-10
RA224	1.369E-11	7.246E-09
RA225	1.121E-16	5.932E-14
RA226	3.185E-17	1.685E-14
RA228	1.538E-18	8.140E-16
AC225	1.121E-16	5.932E-14
AC227	3.565E-13	1.886E-10
AC228	1.538E-18	8.140E-16

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REDUCEZR.CI -- Output in Ci nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
TH227	3.522E-13	1.863E-10
TH228	1.365E-11	7.222E-09
TH229	1.121E-16	5.932E-14
TH230	1.750E-14	9.258E-12
TH231	1.435E-08	7.593E-06
TH232	4.588E-18	2.428E-15
TH234	2.194E-11	1.161E-08
PA231	2.735E-12	1.447E-09
PA233	1.133E-09	5.992E-07
PA234M	2.194E-11	1.161E-08
PA234	2.852E-14	1.509E-11
U232	1.489E-11	7.880E-09
U233	1.549E-13	8.196E-11
U234	2.364E-10	1.251E-07
U235	1.435E-08	7.593E-06
U236	1.093E-08	5.781E-06
U237	7.086E-13	3.749E-10
U238	2.194E-11	1.161E-08
U240	8.601E-23	4.551E-20
NP235	1.581E-14	8.367E-12
NP236	2.613E-15	1.382E-12
NP237	1.133E-09	5.992E-07
NP238	2.556E-15	1.353E-12
NP239	2.921E-14	1.545E-11
NP240M	8.601E-23	4.551E-20
PU236	2.165E-11	1.146E-08
PU238	6.136E-07	3.247E-04
PU239	6.839E-09	3.618E-06
PU240	1.439E-09	7.613E-07
PU241	2.888E-08	1.528E-05
PU242	3.561E-14	1.884E-11
PU243	8.963E-27	4.743E-24
PU244	8.609E-23	4.555E-20
AM241	4.670E-10	2.471E-07
AM242M	5.112E-13	2.705E-10
AM242	5.087E-13	2.691E-10
AM243	2.921E-14	1.545E-11
AM245	2.804E-32	1.484E-29
CM241	7.636E-42	4.040E-39
CM242	4.231E-13	2.239E-10
CM243	1.440E-14	7.617E-12
CM244	1.887E-13	9.984E-11
CM245	2.419E-18	1.280E-15
CM246	3.740E-20	1.979E-17
CM247	8.963E-27	4.743E-24
CM248	1.759E-27	9.309E-25
CM250	7.071E-40	3.741E-37
BK249	1.934E-27	1.023E-24
CF250	4.713E-33	2.494E-30
CF251	2.135E-39	1.130E-36

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REDUCEZR.CI -- Output in Ci nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
H 3	6.236E-06	3.299E-03
BE 10	6.342E-14	3.356E-11
C 14	2.555E-12	1.352E-09
SE 79	9.205E-09	4.870E-06
KR 81	2.290E-16	1.212E-13
KR 85	1.646E-04	8.707E-02
RB 87	6.190E-13	3.275E-10
SR 89	2.945E-19	1.558E-16
SR 90	1.812E-03	9.585E-01
Y 90	1.812E-03	9.589E-01
Y 91	8.699E-17	4.603E-14
ZR 93	4.760E-08	2.519E-05
NB 93M	1.590E-08	8.411E-06
NB 94	4.814E-13	2.547E-10
ZR 95	1.825E-15	9.657E-13
NB 95	4.200E-15	2.222E-12
NB 95M	1.354E-17	7.166E-15
TC 98	7.681E-15	4.064E-12
TC 99	3.146E-07	1.664E-04
RH102	2.159E-10	1.143E-07
RU103	1.501E-24	7.944E-22
RH103M	1.867E-24	9.880E-22
RU106	1.378E-05	7.293E-03
RH106	1.378E-05	7.293E-03
PD107	3.342E-10	1.768E-07
AG108	6.815E-17	3.606E-14
AG108M	7.658E-16	4.052E-13
AG109M	3.127E-16	1.654E-13
CD109	3.127E-16	1.654E-13
AG110	4.559E-12	2.412E-09
AG110M	3.428E-10	1.814E-07
CD113M	1.909E-07	1.010E-04
IN114	9.024E-27	4.775E-24
IN115	2.940E-19	1.556E-16
IN115M	3.055E-29	1.616E-26
SN119M	6.799E-10	3.597E-07
SN121M	1.762E-09	9.321E-07
SN123	1.228E-11	6.499E-09
TE123	2.887E-22	1.527E-19
TE123M	6.645E-17	3.516E-14
SB124	5.265E-21	2.786E-18
SB125	1.937E-05	1.025E-02
TE125M	4.725E-06	2.500E-03
SN126	8.149E-09	4.311E-06
SB126	1.141E-09	6.036E-07
SB126M	8.149E-09	4.311E-06
TE127	2.783E-12	1.473E-09
TE127M	2.841E-12	1.503E-09
XE127	5.117E-36	2.707E-33
TE129	7.143E-30	3.779E-27

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REDUCEZR.CI -- Output in Ci nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
TE129M	1.097E-29	5.804E-27
I129	5.113E-10	2.705E-07
CS134	2.801E-05	1.482E-02
CS135	1.855E-08	9.816E-06
CS137	1.890E-03	1.000E+00
BA137M	1.788E-03	9.461E-01
LA138	4.710E-18	2.492E-15
CE141	8.443E-29	4.467E-26
CE142	6.326E-13	3.347E-10
CE144	4.179E-05	2.211E-02
PR144	4.179E-05	2.211E-02
PR144M	5.014E-07	2.653E-04
ND144	2.998E-17	1.586E-14
PM146	3.150E-09	1.667E-06
SM146	3.185E-16	1.685E-13
PM147	9.620E-04	5.090E-01
SM147	1.964E-13	1.039E-10
PM148	8.247E-26	4.363E-23
PM148M	1.617E-24	8.555E-22
SM148	2.268E-19	1.200E-16
SM149	9.265E-20	4.902E-17
EU150	1.249E-13	6.611E-11
SM151	2.707E-05	1.432E-02
EU152	1.999E-07	1.058E-04
GD152	1.545E-20	8.176E-18
GD153	2.899E-12	1.534E-09
EU154	6.877E-06	3.638E-03
EU155	1.821E-05	9.633E-03
TB160	3.499E-19	1.852E-16
HO166M	9.024E-14	4.775E-11
TM170	8.654E-21	4.579E-18
TM171	4.711E-18	2.493E-15

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REDUCEZR.G -- Output in g nuclide/g calcine

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
H 1	1.864E-09	9.860E-07
H 2	1.163E-13	6.152E-11
H 3	1.361E-18	7.202E-16
HE 3	7.952E-19	4.208E-16
HE 4	2.803E-09	1.483E-06
LI 6	7.506E-17	3.971E-14
LI 7	3.459E-20	1.830E-17
BE 9	4.015E-12	2.125E-09
BE 10	7.514E-14	3.976E-11
B 10	4.538E-19	2.401E-16
B 11	4.137E-10	2.189E-07
C 12	6.992E-06	3.699E-03
C 13	8.035E-08	4.252E-05
C 14	3.504E-09	1.854E-06
N 14	9.394E-06	4.970E-03
N 15	3.508E-08	1.856E-05
O 16	5.638E-04	2.983E-01
O 17	2.260E-07	1.196E-04
O 18	1.130E-06	5.980E-04
F 19	7.983E-14	4.224E-11
NE 20	1.031E-19	5.453E-17
NE 21	8.035E-19	4.252E-16
NE 22	2.378E-22	1.258E-19
NA 23	3.010E-27	1.593E-24
MG 24	2.583E-12	1.367E-09
MG 25	8.496E-17	4.495E-14
MG 26	7.900E-21	4.180E-18
AL 27	9.431E-06	4.990E-03
SI 28	4.553E-10	2.409E-07
SI 29	7.553E-15	3.996E-12
SI 30	1.371E-19	7.254E-17
SI 32	4.559E-35	2.412E-32
P 31	8.156E-25	4.315E-22
P 32	2.746E-39	1.453E-36
S 34	4.074E-36	2.155E-33
CL 37	7.501E-24	3.969E-21
AR 38	6.707E-29	3.549E-26
AR 39	5.986E-29	3.167E-26
AR 40	2.054E-19	1.087E-16
AR 42	1.181E-28	6.248E-26
K 41	6.515E-21	3.447E-18
K 42	5.046E-33	2.670E-30
CA 42	5.251E-23	2.778E-20
CA 43	1.106E-13	5.852E-11
CA 44	8.405E-13	4.447E-10
CA 45	3.549E-20	1.878E-17
CA 46	9.431E-14	4.990E-11
SC 45	1.716E-14	9.078E-12
SC 46	2.365E-23	1.251E-20
TI 46	3.766E-07	1.992E-04

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
TI 47	3.436E-07	1.818E-04
TI 48	3.469E-06	1.836E-03
TI 49	2.641E-07	1.397E-04
TI 50	2.544E-07	1.346E-04
V 50	2.442E-10	1.292E-07
V 51	6.280E-08	3.323E-05
CR 50	2.039E-05	1.079E-02
CR 51	1.292E-40	6.838E-38
CR 52	3.943E-04	2.086E-01
CR 53	4.473E-05	2.367E-02
CR 54	1.129E-05	5.976E-03
MN 54	1.385E-12	7.325E-10
MN 55	1.763E-08	9.329E-06
FE 54	4.169E-05	2.206E-02
FE 55	1.962E-09	1.038E-06
FE 56	6.481E-04	3.429E-01
FE 57	1.517E-05	8.028E-03
FE 58	1.993E-06	1.054E-03
CO 58	6.689E-22	3.539E-19
CO 59	1.410E-09	7.461E-07
CO 60	2.214E-11	1.172E-08
NI 58	1.606E-04	8.495E-02
NI 59	1.290E-07	6.826E-05
NI 60	6.141E-05	3.249E-02
NI 61	2.692E-06	1.424E-03
NI 62	8.428E-06	4.459E-03
NI 63	2.159E-08	1.143E-05
NI 64	2.141E-06	1.133E-03
CU 63	1.427E-09	7.549E-07
CU 65	6.559E-10	3.470E-07
ZN 64	1.088E-14	5.757E-12
ZN 65	1.139E-22	6.024E-20
ZN 66	1.607E-13	8.503E-11
ZN 67	9.861E-18	5.218E-15
ZN 68	5.374E-21	2.844E-18
GA 69	3.748E-25	1.983E-22
GA 71	0.000E+00	0.000E+00
GE 70	3.413E-32	1.806E-29
SR 87	3.928E-10	2.078E-07
SR 88	3.572E-08	1.890E-05
SR 89	2.152E-27	1.139E-24
SR 90	2.236E-13	1.183E-10
Y 89	2.691E-09	1.424E-06
Y 90	5.607E-17	2.967E-14
Y 91	1.547E-24	8.184E-22
ZR 90	2.376E-01	1.257E+02
ZR 91	5.179E-02	2.740E+01
ZR 92	7.922E-02	4.192E+01
ZR 93	1.947E-05	1.030E-02
ZR 94	8.028E-02	4.248E+01

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
ZR 95	1.589E-20	8.407E-18
ZR 96	1.292E-02	6.838E+00
NB 93	4.703E-05	2.488E-02
NB 93M	5.774E-11	3.055E-08
NB 94	4.287E-08	2.268E-05
NB 95	2.008E-20	1.063E-17
NB 95M	6.649E-24	3.518E-21
MO 94	1.243E-11	6.579E-09
MO 95	3.468E-06	1.835E-03
MO 96	7.832E-09	4.144E-06
MO 97	5.186E-06	2.744E-03
MO 98	4.000E-09	2.116E-06
MO100	9.620E-17	5.090E-14
TC 98	1.116E-19	5.904E-17
TC 99	4.845E-13	2.563E-10
RU 98	1.507E-25	7.972E-23
RU 99	1.298E-17	6.870E-15
RU100	2.459E-15	1.301E-12
RU101	8.375E-19	4.431E-16
RU102	9.265E-22	4.902E-19
RU103	3.076E-40	1.628E-37
RU104	4.485E-36	2.373E-33
RH103	7.442E-27	3.937E-24
PD104	9.929E-34	5.254E-31
PD105	2.905E-37	1.537E-34
PD106	9.635E-40	5.098E-37
CD111	4.200E-13	2.222E-10
CD112	3.524E-12	1.865E-09
CD113	1.202E-13	6.359E-11
CD114	6.019E-11	3.184E-08
CD116	2.533E-12	1.340E-09
IN113	1.093E-07	5.784E-05
IN113M	4.333E-19	2.293E-16
IN114	3.528E-33	1.867E-30
IN114M	1.938E-28	1.025E-25
IN115	3.130E-12	1.656E-09
SN112	7.095E-05	3.754E-02
SN113	7.215E-16	3.817E-13
SN114	4.762E-05	2.519E-02
SN115	2.613E-05	1.382E-02
SN116	1.063E-03	5.625E-01
SN117	5.632E-04	2.980E-01
SN118	1.774E-03	9.385E-01
SN119	6.297E-04	3.332E-01
SN119M	1.021E-10	5.401E-08
SN120	2.388E-03	1.263E+00
SN121M	1.492E-09	7.896E-07
SN122	3.391E-04	1.794E-01
SN123	2.177E-15	1.152E-12
SN124	4.238E-04	2.242E-01

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
SB121	3.109E-07	1.645E-04
SB123	3.155E-08	1.669E-05
SB124	5.321E-26	2.816E-23
SB125	4.396E-08	2.326E-05
TE122	1.889E-09	9.996E-07
TE123	4.181E-12	2.212E-09
TE123M	3.160E-20	1.672E-17
TE124	5.041E-11	2.667E-08
TE125	3.208E-07	1.697E-04
TE125M	6.148E-10	3.253E-07
TE126	3.015E-10	1.595E-07
TE127	1.461E-25	7.729E-23
TE127M	4.173E-23	2.208E-20
TE128	1.892E-17	1.001E-14
TE130	1.156E-27	6.116E-25
I127	9.107E-14	4.818E-11
I129	9.710E-22	5.138E-19
XE127	0.000E+00	0.000E+00
XE128	2.074E-16	1.097E-13
XE129	6.055E-20	3.204E-17
XE130	1.765E-22	9.337E-20
XE131	3.467E-26	1.834E-23
XE132	2.295E-36	1.214E-33
XE134	1.401E-45	7.413E-43
CS133	8.262E-42	4.371E-39
ER166	8.360E-37	4.423E-34
ER167	0.000E+00	0.000E+00
TM169	6.964E-26	3.685E-23
TM170	2.534E-32	1.341E-29
TM171	1.951E-31	1.032E-28
YB170	8.662E-28	4.583E-25
YB172	4.405E-17	2.331E-14
YB173	5.475E-18	2.897E-15
YB174	2.776E-20	1.469E-17
LU175	1.273E-08	6.735E-06
LU176	5.019E-11	2.656E-08
LU177	3.062E-22	1.620E-19
LU177M	3.075E-20	1.627E-17
HF174	1.400E-07	7.405E-05
HF175	9.522E-22	5.038E-19
HF176	4.712E-06	2.493E-03
HF177	1.166E-05	6.168E-03
HF178	2.880E-05	1.524E-02
HF179	1.541E-05	8.156E-03
HF180	3.349E-05	1.772E-02
HF181	1.053E-28	5.573E-26
HF182	1.492E-10	7.896E-08
TA181	4.667E-06	2.469E-03
TA182	1.129E-15	5.972E-13
W182	1.295E-07	6.854E-05

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
W183	5.466E-08	2.892E-05
W184	4.078E-10	2.158E-07
W185	1.255E-25	6.639E-23
W186	6.585E-17	3.484E-14
W188	1.501E-30	7.944E-28
RE185	1.131E-13	5.984E-11
RE187	3.126E-19	1.654E-16
RE188	1.532E-32	8.104E-30
OS186	9.514E-16	5.034E-13
OS188	1.350E-21	7.142E-19
OS189	1.074E-24	5.685E-22
OS190	4.335E-27	2.293E-24
IR191	2.671E-32	1.413E-29
HE 4	4.292E-11	2.271E-08
TL206	1.324E-38	7.006E-36
TL207	1.870E-21	9.892E-19
TL208	1.670E-20	8.838E-18
TL209	5.921E-27	3.133E-24
PB206	2.335E-21	1.236E-18
PB207	4.316E-16	2.283E-13
PB208	3.030E-14	1.603E-11
PB209	2.467E-23	1.305E-20
PB210	3.591E-20	1.900E-17
PB211	1.446E-20	7.653E-18
PB212	9.854E-18	5.214E-15
PB214	9.710E-25	5.138E-22
BI208	3.108E-28	1.644E-25
BI209	1.941E-19	1.027E-16
BI210M	5.105E-27	2.701E-24
BI210	2.211E-23	1.170E-20
BI211	8.533E-22	4.515E-19
BI212	9.348E-19	4.946E-16
BI213	5.796E-24	3.067E-21
BI214	7.209E-25	3.814E-22
PO210	5.076E-22	2.685E-19
PO211	1.047E-26	5.541E-24
PO212	4.944E-29	2.616E-26
PO213	8.699E-33	4.603E-30
PO214	9.914E-32	5.246E-29
PO215	1.211E-26	6.407E-24
PO216	3.932E-23	2.080E-20
PO218	1.126E-25	5.956E-23
AT217	6.964E-29	3.685E-26
RN219	2.744E-23	1.452E-20
RN220	1.484E-20	7.852E-18
RN222	2.070E-22	1.095E-19
FR221	6.323E-25	3.346E-22
FR223	1.271E-22	6.727E-20
RA223	6.971E-18	3.688E-15
RA224	8.594E-17	4.547E-14

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
RA225	2.859E-21	1.513E-18
RA226	3.220E-17	1.704E-14
RA228	6.572E-21	3.477E-18
AC225	1.932E-21	1.022E-18
AC227	4.927E-15	2.607E-12
AC228	6.860E-25	3.630E-22
TH227	1.145E-17	6.060E-15
TH228	1.664E-14	8.806E-12
TH229	5.269E-16	2.788E-13
TH230	8.669E-13	4.587E-10
TH231	2.699E-14	1.428E-11
TH232	4.182E-11	2.213E-08
TH234	9.469E-16	5.010E-13
PA231	5.788E-11	3.062E-08
PA233	5.455E-14	2.886E-11
PA234M	3.193E-20	1.689E-17
PA234	1.426E-20	7.545E-18
U232	6.955E-13	3.680E-10
U233	1.600E-11	8.463E-09
U234	3.782E-08	2.001E-05
U235	6.637E-03	3.512E+00
U236	1.689E-04	8.934E-02
U237	8.677E-18	4.591E-15
U238	6.523E-05	3.451E-02
U240	9.280E-29	4.910E-26
NP235	1.127E-17	5.964E-15
NP236	1.983E-13	1.049E-10
NP237	1.606E-06	8.499E-04
NP238	9.861E-21	5.218E-18
NP239	1.259E-19	6.659E-17
NP240M	8.118E-31	4.295E-28
PU236	4.074E-14	2.156E-11
PU238	3.583E-08	1.896E-05
PU239	1.100E-07	5.820E-05
PU240	6.311E-09	3.339E-06
PU241	2.803E-10	1.483E-07
PU242	9.326E-12	4.934E-09
PU243	3.443E-33	1.822E-30
PU244	4.853E-18	2.568E-15
AM241	1.360E-10	7.198E-08
AM242M	5.259E-14	2.782E-11
AM242	6.290E-19	3.328E-16
AM243	1.464E-13	7.749E-11
AM245	4.537E-39	2.400E-36
CM241	0.000E+00	0.000E+00
CM242	1.280E-16	6.771E-14
CM243	2.788E-16	1.475E-13
CM244	2.331E-15	1.234E-12
CM245	1.409E-17	7.453E-15
CM246	1.217E-19	6.439E-17

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
CM247	9.658E-23	5.110E-20
CM248	4.136E-25	2.188E-22
CM250	8.601E-39	4.551E-36
BK249	1.180E-30	6.244E-28
CF250	4.310E-35	2.280E-32
CF251	1.346E-39	7.122E-37
SF250	5.232E-18	2.768E-15
H 3	6.459E-10	3.418E-07
LI 6	8.684E-12	4.595E-09
LI 7	2.207E-13	1.168E-10
BE 9	4.255E-13	2.252E-10
BE 10	2.838E-12	1.501E-09
C 14	5.732E-13	3.033E-10
ZN 66	1.129E-15	5.976E-13
ZN 67	4.990E-17	2.640E-14
ZN 68	8.880E-12	4.699E-09
GA 69	2.640E-15	1.397E-12
ZN 70	3.025E-11	1.600E-08
GE 70	1.152E-18	6.096E-16
GA 71	1.304E-14	6.898E-12
GE 72	1.584E-10	8.383E-08
GE 73	5.700E-10	3.016E-07
GE 74	1.494E-09	7.904E-07
AS 75	3.666E-09	1.940E-06
GE 76	1.100E-08	5.820E-06
SE 76	9.416E-12	4.982E-09
SE 77	2.473E-08	1.309E-05
SE 78	5.109E-08	2.703E-05
SE 79	1.320E-07	6.986E-05
BR 79	1.198E-11	6.339E-09
SE 80	3.176E-07	1.680E-04
KR 80	1.554E-12	8.220E-10
BR 81	5.436E-07	2.876E-04
KR 81	1.088E-14	5.757E-12
SE 82	8.601E-07	4.551E-04
KR 82	2.216E-09	1.172E-06
KR 83	1.378E-06	7.290E-04
KR 84	2.764E-06	1.462E-03
KR 85	4.192E-07	2.218E-04
RB 85	2.998E-06	1.586E-03
KR 86	5.461E-06	2.889E-03
SR 86	1.065E-09	5.637E-07
RB 87	7.071E-06	3.741E-03
SR 87	1.002E-11	5.301E-09
SR 88	1.019E-05	5.389E-03
SR 89	1.013E-23	5.361E-21
Y 89	1.344E-05	7.110E-03
SR 90	1.328E-05	7.026E-03
Y 90	3.330E-09	1.762E-06
ZR 90	3.001E-06	1.588E-03

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
Y 91	3.545E-21	1.876E-18
ZR 91	1.679E-05	8.882E-03
ZR 92	1.742E-05	9.218E-03
ZR 93	1.894E-05	1.002E-02
NB 93	1.675E-11	8.862E-09
NB 93M	5.623E-11	2.975E-08
ZR 94	1.852E-05	9.797E-03
NB 94	2.569E-12	1.359E-09
ZR 95	8.496E-20	4.495E-17
NB 95	1.074E-19	5.681E-17
NB 95M	3.554E-23	1.881E-20
MO 95	1.917E-05	1.014E-02
ZR 96	1.906E-05	1.008E-02
MO 96	4.643E-08	2.457E-05
MO 97	1.799E-05	9.517E-03
MO 98	1.806E-05	9.557E-03
TC 98	8.835E-12	4.675E-09
TC 99	1.855E-05	9.812E-03
RU 99	5.127E-10	2.713E-07
MO100	1.985E-05	1.050E-02
RU100	1.947E-07	1.030E-04
RU101	1.614E-05	8.539E-03
RU102	1.369E-05	7.242E-03
RH102	1.786E-13	9.449E-11
RU103	4.651E-29	2.461E-26
RH103	9.899E-06	5.238E-03
RH103M	5.739E-32	3.036E-29
RU104	6.206E-06	3.283E-03
PD104	3.415E-07	1.807E-04
PD105	3.364E-06	1.780E-03
RU106	4.117E-09	2.178E-06
RH106	3.870E-15	2.048E-12
PD106	1.468E-06	7.769E-04
PD107	6.496E-07	3.437E-04
AG107	5.890E-13	3.117E-10
PD108	3.114E-07	1.648E-04
AG108	9.273E-26	4.906E-23
AG108M	2.937E-17	1.554E-14
CD108	5.655E-14	2.992E-11
AG109	1.490E-07	7.884E-05
AG109M	1.196E-25	6.327E-23
CD109	1.210E-19	6.403E-17
PD110	1.130E-07	5.980E-05
AG110	1.093E-21	5.784E-19
AG110M	7.214E-14	3.817E-11
CD110	7.010E-09	3.709E-06
CD111	9.190E-08	4.862E-05
CD112	6.787E-08	3.591E-05
CD113	7.215E-09	3.817E-06
CD113M	8.797E-10	4.655E-07

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
IN113	4.369E-10	2.311E-07
CD114	1.199E-07	6.343E-05
IN114	6.555E-36	3.468E-33
SN114	2.592E-13	1.372E-10
IN115	4.725E-08	2.500E-05
IN115M	4.819E-36	2.550E-33
SN115	1.952E-09	1.033E-06
CD116	6.162E-08	3.260E-05
SN116	9.107E-09	4.818E-06
SN117	6.066E-08	3.210E-05
SN118	6.749E-08	3.571E-05
SN119	6.466E-08	3.421E-05
SN119M	1.517E-13	8.028E-11
SN120	6.767E-08	3.580E-05
SN121M	2.980E-11	1.576E-08
SB121	7.132E-08	3.774E-05
SN122	7.590E-08	4.016E-05
TE122	4.433E-10	2.346E-07
SN123	1.494E-15	7.904E-13
SB123	9.069E-08	4.798E-05
TE123	9.929E-13	5.254E-10
TE123M	7.488E-21	3.962E-18
SN124	1.191E-07	6.303E-05
SB124	3.008E-25	1.592E-22
TE124	3.493E-10	1.848E-07
SB125	1.875E-08	9.920E-06
TE125	1.375E-07	7.274E-05
TE125M	2.623E-10	1.388E-07
SN126	2.872E-07	1.519E-04
SB126	1.364E-14	7.218E-12
SB126M	1.037E-16	5.489E-14
TE126	5.945E-09	3.145E-06
TE127	1.054E-18	5.577E-16
TE127M	3.011E-16	1.593E-13
I127	6.369E-07	3.370E-04
XE127	1.812E-40	9.585E-38
TE128	1.611E-06	8.523E-04
XE128	3.072E-09	1.625E-06
TE129	3.410E-37	1.804E-34
TE129M	3.641E-34	1.927E-31
I129	2.895E-06	1.532E-03
XE129	3.694E-12	1.955E-09
TE130	6.193E-06	3.277E-03
XE130	1.700E-08	8.994E-06
XE131	1.154E-05	6.108E-03
XE132	1.829E-05	9.677E-03
BA132	2.671E-12	1.413E-09
CS133	2.795E-05	1.479E-02
XE134	3.248E-05	1.719E-02
CS134	2.163E-08	1.145E-05

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
BA134	3.324E-07	1.759E-04
CS135	1.611E-05	8.523E-03
BA135	6.250E-11	3.307E-08
XE136	3.938E-05	2.083E-02
BA136	7.666E-08	4.056E-05
CS137	2.172E-05	1.149E-02
BA137	4.716E-06	2.495E-03
BA137M	3.323E-12	1.758E-09
BA138	2.961E-05	1.567E-02
LA138	2.454E-10	1.298E-07
LA139	2.827E-05	1.496E-02
CE140	2.827E-05	1.496E-02
CE141	2.963E-33	1.568E-30
PR141	2.617E-05	1.385E-02
CE142	2.635E-05	1.394E-02
ND142	4.278E-08	2.263E-05
ND143	2.599E-05	1.375E-02
CE144	1.310E-08	6.930E-06
PR144	5.529E-13	2.925E-10
PR144M	2.764E-15	1.462E-12
ND144	2.534E-05	1.341E-02
ND145	1.770E-05	9.365E-03
ND146	1.388E-05	7.345E-03
PM146	7.072E-12	3.742E-09
SM146	9.099E-12	4.814E-09
PM147	1.037E-06	5.489E-04
SM147	8.639E-06	4.571E-03
ND148	7.900E-06	4.180E-03
PM148	5.018E-31	2.655E-28
PM148M	7.568E-29	4.004E-26
SM148	7.509E-07	3.973E-04
SM149	3.859E-07	2.042E-04
ND150	3.074E-06	1.626E-03
SM150	4.885E-06	2.585E-03
EU150	1.886E-15	9.980E-13
SM151	1.028E-06	5.441E-04
EU151	6.803E-08	3.599E-05
SM152	2.144E-06	1.135E-03
EU152	1.156E-09	6.116E-07
GD152	7.092E-10	3.752E-07
EU153	9.122E-07	4.826E-04
GD153	8.217E-16	4.347E-13
SM154	3.722E-07	1.969E-04
EU154	2.546E-08	1.347E-05
GD154	2.433E-08	1.287E-05
EU155	3.913E-08	2.070E-05
GD155	8.315E-08	4.399E-05
GD156	1.335E-07	7.062E-05
GD157	1.763E-09	9.329E-07
GD158	5.791E-08	3.064E-05

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REDUCEZR.G -- Output in g nuclide/g calcine (continued)

	Cs-137 Normalized to 1.89E-3 Ci	1.0 Ci
TB159	6.646E-09	3.516E-06
GD160	2.654E-09	1.404E-06
TB160	3.099E-23	1.640E-20
DY160	1.065E-10	5.637E-08
DY161	6.843E-10	3.620E-07
DY162	3.772E-10	1.996E-07
DY163	1.359E-10	7.190E-08
DY164	4.202E-11	2.223E-08
HO165	3.132E-11	1.657E-08
HO166M	5.026E-14	2.660E-11
ER166	1.169E-11	6.188E-09
ER167	5.859E-12	3.100E-09
ER168	8.111E-13	4.291E-10
TM169	5.967E-16	3.157E-13
ER170	2.058E-20	1.089E-17
TM170	1.449E-24	7.665E-22
YB170	1.406E-17	7.441E-15
TM171	4.325E-21	2.288E-18
YB171	8.994E-20	4.759E-17
YB172	1.556E-22	8.232E-20

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Source Listing of Program EXTRACT

```
      PROGRAM EXTRACT

!-------- WRITTEN BY D.R. WENZEL

!            This program extracts the grams of each radionuclide
!            from file REDUCEZR.G and sums the mass of radionuclides
!            that are listed more than once in the file.

      CHARACTER (LEN=1) :: DUMMY
      CHARACTER (LEN=7) :: DESC, NAME, NUCLIDE(600)

      INTEGER NUM(600)

      REAL :: DATA(600)

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER_E', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='REDUCEZR.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='EXTRACT.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NUMBER
 1000 FORMAT(5X,A7, 5X, I6)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUM(LAST) = NUMBER
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,600
         DATA(l) = 0.
      END DO

!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ PAST THE FIRST 6 LINES OF INPUT

   35 DO  J=1,6
         READ(2,120) DUMMY
  120    FORMAT(A1)
      END DO

      WRITE(6,605)
```

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Source Listing of Program EXTRACT (continued)

```
  605  FORMAT(/,3X,'Nuclide',2X,'g/g calcine')


!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,200,END=80) DESC, VALUE
  200  FORMAT(A7,5X,1PE9.3)
       DO  J=1,600
          IF(DESC == NUCLIDE(J)) THEN
             DATA(J) = DATA(J) + VALUE
          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(6,620) NUM(J), DATA(J)
  620     FORMAT(6X,I6,2X,1PE10.3)
       END DO

       GO TO 999

!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM EXTRACT
```

See Appendix B-4, pages 4-11, for a listing of file MASTER_E.

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137

Nuclide	g/g calcine	
10011	1.864E-09	H 1
10012	1.163E-13	H 2
20030	7.952E-19	HE 3
50100	4.538E-19	B 10
50110	4.137E-10	B 11
60120	6.992E-06	C 12
60130	8.035E-08	C 13
70140	9.394E-06	N 14
70150	3.508E-08	N 15
80160	5.638E-04	O 16
80170	2.260E-07	O 17
80180	1.130E-06	O 18
90190	7.983E-14	F 19
100200	1.031E-19	NE 20
100210	8.035E-19	NE 21
100220	2.378E-22	NE 22
110230	3.010E-27	NA 23
120240	2.583E-12	MG 24
120250	8.496E-17	MG 25
120260	7.900E-21	MG 26
130270	9.431E-06	AL 27
140280	4.553E-10	SI 28
140290	7.553E-15	SI 29
140300	1.371E-19	SI 30
140320	4.559E-35	SI 32
150310	8.156E-25	P 31
150320	2.746E-39	P 32
160340	4.074E-36	S 34
170370	7.501E-24	CL 37
180380	6.707E-29	AR 38
180390	5.986E-29	AR 39
180400	2.054E-19	AR 40
180420	1.181E-28	AR 42
190410	6.515E-21	K 41
190420	5.046E-33	K 42
200420	5.251E-23	CA 42
200430	1.106E-13	CA 43
200440	8.405E-13	CA 44
200450	3.549E-20	CA 45
200460	9.431E-14	CA 46
210450	1.716E-14	SC 45
210460	2.365E-23	SC 46
220460	3.766E-07	TI 46
220470	3.436E-07	TI 47
220480	3.469E-06	TI 48
220490	2.641E-07	TI 49
220500	2.544E-07	TI 50
230500	2.442E-10	V 50
230510	6.280E-08	V 51
240500	2.039E-05	CR 50
240510	1.292E-40	CR 51
240520	3.943E-04	CR 52

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
240530	4.473E-05	CR 53
240540	1.129E-05	CR 54
250540	1.385E-12	MN 54
250550	1.763E-08	MN 55
260540	4.169E-05	FE 54
260550	1.962E-09	FE 55
260560	6.481E-04	FE 56
260570	1.517E-05	FE 57
260580	1.993E-06	FE 58
270580	6.689E-22	CO 58
270590	1.410E-09	CO 59
270600	2.000E-09	CO 60
280580	1.606E-04	NI 58
280590	1.290E-07	NI 59
280600	6.141E-05	NI 60
280610	2.692E-06	NI 61
280620	8.428E-06	NI 62
280630	2.159E-08	NI 63
280640	2.141E-06	NI 64
290630	1.427E-09	CU 63
290650	6.559E-10	CU 65
300640	1.088E-14	ZN 64
300650	1.139E-22	ZN 65
420940	1.243E-11	MO 94
440980	1.507E-25	RU 98
491131	4.333E-19	IN113M
491141	1.938E-28	IN114M
501120	7.095E-05	SN112
501130	7.215E-16	SN113
701730	5.475E-18	YB173
701740	2.776E-20	YB174
711750	1.273E-08	LU175
711760	5.019E-11	LU176
711770	3.062E-22	LU177
711771	3.075E-20	LU177M
721740	1.400E-07	HF174
721750	9.522E-22	HF175
721760	4.712E-06	HF176
721770	1.166E-05	HF177
721780	2.880E-05	HF178
721790	1.541E-05	HF179
721800	3.349E-05	HF180
721810	1.053E-28	HF181
721820	1.492E-10	HF182
731810	4.667E-06	TA181
731820	1.129E-15	TA182
741820	1.295E-07	W182
741830	5.466E-08	W183
741840	4.078E-10	W184
741850	1.255E-25	W185
741860	6.585E-17	W186
741880	1.501E-30	W188

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
751850	1.131E-13	RE185
751870	3.126E-19	RE187
751880	1.532E-32	RE188
761860	9.514E-16	OS186
761880	1.350E-21	OS188
761890	1.074E-24	OS189
761900	4.335E-27	OS190
20040	2.846E-09	HE 4
812060	1.324E-38	TL206
812070	1.870E-21	TL207
812080	1.670E-20	TL208
812090	5.921E-27	TL209
822060	2.335E-21	PB206
822070	4.316E-16	PB207
822080	3.030E-14	PB208
822090	2.467E-23	PB209
822100	3.591E-20	PB210
822110	1.446E-20	PB211
822120	9.854E-18	PB212
822140	9.710E-25	PB214
832080	3.108E-28	BI208
832090	1.941E-19	BI209
832101	5.105E-27	BI210M
832100	2.211E-23	BI210
832110	8.533E-22	BI211
832120	9.348E-19	BI212
832130	5.796E-24	BI213
832140	7.209E-25	BI214
842100	5.076E-22	PO210
842110	1.047E-26	PO211
842120	4.944E-29	PO212
842130	8.699E-33	PO213
842140	9.914E-32	PO214
842150	1.211E-26	PO215
842160	3.932E-23	PO216
842180	1.126E-25	PO218
852170	6.964E-29	AT217
862190	2.744E-23	RN219
862200	1.484E-20	RN220
862220	2.070E-22	RN222
872210	6.323E-25	FR221
872230	1.271E-22	FR223
882230	6.971E-18	RA223
882240	8.594E-17	RA224
882250	2.859E-21	RA225
882260	3.220E-17	RA226
882280	6.572E-21	RA228
892250	1.932E-21	AC225
892270	4.927E-15	AC227
892280	6.860E-25	AC228
902270	1.145E-17	TH227
902280	1.664E-14	TH228

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
902290	5.269E-16	TH229
902300	8.669E-13	TH230
902310	2.699E-14	TH231
902320	4.182E-11	TH232
902340	9.469E-16	TH234
912310	5.788E-11	PA231
912330	5.455E-14	PA233
912341	3.193E-20	PA234M
912340	1.426E-20	PA234
922320	6.955E-13	U232
922330	1.600E-11	U233
922340	1.740E-06	U234
922350	3.520E-05	U235
922360	3.070E-06	U236
922370	8.677E-18	U237
922380	1.110E-05	U238
922400	9.280E-29	U240
932350	1.127E-17	NP235
932360	1.983E-13	NP236
932370	5.200E-07	NP237
932380	9.861E-21	NP238
932390	1.259E-19	NP239
932401	8.118E-31	NP240M
942360	4.074E-14	PU236
942380	1.110E-06	PU238
942390	3.890E-06	PU239
942400	9.800E-07	PU240
942410	2.600E-07	PU241
942420	1.300E-07	PU242
942430	3.443E-33	PU243
942440	4.853E-18	PU244
952410	3.200E-07	AM241
952421	5.259E-14	AM242M
952420	6.290E-19	AM242
952430	1.464E-13	AM243
952450	4.537E-39	AM245
962420	1.280E-16	CM242
962430	2.788E-16	CM243
962440	2.331E-15	CM244
962450	1.409E-17	CM245
962460	1.217E-19	CM246
962470	9.658E-23	CM247
962480	4.136E-25	CM248
962500	8.601E-39	CM250
972490	1.180E-30	BK249
982500	4.310E-35	CF250
982510	1.346E-39	CF251
10030	6.459E-10	H 3
30060	8.684E-12	LI 6
30070	2.207E-13	LI 7
40090	4.441E-12	BE 9
40100	2.913E-12	BE 10

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
60140	3.505E-09	C 14
300660	1.618E-13	ZN 66
300670	5.976E-17	ZN 67
300680	8.880E-12	ZN 68
310690	2.640E-15	GA 69
300700	3.025E-11	ZN 70
320700	1.152E-18	GE 70
310710	1.304E-14	GA 71
320720	1.584E-10	GE 72
320730	5.700E-10	GE 73
320740	1.494E-09	GE 74
330750	3.666E-09	AS 75
320760	1.100E-08	GE 76
340760	9.416E-12	SE 76
340770	2.473E-08	SE 77
340780	5.109E-08	SE 78
340790	1.320E-07	SE 79
350790	1.198E-11	BR 79
340800	3.176E-07	SE 80
360800	1.554E-12	KR 80
350810	5.436E-07	BR 81
360810	1.088E-14	KR 81
340820	8.601E-07	SE 82
360820	2.216E-09	KR 82
360830	1.378E-06	KR 83
360840	2.764E-06	KR 84
360850	4.192E-07	KR 85
370850	2.998E-06	RB 85
360860	5.461E-06	KR 86
380860	1.065E-09	SR 86
370870	7.071E-06	RB 87
380870	4.028E-10	SR 87
380880	1.023E-05	SR 88
380890	1.013E-23	SR 89
390890	1.344E-05	Y 89
380900	1.820E-05	SR 90
390900	3.330E-09	Y 90
400900	2.376E-01	ZR 90
390910	3.547E-21	Y 91
400910	5.181E-02	ZR 91
400920	7.924E-02	ZR 92
400930	3.841E-05	ZR 93
410930	4.703E-05	NB 93
410931	1.140E-10	NB 93M
400940	8.030E-02	ZR 94
410940	4.287E-08	NB 94
400950	1.009E-19	ZR 95
410950	1.275E-19	NB 95
410951	4.219E-23	NB 95M
420950	2.264E-05	MO 95
400960	1.294E-02	ZR 96
420960	5.426E-08	MO 96

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
420970	2.318E-05	MO 97
420980	1.806E-05	MO 98
430980	8.835E-12	TC 98
430990	1.855E-05	TC 99
440990	5.127E-10	RU 99
421000	1.985E-05	MO100
441000	1.947E-07	RU100
441010	1.614E-05	RU101
441020	1.369E-05	RU102
451020	1.786E-13	RH102
441030	4.651E-29	RU103
451030	9.899E-06	RH103
451031	5.739E-32	RH103M
441040	6.206E-06	RU104
461040	3.415E-07	PD104
461050	3.364E-06	PD105
441060	4.117E-09	RU106
451060	3.870E-15	RH106
461060	1.468E-06	PD106
461070	6.496E-07	PD107
471070	5.890E-13	AG107
461080	3.114E-07	PD108
471080	9.273E-26	AG108
471081	2.937E-17	AG108M
481080	5.655E-14	CD108
471090	1.490E-07	AG109
471091	1.196E-25	AG109M
481090	1.210E-19	CD109
461100	1.130E-07	PD110
471100	1.093E-21	AG110
471101	7.214E-14	AG110M
481100	7.010E-09	CD110
481110	9.190E-08	CD111
481120	6.787E-08	CD112
481130	7.215E-09	CD113
481131	8.797E-10	CD113M
491130	1.097E-07	IN113
481140	1.200E-07	CD114
491140	3.535E-33	IN114
501140	4.762E-05	SN114
491150	4.725E-08	IN115
491151	4.819E-36	IN115M
501150	2.613E-05	SN115
481160	6.162E-08	CD116
501160	1.063E-03	SN116
501170	5.633E-04	SN117
501180	1.774E-03	SN118
501190	6.298E-04	SN119
501191	1.023E-10	SN119M
501200	2.388E-03	SN120
501211	1.522E-09	SN121M
511210	3.822E-07	SB121

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
501220	3.392E-04	SN122
521220	2.332E-09	TE122
501230	3.671E-15	SN123
511230	1.222E-07	SB123
521230	5.174E-12	TE123
521231	3.909E-20	TE123M
501240	4.239E-04	SN124
511240	3.540E-25	SB124
521240	3.997E-10	TE124
511250	6.271E-08	SB125
521250	4.583E-07	TE125
521251	8.771E-10	TE125M
501260	2.872E-07	SN126
511260	1.364E-14	SB126
511261	1.037E-16	SB126M
521260	6.247E-09	TE126
521270	1.054E-18	TE127
521271	3.011E-16	TE127M
531270	6.369E-07	I127
541270	1.812E-40	XE127
521280	1.611E-06	TE128
541280	3.072E-09	XE128
521290	3.410E-37	TE129
521291	3.641E-34	TE129M
531290	2.895E-06	I129
541290	3.694E-12	XE129
521300	6.193E-06	TE130
541300	1.700E-08	XE130
541310	1.154E-05	XE131
541320	1.829E-05	XE132
561320	2.671E-12	BA132
551330	2.795E-05	CS133
541340	3.248E-05	XE134
551340	2.700E-08	CS134
561340	3.324E-07	BA134
551350	1.611E-05	CS135
561350	6.250E-11	BA135
541360	3.938E-05	XE136
561360	7.666E-08	BA136
551370	2.170E-05	CS137
561370	4.716E-06	BA137
561371	3.323E-12	BA137M
561380	2.961E-05	BA138
571380	2.454E-10	LA138
571390	2.827E-05	LA139
581400	2.827E-05	CE140
581410	2.963E-33	CE141
591410	2.617E-05	PR141
581420	2.635E-05	CE142
601420	4.278E-08	ND142
601430	2.599E-05	ND143
581440	1.310E-08	CE144

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EXTRACT.OUT -- g radionuclide/1.89E-3 Ci Cs-137 (continued)

Nuclide	g/g calcine	
591440	5.529E-13	PR144
591441	2.764E-15	PR144M
601440	2.534E-05	ND144
601450	1.770E-05	ND145
601460	1.388E-05	ND146
611460	7.072E-12	PM146
621460	9.099E-12	SM146
611470	1.037E-06	PM147
621470	8.639E-06	SM147
601480	7.900E-06	ND148
611480	5.018E-31	PM148
611481	7.568E-29	PM148M
621480	7.509E-07	SM148
621490	3.859E-07	SM149
601500	3.074E-06	ND150
621500	4.885E-06	SM150
631500	1.886E-15	EU150
621510	1.028E-06	SM151
631510	6.803E-08	EU151
621520	2.144E-06	SM152
631520	1.156E-09	EU152
641520	7.092E-10	GD152
631530	9.122E-07	EU153
641530	8.217E-16	GD153
621540	3.722E-07	SM154
631540	1.370E-07	EU154
641540	2.433E-08	GD154
631550	6.000E-10	EU155
641550	8.315E-08	GD155
641560	1.335E-07	GD156
641570	1.763E-09	GD157
641580	5.791E-08	GD158
651590	6.646E-09	TB159
641600	2.654E-09	GD160
651600	3.099E-23	TB160
661600	1.065E-10	DY160
661610	6.843E-10	DY161
661620	3.772E-10	DY162
661630	1.359E-10	DY163
661640	4.202E-11	DY164
671650	3.132E-11	HO165
671661	5.026E-14	HO166M
681660	1.169E-11	ER166
681670	5.859E-12	ER167
681680	8.111E-13	ER168
691690	5.967E-16	TM169
681700	2.058E-20	ER170
691700	1.449E-24	TM170
701700	1.406E-17	YB170
691710	4.325E-21	TM171
701710	8.994E-20	YB171
701720	4.405E-17	YB172

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File ZR_RUN1.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 G CALCINE
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                  Ci/g
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC     11.5    1   2   5   0
  DEC     14.0    2   3   5   0
  DEC     15.0    3   4   5   0
  DEC     22.0    4   5   5   0
  DEC     24.0    5   6   5   0
  DEC     28.0    6   7   5   0
  DEC     34.0    7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   10011 1.864E-09  10012 1.163E-13  20030 7.952E-19 0 0.
  1   50100 4.538E-19  50110 4.137E-10  60120 6.992E-06 0 0.
  1   60130 8.035E-08  70140 9.394E-06  70150 3.508E-08 0 0.
  1   80160 5.638E-04  80170 2.260E-07  80180 1.130E-06 0 0.
  1   90190 7.983E-14 100200 1.031E-19 100210 8.035E-19 0 0.
  1  100220 2.378E-22 110230 3.010E-27 120240 2.583E-12 0 0.
  1  120250 8.496E-17 120260 7.900E-21 130270 9.431E-06 0 0.
  1  140280 4.553E-10 140290 7.553E-15 140300 1.371E-19 0 0.
  1  140320 4.559E-35 150310 8.156E-25 150320 2.746E-39 0 0.
  1  160340 4.074E-36 170370 7.501E-24 180380 6.707E-29 0 0.
  1  180390 5.986E-29 180400 2.054E-19 180420 1.181E-28 0 0.
  1  190410 6.515E-21 190420 5.046E-33 200420 5.251E-23 0 0.
  1  200430 1.106E-13 200440 8.405E-13 200450 3.549E-20 0 0.
  1  200460 9.431E-14 210450 1.716E-14 210460 2.365E-23 0 0.
  1  220460 3.766E-07 220470 3.436E-07 220480 3.469E-06 0 0.
  1  220490 2.641E-07 220500 2.544E-07 230500 2.442E-10 0 0.
  1  230510 6.280E-08 240500 2.039E-05 240510 1.292E-40 0 0.
  1  240520 3.943E-04 240530 4.473E-05 240540 1.129E-05 0 0.
  1  250540 1.385E-12 250550 1.763E-08 260540 4.169E-05 0 0.
  1  260550 1.962E-09 260560 6.481E-04 260570 1.517E-05 0 0.
  1  260580 1.993E-06 270580 6.689E-22 270590 1.410E-09 0 0.
  1  270600 2.000E-09 280580 1.606E-04 280590 1.290E-07 0 0.
  1  280600 6.141E-05 280610 2.692E-06 280620 8.428E-06 0 0.
  1  280630 2.159E-08 280640 2.141E-06 290630 1.427E-09 0 0.
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File ZR_RUN1.INP (continued)

```
 1  290650 6.559E-10 300640 1.088E-14 300650 1.139E-22 0 0.
 1  420940 1.243E-11 440980 1.507E-25 491131 4.333E-19 0 0.
 1  491141 1.938E-28 501120 7.095E-05 501130 7.215E-16 0 0.
 1  701730 5.475E-18 701740 2.776E-20 711750 1.273E-08 0 0.
 1  711760 5.019E-11 711770 3.062E-22 711771 3.075E-20 0 0.
 1  721740 1.400E-07 721750 9.522E-22 721760 4.712E-06 0 0.
 1  721770 1.166E-05 721780 2.880E-05 721790 1.541E-05 0 0.
 1  721800 3.349E-05 721810 1.053E-28 721820 1.492E-10 0 0.
 1  731810 4.667E-06 731820 1.129E-15 741820 1.295E-07 0 0.
 1  741830 5.466E-08 741840 4.078E-10 741850 1.255E-25 0 0.
 1  741860 6.585E-17 741880 1.501E-30 751850 1.131E-13 0 0.
 1  751870 3.126E-19 751880 1.532E-32 761860 9.514E-16 0 0.
 1  761880 1.350E-21 761890 1.074E-24 761900 4.335E-27 0 0.
 2  962450 1.410E-17 942410 2.600E-07 952410 3.200E-07 0 0.
 2  932370 5.200E-07 912330 5.460E-14 922330 8.530E-14 0 0.
 2  902290 5.270E-16 882250 2.860E-21 892250 1.930E-21 0 0.
 2  942440 4.850E-18 942360 4.070E-14 922320 3.680E-15 0 0.
 2  962440 2.330E-15 942400 9.800E-07 922360 3.070E-06 0 0.
 2  902320 4.180E-11 882280 5.640E-21 902280 1.660E-14 0 0.
 2  882240 8.500E-17 862200 1.480E-20 822120 9.850E-18 0 0.
 2  832120 9.340E-19 812080 1.660E-20 952421 5.260E-14 0 0.
 2  952420 6.290E-19 962420 1.280E-16 962460 1.220E-19 0 0.
 2  942420 1.300E-07 942380 1.110E-06 922380 1.110E-05 0 0.
 2  902340 9.470E-16 912340 1.430E-20 912341 3.190E-20 0 0.
 2  922340 1.740E-06 902300 8.670E-13 882260 3.220E-17 0 0.
 2  822100 3.590E-20 842100 5.070E-22 952430 1.460E-13 0 0.
 2  932390 1.260E-19 962430 2.790E-16 942390 3.890E-06 0 0.
 2  922350 3.520E-05 902310 2.700E-14 912310 6.580E-11 0 0.
 2  892270 4.930E-15 812070 1.870E-21 962480 4.450E-05 0 0.
 2  982500 4.310E-15 982510 1.350E-19      0 0.        0 0.
 3   10030 6.459E-10  30060 8.684E-12  30070 2.207E-13 0 0.
 3   40090 4.441E-12  40100 2.913E-12  60140 3.505E-09 0 0.
 3  300660 1.618E-13 300670 5.976E-17 300680 8.880E-12 0 0.
 3  310690 2.640E-15 300700 3.025E-11 320700 1.152E-18 0 0.
 3  310710 1.304E-14 320720 1.584E-10 320730 5.700E-10 0 0.
 3  320740 1.494E-09 330750 3.666E-09 320760 1.100E-08 0 0.
 3  340760 9.416E-12 340770 2.473E-08 340780 5.109E-08 0 0.
 3  340790 1.320E-07 350790 1.198E-11 340800 3.176E-07 0 0.
 3  360800 1.554E-12 350810 5.436E-07 360810 1.088E-14 0 0.
 3  340820 8.601E-07 360820 2.216E-09 360830 1.378E-06 0 0.
 3  360840 2.764E-06 360850 4.192E-07 370850 2.998E-06 0 0.
 3  360860 5.461E-06 380860 1.065E-09 370870 7.071E-06 0 0.
 3  380870 4.930E-11 380880 1.019E-05 380890 1.013E-23 0 0.
 3  390890 1.344E-05 380900 1.820E-05 390900 3.330E-09 0 0.
 3  400900 2.376E-02 390910 3.545E-21 400910 5.196E-03 0 0.
 3  400920 7.939E-03 400930 2.089E-05 410930 4.703E-05 0 0.
 3  410931 6.200E-11 400940 8.047E-03 410940 4.287E-08 0 0.
 3  400950 8.655E-20 410950 1.094E-19 410951 3.620E-23 0 0.
 3  420950 1.952E-05 400960 1.311E-03 420960 4.721E-08 0 0.
 3  420970 1.851E-05 420980 1.806E-05 430980 8.835E-12 0 0.
 3  430990 1.855E-05 440990 5.127E-10 421000 1.985E-05 0 0.
 3  441000 1.947E-07 441010 1.614E-05 441020 1.369E-05 0 0.
 3  451020 1.786E-13 441030 4.651E-29 451030 9.899E-06 0 0.
 3  451031 5.739E-32 441040 6.206E-06 461040 3.415E-07 0 0.
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File ZR_RUN1.INP (continued)

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3  461050 3.364E-06 441060 4.117E-09 451060 3.870E-15 0 0.
3  461060 1.468E-06 461070 6.496E-07 471070 5.890E-13 0 0.
3  461080 3.114E-07 471080 9.273E-26 471081 2.937E-17 0 0.
3  481080 5.655E-14 471090 1.490E-07 471091 1.196E-25 0 0.
3  481090 1.210E-19 461100 1.130E-07 471100 1.093E-21 0 0.
3  471101 7.214E-14 481100 7.010E-09 481110 9.190E-08 0 0.
3  481120 6.787E-08 481130 7.215E-09 481131 8.797E-10 0 0.
3  491130 1.097E-07 481140 1.200E-07 491140 3.535E-33 0 0.
3  501140 4.762E-05 491150 4.725E-08 491151 4.819E-36 0 0.
3  501150 2.613E-05 481160 6.162E-08 501160 1.063E-03 0 0.
3  501170 5.633E-04 501180 1.774E-03 501190 6.298E-04 0 0.
3  501191 1.023E-10 501200 2.388E-03 501211 1.522E-09 0 0.
3  511210 3.822E-07 501220 7.595E-08 521220 2.332E-09 0 0.
3  501230 1.494E-15 511230 9.069E-08 521230 5.174E-12 0 0.
3  521231 3.909E-20 501240 1.191E-07 511240 3.008E-25 0 0.
3  521240 3.496E-10 511250 1.875E-08 521250 1.375E-07 0 0.
3  521251 2.623E-10 501260 2.872E-07 511260 1.364E-14 0 0.
3  511261 1.037E-16 521260 5.945E-09 521270 1.054E-18 0 0.
3  521271 3.011E-16 531270 6.369E-07 541270 1.812E-40 0 0.
3  521280 1.611E-06 541280 3.072E-09 521290 3.410E-37 0 0.
3  521291 3.641E-34 531290 2.895E-06 541290 3.694E-12 0 0.
3  521300 6.193E-06 541300 1.700E-08 541310 1.154E-05 0 0.
3  541320 1.829E-05 561320 2.671E-12 551330 2.795E-05 0 0.
3  541340 3.248E-05 551340 2.700E-08 561340 3.324E-07 0 0.
3  551350 1.611E-05 561350 6.250E-11 541360 3.938E-05 0 0.
3  561360 7.666E-08 551370 2.170E-05 561370 4.716E-06 0 0.
3  561371 3.323E-12 561380 2.961E-05 571380 2.454E-10 0 0.
3  571390 2.827E-05 581400 2.827E-05 581410 2.963E-33 0 0.
3  591410 2.617E-05 581420 2.635E-05 601420 4.278E-08 0 0.
3  601430 2.599E-05 581440 1.310E-08 591440 5.529E-13 0 0.
3  591441 2.764E-15 601440 2.534E-05 601450 1.770E-05 0 0.
3  601460 1.388E-05 611460 7.072E-12 621460 9.099E-12 0 0.
3  611470 1.037E-06 621470 8.639E-06 601480 7.900E-06 0 0.
3  611480 5.018E-31 611481 7.568E-29 621480 7.509E-07 0 0.
3  621490 3.859E-07 601500 3.074E-06 621500 4.885E-06 0 0.
3  631500 1.886E-15 621510 1.028E-06 631510 6.803E-08 0 0.
3  621520 2.144E-06 631520 1.156E-09 641520 7.092E-10 0 0.
3  631530 9.122E-07 641530 8.217E-16 621540 3.722E-07 0 0.
3  631540 1.370E-07 641540 2.433E-08 631550 6.000E-10 0 0.
3  641550 8.315E-08 641560 1.335E-07 641570 1.763E-09 0 0.
3  641580 5.791E-08 651590 6.646E-09 641600 2.654E-09 0 0.
3  651600 3.099E-23 661600 1.065E-10 661610 6.843E-10 0 0.
3  661620 3.772E-10 661630 1.359E-10 661640 4.202E-11 0 0.
3  671650 3.132E-11 671661 5.026E-14 681660 1.169E-11 0 0.
3  681670 5.859E-12 681680 8.111E-13 691690 5.967E-16 0 0.
3  681700 2.058E-20 691700 1.449E-24 701700 1.406E-17 0 0.
3  691710 4.325E-21 701710 8.994E-20 701720 4.405E-17 0 0.
0
```

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File ZR_RUN1.BAT

```
echo off
echo **                                                                **
echo **                            O R I G E N 2                       **
echo **                                                                **
copy zr_run1.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy zr_run1.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out zr_run1.u6 >nul
copy tape13.out+tape11.out zr_run1.u11 >nul
ren tape7.out zr_run1.pch
ren tape15.out zr_run1.dbg
ren tape16.out zr_run1.vxs
ren tape50.out zr_run1.ech
rem  cleanup files
del tape*.inp
del tape*.out
del zr_run1.pch
del zr_run1.dbg
del zr_run1.vxs
del zr_run1.ech
del zr_run1.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed **************************
echo ************************************************************************
echo on
```

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zr_run1.ci
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	Ci/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
CA 45	6.322E-16	1.101E-23	1.101E-23	1.101E-23	2.084E-28	2.084E-28	2.084E-28	1.865E-32
SC 46	8.015E-19	6.523E-34	3.430E-37	3.430E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00
V 50	4.367E-23	4.367E-23	4.367E-23	4.367E-23	4.367E-23	4.367E-23	4.367E-23	4.367E-23
MN 54	1.072E-08	9.639E-13	1.272E-13	5.657E-14	1.949E-16	3.859E-17	1.532E-18	2.977E-20
FE 55	4.907E-06	2.287E-07	1.175E-07	8.997E-08	1.392E-08	8.167E-09	2.812E-09	5.679E-10
CO 58	2.129E-17	2.901E-35	2.586E-39	2.586E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 60	2.262E-06	4.984E-07	3.588E-07	3.145E-07	1.253E-07	9.629E-08	5.689E-08	2.584E-08
NI 59	9.775E-09	9.774E-09	9.774E-09	9.773E-09	9.773E-09	9.773E-09	9.772E-09	9.772E-09
NI 63	1.332E-06	1.222E-06	1.199E-06	1.190E-06	1.129E-06	1.112E-06	1.079E-06	1.031E-06
ZN 65	9.387E-19	6.131E-24	6.131E-24	6.131E-24	4.280E-27	4.280E-27	4.280E-27	4.280E-27
IN113M	7.251E-12	7.502E-23	7.498E-23	7.498E-23	1.544E-29	1.542E-29	2.332E-33	0.000E+00
SN113	7.246E-12	7.498E-23	7.498E-23	7.498E-23	1.543E-29	1.543E-29	2.330E-33	4.771E-39
LU176	3.400E-18	3.400E-18	3.400E-18	3.400E-18	3.400E-18	3.400E-18	3.400E-18	3.400E-18
LU177	3.368E-17	2.342E-25	2.242E-25	2.260E-25	2.535E-30	2.419E-30	2.419E-30	1.406E-34
LU177M	1.464E-16	1.018E-24	1.018E-24	1.018E-24	1.102E-29	1.102E-29	1.102E-29	6.112E-34
HF175	1.015E-17	8.773E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF182	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14
TA182	7.046E-12	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14	3.258E-14
W185	1.180E-21	1.706E-38	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RE187	1.196E-26	1.196E-26	1.196E-26	1.196E-26	1.196E-26	1.196E-26	1.196E-26	1.196E-26
TL207	3.563E-13	1.201E-12	1.350E-12	1.406E-12	1.751E-12	1.838E-12	1.994E-12	2.196E-12
TL208	4.890E-12	3.471E-13	3.160E-13	3.099E-13	2.873E-13	2.832E-13	2.732E-13	2.582E-13
TL209	0.000E+00	2.667E-18	2.778E-18	2.829E-18	3.278E-18	3.437E-18	3.796E-18	4.435E-18
PB209	0.000E+00	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
PB210	2.742E-18	3.351E-16	5.833E-16	7.090E-16	2.098E-15	2.682E-15	4.141E-15	7.130E-15
PB211	0.000E+00	1.204E-12	1.354E-12	1.410E-12	1.756E-12	1.843E-12	2.000E-12	2.202E-12
PB212	1.369E-11	9.659E-13	8.795E-13	8.626E-13	7.997E-13	7.883E-13	7.602E-13	7.187E-13
PB214	0.000E+00	2.970E-15	4.378E-15	5.020E-15	1.078E-14	1.284E-14	1.752E-14	2.596E-14
BI210	0.000E+00	3.351E-16	5.835E-16	7.093E-16	2.098E-15	2.684E-15	4.142E-15	7.132E-15
BI211	0.000E+00	1.204E-12	1.354E-12	1.410E-12	1.756E-12	1.843E-12	2.000E-12	2.202E-12
BI212	1.369E-11	9.659E-13	8.795E-13	8.626E-13	7.997E-13	7.883E-13	7.602E-13	7.187E-13
BI213	0.000E+00	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
BI214	0.000E+00	2.970E-15	4.378E-15	5.020E-15	1.078E-14	1.284E-14	1.752E-14	2.596E-14
PO210	2.278E-18	3.351E-16	5.203E-16	6.333E-16	2.098E-15	2.500E-15	4.144E-15	7.132E-15
PO211	0.000E+00	3.372E-15	3.791E-15	3.948E-15	4.916E-15	5.160E-15	5.599E-15	6.165E-15
PO212	0.000E+00	6.189E-13	5.635E-13	5.527E-13	5.124E-13	5.050E-13	4.871E-13	4.605E-13
PO213	0.000E+00	1.208E-16	1.258E-16	1.281E-16	1.485E-16	1.557E-16	1.719E-16	2.009E-16
PO214	0.000E+00	2.970E-15	4.377E-15	5.019E-15	1.078E-14	1.284E-14	1.752E-14	2.596E-14
PO215	0.000E+00	1.204E-12	1.354E-12	1.410E-12	1.756E-12	1.843E-12	2.000E-12	2.202E-12
PO216	0.000E+00	9.659E-13	8.795E-13	8.626E-13	7.997E-13	7.883E-13	7.602E-13	7.187E-13
PO218	0.000E+00	2.971E-15	4.379E-15	5.021E-15	1.079E-14	1.285E-14	1.753E-14	2.597E-14
AT217	0.000E+00	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
RN219	0.000E+00	1.204E-12	1.354E-12	1.410E-12	1.756E-12	1.843E-12	2.000E-12	2.202E-12
RN220	1.366E-11	9.659E-13	8.795E-13	8.626E-13	7.997E-13	7.883E-13	7.602E-13	7.187E-13
RN222	0.000E+00	2.971E-15	4.379E-15	5.021E-15	1.079E-14	1.285E-14	1.753E-14	2.597E-14
FR221	0.000E+00	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
FR223	0.000E+00	1.661E-14	1.865E-14	1.942E-14	2.419E-14	2.538E-14	2.754E-14	3.033E-14
RA223	0.000E+00	1.204E-12	1.354E-12	1.410E-12	1.756E-12	1.843E-12	2.000E-12	2.202E-12
RA224	1.354E-11	9.659E-13	8.795E-13	8.626E-13	7.997E-13	7.883E-13	7.602E-13	7.187E-13
RA225	1.122E-16	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
RA226	3.185E-17	2.971E-15	4.379E-15	5.021E-15	1.079E-14	1.285E-14	1.753E-14	2.597E-14
RA228	1.320E-18	3.637E-18	3.880E-18	3.967E-18	4.381E-18	4.461E-18	4.587E-18	4.730E-18
AC225	1.121E-16	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
AC227	3.567E-13	1.204E-12	1.351E-12	1.407E-12	1.753E-12	1.839E-12	1.996E-12	2.198E-12
AC228	0.000E+00	3.637E-18	3.880E-18	3.967E-18	4.381E-18	4.461E-18	4.588E-18	4.730E-18
TH227	0.000E+00	1.188E-12	1.335E-12	1.391E-12	1.732E-12	1.817E-12	1.972E-12	2.172E-12
TH228	1.361E-11	9.648E-13	8.775E-13	8.594E-13	7.994E-13	7.862E-13	7.593E-13	7.183E-13
TH229	1.121E-16	1.235E-16	1.286E-16	1.310E-16	1.518E-16	1.591E-16	1.757E-16	2.053E-16
TH230	1.751E-14	1.175E-12	1.434E-12	1.538E-12	2.282E-12	2.498E-12	2.935E-12	3.603E-12
TH231	1.436E-08	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.613E-11
TH232	4.586E-18	4.699E-18	4.723E-18	4.733E-18	4.802E-18	4.822E-18	4.861E-18	4.920E-18
TH234	2.194E-11	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12
PA231	3.109E-12	3.128E-12	3.132E-12	3.134E-12	3.145E-12	3.148E-12	3.154E-12	3.163E-12
PA233	1.134E-09	3.715E-10	3.727E-10	3.733E-10	3.768E-10	3.779E-10	3.800E-10	3.834E-10
PA234M	2.192E-11	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12

Appendix E-5
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zr_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	Ci/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
PA234	2.860E-14	4.853E-15	4.853E-15	4.853E-15	4.853E-15	4.853E-15	4.853E-15	4.853E-15
U232	7.880E-14	8.146E-13	8.188E-13	8.170E-13	7.813E-13	7.679E-13	7.404E-13	6.996E-13
U233	8.261E-16	1.974E-14	2.398E-14	2.578E-14	3.726E-14	4.074E-14	4.737E-14	5.738E-14
U234	1.088E-08	1.147E-08	1.159E-08	1.164E-08	1.196E-08	1.205E-08	1.223E-08	1.248E-08
U235	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.612E-11	7.613E-11
U236	1.987E-10	1.988E-10	1.988E-10	1.988E-10	1.988E-10	1.989E-10	1.989E-10	1.989E-10
U237	0.000E+00	3.779E-10	3.351E-10	3.193E-10	2.280E-10	2.070E-10	1.708E-10	1.279E-10
U238	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12	3.733E-12
U240	0.000E+00	1.673E-14	2.037E-14	2.182E-14	3.201E-14	3.492E-14	4.074E-14	4.947E-14
NP237	3.667E-10	3.715E-10	3.727E-10	3.732E-10	3.768E-10	3.779E-10	3.800E-10	3.834E-10
NP238	0.000E+00	2.426E-15	2.399E-15	2.388E-15	2.313E-15	2.292E-15	2.251E-15	2.190E-15
NP239	2.924E-14	2.908E-14	2.908E-14	2.908E-14	2.906E-14	2.905E-14	2.904E-14	2.902E-14
NP240M	0.000E+00	1.673E-14	2.037E-14	2.182E-14	3.201E-14	3.492E-14	4.074E-14	4.947E-14
PU236	2.163E-11	1.321E-12	7.193E-13	5.641E-13	1.028E-13	6.324E-14	2.391E-14	5.561E-15
PU238	1.901E-05	1.736E-05	1.702E-05	1.689E-05	1.598E-05	1.573E-05	1.524E-05	1.453E-05
PU239	2.419E-07	2.418E-07	2.418E-07	2.418E-07	2.417E-07	2.417E-07	2.417E-07	2.417E-07
PU240	2.234E-07	2.231E-07	2.231E-07	2.230E-07	2.229E-07	2.228E-07	2.227E-07	2.226E-07
PU241	2.680E-05	1.540E-05	1.366E-05	1.302E-05	9.293E-06	8.440E-06	6.962E-06	5.215E-06
PU242	4.966E-10	4.966E-10	4.965E-10	4.965E-10	4.965E-10	4.965E-10	4.965E-10	4.965E-10
PU243	0.000E+00	1.095E-25	1.330E-25	1.424E-25	2.083E-25	2.270E-25	2.644E-25	3.203E-25
PU244	8.605E-23	1.675E-14	2.040E-14	2.185E-14	3.205E-14	3.496E-14	4.079E-14	4.953E-14
AM241	1.099E-06	1.454E-06	1.507E-06	1.526E-06	1.632E-06	1.655E-06	1.693E-06	1.735E-06
AM242M	5.114E-13	4.853E-13	4.798E-13	4.776E-13	4.626E-13	4.584E-13	4.501E-13	4.380E-13
AM242	5.087E-13	4.829E-13	4.774E-13	4.752E-13	4.603E-13	4.561E-13	4.479E-13	4.358E-13
AM243	2.912E-14	2.908E-14	2.908E-14	2.908E-14	2.906E-14	2.905E-14	2.904E-14	2.902E-14
CM242	4.234E-13	3.993E-13	3.956E-13	3.936E-13	3.807E-13	3.778E-13	3.712E-13	3.604E-13
CM243	1.441E-14	1.089E-14	1.025E-14	1.000E-14	8.438E-15	8.037E-15	7.292E-15	6.302E-15
CM244	1.886E-13	1.214E-13	1.104E-13	1.062E-13	8.125E-14	7.526E-14	6.458E-14	5.133E-14
CM245	2.422E-18	2.420E-18	2.419E-18	2.419E-18	2.418E-18	2.417E-18	2.416E-18	2.415E-18
CM246	3.749E-20	5.937E-16	6.813E-16	7.132E-16	8.947E-16	9.352E-16	1.004E-15	1.084E-15
CM247	0.000E+00	1.095E-25	1.330E-25	1.424E-25	2.083E-25	2.270E-25	2.644E-25	3.203E-25
CM248	1.893E-07	1.893E-07	1.893E-07	1.893E-07	1.893E-07	1.893E-07	1.893E-07	1.893E-07
CF250	4.714E-13	2.563E-13	2.245E-13	2.129E-13	1.469E-13	1.321E-13	1.069E-13	7.779E-14
CF251	2.142E-19	2.123E-19	2.119E-19	2.117E-19	2.106E-19	2.103E-19	2.096E-19	2.086E-19
H 3	6.236E-06	3.270E-06	2.842E-06	2.687E-06	1.814E-06	1.621E-06	1.295E-06	9.248E-07
BE 10	6.512E-14	6.512E-14	6.512E-14	6.512E-14	6.512E-14	6.512E-14	6.512E-14	6.512E-14
C 14	1.563E-08	1.561E-08	1.560E-08	1.560E-08	1.559E-08	1.558E-08	1.558E-08	1.556E-08
SE 79	9.199E-09	9.198E-09	9.198E-09	9.198E-09	9.197E-09	9.197E-09	9.197E-09	9.196E-09
KR 81	2.289E-16	2.289E-16	2.289E-16	2.289E-16	2.289E-16	2.289E-16	2.289E-16	2.289E-16
KR 85	1.645E-04	7.822E-05	6.655E-05	6.238E-05	3.967E-05	3.486E-05	2.691E-05	1.826E-05
RB 87	6.190E-13	6.190E-13	6.190E-13	6.190E-13	6.190E-13	6.190E-13	6.190E-13	6.190E-13
SR 90	2.484E-03	1.889E-03	1.780E-03	1.738E-03	1.471E-03	1.403E-03	1.275E-03	1.106E-03
Y 90	1.813E-03	1.889E-03	1.780E-03	1.738E-03	1.472E-03	1.403E-03	1.276E-03	1.106E-03
Y 91	8.698E-17	2.190E-38	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 93	5.251E-08	5.251E-08	5.251E-08	5.251E-08	5.251E-08	5.251E-08	5.251E-08	5.251E-08
NB 93M	1.753E-08	3.188E-08	3.403E-08	3.482E-08	3.934E-08	4.036E-08	4.212E-08	4.416E-08
NB 94	8.035E-09	8.032E-09	8.031E-09	8.031E-09	8.029E-09	8.029E-09	8.028E-09	8.026E-09
ZR 95	1.860E-15	3.213E-35	2.861E-39	2.861E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	4.280E-15	7.134E-35	5.208E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	1.379E-17	2.536E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TC 98	7.679E-15	7.679E-15	7.679E-15	7.679E-15	7.679E-15	7.679E-15	7.679E-15	7.679E-15
TC 99	3.146E-07	3.146E-07	3.146E-07	3.146E-07	3.146E-07	3.146E-07	3.146E-07	3.146E-07
RH102	2.159E-10	1.382E-11	7.605E-12	5.988E-12	1.124E-12	6.967E-13	2.678E-13	6.383E-14
RU106	1.378E-05	5.069E-09	9.084E-10	4.567E-10	3.708E-12	9.373E-13	5.989E-14	9.671E-16
RH106	1.378E-05	5.069E-09	9.084E-10	4.567E-10	3.708E-12	9.373E-13	5.989E-14	9.671E-16
PD107	3.342E-10	3.342E-10	3.342E-10	3.342E-10	3.342E-10	3.342E-10	3.342E-10	3.342E-10
AG108	0.000E+00	6.401E-17	6.314E-17	6.280E-17	6.044E-17	5.979E-17	5.850E-17	5.661E-17
AG108M	7.658E-16	7.192E-16	7.095E-16	7.056E-16	6.792E-16	6.718E-16	6.573E-16	6.361E-16
AG109M	3.127E-16	6.080E-19	1.748E-19	1.013E-19	1.743E-21	0.000E+00	0.000E+00	0.000E+00
CD109	3.125E-16	6.080E-19	1.748E-19	7.943E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110	4.559E-12	3.970E-17	3.154E-18	1.146E-18	9.527E-22	1.256E-22	0.000E+00	0.000E+00
AG110M	3.428E-10	2.985E-15	2.371E-16	8.613E-17	7.163E-20	0.000E+00	0.000E+00	0.000E+00
CD113M	1.908E-07	1.105E-07	9.813E-08	9.358E-08	6.710E-08	6.102E-08	5.046E-08	3.794E-08
IN115	2.941E-19	2.941E-19	2.941E-19	2.941E-19	2.941E-19	2.941E-19	2.941E-19	2.941E-19
SN119M	4.583E-07	3.167E-12	2.392E-13	8.513E-14	6.151E-17	7.768E-18	9.500E-20	0.000E+00

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zr_run1.ci (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	Ci/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
SN121M	9.002E-08	7.675E-08	7.413E-08	7.311E-08	6.635E-08	6.453E-08	6.105E-08	5.617E-08
SN123	1.228E-11	1.996E-21	1.996E-21	1.996E-21	2.195E-27	2.195E-27	8.641E-31	6.747E-36
TE123	1.504E-21	1.504E-21	1.504E-21	1.504E-21	1.504E-21	1.504E-21	1.504E-21	1.504E-21
TE123M	3.469E-16	9.434E-27	9.434E-27	9.434E-27	3.495E-33	3.495E-33	7.388E-37	0.000E+00
SB125	1.937E-05	1.090E-06	5.829E-07	4.538E-07	7.873E-08	4.773E-08	1.754E-08	3.908E-09
TE125M	4.726E-06	2.658E-07	1.422E-07	1.107E-07	1.921E-08	1.165E-08	4.280E-09	9.535E-10
SN126	8.151E-09	8.151E-09	8.151E-09	8.151E-09	8.150E-09	8.150E-09	8.150E-09	8.150E-09
SB126	1.141E-09	1.141E-09	1.141E-09	1.141E-09	1.141E-09	1.141E-09	1.141E-09	1.141E-09
SB126M	8.148E-09	8.151E-09	8.151E-09	8.151E-09	8.150E-09	8.150E-09	8.150E-09	8.150E-09
TE127	2.783E-12	6.993E-24	6.968E-24	6.970E-24	6.079E-31	6.161E-31	5.591E-35	0.000E+00
TE127M	2.841E-12	7.139E-24	7.139E-24	7.139E-24	6.207E-31	6.207E-31	5.730E-35	0.000E+00
I129	5.113E-10	5.113E-10	5.113E-10	5.113E-10	5.113E-10	5.113E-10	5.113E-10	5.113E-10
CS134	3.495E-05	7.320E-07	3.159E-07	2.257E-07	2.146E-08	1.095E-08	2.855E-09	3.799E-10
CS135	1.856E-08	1.856E-08	1.856E-08	1.856E-08	1.856E-08	1.856E-08	1.856E-08	1.856E-08
CS137	1.888E-03	1.448E-03	1.366E-03	1.335E-03	1.136E-03	1.085E-03	9.888E-04	8.608E-04
BA137M	1.788E-03	1.370E-03	1.293E-03	1.263E-03	1.075E-03	1.026E-03	9.354E-04	8.143E-04
LA138	4.711E-18	4.711E-18	4.711E-18	4.711E-18	4.711E-18	4.711E-18	4.711E-18	4.711E-18
CE142	6.325E-13	6.325E-13	6.325E-13	6.325E-13	6.325E-13	6.325E-13	6.325E-13	6.325E-13
CE144	4.181E-05	1.490E-09	1.607E-10	6.596E-11	1.294E-13	2.179E-14	6.180E-16	2.971E-18
PR144	4.179E-05	1.490E-09	1.607E-10	6.596E-11	1.294E-13	2.179E-14	6.180E-16	2.971E-18
PR144M	5.015E-07	1.787E-11	1.929E-12	7.915E-13	1.552E-15	2.614E-16	7.416E-18	3.565E-20
ND144	2.999E-17	3.000E-17	3.000E-17	3.000E-17	3.000E-17	3.000E-17	3.000E-17	3.000E-17
PM146	3.150E-09	7.394E-10	5.395E-10	4.757E-10	1.969E-10	1.530E-10	9.242E-11	4.339E-11
SM146	3.184E-16	3.885E-16	3.943E-16	3.962E-16	4.043E-16	4.055E-16	4.073E-16	4.087E-16
PM147	9.617E-04	4.608E-05	2.380E-05	1.828E-05	2.875E-06	1.695E-06	5.891E-07	1.207E-07
SM147	1.964E-13	2.189E-13	2.194E-13	2.195E-13	2.199E-13	2.200E-13	2.200E-13	2.200E-13
SM148	2.268E-19	2.268E-19	2.268E-19	2.268E-19	2.268E-19	2.268E-19	2.268E-19	2.268E-19
SM149	9.268E-20	9.268E-20	9.268E-20	9.268E-20	9.268E-20	9.268E-20	9.268E-20	9.268E-20
EU150	1.249E-13	1.001E-13	9.540E-14	9.358E-14	8.178E-14	7.869E-14	7.286E-14	6.491E-14
SM151	2.706E-05	2.476E-05	2.429E-05	2.410E-05	2.284E-05	2.249E-05	2.181E-05	2.082E-05
EU152	2.000E-07	1.113E-07	9.798E-08	9.311E-08	6.517E-08	5.886E-08	4.800E-08	3.536E-08
GD152	1.545E-20	1.856E-20	1.903E-20	1.920E-20	2.018E-20	2.040E-20	2.078E-20	2.123E-20
GD153	2.899E-12	1.728E-17	1.278E-18	4.603E-19	3.039E-22	3.039E-22	3.039E-22	3.039E-22
EU154	3.700E-05	1.464E-05	1.197E-05	1.104E-05	6.282E-06	5.347E-06	3.873E-06	2.388E-06
EU155	2.792E-07	5.595E-08	3.945E-08	3.430E-08	1.290E-08	9.751E-09	5.575E-09	2.410E-09
TB160	3.499E-19	1.137E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HO166M	9.024E-14	8.964E-14	8.951E-14	8.946E-14	8.910E-14	8.899E-14	8.879E-14	8.848E-14
TM170	8.659E-21	1.271E-30	1.271E-30	1.271E-30	1.314E-36	1.314E-36	0.000E+00	0.000E+00
TM171	4.711E-18	7.950E-20	4.013E-20	4.013E-20	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Appendix E-6
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Source Listing of Program ROUNDZR1

```
      PROGRAM ROUNDZR1

!-------- WRITTEN BY D.R. WENZEL

!            To format the output of an ORIGEN2 run for zirconium
!            calcine and convert the output to 2 places of accuracy

      CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
      CHARACTER (LEN=10) :: BLANK, ZERO(7)
      CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
      CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
      CHARACTER (LEN=96) :: BUFFER2
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9)
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      EQUIVALENCE (BUFFER2, BUFFER3(1))
      EQUIVALENCE (ZERO(1), BUFFER3(27))

      REAL :: DATA(175,7), VALUE(7)

      DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='ZR_RUN1.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='ROUNDZR1.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'ROUNDZR1.OUT  (Ci/g calcine)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NAME2
 1000 FORMAT(A12, 5X, A24)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUCLIDE2(LAST) = NAME2
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,175
         DO K=1,7
            DATA(l,K) = 0.
         END DO

      END DO
```

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Page 2 of 6

Source Listing of Program ROUNDZR1 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'1999Jul   2002Jan   ', &
              '2003Jan   2010Jan   2012Jan   2016Jan   2022Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,175
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7
                DATA(J,K) = VALUE(K)
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO

       GO TO 999
```

Appendix E-6
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Source Listing of Program ROUNDZR1 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDZR1
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

Appendix E-6
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ROUNDZR1.OUT (Ci/g calcine)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H-3	1.235E+01	yr	3.3E-06	2.8E-06	2.7E-06	1.8E-06	1.6E-06	1.3E-06	9.2E-07
Be-10	1.600E+06	yr	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14
C-14	5.729E+03	yr	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08	1.6E-08
Fe-55	2.600E+00	yr	2.3E-07	1.2E-07	9.0E-08	1.4E-08	8.2E-09	2.8E-09	5.7E-10
Ni-59	8.000E+04	yr	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09	9.8E-09
Co-60	5.270E+00	yr	5.0E-07	3.6E-07	3.1E-07	1.3E-07	9.6E-08	5.7E-08	2.6E-08
Ni-63	9.200E+01	yr	1.2E-06	1.2E-06	1.2E-06	1.1E-06	1.1E-06	1.1E-06	1.0E-06
Se-79	6.496E+04	yr	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.2E-09
Rb-87	4.696E+10	yr	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13
Sr-90	2.912E+01	yr	1.9E-03	1.8E-03	1.7E-03	1.5E-03	1.4E-03	1.3E-03	1.1E-03
Y-90	6.400E+01	h	1.9E-03	1.8E-03	1.7E-03	1.5E-03	1.4E-03	1.3E-03	1.1E-03
Zr-93	1.530E+06	yr	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08	5.3E-08
Nb-93m	1.360E+01	yr	3.2E-08	3.4E-08	3.5E-08	3.9E-08	4.0E-08	4.2E-08	4.4E-08
Nb-94	2.030E+04	yr	8.0E-09	8.0E-09	8.0E-09	8.0E-09	8.0E-09	8.0E-09	8.0E-09
Tc-98	4.199E+06	yr	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15
Tc-99	2.130E+05	yr	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07
Rh-102	1.059E+03	d	1.4E-11	7.6E-12	6.0E-12	1.1E-12	7.0E-13	2.7E-13	6.4E-14
Ru-106	3.682E+02	d	5.1E-09	9.1E-10	4.6E-10	3.7E-12	9.4E-13	6.0E-14	9.7E-16
Rh-106	2.990E+01	s	5.1E-09	9.1E-10	4.6E-10	3.7E-12	9.4E-13	6.0E-14	9.7E-16
Pd-107	6.496E+06	yr	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10
Ag-108	2.370E+00	m	6.4E-17	6.3E-17	6.3E-17	6.0E-17	6.0E-17	5.8E-17	5.7E-17
Ag-108m	1.270E+02	yr	7.2E-16	7.1E-16	7.1E-16	6.8E-16	6.7E-16	6.6E-16	6.4E-16
Ag-109m	3.960E+01	s	6.1E-19	1.7E-19	1.0E-19	1.7E-21			
Cd-109	4.640E+02	d	6.1E-19	1.7E-19	7.9E-20				
Ag-110	2.460E+01	s	4.0E-17	3.2E-18	1.1E-18	9.5E-22	1.3E-22		
Ag-110m	2.499E+02	d	3.0E-15	2.4E-16	8.6E-17	7.2E-20			
Cd-113m	1.459E+01	yr	1.1E-07	9.8E-08	9.4E-08	6.7E-08	6.1E-08	5.0E-08	3.8E-08
In-115	4.997E+14	yr	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19
Sn-119m	2.450E+02	d	3.2E-12	2.4E-13	8.5E-14	6.2E-17	7.8E-18	9.5E-20	
Sn-121m	4.997E+01	yr	7.7E-08	7.4E-08	7.3E-08	6.6E-08	6.5E-08	6.1E-08	5.6E-08
Te-123	1.000E+13	yr	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21
Sb-125	2.770E+00	yr	1.1E-06	5.8E-07	4.5E-07	7.9E-08	4.8E-08	1.8E-08	3.9E-09
Te-125m	5.800E+01	d	2.7E-07	1.4E-07	1.1E-07	1.9E-08	1.2E-08	4.3E-09	9.5E-10
Sn-126	1.000E+05	yr	8.2E-09	8.2E-09	8.2E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09
Sb-126	1.240E+01	d	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09
Sb-126m	1.900E+01	m	8.2E-09	8.2E-09	8.2E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09
I-129	1.570E+07	yr	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10
Cs-134	2.062E+00	yr	7.3E-07	3.2E-07	2.3E-07	2.1E-08	1.1E-08	2.9E-09	3.8E-10
Cs-135	2.300E+06	yr	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08
Cs-137	3.000E+01	yr	1.4E-03	1.4E-03	1.3E-03	1.1E-03	1.1E-03	9.9E-04	8.6E-04
Ba-137m	2.552E+00	m	1.4E-03	1.3E-03	1.3E-03	1.1E-03	1.0E-03	9.4E-04	8.1E-04
La-138	1.350E+11	yr	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18
Ce-142	1.049E+11	yr	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13
Ce-144	2.843E+02	d	1.5E-09	1.6E-10	6.6E-11	1.3E-13	2.2E-14	6.2E-16	3.0E-18
Pr-144	1.728E+01	m	1.5E-09	1.6E-10	6.6E-11	1.3E-13	2.2E-14	6.2E-16	3.0E-18
Pr-144m	7.200E+00	m	1.8E-11	1.9E-12	7.9E-13	1.6E-15	2.6E-16	7.4E-18	3.6E-20
Nd-144	2.099E+15	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Pm-146	5.500E+00	yr	7.4E-10	5.4E-10	4.8E-10	2.0E-10	1.5E-10	9.2E-11	4.3E-11
Sm-146	7.000E+07	yr	3.9E-16	3.9E-16	4.0E-16	4.0E-16	4.1E-16	4.1E-16	4.1E-16
Pm-147	2.623E+00	yr	4.6E-05	2.4E-05	1.8E-05	2.9E-06	1.7E-06	5.9E-07	1.2E-07
Sm-147	1.070E+11	yr	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13
Sm-148	8.001E+15	yr	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19
Sm-149	9.994E+15	yr	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20
Eu-150	3.600E+01	yr	1.0E-13	9.5E-14	9.4E-14	8.2E-14	7.9E-14	7.3E-14	6.5E-14
Sm-151	8.999E+01	yr	2.5E-05	2.4E-05	2.4E-05	2.3E-05	2.2E-05	2.2E-05	2.1E-05
Eu-152	1.360E+01	yr	1.1E-07	9.8E-08	9.3E-08	6.5E-08	5.9E-08	4.8E-08	3.5E-08
Gd-152	1.080E+14	yr	1.9E-20	1.9E-20	1.9E-20	2.0E-20	2.0E-20	2.1E-20	2.1E-20
Gd-153	2.420E+02	d	1.7E-17	1.3E-18	4.6E-19	3.0E-22	3.0E-22	3.0E-22	3.0E-22
Eu-154	8.600E+00	yr	1.5E-05	1.2E-05	1.1E-05	6.3E-06	5.3E-06	3.9E-06	2.4E-06
Eu-155	4.959E+00	yr	5.6E-08	3.9E-08	3.4E-08	1.3E-08	9.8E-09	5.6E-09	2.4E-09
Ho-166m	1.200E+03	yr	9.0E-14	9.0E-14	8.9E-14	8.9E-14	8.9E-14	8.9E-14	8.8E-14
Tm-171	1.920E+00	yr	7.9E-20	4.0E-20	4.0E-20				
Tl-207	4.770E+00	m	1.2E-12	1.3E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Tl-208	3.070E+00	m	3.5E-13	3.2E-13	3.1E-13	2.9E-13	2.8E-13	2.7E-13	2.6E-13
Tl-209	2.200E+00	m	2.7E-18	2.8E-18	2.8E-18	3.3E-18	3.4E-18	3.8E-18	4.4E-18

Appendix E-6
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ROUNDZR1.OUT (Ci/g calcine) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Pb-209	3.300E+00	h	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Pb-210	2.230E+01	yr	3.4E-16	5.8E-16	7.1E-16	2.1E-15	2.7E-15	4.1E-15	7.1E-15
Pb-211	3.610E+01	m	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Pb-212	1.064E+01	h	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Pb-214	2.680E+01	m	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Bi-210m	3.000E+06	yr							
Bi-210	5.012E+00	d	3.4E-16	5.8E-16	7.1E-16	2.1E-15	2.7E-15	4.1E-15	7.1E-15
Bi-211	2.130E+00	m	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Bi-212	6.055E+01	m	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Bi-213	4.565E+01	m	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Bi-214	1.990E+01	m	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Po-210	1.384E+02	d	3.4E-16	5.2E-16	6.3E-16	2.1E-15	2.5E-15	4.1E-15	7.1E-15
Po-211	5.600E-01	s	3.4E-15	3.8E-15	3.9E-15	4.9E-15	5.2E-15	5.6E-15	6.2E-15
Po-212	3.000E-07	s	6.2E-13	5.6E-13	5.5E-13	5.1E-13	5.1E-13	4.9E-13	4.6E-13
Po-213	4.200E-06	s	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.7E-16	2.0E-16
Po-214	1.643E-04	s	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Po-215	1.780E-03	s	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Po-216	1.500E-01	s	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Po-218	3.050E+00	m	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
At-217	3.230E-02	s	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Rn-219	3.960E+00	s	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Rn-220	5.560E+01	s	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Rn-222	3.824E+00	d	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Fr-221	4.800E+00	m	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Fr-223	2.180E+01	m	1.7E-14	1.9E-14	1.9E-14	2.4E-14	2.5E-14	2.8E-14	3.0E-14
Ra-223	1.143E+01	d	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Ra-224	3.660E+00	d	9.7E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Ra-225	1.480E+01	d	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Ra-226	1.600E+03	yr	3.0E-15	4.4E-15	5.0E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Ra-228	6.700E+00	yr	3.6E-18	3.9E-18	4.0E-18	4.4E-18	4.5E-18	4.6E-18	4.7E-18
Ac-225	1.000E+01	d	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Ac-227	2.177E+01	yr	1.2E-12	1.4E-12	1.4E-12	1.8E-12	1.8E-12	2.0E-12	2.2E-12
Ac-228	6.131E+00	h	3.6E-18	3.9E-18	4.0E-18	4.4E-18	4.5E-18	4.6E-18	4.7E-18
Th-227	1.872E+01	d	1.2E-12	1.3E-12	1.4E-12	1.7E-12	1.8E-12	2.0E-12	2.2E-12
Th-228	1.913E+00	yr	9.6E-13	8.8E-13	8.6E-13	8.0E-13	7.9E-13	7.6E-13	7.2E-13
Th-229	7.339E+03	yr	1.2E-16	1.3E-16	1.3E-16	1.5E-16	1.6E-16	1.8E-16	2.1E-16
Th-230	7.700E+04	yr	1.2E-12	1.4E-12	1.5E-12	2.3E-12	2.5E-12	2.9E-12	3.6E-12
Th-231	2.552E+01	h	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11
Th-232	1.405E+10	yr	4.7E-18	4.7E-18	4.7E-18	4.8E-18	4.8E-18	4.9E-18	4.9E-18
Th-234	2.410E+01	d	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-231	3.277E+04	yr	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.1E-12	3.2E-12	3.2E-12
Pa-233	2.700E+01	d	3.7E-10	3.7E-10	3.7E-10	3.8E-10	3.8E-10	3.8E-10	3.8E-10
Pa-234m	1.170E+00	m	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-234	6.700E+00	h	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15
U-232	7.200E+01	yr	8.1E-13	8.2E-13	8.2E-13	7.8E-13	7.7E-13	7.4E-13	7.0E-13
U-233	1.585E+05	yr	2.0E-14	2.4E-14	2.6E-14	3.7E-14	4.1E-14	4.7E-14	5.7E-14
U-234	2.445E+05	yr	1.1E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08	1.2E-08
U-235	7.038E+08	yr	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11
U-236	2.341E+07	yr	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.0E-10
U-237	6.750E+00	d	3.8E-10	3.4E-10	3.2E-10	2.3E-10	2.1E-10	1.7E-10	1.3E-10
U-238	4.468E+09	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
U-240	1.410E+01	h	1.7E-14	2.0E-14	2.2E-14	3.2E-14	3.5E-14	4.1E-14	4.9E-14
Np-236	1.150E+05	yr							
Np-237	2.140E+06	yr	3.7E-10	3.7E-10	3.7E-10	3.8E-10	3.8E-10	3.8E-10	3.8E-10
Np-238	2.117E+00	d	2.4E-15	2.4E-15	2.4E-15	2.3E-15	2.3E-15	2.3E-15	2.2E-15
Np-239	2.355E+00	d	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14
Np-240m	7.400E+00	m	1.7E-14	2.0E-14	2.2E-14	3.2E-14	3.5E-14	4.1E-14	4.9E-14
Pu-236	2.851E+00	yr	1.3E-12	7.2E-13	5.6E-13	1.0E-13	6.3E-14	2.4E-14	5.6E-15
Pu-238	8.774E+01	yr	1.7E-05	1.7E-05	1.7E-05	1.6E-05	1.6E-05	1.5E-05	1.5E-05
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.4E-07
Pu-240	6.537E+03	yr	2.2E-07	2.2E-07	2.2E-07	2.2E-07	2.2E-07	2.2E-07	2.2E-07
Pu-241	1.440E+01	yr	1.5E-05	1.4E-05	1.3E-05	9.3E-06	8.4E-06	7.0E-06	5.2E-06
Pu-242	3.869E+05	yr	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10
Pu-243	4.956E+00	h	1.1E-25	1.3E-25	1.4E-25	2.1E-25	2.3E-25	2.6E-25	3.2E-25
Pu-244	8.261E+07	yr	1.7E-14	2.0E-14	2.2E-14	3.2E-14	3.5E-14	4.1E-14	5.0E-14

Appendix E-6
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ROUNDZR1.OUT (Ci/g calcine) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

Nuclide	Half-Life		1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
Am-241	4.322E+02	yr	1.5E-06	1.5E-06	1.5E-06	1.6E-06	1.7E-06	1.7E-06	1.7E-06
Am-242m	1.520E+02	yr	4.9E-13	4.8E-13	4.8E-13	4.6E-13	4.6E-13	4.5E-13	4.4E-13
Am-242	1.602E+01	h	4.8E-13	4.8E-13	4.8E-13	4.6E-13	4.6E-13	4.5E-13	4.4E-13
Am-243	7.380E+03	yr	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14	2.9E-14
Cm-242	1.632E+02	d	4.0E-13	4.0E-13	3.9E-13	3.8E-13	3.8E-13	3.7E-13	3.6E-13
Cm-243	2.850E+01	yr	1.1E-14	1.0E-14	1.0E-14	8.4E-15	8.0E-15	7.3E-15	6.3E-15
Cm-244	1.811E+01	yr	1.2E-13	1.1E-13	1.1E-13	8.1E-14	7.5E-14	6.5E-14	5.1E-14
Cm-245	8.499E+03	yr	2.4E-18	2.4E-18	2.4E-18	2.4E-18	2.4E-18	2.4E-18	2.4E-18
Cm-246	4.731E+03	yr	5.9E-16	6.8E-16	7.1E-16	8.9E-16	9.4E-16	1.0E-15	1.1E-15
Cm-247	1.560E+07	yr	1.1E-25	1.3E-25	1.4E-25	2.1E-25	2.3E-25	2.6E-25	3.2E-25
Cm-248	3.391E+05	yr	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07
Cf-249	3.505E+02	yr							
Cf-250	1.308E+01	yr	2.6E-13	2.2E-13	2.1E-13	1.5E-13	1.3E-13	1.1E-13	7.8E-14
Cf-251	8.980E+02	yr	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19
Cf-252	2.638E+00	yr							
Ca-45	1.630E+02	d	1.1E-23	1.1E-23	1.1E-23	2.1E-28	2.1E-28	2.1E-28	1.9E-32
V-50	4.000E+16	yr	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23
Mn-54	3.125E+02	d	9.6E-13	1.3E-13	5.7E-14	1.9E-16	3.9E-17	1.5E-18	3.0E-20
Fe-55	2.600E+00	yr	2.3E-07	1.2E-07	9.0E-08	1.4E-08	8.2E-09	2.8E-09	5.7E-10
Lu-176	3.000E+10	yr	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18
Lu-177	6.709E+00	d	2.3E-25	2.2E-25	2.3E-25	2.5E-30	2.4E-30	2.4E-30	1.4E-34
Hf-182	9.000E+06	yr	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Ta-182	1.150E+02	d	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Re-187	5.000E+10	yr	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26

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zr_run1.g
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	g/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
HE 3	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19
B 10	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19
B 11	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10
C 12	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06
C 13	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08
N 14	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06
N 15	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08
O 16	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04
O 17	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07
O 18	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06
F 19	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14
NE 20	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19
NE 21	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19
NE 22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22
MG 24	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12
MG 25	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17
MG 26	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21
AL 27	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06
SI 28	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10
SI 29	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15
SI 30	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19
P 31	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25
CL 37	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24
AR 40	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19
K 41	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21
CA 42	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23
CA 43	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13
CA 44	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13
CA 45	3.549E-20	6.181E-28	6.181E-28	6.181E-28	1.170E-32	1.170E-32	1.170E-32	1.047E-36
CA 46	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14
SC 45	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14
SC 46	2.365E-23	1.925E-38	1.012E-41	1.012E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TI 46	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07
TI 47	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07
TI 48	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06
TI 49	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07
TI 50	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07
V 50	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10
V 51	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08
CR 50	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05
CR 52	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04
CR 53	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05
CR 54	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05
MN 54	1.385E-12	1.245E-16	1.643E-17	7.308E-18	2.517E-20	4.985E-21	1.979E-22	3.845E-24
MN 55	1.763E-08	1.950E-08	1.955E-08	1.956E-08	1.959E-08	1.959E-08	1.959E-08	1.959E-08
FE 54	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05
FE 55	1.962E-09	9.146E-11	4.696E-11	3.597E-11	5.566E-12	3.266E-12	1.124E-12	2.271E-13
FE 56	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04
FE 57	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05
FE 58	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06
CO 58	6.689E-22	9.117E-40	8.128E-44	8.128E-44	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CO 59	1.410E-09	1.423E-09	1.426E-09	1.427E-09	1.435E-09	1.437E-09	1.441E-09	1.448E-09
CO 60	2.000E-09	4.407E-10	3.172E-10	2.781E-10	1.107E-10	8.512E-11	5.030E-11	2.285E-11
NI 58	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04
NI 59	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07	1.290E-07
NI 60	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05
NI 61	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06
NI 62	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06
NI 63	2.159E-08	1.980E-08	1.943E-08	1.928E-08	1.829E-08	1.802E-08	1.748E-08	1.671E-08
NI 64	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06
CU 63	1.427E-09	3.219E-09	3.588E-09	3.734E-09	4.725E-09	4.998E-09	5.533E-09	6.306E-09
CU 65	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10
ZN 64	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14
ZN 65	1.139E-22	7.440E-28	7.440E-28	7.440E-28	5.194E-31	5.194E-31	5.194E-31	5.194E-31
MO 94	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11
RU 98	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25

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zr_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	g/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
IN113	0.000E+00	7.219E-16	7.219E-16	7.219E-16	7.219E-16	7.219E-16	7.219E-16	7.219E-16
IN113M	4.333E-19	4.484E-30	4.481E-30	4.481E-30	9.226E-37	9.218E-37	1.393E-40	0.000E+00
SN112	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05
SN113	7.215E-16	7.466E-27	7.466E-27	7.466E-27	1.536E-33	1.536E-33	2.320E-37	4.750E-43
YB173	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18
YB174	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20
LU175	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08
LU176	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11
LU177	3.062E-22	2.129E-30	2.038E-30	2.055E-30	2.305E-35	2.199E-35	2.199E-35	1.278E-39
LU177M	3.075E-20	2.139E-28	2.139E-28	2.139E-28	2.315E-33	2.315E-33	2.315E-33	1.284E-37
HF174	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07
HF175	9.522E-22	8.227E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
HF176	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06
HF177	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05
HF178	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05
HF179	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05
HF180	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05
HF182	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10
TA181	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06
TA182	1.129E-15	5.220E-18	5.220E-18	5.220E-18	5.220E-18	5.220E-18	5.220E-18	5.220E-18
W182	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07
W183	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08
W184	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10
W185	1.255E-25	1.815E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
W186	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17
RE185	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13
RE187	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19
OS186	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16
OS188	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21
OS189	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24
HE 4	0.000E+00	1.794E-09	2.168E-09	2.316E-09	3.329E-09	3.610E-09	4.162E-09	4.965E-09
TL207	1.870E-21	6.304E-21	7.086E-21	7.381E-21	9.190E-21	9.646E-21	1.047E-20	1.153E-20
TL208	1.660E-20	1.178E-21	1.073E-21	1.052E-21	9.754E-22	9.614E-22	9.273E-22	8.766E-22
TL209	0.000E+00	6.518E-27	6.790E-27	6.914E-27	8.012E-27	8.401E-27	9.278E-27	1.084E-26
PB206	0.000E+00	3.995E-19	8.100E-19	1.043E-18	4.618E-18	6.433E-18	1.167E-17	2.475E-17
PB207	0.000E+00	3.685E-15	4.966E-15	5.519E-15	9.973E-15	1.141E-14	1.450E-14	1.956E-14
PB208	0.000E+00	1.703E-14	1.795E-14	1.831E-14	2.064E-14	2.128E-14	2.253E-14	2.432E-14
PB209	0.000E+00	2.716E-23	2.829E-23	2.881E-23	3.338E-23	3.500E-23	3.866E-23	4.517E-23
PB210	3.590E-20	4.387E-18	7.637E-18	9.283E-18	2.747E-17	3.512E-17	5.421E-17	9.336E-17
PB211	0.000E+00	4.877E-20	5.482E-20	5.710E-20	7.109E-20	7.462E-20	8.097E-20	8.916E-20
PB212	9.850E-18	6.949E-19	6.327E-19	6.206E-19	5.753E-19	5.671E-19	5.469E-19	5.171E-19
PB214	0.000E+00	9.056E-23	1.335E-22	1.531E-22	3.288E-22	3.916E-22	5.343E-22	7.915E-22
BI209	0.000E+00	5.408E-19	6.683E-19	7.208E-19	1.119E-18	1.245E-18	1.516E-18	1.977E-18
BI210	0.000E+00	2.700E-21	4.701E-21	5.715E-21	1.690E-20	2.162E-20	3.337E-20	5.746E-20
BI211	0.000E+00	2.878E-21	3.235E-21	3.369E-21	4.195E-21	4.403E-21	4.778E-21	5.261E-21
BI212	9.340E-19	6.592E-20	6.002E-20	5.886E-20	5.457E-20	5.379E-20	5.188E-20	4.905E-20
BI213	0.000E+00	6.382E-24	6.648E-24	6.769E-24	7.844E-24	8.224E-24	9.083E-24	1.061E-23
BI214	0.000E+00	6.724E-23	9.912E-23	1.136E-22	2.441E-22	2.908E-22	3.967E-22	5.877E-22
PO210	5.070E-22	7.456E-20	1.158E-19	1.409E-19	4.669E-19	5.563E-19	9.221E-19	1.587E-18
PO211	0.000E+00	3.531E-26	3.969E-26	4.134E-26	5.147E-26	5.402E-26	5.862E-26	6.454E-26
PO212	0.000E+00	3.487E-30	3.175E-30	3.114E-30	2.887E-30	2.846E-30	2.745E-30	2.595E-30
PO213	0.000E+00	9.574E-33	9.974E-33	1.016E-32	1.177E-32	1.234E-32	1.363E-32	1.592E-32
PO214	0.000E+00	9.251E-30	1.364E-29	1.564E-29	3.359E-29	4.000E-29	5.458E-29	8.086E-29
PO215	0.000E+00	4.084E-26	4.590E-26	4.781E-26	5.953E-26	6.249E-26	6.780E-26	7.466E-26
PO216	0.000E+00	2.773E-24	2.525E-24	2.476E-24	2.296E-24	2.263E-24	2.182E-24	2.063E-24
PO218	0.000E+00	1.050E-23	1.548E-23	1.775E-23	3.812E-23	4.541E-23	6.195E-23	9.178E-23
AT217	0.000E+00	7.667E-29	7.987E-29	8.133E-29	9.424E-29	9.881E-29	1.091E-28	1.275E-28
RN219	0.000E+00	9.255E-23	1.040E-22	1.084E-22	1.349E-22	1.416E-22	1.536E-22	1.692E-22
RN220	1.480E-20	1.047E-21	9.532E-22	9.348E-22	8.667E-22	8.543E-22	8.239E-22	7.790E-22
RN222	0.000E+00	1.931E-20	2.846E-20	3.263E-20	7.009E-20	8.349E-20	1.139E-19	1.687E-19
FR221	0.000E+00	6.962E-25	7.253E-25	7.385E-25	8.558E-25	8.973E-25	9.909E-25	1.158E-24
FR223	0.000E+00	4.293E-22	4.819E-22	5.018E-22	6.252E-22	6.559E-22	7.118E-22	7.839E-22
RA223	0.000E+00	2.351E-17	2.643E-17	2.752E-17	3.427E-17	3.597E-17	3.903E-17	4.298E-17
RA224	8.500E-17	6.062E-18	5.519E-18	5.413E-18	5.019E-18	4.947E-18	4.771E-18	4.511E-18
RA225	2.860E-21	3.148E-21	3.279E-21	3.339E-21	3.869E-21	4.057E-21	4.480E-21	5.236E-21

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zr_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	g/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
RA226	3.220E-17	3.004E-15	4.427E-15	5.076E-15	1.090E-14	1.299E-14	1.772E-14	2.625E-14
RA228	5.640E-21	1.554E-20	1.657E-20	1.694E-20	1.871E-20	1.905E-20	1.959E-20	2.020E-20
AC225	1.930E-21	2.126E-21	2.215E-21	2.256E-21	2.614E-21	2.740E-21	3.027E-21	3.537E-21
AC227	4.930E-15	1.664E-14	1.867E-14	1.944E-14	2.423E-14	2.541E-14	2.758E-14	3.038E-14
AC228	0.000E+00	1.622E-24	1.730E-24	1.769E-24	1.953E-24	1.989E-24	2.045E-24	2.109E-24
TH227	0.000E+00	3.863E-17	4.342E-17	4.523E-17	5.631E-17	5.911E-17	6.414E-17	7.062E-17
TH228	1.660E-14	1.177E-15	1.070E-15	1.048E-15	9.749E-16	9.588E-16	9.260E-16	8.760E-16
TH229	5.270E-16	5.801E-16	6.043E-16	6.154E-16	7.131E-16	7.477E-16	8.257E-16	9.649E-16
TH230	8.670E-13	5.816E-11	7.101E-11	7.619E-11	1.130E-10	1.237E-10	1.454E-10	1.784E-10
TH231	2.700E-14	1.431E-16	1.431E-16	1.431E-16	1.431E-16	1.431E-16	1.431E-16	1.431E-16
TH232	4.180E-11	4.283E-11	4.305E-11	4.314E-11	4.377E-11	4.395E-11	4.430E-11	4.484E-11
TH234	9.470E-16	1.611E-16	1.611E-16	1.612E-16	1.611E-16	1.611E-16	1.611E-16	1.611E-16
PA231	6.580E-11	6.620E-11	6.628E-11	6.632E-11	6.655E-11	6.661E-11	6.674E-11	6.694E-11
PA233	5.460E-14	1.789E-14	1.795E-14	1.798E-14	1.815E-14	1.820E-14	1.830E-14	1.846E-14
PA234M	3.190E-20	5.434E-21	5.434E-21	5.434E-21	5.434E-21	5.434E-21	5.434E-21	5.434E-21
PA234	1.430E-20	2.427E-21	2.427E-21	2.427E-21	2.427E-21	2.427E-21	2.427E-21	2.427E-21
U232	3.680E-15	3.804E-14	3.824E-14	3.816E-14	3.649E-14	3.586E-14	3.458E-14	3.267E-14
U233	8.530E-14	2.038E-12	2.476E-12	2.663E-12	3.848E-12	4.207E-12	4.891E-12	5.925E-12
U234	1.740E-06	1.835E-06	1.854E-06	1.862E-06	1.914E-06	1.928E-06	1.956E-06	1.997E-06
U235	3.520E-05	3.520E-05	3.520E-05	3.520E-05	3.520E-05	3.520E-05	3.520E-05	3.520E-05
U236	3.070E-06	3.071E-06	3.071E-06	3.072E-06	3.072E-06	3.072E-06	3.073E-06	3.073E-06
U237	0.000E+00	4.628E-15	4.103E-15	3.910E-15	2.792E-15	2.535E-15	2.091E-15	1.567E-15
U238	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05
U240	0.000E+00	1.806E-20	2.199E-20	2.356E-20	3.455E-20	3.769E-20	4.397E-20	5.340E-20
NP237	5.200E-07	5.268E-07	5.285E-07	5.292E-07	5.343E-07	5.358E-07	5.389E-07	5.436E-07
NP238	0.000E+00	9.358E-21	9.252E-21	9.210E-21	8.921E-21	8.840E-21	8.680E-21	8.446E-21
NP239	1.260E-19	1.253E-19	1.253E-19	1.253E-19	1.252E-19	1.252E-19	1.251E-19	1.251E-19
NP240M	0.000E+00	1.580E-22	1.923E-22	2.061E-22	3.022E-22	3.297E-22	3.846E-22	4.671E-22
PU236	4.070E-14	2.485E-15	1.353E-15	1.061E-15	1.935E-16	1.190E-16	4.499E-17	1.046E-17
PU238	1.110E-06	1.014E-06	9.938E-07	9.860E-07	9.329E-07	9.183E-07	8.897E-07	8.485E-07
PU239	3.890E-06	3.889E-06	3.888E-06	3.888E-06	3.888E-06	3.887E-06	3.887E-06	3.886E-06
PU240	9.800E-07	9.788E-07	9.785E-07	9.784E-07	9.777E-07	9.775E-07	9.771E-07	9.765E-07
PU241	2.600E-07	1.495E-07	1.325E-07	1.263E-07	9.016E-08	8.189E-08	6.755E-08	5.060E-08
PU242	1.300E-07	1.300E-07	1.300E-07	1.300E-07	1.300E-07	1.300E-07	1.300E-07	1.300E-07
PU243	0.000E+00	4.204E-32	5.110E-32	5.471E-32	8.001E-32	8.720E-32	1.015E-31	1.230E-31
PU244	4.850E-18	9.443E-10	1.150E-09	1.232E-09	1.806E-09	1.971E-09	2.299E-09	2.792E-09
AM241	3.200E-07	4.236E-07	4.388E-07	4.443E-07	4.753E-07	4.820E-07	4.932E-07	5.054E-07
AM242M	5.260E-14	4.991E-14	4.935E-14	4.912E-14	4.758E-14	4.715E-14	4.630E-14	4.505E-14
AM242	6.290E-19	5.971E-19	5.903E-19	5.876E-19	5.691E-19	5.640E-19	5.538E-19	5.388E-19
AM243	1.460E-13	1.458E-13	1.458E-13	1.458E-13	1.457E-13	1.457E-13	1.456E-13	1.455E-13
CM242	1.280E-16	1.207E-16	1.196E-16	1.190E-16	1.151E-16	1.142E-16	1.122E-16	1.090E-16
CM243	2.790E-16	2.109E-16	1.985E-16	1.937E-16	1.634E-16	1.556E-16	1.412E-16	1.220E-16
CM244	2.330E-15	1.500E-15	1.363E-15	1.312E-15	1.004E-15	9.299E-16	7.979E-16	6.341E-16
CM245	1.410E-17	1.409E-17	1.408E-17	1.408E-17	1.407E-17	1.407E-17	1.407E-17	1.406E-17
CM246	1.220E-19	1.932E-15	2.217E-15	2.321E-15	2.911E-15	3.043E-15	3.268E-15	3.527E-15
CM247	0.000E+00	1.179E-21	1.433E-21	1.535E-21	2.244E-21	2.446E-21	2.848E-21	3.450E-21
CM248	4.450E-05	4.450E-05	4.450E-05	4.450E-05	4.450E-05	4.450E-05	4.450E-05	4.450E-05
CF250	4.310E-15	2.343E-15	2.053E-15	1.947E-15	1.343E-15	1.208E-15	9.775E-16	7.113E-16
CF251	1.350E-19	1.338E-19	1.335E-19	1.334E-19	1.327E-19	1.325E-19	1.321E-19	1.315E-19
SF250	0.000E+00	8.785E-11	1.069E-10	1.146E-10	1.681E-10	1.833E-10	2.139E-10	2.597E-10
H 3	6.459E-10	3.387E-10	2.944E-10	2.783E-10	1.879E-10	1.679E-10	1.342E-10	9.579E-11
LI 6	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12
LI 7	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13
BE 9	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12
BE 10	2.913E-12	2.913E-12	2.913E-12	2.913E-12	2.913E-12	2.913E-12	2.913E-12	2.913E-12
C 14	3.505E-09	3.500E-09	3.499E-09	3.499E-09	3.496E-09	3.495E-09	3.493E-09	3.491E-09
ZN 66	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13
ZN 67	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17
ZN 68	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12
GA 69	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15
ZN 70	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11
GE 70	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18
GA 71	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14
GE 72	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10
GE 73	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10

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zr_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	g/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
GE 74	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09
AS 75	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09
GE 76	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08
SE 76	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12
SE 77	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08
SE 78	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08
SE 79	1.320E-07	1.320E-07	1.320E-07	1.320E-07	1.320E-07	1.320E-07	1.320E-07	1.320E-07
BR 79	1.198E-11	2.818E-11	3.170E-11	3.311E-11	4.296E-11	4.578E-11	5.141E-11	5.986E-11
SE 80	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07
KR 80	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12
BR 81	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07
KR 81	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14
SE 82	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07
KR 82	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09
KR 83	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06
KR 84	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06
KR 85	4.192E-07	1.993E-07	1.695E-07	1.589E-07	1.011E-07	8.881E-08	6.857E-08	4.652E-08
RB 85	2.998E-06	3.218E-06	3.248E-06	3.258E-06	3.316E-06	3.328E-06	3.349E-06	3.371E-06
KR 86	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06
SR 86	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09
RB 87	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06
SR 87	4.930E-11	4.930E-11	4.930E-11	4.930E-11	4.930E-11	4.930E-11	4.930E-11	4.930E-11
SR 88	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05
Y 89	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05
SR 90	1.820E-05	1.384E-05	1.304E-05	1.274E-05	1.078E-05	1.028E-05	9.346E-06	8.102E-06
Y 90	3.330E-09	3.471E-09	3.271E-09	3.194E-09	2.704E-09	2.578E-09	2.344E-09	2.032E-09
ZR 90	2.376E-02	2.376E-02	2.377E-02	2.377E-02	2.377E-02	2.377E-02	2.377E-02	2.377E-02
Y 91	3.545E-21	8.926E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ZR 91	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03
ZR 92	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03
ZR 93	2.089E-05	2.089E-05	2.089E-05	2.089E-05	2.089E-05	2.089E-05	2.089E-05	2.089E-05
NB 93	4.703E-05	4.703E-05	4.703E-05	4.703E-05	4.703E-05	4.703E-05	4.703E-05	4.703E-05
NB 93M	6.200E-11	1.127E-10	1.204E-10	1.231E-10	1.391E-10	1.427E-10	1.490E-10	1.562E-10
ZR 94	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03
NB 94	4.287E-08	4.285E-08	4.285E-08	4.285E-08	4.284E-08	4.283E-08	4.283E-08	4.282E-08
ZR 95	8.655E-20	1.495E-39	1.331E-43	1.331E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95	1.094E-19	1.824E-39	1.331E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
NB 95M	3.620E-23	6.656E-43	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 95	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05
ZR 96	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03
MO 96	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08
MO 97	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05
MO 98	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05
TC 98	8.835E-12	8.835E-12	8.835E-12	8.835E-12	8.835E-12	8.835E-12	8.835E-12	8.835E-12
TC 99	1.855E-05	1.855E-05	1.855E-05	1.855E-05	1.855E-05	1.855E-05	1.855E-05	1.855E-05
RU 99	5.127E-10	1.207E-09	1.358E-09	1.418E-09	1.841E-09	1.961E-09	2.203E-09	2.565E-09
MO100	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05
RU100	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07
RU101	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05
RU102	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05
RH102	1.786E-13	1.143E-14	6.290E-15	4.953E-15	9.294E-16	5.762E-16	2.215E-16	5.279E-17
RH103	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06
RU104	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06
PD104	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07
PD105	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06
RU106	4.117E-09	1.514E-12	2.714E-13	1.364E-13	1.108E-15	2.800E-16	1.789E-17	2.889E-19
RH106	3.870E-15	1.423E-18	2.551E-19	1.283E-19	1.041E-21	2.632E-22	1.682E-23	2.716E-25
PD106	1.468E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06
PD107	6.496E-07	6.496E-07	6.496E-07	6.496E-07	6.496E-07	6.496E-07	6.496E-07	6.496E-07
AG107	5.890E-13	1.386E-12	1.559E-12	1.629E-12	2.114E-12	2.253E-12	2.530E-12	2.946E-12
PD108	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07
AG108	0.000E+00	8.710E-26	8.592E-26	8.545E-26	8.225E-26	8.135E-26	7.960E-26	7.703E-26
AG108M	2.937E-17	2.758E-17	2.721E-17	2.706E-17	2.605E-17	2.576E-17	2.521E-17	2.440E-17
CD108	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14
AG109	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07
AG109M	1.196E-25	2.325E-28	6.686E-29	3.874E-29	6.666E-31	0.000E+00	0.000E+00	0.000E+00

Appendix E-7
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zr_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	g/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
CD109	1.210E-19	2.354E-22	6.768E-23	3.075E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD110	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07
AG110	1.093E-21	9.519E-27	7.561E-28	2.747E-28	2.284E-31	3.011E-32	0.000E+00	0.000E+00
AG110M	7.214E-14	6.282E-19	4.989E-20	1.812E-20	1.507E-23	0.000E+00	0.000E+00	0.000E+00
CD110	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09
CD111	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08
CD112	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08
CD113	7.215E-09	7.215E-09	7.215E-09	7.215E-09	7.216E-09	7.216E-09	7.216E-09	7.216E-09
CD113M	8.797E-10	5.094E-10	4.523E-10	4.313E-10	3.093E-10	2.813E-10	2.326E-10	1.749E-10
IN113	1.097E-07	1.101E-07	1.101E-07	1.101E-07	1.103E-07	1.103E-07	1.103E-07	1.104E-07
CD114	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07
SN114	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05
IN115	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08
SN115	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05
CD116	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08
SN116	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03
SN117	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04
SN118	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03
SN119	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04
SN119M	1.023E-10	7.069E-16	5.340E-17	1.900E-17	1.373E-20	1.734E-21	2.121E-23	0.000E+00
SN120	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03
SN121M	1.522E-09	1.298E-09	1.253E-09	1.236E-09	1.122E-09	1.091E-09	1.032E-09	9.497E-10
SB121	3.822E-07	3.824E-07	3.825E-07	3.825E-07	3.826E-07	3.826E-07	3.827E-07	3.828E-07
SN122	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08
TE122	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09
SN123	1.494E-15	2.427E-25	2.427E-25	2.427E-25	2.670E-31	2.670E-31	1.051E-34	8.206E-40
SB123	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08
TE123	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12
TE123M	3.909E-20	1.063E-30	1.063E-30	1.063E-30	3.939E-37	3.939E-37	8.325E-41	0.000E+00
SN124	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07
TE124	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10
SB125	1.875E-08	1.055E-09	5.642E-10	4.393E-10	7.621E-11	4.620E-11	1.698E-11	3.783E-12
TE125	1.375E-07	1.554E-07	1.559E-07	1.561E-07	1.564E-07	1.565E-07	1.565E-07	1.565E-07
TE125M	2.623E-10	1.475E-11	7.893E-12	6.145E-12	1.066E-12	6.464E-13	2.375E-13	5.292E-14
SN126	2.872E-07	2.872E-07	2.872E-07	2.872E-07	2.872E-07	2.872E-07	2.871E-07	2.871E-07
SB126	1.364E-14	1.364E-14	1.364E-14	1.364E-14	1.364E-14	1.364E-14	1.364E-14	1.364E-14
SB126M	1.037E-16	1.037E-16	1.037E-16	1.037E-16	1.037E-16	1.037E-16	1.037E-16	1.037E-16
TE126	5.945E-09	5.968E-09	5.973E-09	5.975E-09	5.989E-09	5.993E-09	6.001E-09	6.013E-09
TE127	1.054E-18	2.649E-30	2.639E-30	2.640E-30	2.303E-37	2.333E-37	2.118E-41	0.000E+00
TE127M	3.011E-16	7.566E-28	7.566E-28	7.566E-28	6.577E-35	6.577E-35	6.072E-39	0.000E+00
I127	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07
TE128	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06
XE128	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09
I129	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06
XE129	3.694E-12	5.164E-12	5.484E-12	5.611E-12	6.506E-12	6.762E-12	7.273E-12	8.040E-12
TE130	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06
XE130	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08
XE131	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05
XE132	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05
BA132	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12
CS133	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05
XE134	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05
CS134	2.700E-08	5.655E-10	2.440E-10	1.744E-10	1.658E-11	8.463E-12	2.206E-12	2.935E-13
BA134	3.324E-07	3.588E-07	3.592E-07	3.592E-07	3.594E-07	3.594E-07	3.594E-07	3.594E-07
CS135	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.611E-05
BA135	6.250E-11	1.183E-10	1.305E-10	1.353E-10	1.693E-10	1.790E-10	1.984E-10	2.276E-10
XE136	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05
BA136	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08
CS137	2.170E-05	1.664E-05	1.570E-05	1.534E-05	1.305E-05	1.246E-05	1.136E-05	9.892E-06
BA137	4.716E-06	9.780E-06	1.071E-05	1.107E-05	1.336E-05	1.395E-05	1.505E-05	1.652E-05
BA137M	3.323E-12	2.545E-12	2.402E-12	2.347E-12	1.997E-12	1.907E-12	1.738E-12	1.513E-12
BA138	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05
LA138	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10
LA139	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05
CE140	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05
PR141	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05

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zr_run1.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

	g/g	11.5YR	14.0YR	15.0YR	22.0YR	24.0YR	28.0YR	34.0YR
CE142	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05
ND142	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08
ND143	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05
CE144	1.310E-08	4.667E-13	5.036E-14	2.067E-14	4.053E-17	6.827E-18	1.936E-19	9.310E-22
PR144	5.529E-13	1.971E-17	2.126E-18	8.727E-19	1.711E-21	2.883E-22	8.177E-24	3.931E-26
PR144M	2.764E-15	9.852E-20	1.063E-20	4.362E-21	8.556E-24	1.441E-24	4.087E-26	1.965E-28
ND144	2.534E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05
ND145	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05
ND146	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05
PM146	7.072E-12	1.660E-12	1.211E-12	1.068E-12	4.420E-13	3.435E-13	2.075E-13	9.742E-14
SM146	9.099E-12	1.110E-11	1.127E-11	1.132E-11	1.155E-11	1.159E-11	1.164E-11	1.168E-11
PM147	1.037E-06	4.968E-08	2.567E-08	1.971E-08	3.100E-09	1.828E-09	6.352E-10	1.301E-10
SM147	8.639E-06	9.626E-06	9.650E-06	9.656E-06	9.673E-06	9.674E-06	9.675E-06	9.676E-06
ND148	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06
SM148	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07
SM149	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07
ND150	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06
SM150	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06
EU150	1.886E-15	1.511E-15	1.440E-15	1.413E-15	1.235E-15	1.188E-15	1.100E-15	9.800E-16
SM151	1.028E-06	9.409E-07	9.229E-07	9.158E-07	8.678E-07	8.545E-07	8.286E-07	7.912E-07
EU151	6.803E-08	1.552E-07	1.731E-07	1.802E-07	2.283E-07	2.415E-07	2.675E-07	3.049E-07
SM152	2.144E-06	2.144E-06	2.144E-06	2.144E-06	2.145E-06	2.145E-06	2.145E-06	2.145E-06
EU152	1.156E-09	6.433E-10	5.664E-10	5.382E-10	3.767E-10	3.402E-10	2.775E-10	2.044E-10
GD152	7.092E-10	8.520E-10	8.735E-10	8.813E-10	9.263E-10	9.365E-10	9.540E-10	9.743E-10
EU153	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07
GD153	8.217E-16	4.898E-21	3.622E-22	1.305E-22	8.616E-26	8.616E-26	8.616E-26	8.616E-26
SM154	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07
EU154	1.370E-07	5.422E-08	4.433E-08	4.090E-08	2.326E-08	1.980E-08	1.434E-08	8.843E-09
GD154	2.433E-08	1.071E-07	1.170E-07	1.204E-07	1.381E-07	1.415E-07	1.470E-07	1.525E-07
EU155	6.000E-10	1.202E-10	8.479E-11	7.373E-11	2.772E-11	2.096E-11	1.198E-11	5.180E-12
GD155	8.315E-08	8.363E-08	8.367E-08	8.368E-08	8.372E-08	8.373E-08	8.374E-08	8.374E-08
GD156	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07
GD157	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09
GD158	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08
TB159	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09
GD160	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09
TB160	3.099E-23	1.007E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
DY160	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10
DY161	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10
DY162	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10
DY163	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10
DY164	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11
HO165	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11
HO166M	5.026E-14	4.993E-14	4.986E-14	4.983E-14	4.963E-14	4.957E-14	4.945E-14	4.928E-14
ER166	1.169E-11	1.169E-11	1.169E-11	1.169E-11	1.169E-11	1.169E-11	1.169E-11	1.169E-11
ER167	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12
ER168	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13
TM169	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16
ER170	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20
TM170	1.449E-24	2.127E-34	2.127E-34	2.127E-34	2.199E-40	2.199E-40	0.000E+00	0.000E+00
YB170	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17
TM171	4.325E-21	7.298E-23	3.683E-23	3.683E-23	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB171	8.994E-20	9.419E-20	9.423E-20	9.423E-20	9.427E-20	9.427E-20	9.427E-20	9.427E-20
YB172	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17

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Source Listing of Program ELEZR1

```
      PROGRAM ELEZR1

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/18/02

!            To sum the g/L of coprocess waste and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='ZR_RUN1.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='ZR_RUN1.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'ZR_RUN1.ELE     g/g Zr calcine')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Source Listing of Program ELEZR1 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'1999Jul   2002Jan   2003Jan   2010' &
            'Jan   2012Jan   2016Jan   2022Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J)
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999
```

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Source Listing of Program ELEZR1 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELEZR1
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

Appendix E-8
Page 4 of 5

ZR_RUN1.ELE g/g Zr calcine
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
H	3.4E-10	2.9E-10	2.8E-10	1.9E-10	1.7E-10	1.3E-10	9.6E-11
He	1.8E-09	2.2E-09	2.3E-09	3.3E-09	3.6E-09	4.2E-09	5.0E-09
Li	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12
Be	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12
B	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10
C	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
N	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06
O	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04
F	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14
Ne	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19
Mg	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12
Si	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10
P	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25
Cl	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24
Ar	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19
K	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21
Ca	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12
Sc	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14
Ti	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
V	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08
Mn	1.9E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Fe	9.1E-11	4.7E-11	3.6E-11	5.6E-12	3.3E-12	1.1E-12	2.3E-13
Co	1.9E-09	1.7E-09	1.7E-09	1.5E-09	1.5E-09	1.5E-09	1.5E-09
Ni	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07
Cu	3.9E-09	4.2E-09	4.4E-09	5.4E-09	5.7E-09	6.2E-09	7.0E-09
Zn	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11
Ga	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Ge	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
As	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09
Se	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06
Br	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.4E-07
Kr	9.8E-06	9.8E-06	9.8E-06	9.7E-06	9.7E-06	9.7E-06	9.7E-06
Rb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Sr	2.4E-05	2.3E-05	2.3E-05	2.1E-05	2.0E-05	2.0E-05	1.8E-05
Y	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
Zr	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Nb	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05
Mo	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05
Tc	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
Ru	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05
Rh	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06
Pd	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06
Ag	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07
Cd	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07
In	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Sn	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07
Sb	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07
Te	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06
I	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Xe	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04
Cs	6.1E-05	6.0E-05	5.9E-05	5.7E-05	5.7E-05	5.5E-05	5.4E-05
Ba	4.0E-05	4.1E-05	4.1E-05	4.3E-05	4.4E-05	4.5E-05	4.7E-05

Appendix E-8
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ZR_RUN1.ELE g/g Zr calcine (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:35

Element	1999Jul	2002Jan	2003Jan	2010Jan	2012Jan	2016Jan	2022Jan
La	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05
Ce	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05
Pr	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Nd	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Pm	5.0E-08	2.6E-08	2.0E-08	3.1E-09	1.8E-09	6.4E-10	1.3E-10
Sm	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.9E-05
Eu	1.1E-06	1.1E-06	1.1E-06	1.2E-06	1.2E-06	1.2E-06	1.2E-06
Gd	3.9E-07	4.0E-07	4.0E-07	4.2E-07	4.2E-07	4.3E-07	4.3E-07
Tb	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Dy	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Ho	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11
Er	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11
Tm	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16
Yb	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17
Lu	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
Hf	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Ta	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
W	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Re	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13
Os	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16
Tl	7.5E-21	8.2E-21	8.4E-21	1.0E-20	1.1E-20	1.1E-20	1.2E-20
Pb	2.1E-14	2.3E-14	2.4E-14	3.1E-14	3.3E-14	3.7E-14	4.4E-14
Bi	6.1E-19	7.4E-19	7.9E-19	1.2E-18	1.3E-18	1.6E-18	2.1E-18
Po	7.5E-20	1.2E-19	1.4E-19	4.7E-19	5.6E-19	9.2E-19	1.6E-18
At	7.7E-29	8.0E-29	8.1E-29	9.4E-29	9.9E-29	1.1E-28	1.3E-28
Rn	2.0E-20	3.0E-20	3.4E-20	7.1E-20	8.4E-20	1.1E-19	1.7E-19
Fr	4.3E-22	4.8E-22	5.0E-22	6.3E-22	6.6E-22	7.1E-22	7.9E-22
Ra	3.0E-15	4.5E-15	5.1E-15	1.1E-14	1.3E-14	1.8E-14	2.6E-14
Ac	1.7E-14	1.9E-14	1.9E-14	2.4E-14	2.5E-14	2.8E-14	3.0E-14
Th	1.0E-10	1.1E-10	1.2E-10	1.6E-10	1.7E-10	1.9E-10	2.2E-10
Pa	6.6E-11	6.6E-11	6.6E-11	6.7E-11	6.7E-11	6.7E-11	6.7E-11
U	5.1E-05	5.1E-05	5.1E-05	5.1E-05	5.1E-05	5.1E-05	5.1E-05
Np	5.3E-07	5.3E-07	5.3E-07	5.3E-07	5.4E-07	5.4E-07	5.4E-07
Pu	6.2E-06	6.1E-06	6.1E-06	6.0E-06	6.0E-06	6.0E-06	5.9E-06
Am	4.2E-07	4.4E-07	4.4E-07	4.8E-07	4.8E-07	4.9E-07	5.1E-07
Cm	4.5E-05	4.5E-05	4.5E-05	4.5E-05	4.5E-05	4.5E-05	4.5E-05
Cf	2.3E-15	2.1E-15	1.9E-15	1.3E-15	1.2E-15	9.8E-16	7.1E-16
Total	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**

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File ZR_RUN2.INP

```
-1
-1
-1
  RDA     ORIGEN2, VERSION 2.1 (8-1-91) GENERIC FUEL
  BAS     PWRU FUEL
  RDA     -1 = 1 G CALCINE
  RDA     WARNING:  VECTORS ARE OFTEN CHANGED WITH RESPECT TO THEIR CONTENT.
  RDA               THESE CHANGES WILL BE NOTED ON RDA CARDS.
  CUT     -1
  LIP     0 0 0
  LIB     0  1 2 3  601  602  603   9   3   0  1   38
  TIT     INITIAL COMPOSITIONS OF UNIT AMOUNTS OF FUEL AND STRUCT MAT'LS
  RDA     READ FUEL COMPOSITION INCLUDING IMPURITIES
  INP     -1   1  -1  -1  1  1
  TIT     IRRADIATION OF GENERIC FUEL
  MOV     -1   1   0   1.0
  HED      1                                                  Ci/g
  OPTL    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTA    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  OPTF    8 8 8 8 5   8 5 8 8 8   8 8 8 8 8   8 8 8 8 8   8 8 8 8
  DEC     44.0    1   2   5   0
  DEC     54.0    2   3   5   0
  DEC    128.0    3   4   5   0
  DEC    412.0    4   5   5   0
  DEC   1028.0    5   6   5   0
  DEC   1122.0    6   7   5   0
  DEC  10012.0    7   8   5   0
  OUT      -8    1     -1    0
  OUT       8    1     -1    0
  END
  1   10011 1.864E-09  10012 1.163E-13  20030 7.952E-19 0 0.
  1   50100 4.538E-19  50110 4.137E-10  60120 6.992E-06 0 0.
  1   60130 8.035E-08  70140 9.394E-06  70150 3.508E-08 0 0.
  1   80160 5.638E-04  80170 2.260E-07  80180 1.130E-06 0 0.
  1   90190 7.983E-14 100200 1.031E-19 100210 8.035E-19 0 0.
  1  100220 2.378E-22 110230 3.010E-27 120240 2.583E-12 0 0.
  1  120250 8.496E-17 120260 7.900E-21 130270 9.431E-06 0 0.
  1  140280 4.553E-10 140290 7.553E-15 140300 1.371E-19 0 0.
  1  140320 4.559E-35 150310 8.156E-25 150320 2.746E-39 0 0.
  1  160340 4.074E-36 170370 7.501E-24 180380 6.707E-29 0 0.
  1  180390 5.986E-29 180400 2.054E-19 180420 1.181E-28 0 0.
  1  190410 6.515E-21 190420 5.046E-33 200420 5.251E-23 0 0.
  1  200430 1.106E-13 200440 8.405E-13 200450 3.549E-20 0 0.
  1  200460 9.431E-14 210450 1.716E-14 210460 2.365E-23 0 0.
  1  220460 3.766E-07 220470 3.436E-07 220480 3.469E-06 0 0.
  1  220490 2.641E-07 220500 2.544E-07 230500 2.442E-10 0 0.
  1  230510 6.280E-08 240500 2.039E-05 240510 1.292E-40 0 0.
  1  240520 3.943E-04 240530 4.473E-05 240540 1.129E-05 0 0.
  1  250540 1.385E-12 250550 1.763E-08 260540 4.169E-05 0 0.
  1  260550 1.962E-09 260560 6.481E-04 260570 1.517E-05 0 0.
  1  260580 1.993E-06 270580 6.689E-22 270590 1.410E-09 0 0.
  1  270600 2.000E-09 280580 1.606E-04 280590 1.290E-07 0 0.
  1  280600 6.141E-05 280610 2.692E-06 280620 8.428E-06 0 0.
  1  280630 2.159E-08 280640 2.141E-06 290630 1.427E-09 0 0.
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File ZR_RUN2.INP (continued)

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1  290650 6.559E-10 300640 1.088E-14 300650 1.139E-22 0 0.
1  420940 1.243E-11 440980 1.507E-25 491131 4.333E-19 0 0.
1  491141 1.938E-28 501120 7.095E-05 501130 7.215E-16 0 0.
1  701730 5.475E-18 701740 2.776E-20 711750 1.273E-08 0 0.
1  711760 5.019E-11 711770 3.062E-22 711771 3.075E-20 0 0.
1  721740 1.400E-07 721750 9.522E-22 721760 4.712E-06 0 0.
1  721770 1.166E-05 721780 2.880E-05 721790 1.541E-05 0 0.
1  721800 3.349E-05 721810 1.053E-28 721820 1.492E-10 0 0.
1  731810 4.667E-06 731820 1.129E-15 741820 1.295E-07 0 0.
1  741830 5.466E-08 741840 4.078E-10 741850 1.255E-25 0 0.
1  741860 6.585E-17 741880 1.501E-30 751850 1.131E-13 0 0.
1  751870 3.126E-19 751880 1.532E-32 761860 9.514E-16 0 0.
1  761880 1.350E-21 761890 1.074E-24 761900 4.335E-27 0 0.
2  962450 1.410E-17 942410 2.600E-07 952410 3.200E-07 0 0.
2  932370 5.200E-07 912330 5.460E-14 922330 8.530E-14 0 0.
2  902290 5.270E-16 882250 2.860E-21 892250 1.930E-21 0 0.
2  942440 4.850E-18 942360 4.070E-14 922320 3.680E-15 0 0.
2  962440 2.330E-15 942400 9.800E-07 922360 3.070E-06 0 0.
2  902320 4.180E-11 882280 5.640E-21 902280 1.660E-14 0 0.
2  882240 8.500E-17 862200 1.480E-20 822120 9.850E-18 0 0.
2  832120 9.340E-19 812080 1.660E-20 952421 5.260E-14 0 0.
2  952420 6.290E-19 962420 1.280E-16 962460 1.220E-19 0 0.
2  942420 1.300E-07 942380 1.110E-06 922380 1.110E-05 0 0.
2  902340 9.470E-16 912340 1.430E-20 912341 3.190E-20 0 0.
2  922340 1.740E-06 902300 8.670E-13 882260 3.220E-17 0 0.
2  822100 3.590E-20 842100 5.070E-22 952430 1.460E-13 0 0.
2  932390 1.260E-19 962430 2.790E-16 942390 3.890E-06 0 0.
2  922350 3.520E-05 902310 2.700E-14 912310 6.580E-11 0 0.
2  892270 4.930E-15 812070 1.870E-21 962480 4.450E-05 0 0.
2  982500 4.310E-15 982510 1.350E-19      0 0.        0 0.
3   10030 6.459E-10  30060 8.684E-12  30070 2.207E-13 0 0.
3   40090 4.441E-12  40100 2.913E-12  60140 3.505E-09 0 0.
3  300660 1.618E-13 300670 5.976E-17 300680 8.880E-12 0 0.
3  310690 2.640E-15 300700 3.025E-11 320700 1.152E-18 0 0.
3  310710 1.304E-14 320720 1.584E-10 320730 5.700E-10 0 0.
3  320740 1.494E-09 330750 3.666E-09 320760 1.100E-08 0 0.
3  340760 9.416E-12 340770 2.473E-08 340780 5.109E-08 0 0.
3  340790 1.320E-07 350790 1.198E-11 340800 3.176E-07 0 0.
3  360800 1.554E-12 350810 5.436E-07 360810 1.088E-14 0 0.
3  340820 8.601E-07 360820 2.216E-09 360830 1.378E-06 0 0.
3  360840 2.764E-06 360850 4.192E-07 370850 2.998E-06 0 0.
3  360860 5.461E-06 380860 1.065E-09 370870 7.071E-06 0 0.
3  380870 4.930E-11 380880 1.019E-05 380890 1.013E-23 0 0.
3  390890 1.344E-05 380900 1.820E-05 390900 3.330E-09 0 0.
3  400900 2.376E-02 390910 3.545E-21 400910 5.196E-03 0 0.
3  400920 7.939E-03 400930 2.089E-05 410930 4.703E-05 0 0.
3  410931 6.200E-11 400940 8.047E-03 410940 4.287E-08 0 0.
3  400950 8.655E-20 410950 1.094E-19 410951 3.620E-23 0 0.
3  420950 1.952E-05 400960 1.311E-03 420960 4.721E-08 0 0.
3  420970 1.851E-05 420980 1.806E-05 430980 8.835E-12 0 0.
3  430990 1.855E-05 440990 5.127E-10 421000 1.985E-05 0 0.
3  441000 1.947E-07 441010 1.614E-05 441020 1.369E-05 0 0.
3  451020 1.786E-13 441030 4.651E-29 451030 9.899E-06 0 0.
3  451031 5.739E-32 441040 6.206E-06 461040 3.415E-07 0 0.
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File ZR_RUN2.INP (continued)

```
3  461050 3.364E-06 441060 4.117E-09 451060 3.870E-15 0 0.
3  461060 1.468E-06 461070 6.496E-07 471070 5.890E-13 0 0.
3  461080 3.114E-07 471080 9.273E-26 471081 2.937E-17 0 0.
3  481080 5.655E-14 471090 1.490E-07 471091 1.196E-25 0 0.
3  481090 1.210E-19 461100 1.130E-07 471100 1.093E-21 0 0.
3  471101 7.214E-14 481100 7.010E-09 481110 9.190E-08 0 0.
3  481120 6.787E-08 481130 7.215E-09 481131 8.797E-10 0 0.
3  491130 1.097E-07 481140 1.200E-07 491140 3.535E-33 0 0.
3  501140 4.762E-05 491150 4.725E-08 491151 4.819E-36 0 0.
3  501150 2.613E-05 481160 6.162E-08 501160 1.063E-03 0 0.
3  501170 5.633E-04 501180 1.774E-03 501190 6.298E-04 0 0.
3  501191 1.023E-10 501200 2.388E-03 501211 1.522E-09 0 0.
3  511210 3.822E-07 501220 7.595E-08 521220 2.332E-09 0 0.
3  501230 1.494E-15 511230 9.069E-08 521230 5.174E-12 0 0.
3  521231 3.909E-20 501240 1.191E-07 511240 3.008E-25 0 0.
3  521240 3.496E-10 511250 1.875E-08 521250 1.375E-07 0 0.
3  521251 2.623E-10 501260 2.872E-07 511260 1.364E-14 0 0.
3  511261 1.037E-16 521260 5.945E-09 521270 1.054E-18 0 0.
3  521271 3.011E-16 531270 6.369E-07 541270 1.812E-40 0 0.
3  521280 1.611E-06 541280 3.072E-09 521290 3.410E-37 0 0.
3  521291 3.641E-34 531290 2.895E-06 541290 3.694E-12 0 0.
3  521300 6.193E-06 541300 1.700E-08 541310 1.154E-05 0 0.
3  541320 1.829E-05 561320 2.671E-12 551330 2.795E-05 0 0.
3  541340 3.248E-05 551340 2.700E-08 561340 3.324E-07 0 0.
3  551350 1.611E-05 561350 6.250E-11 541360 3.938E-05 0 0.
3  561360 7.666E-08 551370 2.170E-05 561370 4.716E-06 0 0.
3  561371 3.323E-12 561380 2.961E-05 571380 2.454E-10 0 0.
3  571390 2.827E-05 581400 2.827E-05 581410 2.963E-33 0 0.
3  591410 2.617E-05 581420 2.635E-05 601420 4.278E-08 0 0.
3  601430 2.599E-05 581440 1.310E-08 591440 5.529E-13 0 0.
3  591441 2.764E-15 601440 2.534E-05 601450 1.770E-05 0 0.
3  601460 1.388E-05 611460 7.072E-12 621460 9.099E-12 0 0.
3  611470 1.037E-06 621470 8.639E-06 601480 7.900E-06 0 0.
3  611480 5.018E-31 611481 7.568E-29 621480 7.509E-07 0 0.
3  621490 3.859E-07 601500 3.074E-06 621500 4.885E-06 0 0.
3  631500 1.886E-15 621510 1.028E-06 631510 6.803E-08 0 0.
3  621520 2.144E-06 631520 1.156E-09 641520 7.092E-10 0 0.
3  631530 9.122E-07 641530 8.217E-16 621540 3.722E-07 0 0.
3  631540 1.370E-07 641540 2.433E-08 631550 6.000E-10 0 0.
3  641550 8.315E-08 641560 1.335E-07 641570 1.763E-09 0 0.
3  641580 5.791E-08 651590 6.646E-09 641600 2.654E-09 0 0.
3  651600 3.099E-23 661600 1.065E-10 661610 6.843E-10 0 0.
3  661620 3.772E-10 661630 1.359E-10 661640 4.202E-11 0 0.
3  671650 3.132E-11 671661 5.026E-14 681660 1.169E-11 0 0.
3  681670 5.859E-12 681680 8.111E-13 691690 5.967E-16 0 0.
3  681700 2.058E-20 691700 1.449E-24 701700 1.406E-17 0 0.
3  691710 4.325E-21 701710 8.994E-20 701720 4.405E-17 0 0.
0
```

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File ZR_RUN2.BAT

```
echo off
echo **                                                                **
echo **                          O R I G E N 2                         **
echo **                                                                **
copy zr_run2.INP tape5.inp >nul
REM  (NOT USED IN THIS CASE) copy zr_run2.u3 tape3.inp >nul
copy \origen2\libs\decay.lib+\origen2\libs\pwrus.lib tape9.inp >nul
copy \origen2\libs\gxuo2brm.lib tape10.inp >nul
\origen2\code\origen2
echo finished with origen2 calculation
rem  combine and save files from run
copy tape12.out+tape6.out zr_run2.u6 >nul
copy tape13.out+tape11.out zr_run2.u11 >nul
ren tape7.out zr_run2.pch
ren tape15.out zr_run2.dbg
ren tape16.out zr_run2.vxs
ren tape50.out zr_run2.ech
rem  cleanup files
del tape*.inp
del tape*.out
del zr_run2.pch
del zr_run2.dbg
del zr_run2.vxs
del zr_run2.ech
del zr_run2.u11
echo ************************************************************************
echo ******************* O R I G E N 2 - Version 2.1 **********************
echo ********************** Execution Completed **************************
echo ************************************************************************
echo on
```

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ROUNDZR2.OUT (Ci/g calcine)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	5.3E-07	3.0E-07	4.7E-09	5.6E-16	5.4E-31	5.4E-31	
Be-10	1.600E+06	yr	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14
C-14	5.729E+03	yr	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.4E-08	1.4E-08	4.7E-09
Fe-55	2.600E+00	yr	3.9E-11	2.7E-12	7.4E-21				
Ni-59	8.000E+04	yr	9.8E-09	9.8E-09	9.8E-09	9.7E-09	9.7E-09	9.7E-09	9.0E-09
Co-60	5.270E+00	yr	6.9E-09	1.9E-09	1.1E-13	6.6E-30			
Ni-63	9.200E+01	yr	9.6E-07	8.9E-07	5.1E-07	6.0E-08	5.8E-10	2.8E-10	
Se-79	6.496E+04	yr	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.1E-09	9.1E-09	8.3E-09
Rb-87	4.696E+10	yr	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13
Sr-90	2.912E+01	yr	8.7E-04	6.9E-04	1.2E-04	1.4E-07	5.8E-14	6.2E-15	
Y-90	6.400E+01	h	8.7E-04	6.9E-04	1.2E-04	1.4E-07	5.8E-14	6.2E-15	
Zr-93	1.530E+06	yr	5.3E-08	5.3E-08	5.3E-08	5.2E-08	5.2E-08	5.2E-08	5.2E-08
Nb-93m	1.360E+01	yr	4.6E-08	4.8E-08	5.0E-08	5.0E-08	5.0E-08	5.0E-08	5.0E-08
Nb-94	2.030E+04	yr	8.0E-09	8.0E-09	8.0E-09	7.9E-09	7.8E-09	7.7E-09	5.7E-09
Tc-98	4.199E+06	yr	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15
Tc-99	2.130E+05	yr	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.0E-07
Rh-102	1.059E+03	d	5.8E-15	5.4E-16	1.1E-23				
Ru-106	3.682E+02	d							
Rh-106	2.990E+01	s							
Pd-107	6.496E+06	yr	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10
Ag-108	2.370E+00	m	5.4E-17	5.1E-17	3.4E-17	7.2E-18	2.5E-19	1.5E-19	
Ag-108m	1.270E+02	yr	6.0E-16	5.7E-16	3.8E-16	8.1E-17	2.8E-18	1.7E-18	1.4E-39
Ag-109m	3.960E+01	s	1.2E-26	1.2E-26					
Cd-109	4.640E+02	d	1.2E-26	1.2E-26					
Ag-110	2.460E+01	s	2.0E-31						
Ag-110m	2.499E+02	d	1.5E-29	6.0E-34					
Cd-113m	1.459E+01	yr	2.4E-08	1.5E-08	4.4E-10	6.0E-16	1.2E-28	1.2E-28	
In-115	4.997E+14	yr	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19
Sn-119m	2.450E+02	d							
Sn-121m	4.997E+01	yr	4.9E-08	4.3E-08	1.5E-08	3.0E-10	5.8E-14	1.6E-14	
Te-123	1.000E+13	yr	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21
Sb-125	2.770E+00	yr	3.2E-10	2.6E-11	2.4E-19				
Te-125m	5.800E+01	d	7.8E-11	6.4E-12	5.8E-20				
Sn-126	1.000E+05	yr	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	7.6E-09
Sb-126	1.240E+01	d	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09
Sb-126m	1.900E+01	m	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	7.6E-09
I-129	1.570E+07	yr	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10
Cs-134	2.062E+00	yr	1.3E-11	4.6E-13	7.2E-24				
Cs-135	2.300E+06	yr	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.8E-08
Cs-137	3.000E+01	yr	6.8E-04	5.4E-04	9.8E-05	1.4E-07	9.1E-14	1.0E-14	
Ba-137m	2.552E+00	m	6.5E-04	5.1E-04	9.3E-05	1.3E-07	8.6E-14	9.8E-15	
La-138	1.350E+11	yr	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18
Ce-142	1.049E+11	yr	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13
Ce-144	2.843E+02	d	4.0E-22	5.4E-26					
Pr-144	1.728E+01	m	4.0E-22	5.4E-26					
Pr-144m	7.200E+00	m	4.8E-24	6.5E-28					
Nd-144	2.099E+15	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Pm-146	5.500E+00	yr	1.2E-11	3.5E-12	3.1E-16	8.9E-32			
Sm-146	7.000E+07	yr	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16
Pm-147	2.623E+00	yr	8.6E-09	6.1E-10	2.0E-18				
Sm-147	1.070E+11	yr	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13
Sm-148	8.001E+15	yr	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19
Sm-149	9.994E+15	yr	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20
Eu-150	3.600E+01	yr	5.4E-14	4.4E-14	1.1E-14	4.5E-17	3.2E-22	3.2E-22	
Sm-151	8.999E+01	yr	1.9E-05	1.8E-05	1.0E-05	1.1E-06	9.9E-09	4.8E-09	
Eu-152	1.360E+01	yr	2.1E-08	1.3E-08	2.9E-10	1.5E-16	3.5E-30	3.5E-30	
Gd-152	1.080E+14	yr	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20
Gd-153	2.420E+02	d							
Eu-154	8.600E+00	yr	1.1E-06	4.8E-07	1.2E-09	1.4E-19	5.8E-41		
Eu-155	4.959E+00	yr	6.0E-10	1.5E-10	4.7E-15	2.7E-32			
Ho-166m	1.200E+03	yr	8.8E-14	8.7E-14	8.4E-14	7.1E-14	5.0E-14	4.7E-14	2.8E-16
Tm-171	1.920E+00	yr	5.9E-25	5.9E-25	1.5E-36				
Tl-207	4.770E+00	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Tl-208	3.070E+00	m	2.3E-13	2.1E-13	1.0E-13	6.8E-15	2.3E-17	1.3E-17	4.1E-17
Tl-209	2.200E+00	m	5.7E-18	7.4E-18	3.1E-17	3.3E-16	2.4E-15	2.9E-15	2.4E-13

Appendix E-9
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ROUNDZR2.OUT (Ci/g calcine) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.300E+00	h	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Pb-210	2.230E+01	yr	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Pb-211	3.610E+01	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Pb-212	1.064E+01	h	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Pb-214	2.680E+01	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Bi-210m	3.000E+06	yr							
Bi-210	5.012E+00	d	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Bi-211	2.130E+00	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Bi-212	6.055E+01	m	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Bi-213	4.565E+01	m	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Bi-214	1.990E+01	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Po-210	1.384E+02	d	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Po-211	5.600E-01	s	6.9E-15	7.5E-15	9.0E-15	1.0E-14	1.3E-14	1.3E-14	4.8E-14
Po-212	3.000E-07	s	4.2E-13	3.8E-13	1.9E-13	1.2E-14	4.2E-17	2.3E-17	7.3E-17
Po-213	4.200E-06	s	2.6E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Po-214	1.643E-04	s	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Po-215	1.780E-03	s	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Po-216	1.500E-01	s	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Po-218	3.050E+00	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
At-217	3.230E-02	s	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Rn-219	3.960E+00	s	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Rn-220	5.560E+01	s	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Rn-222	3.824E+00	d	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Fr-221	4.800E+00	m	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Fr-223	2.180E+01	m	3.4E-14	3.7E-14	4.4E-14	5.2E-14	6.5E-14	6.6E-14	2.4E-13
Ra-223	1.143E+01	d	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Ra-224	3.660E+00	d	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Ra-225	1.480E+01	d	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Ra-226	1.600E+03	yr	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Ra-228	6.700E+00	yr	4.9E-18	5.0E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Ac-225	1.000E+01	d	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Ac-227	2.177E+01	yr	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Ac-228	6.131E+00	h	4.9E-18	5.0E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Th-227	1.872E+01	d	2.4E-12	2.6E-12	3.2E-12	3.7E-12	4.6E-12	4.7E-12	1.7E-11
Th-228	1.913E+00	yr	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Th-229	7.339E+03	yr	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Th-230	7.700E+04	yr	4.7E-12	5.9E-12	1.5E-11	5.8E-11	1.6E-10	1.7E-10	1.5E-09
Th-231	2.552E+01	h	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.8E-11
Th-232	1.405E+10	yr	5.0E-18	5.1E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Th-234	2.410E+01	d	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-231	3.277E+04	yr	3.2E-12	3.2E-12	3.3E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Pa-233	2.700E+01	d	3.9E-10	3.9E-10	4.4E-10	5.6E-10	6.9E-10	7.0E-10	7.7E-10
Pa-234m	1.170E+00	m	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-234	6.700E+00	h	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15
U-232	7.200E+01	yr	6.4E-13	5.8E-13	2.8E-13	1.8E-14	4.9E-17	2.0E-17	
U-233	1.585E+05	yr	7.4E-14	9.1E-14	2.3E-13	8.5E-13	2.6E-12	2.8E-12	3.2E-11
U-234	2.445E+05	yr	1.3E-08	1.3E-08	1.5E-08	1.7E-08	1.8E-08	1.8E-08	1.7E-08
U-235	7.038E+08	yr	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.8E-11
U-236	2.341E+07	yr	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.1E-10	2.1E-10	2.4E-10
U-237	6.750E+00	d	7.9E-11	4.9E-11	1.4E-12	1.6E-18	5.5E-23	5.4E-23	2.6E-23
U-238	4.468E+09	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
U-240	1.410E+01	h	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Np-236	1.150E+05	yr							
Np-237	2.140E+06	yr	3.9E-10	3.9E-10	4.4E-10	5.6E-10	6.9E-10	7.0E-10	7.7E-10
Np-238	2.117E+00	d	2.1E-15	2.0E-15	1.4E-15	3.9E-16	2.4E-17	1.5E-17	3.8E-35
Np-239	2.355E+00	d	2.9E-14	2.9E-14	2.9E-14	2.8E-14	2.6E-14	2.6E-14	1.1E-14
Np-240m	7.400E+00	m	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Pu-236	2.851E+00	yr	4.9E-16	4.3E-17	6.6E-25				
Pu-238	8.774E+01	yr	1.3E-05	1.2E-05	6.9E-06	7.3E-07	5.7E-09	2.7E-09	1.5E-32
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07	1.8E-07
Pu-240	6.537E+03	yr	2.2E-07	2.2E-07	2.2E-07	2.1E-07	2.0E-07	2.0E-07	7.7E-08
Pu-241	1.440E+01	yr	3.2E-06	2.0E-06	5.7E-08	6.5E-14	2.2E-18	2.2E-18	1.1E-18
Pu-242	3.869E+05	yr	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	4.9E-10
Pu-243	4.956E+00	h	4.1E-25	5.0E-25	1.2E-24	3.4E-24	6.8E-24	7.1E-24	1.2E-23
Pu-244	8.261E+07	yr	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11

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ROUNDZR2.OUT (Ci/g calcine) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Am-241	4.322E+02	yr	1.8E-06	1.8E-06	1.6E-06	1.0E-06	3.9E-07	3.3E-07	2.2E-13
Am-242m	1.520E+02	yr	4.2E-13	4.0E-13	2.9E-13	7.8E-14	4.7E-15	3.1E-15	7.6E-33
Am-242	1.602E+01	h	4.2E-13	4.0E-13	2.8E-13	7.8E-14	4.7E-15	3.1E-15	7.6E-33
Am-243	7.380E+03	yr	2.9E-14	2.9E-14	2.9E-14	2.8E-14	2.6E-14	2.6E-14	1.1E-14
Cm-242	1.632E+02	d	3.4E-13	3.3E-13	2.3E-13	6.4E-14	3.9E-15	2.5E-15	6.3E-33
Cm-243	2.850E+01	yr	4.9E-15	3.9E-15	6.4E-16	6.4E-19	2.0E-25	2.0E-25	
Cm-244	1.811E+01	yr	3.5E-14	2.4E-14	1.4E-15	2.7E-20	1.5E-30	1.5E-30	
Cm-245	8.499E+03	yr	2.4E-18	2.4E-18	2.4E-18	2.3E-18	2.2E-18	2.2E-18	1.1E-18
Cm-246	4.731E+03	yr	1.2E-15	1.2E-15	1.3E-15	1.2E-15	1.1E-15	1.1E-15	3.0E-16
Cm-247	1.560E+07	yr	4.1E-25	5.0E-25	1.2E-24	3.4E-24	6.8E-24	7.1E-24	1.2E-23
Cm-248	3.391E+05	yr	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07
Cf-249	3.505E+02	yr							
Cf-250	1.308E+01	yr	4.6E-14	2.7E-14	5.3E-16	1.6E-22	1.0E-36	1.0E-36	
Cf-251	8.980E+02	yr	2.1E-19	2.1E-19	1.9E-19	1.6E-19	9.7E-20	9.0E-20	8.1E-23
Cf-252	2.638E+00	yr							
Ca-45	1.630E+02	d							
V-50	4.000E+16	yr	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23
Mn-54	3.125E+02	d	3.5E-24	1.1E-27					
Fe-55	2.600E+00	yr	3.9E-11	2.7E-12	7.4E-21				
Lu-176	3.000E+10	yr	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Ta-182	1.150E+02	d	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Re-187	5.000E+10	yr	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26

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Source Listing of Program ROUNDZR2

```
      PROGRAM ROUNDZR2

!-------- WRITTEN BY D.R. WENZEL

!            To format the output of an ORIGEN2 run for zirconium
!            calcine and convert the output to 2 places of accuracy

      CHARACTER (LEN=1) :: BUFFER1(111), BUFFER3(96)
      CHARACTER (LEN=10) :: BLANK, ZERO(7)
      CHARACTER (LEN=12) :: DESC, NAME, NUCLIDE(175)
      CHARACTER (LEN=24) :: NAME2, NUCLIDE2(175)
      CHARACTER (LEN=96) :: BUFFER2
      CHARACTER (LEN=111) :: BUFFER, ORGLINE

      COMMON /AMT/ AMOUNT(9)
      EQUIVALENCE (ORGLINE, BUFFER1(1))
      EQUIVALENCE (BUFFER2, BUFFER3(1))
      EQUIVALENCE (ZERO(1), BUFFER3(27))

      REAL :: DATA(175,7), VALUE(7)

      DATA BLANK /'          '/

!-------- OPEN OUTPUT FILE

      OPEN(1,FILE ='MASTER', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(2,FILE ='ZR_RUN2.CI', STATUS='OLD',FORM='FORMATTED', ERR = 900)

      OPEN(6,FILE ='ROUNDZR2.OUT', STATUS='UNKNOWN', ERR = 900)

      WRITE(6,600)
  600 FORMAT(1x,'ROUNDZR2.OUT  (Ci/g calcine)')

!-------- READ MASTER LIST OF RADIONUCLIDES TO BE INCLUDED ON THE
!         FINAL REPORT

      LAST = 0
   10 READ(1,1000,END=20) NAME, NAME2
 1000 FORMAT(A12, 5X, A24)
      LAST = LAST + 1
      NUCLIDE(LAST) = NAME
      NUCLIDE2(LAST) = NAME2
      GO TO 10

!-------- ZERO MEMORY

   20 DO  l=1,175
         DO K=1,7
            DATA(l,K) = 0.
         END DO

      END DO
```

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Source Listing of Program ROUNDZR2 (continued)

```
!-------- READ RADIONUCLIDE INVENTORIES

!-------- READ FIRST 3 LINES OF FILE AND ECHO line 2

   35  DO  J=1,3
          READ(2,120) ORGLINE
  120     FORMAT(A111)

          IF(J == 2) THEN
             WRITE(6,120) ORGLINE
          END IF

       END DO

       WRITE(6,605)
  605  FORMAT(/,3X,'Nuclide',5X,'Half-Life',6X,'2032Jan   2042Jan   ', &
              '2116Jan   2400Jan   3016Jan   3110Jan   12000Jan')

!-------- READ RADIONUCLIDE INVENTORIES

   50  READ(2,120,END=80) ORGLINE
       WRITE(BUFFER,120) ORGLINE
       READ(BUFFER,400) DESC, VALUE
  400  FORMAT(A12,9X,7(E10.4))
       DO  J=1,175
          IF(DESC == NUCLIDE(J)) THEN
             DO 60 K=1,7
                DATA(J,K) = VALUE(K)
   60        CONTINUE

          END IF

       END DO

       GO TO 50

   80  DO  J=1,LAST
          WRITE(BUFFER2,620) NUCLIDE2(J), (DATA(J,K),K=1,7)
  620     FORMAT(2X,A24,7(1PE10.1))
          DO K=1,7
             IF(DATA(J,K) == 0.) THEN
                ZERO(K) = BLANK
             ENDIF

          END DO

          WRITE(6,625) BUFFER2
  625     FORMAT(A96)

       END DO

       GO TO 999
```

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Source Listing of Program ROUNDZR2 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE ')

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ROUNDZR2
```

See Appendix A-2, pages 4-6, for a listing of file MASTER.

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ROUNDZR2.OUT (Ci/g calcine)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H-3	1.235E+01	yr	5.3E-07	3.0E-07	4.7E-09	5.6E-16	5.4E-31	5.4E-31	
Be-10	1.600E+06	yr	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14	6.5E-14
C-14	5.729E+03	yr	1.6E-08	1.6E-08	1.5E-08	1.5E-08	1.4E-08	1.4E-08	4.7E-09
Fe-55	2.600E+00	yr	3.9E-11	2.7E-12	7.4E-21				
Ni-59	8.000E+04	yr	9.8E-09	9.8E-09	9.8E-09	9.7E-09	9.7E-09	9.7E-09	9.0E-09
Co-60	5.270E+00	yr	6.9E-09	1.9E-09	1.1E-13	6.6E-30			
Ni-63	9.200E+01	yr	9.6E-07	8.9E-07	5.1E-07	6.0E-08	5.8E-10	2.8E-10	
Se-79	6.496E+04	yr	9.2E-09	9.2E-09	9.2E-09	9.2E-09	9.1E-09	9.1E-09	8.3E-09
Rb-87	4.696E+10	yr	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13	6.2E-13
Sr-90	2.912E+01	yr	8.7E-04	6.9E-04	1.2E-04	1.4E-07	5.8E-14	6.2E-15	
Y-90	6.400E+01	h	8.7E-04	6.9E-04	1.2E-04	1.4E-07	5.8E-14	6.2E-15	
Zr-93	1.530E+06	yr	5.3E-08	5.3E-08	5.3E-08	5.2E-08	5.2E-08	5.2E-08	5.2E-08
Nb-93m	1.360E+01	yr	4.6E-08	4.8E-08	5.0E-08	5.0E-08	5.0E-08	5.0E-08	5.0E-08
Nb-94	2.030E+04	yr	8.0E-09	8.0E-09	8.0E-09	7.9E-09	7.8E-09	7.7E-09	5.7E-09
Tc-98	4.199E+06	yr	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15	7.7E-15
Tc-99	2.130E+05	yr	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.1E-07	3.0E-07
Rh-102	1.059E+03	d	5.8E-15	5.4E-16	1.1E-23				
Ru-106	3.682E+02	d							
Rh-106	2.990E+01	s							
Pd-107	6.496E+06	yr	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10	3.3E-10
Ag-108	2.370E+00	m	5.4E-17	5.1E-17	3.4E-17	7.2E-18	2.5E-19	1.5E-19	
Ag-108m	1.270E+02	yr	6.0E-16	5.7E-16	3.8E-16	8.1E-17	2.8E-18	1.7E-18	1.4E-39
Ag-109m	3.960E+01	s	1.2E-26	1.2E-26					
Cd-109	4.640E+02	d	1.2E-26	1.2E-26					
Ag-110	2.460E+01	s	2.0E-31						
Ag-110m	2.499E+02	d	1.5E-29	6.0E-34					
Cd-113m	1.459E+01	yr	2.4E-08	1.5E-08	4.4E-10	6.0E-16	1.2E-28	1.2E-28	
In-115	4.997E+14	yr	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19	2.9E-19
Sn-119m	2.450E+02	d							
Sn-121m	4.997E+01	yr	4.9E-08	4.3E-08	1.5E-08	3.0E-10	5.8E-14	1.6E-14	
Te-123	1.000E+13	yr	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21	1.5E-21
Sb-125	2.770E+00	yr	3.2E-10	2.6E-11	2.4E-19				
Te-125m	5.800E+01	d	7.8E-11	6.4E-12	5.8E-20				
Sn-126	1.000E+05	yr	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	7.6E-09
Sb-126	1.240E+01	d	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09	1.1E-09
Sb-126m	1.900E+01	m	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	8.1E-09	7.6E-09
I-129	1.570E+07	yr	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10	5.1E-10
Cs-134	2.062E+00	yr	1.3E-11	4.6E-13	7.2E-24				
Cs-135	2.300E+06	yr	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.9E-08	1.8E-08
Cs-137	3.000E+01	yr	6.8E-04	5.4E-04	9.8E-05	1.4E-07	9.1E-14	1.0E-14	
Ba-137m	2.552E+00	m	6.5E-04	5.1E-04	9.3E-05	1.3E-07	8.6E-14	9.8E-15	
La-138	1.350E+11	yr	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18	4.7E-18
Ce-142	1.049E+11	yr	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13	6.3E-13
Ce-144	2.843E+02	d	4.0E-22	5.4E-26					
Pr-144	1.728E+01	m	4.0E-22	5.4E-26					
Pr-144m	7.200E+00	m	4.8E-24	6.5E-28					
Nd-144	2.099E+15	yr	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17	3.0E-17
Pm-146	5.500E+00	yr	1.2E-11	3.5E-12	3.1E-16	8.9E-32			
Sm-146	7.000E+07	yr	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16	4.1E-16
Pm-147	2.623E+00	yr	8.6E-09	6.1E-10	2.0E-18				
Sm-147	1.070E+11	yr	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13	2.2E-13
Sm-148	8.001E+15	yr	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19	2.3E-19
Sm-149	9.994E+15	yr	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20	9.3E-20
Eu-150	3.600E+01	yr	5.4E-14	4.4E-14	1.1E-14	4.5E-17	3.2E-22	3.2E-22	
Sm-151	8.999E+01	yr	1.9E-05	1.8E-05	1.0E-05	1.1E-06	9.9E-09	4.8E-09	
Eu-152	1.360E+01	yr	2.1E-08	1.3E-08	2.9E-10	1.5E-16	3.5E-30	3.5E-30	
Gd-152	1.080E+14	yr	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20	2.2E-20
Gd-153	2.420E+02	d							
Eu-154	8.600E+00	yr	1.1E-06	4.8E-07	1.2E-09	1.4E-19	5.8E-41		
Eu-155	4.959E+00	yr	6.0E-10	1.5E-10	4.7E-15	2.7E-32			
Ho-166m	1.200E+03	yr	8.8E-14	8.7E-14	8.4E-14	7.1E-14	5.0E-14	4.7E-14	2.8E-16
Tm-171	1.920E+00	yr	5.9E-25	5.9E-25	1.5E-36				
Tl-207	4.770E+00	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Tl-208	3.070E+00	m	2.3E-13	2.1E-13	1.0E-13	6.8E-15	2.3E-17	1.3E-17	4.1E-17
Tl-209	2.200E+00	m	5.7E-18	7.4E-18	3.1E-17	3.3E-16	2.4E-15	2.9E-15	2.4E-13

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ROUNDZR2.OUT (Ci/g calcine) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Pb-209	3.300E+00	h	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Pb-210	2.230E+01	yr	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Pb-211	3.610E+01	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Pb-212	1.064E+01	h	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Pb-214	2.680E+01	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Bi-210m	3.000E+06	yr							
Bi-210	5.012E+00	d	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Bi-211	2.130E+00	m	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Bi-212	6.055E+01	m	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Bi-213	4.565E+01	m	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Bi-214	1.990E+01	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Po-210	1.384E+02	d	1.5E-14	2.5E-14	2.4E-13	4.6E-12	2.9E-11	3.3E-11	1.2E-09
Po-211	5.600E-01	s	6.9E-15	7.5E-15	9.0E-15	1.0E-14	1.3E-14	1.3E-14	4.8E-14
Po-212	3.000E-07	s	4.2E-13	3.8E-13	1.9E-13	1.2E-14	4.2E-17	2.3E-17	7.3E-17
Po-213	4.200E-06	s	2.6E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Po-214	1.643E-04	s	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Po-215	1.780E-03	s	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Po-216	1.500E-01	s	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Po-218	3.050E+00	m	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
At-217	3.230E-02	s	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Rn-219	3.960E+00	s	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Rn-220	5.560E+01	s	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Rn-222	3.824E+00	d	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Fr-221	4.800E+00	m	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Fr-223	2.180E+01	m	3.4E-14	3.7E-14	4.4E-14	5.2E-14	6.5E-14	6.6E-14	2.4E-13
Ra-223	1.143E+01	d	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Ra-224	3.660E+00	d	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Ra-225	1.480E+01	d	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Ra-226	1.600E+03	yr	4.4E-14	6.7E-14	4.0E-13	4.6E-12	2.9E-11	3.4E-11	1.2E-09
Ra-228	6.700E+00	yr	4.9E-18	5.0E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Ac-225	1.000E+01	d	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Ac-227	2.177E+01	yr	2.5E-12	2.7E-12	3.2E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Ac-228	6.131E+00	h	4.9E-18	5.0E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Th-227	1.872E+01	d	2.4E-12	2.6E-12	3.2E-12	3.7E-12	4.6E-12	4.7E-12	1.7E-11
Th-228	1.913E+00	yr	6.5E-13	5.9E-13	2.9E-13	1.9E-14	6.5E-17	3.6E-17	1.1E-16
Th-229	7.339E+03	yr	2.7E-16	3.4E-16	1.4E-15	1.5E-14	1.1E-13	1.3E-13	1.1E-11
Th-230	7.700E+04	yr	4.7E-12	5.9E-12	1.5E-11	5.8E-11	1.6E-10	1.7E-10	1.5E-09
Th-231	2.552E+01	h	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.8E-11
Th-232	1.405E+10	yr	5.0E-18	5.1E-18	5.8E-18	8.7E-18	1.5E-17	1.6E-17	1.1E-16
Th-234	2.410E+01	d	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-231	3.277E+04	yr	3.2E-12	3.2E-12	3.3E-12	3.7E-12	4.7E-12	4.8E-12	1.7E-11
Pa-233	2.700E+01	d	3.9E-10	3.9E-10	4.4E-10	5.6E-10	6.9E-10	7.0E-10	7.7E-10
Pa-234m	1.170E+00	m	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
Pa-234	6.700E+00	h	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15	4.9E-15
U-232	7.200E+01	yr	6.4E-13	5.8E-13	2.8E-13	1.8E-14	4.9E-17	2.0E-17	
U-233	1.585E+05	yr	7.4E-14	9.1E-14	2.3E-13	8.5E-13	2.6E-12	2.8E-12	3.2E-11
U-234	2.445E+05	yr	1.3E-08	1.3E-08	1.5E-08	1.7E-08	1.8E-08	1.8E-08	1.7E-08
U-235	7.038E+08	yr	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.6E-11	7.8E-11
U-236	2.341E+07	yr	2.0E-10	2.0E-10	2.0E-10	2.0E-10	2.1E-10	2.1E-10	2.4E-10
U-237	6.750E+00	d	7.9E-11	4.9E-11	1.4E-12	1.6E-18	5.5E-23	5.4E-23	2.6E-23
U-238	4.468E+09	yr	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12	3.7E-12
U-240	1.410E+01	h	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Np-236	1.150E+05	yr							
Np-237	2.140E+06	yr	3.9E-10	3.9E-10	4.4E-10	5.6E-10	6.9E-10	7.0E-10	7.7E-10
Np-238	2.117E+00	d	2.1E-15	2.0E-15	1.4E-15	3.9E-16	2.4E-17	1.5E-17	3.8E-35
Np-239	2.355E+00	d	2.9E-14	2.9E-14	2.9E-14	2.8E-14	2.6E-14	2.6E-14	1.1E-14
Np-240m	7.400E+00	m	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11
Pu-236	2.851E+00	yr	4.9E-16	4.3E-17	6.6E-25				
Pu-238	8.774E+01	yr	1.3E-05	1.2E-05	6.9E-06	7.3E-07	5.7E-09	2.7E-09	1.5E-32
Pu-239	2.406E+04	yr	2.4E-07	2.4E-07	2.4E-07	2.4E-07	2.3E-07	2.3E-07	1.8E-07
Pu-240	6.537E+03	yr	2.2E-07	2.2E-07	2.2E-07	2.1E-07	2.0E-07	2.0E-07	7.7E-08
Pu-241	1.440E+01	yr	3.2E-06	2.0E-06	5.7E-08	6.5E-14	2.2E-18	2.2E-18	1.1E-18
Pu-242	3.869E+05	yr	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	5.0E-10	4.9E-10
Pu-243	4.956E+00	h	4.1E-25	5.0E-25	1.2E-24	3.4E-24	6.8E-24	7.1E-24	1.2E-23
Pu-244	8.261E+07	yr	6.4E-14	7.9E-14	1.9E-13	6.0E-13	1.5E-12	1.6E-12	1.4E-11

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ROUNDZR2.OUT (Ci/g calcine) (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Nuclide	Half-Life		2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
Am-241	4.322E+02	yr	1.8E-06	1.8E-06	1.6E-06	1.0E-06	3.9E-07	3.3E-07	2.2E-13
Am-242m	1.520E+02	yr	4.2E-13	4.0E-13	2.9E-13	7.8E-14	4.7E-15	3.1E-15	7.6E-33
Am-242	1.602E+01	h	4.2E-13	4.0E-13	2.8E-13	7.8E-14	4.7E-15	3.1E-15	7.6E-33
Am-243	7.380E+03	yr	2.9E-14	2.9E-14	2.9E-14	2.8E-14	2.6E-14	2.6E-14	1.1E-14
Cm-242	1.632E+02	d	3.4E-13	3.3E-13	2.3E-13	6.4E-14	3.9E-15	2.5E-15	6.3E-33
Cm-243	2.850E+01	yr	4.9E-15	3.9E-15	6.4E-16	6.4E-19	2.0E-25	2.0E-25	
Cm-244	1.811E+01	yr	3.5E-14	2.4E-14	1.4E-15	2.7E-20	1.5E-30	1.5E-30	
Cm-245	8.499E+03	yr	2.4E-18	2.4E-18	2.4E-18	2.3E-18	2.2E-18	2.2E-18	1.1E-18
Cm-246	4.731E+03	yr	1.2E-15	1.2E-15	1.3E-15	1.2E-15	1.1E-15	1.1E-15	3.0E-16
Cm-247	1.560E+07	yr	4.1E-25	5.0E-25	1.2E-24	3.4E-24	6.8E-24	7.1E-24	1.2E-23
Cm-248	3.391E+05	yr	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07	1.9E-07
Cf-249	3.505E+02	yr							
Cf-250	1.308E+01	yr	4.6E-14	2.7E-14	5.3E-16	1.6E-22	1.0E-36	1.0E-36	
Cf-251	8.980E+02	yr	2.1E-19	2.1E-19	1.9E-19	1.6E-19	9.7E-20	9.0E-20	8.1E-23
Cf-252	2.638E+00	yr							
Ca-45	1.630E+02	d							
V-50	4.000E+16	yr	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23	4.4E-23
Mn-54	3.125E+02	d	3.5E-24	1.1E-27					
Fe-55	2.600E+00	yr	3.9E-11	2.7E-12	7.4E-21				
Lu-176	3.000E+10	yr	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18	3.4E-18
Lu-177	6.709E+00	d							
Hf-182	9.000E+06	yr	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Ta-182	1.150E+02	d	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14	3.3E-14
Re-187	5.000E+10	yr	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26	1.2E-26

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zr_run2.g
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

	g/g	44.0YR	54.0YR	128.0YR	412.0YR	1028.0YR	1122.0YR	1.0E+04YR
HE 3	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19	7.952E-19
B 10	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19	4.538E-19
B 11	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10	4.137E-10
C 12	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06	6.992E-06
C 13	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08	8.035E-08
N 14	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06	9.394E-06
N 15	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08	3.508E-08
O 16	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04	5.638E-04
O 17	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07	2.260E-07
O 18	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06	1.130E-06
F 19	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14	7.983E-14
NE 20	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19	1.031E-19
NE 21	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19	8.035E-19
NE 22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22	2.378E-22
MG 24	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12	2.583E-12
MG 25	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17	8.496E-17
MG 26	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21	7.900E-21
AL 27	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06	9.431E-06
SI 28	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10	4.553E-10
SI 29	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15	7.553E-15
SI 30	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19	1.371E-19
P 31	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25	8.156E-25
CL 37	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24	7.501E-24
AR 40	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19	2.054E-19
K 41	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21	6.515E-21
CA 42	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23	5.251E-23
CA 43	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13	1.106E-13
CA 44	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13	8.405E-13
CA 46	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14	9.431E-14
SC 45	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14	1.716E-14
TI 46	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07	3.766E-07
TI 47	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07	3.436E-07
TI 48	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06	3.469E-06
TI 49	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07	2.641E-07
TI 50	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07	2.544E-07
V 50	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10	2.442E-10
V 51	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08	6.280E-08
CR 50	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05	2.039E-05
CR 52	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04	3.943E-04
CR 53	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05	4.473E-05
CR 54	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05	1.129E-05
MN 54	1.385E-12	4.574E-28	1.386E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MN 55	1.763E-08	1.959E-08	1.959E-08	1.959E-08	1.959E-08	1.959E-08	1.959E-08	1.959E-08
FE 54	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05	4.169E-05
FE 55	1.962E-09	1.579E-14	1.098E-15	2.970E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
FE 56	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04	6.481E-04
FE 57	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05	1.517E-05
FE 58	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06	1.993E-06
CO 59	1.410E-09	1.459E-09	1.470E-09	1.553E-09	1.870E-09	2.554E-09	2.658E-09	1.213E-08
CO 60	2.000E-09	6.129E-12	1.645E-12	9.749E-17	5.829E-33	0.000E+00	0.000E+00	0.000E+00
NI 58	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04	1.606E-04
NI 59	1.290E-07	1.290E-07	1.289E-07	1.289E-07	1.285E-07	1.279E-07	1.278E-07	1.183E-07
NI 60	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05	6.141E-05
NI 61	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06	2.692E-06
NI 62	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06	8.428E-06
NI 63	2.159E-08	1.550E-08	1.437E-08	8.231E-09	9.686E-10	9.345E-12	4.603E-12	0.000E+00
NI 64	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06	2.141E-06
CU 63	1.427E-09	7.519E-09	8.644E-09	1.479E-08	2.205E-08	2.301E-08	2.301E-08	2.302E-08
CU 65	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10	6.559E-10
ZN 64	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.088E-14
ZN 65	1.139E-22	1.640E-42	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
MO 94	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11	1.243E-11
RU 98	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25	1.507E-25
IN113	0.000E+00	7.219E-16	7.219E-16	7.219E-16	7.219E-16	7.219E-16	7.219E-16	7.219E-16
SN112	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05	7.095E-05
YB173	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18	5.475E-18

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zr_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

	g/g	44.0YR	54.0YR	128.0YR	412.0YR	1028.0YR	1122.0YR	1.0E+04YR
YB174	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20	2.776E-20
LU175	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08	1.273E-08
LU176	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11	5.019E-11
HF174	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07	1.400E-07
HF176	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06	4.712E-06
HF177	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05	1.166E-05
HF178	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05	2.880E-05
HF179	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05	1.541E-05
HF180	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05	3.349E-05
HF182	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.492E-10	1.491E-10
TA181	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06	4.667E-06
TA182	1.129E-15	5.220E-18	5.220E-18	5.220E-18	5.219E-18	5.219E-18	5.219E-18	5.216E-18
W182	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07	1.295E-07
W183	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08	5.466E-08
W184	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10	4.078E-10
W186	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17	6.585E-17
RE185	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13	1.131E-13
RE187	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19	3.126E-19
OS186	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16	9.514E-16
OS188	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21	1.350E-21
OS189	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24	1.074E-24
HE 4	0.000E+00	6.235E-09	7.424E-09	1.418E-08	2.459E-08	3.151E-08	3.223E-08	7.034E-08
TL207	1.870E-21	1.290E-20	1.395E-20	1.682E-20	1.961E-20	2.453E-20	2.503E-20	9.036E-20
TL208	1.660E-20	7.964E-22	7.234E-22	3.547E-22	2.305E-23	7.929E-26	4.400E-26	1.397E-25
TL209	0.000E+00	1.404E-26	1.814E-26	7.581E-26	8.083E-25	5.776E-24	6.983E-24	5.890E-22
PB206	0.000E+00	6.725E-17	1.454E-16	3.485E-15	2.194E-13	3.837E-12	4.983E-12	1.960E-09
PB207	0.000E+00	2.892E-14	3.923E-14	1.289E-13	5.268E-13	1.563E-12	1.741E-12	4.165E-11
PB208	0.000E+00	2.854E-14	3.105E-14	4.371E-14	5.510E-14	5.589E-14	5.589E-14	5.612E-14
PB209	0.000E+00	5.852E-23	7.557E-23	3.159E-22	3.368E-21	2.407E-20	2.910E-20	2.454E-18
PB210	3.590E-20	1.907E-16	3.337E-16	3.200E-15	6.033E-14	3.795E-13	4.262E-13	1.526E-11
PB211	0.000E+00	9.976E-20	1.079E-19	1.302E-19	1.517E-19	1.898E-19	1.936E-19	6.990E-19
PB212	9.850E-18	4.697E-19	4.267E-19	2.092E-19	1.359E-20	4.677E-23	2.595E-23	8.240E-23
PB214	0.000E+00	1.338E-21	2.034E-21	1.217E-20	1.405E-19	8.838E-19	1.046E-18	3.554E-17
BI209	0.000E+00	2.922E-18	4.150E-18	2.847E-17	8.347E-16	1.444E-14	1.903E-14	1.583E-11
BI210	0.000E+00	1.174E-19	2.054E-19	1.969E-18	3.712E-17	2.335E-16	2.623E-16	9.390E-15
BI211	0.000E+00	5.886E-21	6.367E-21	7.679E-21	8.953E-21	1.120E-20	1.142E-20	4.124E-20
BI212	9.340E-19	4.456E-20	4.047E-20	1.985E-20	1.289E-21	4.436E-24	2.462E-24	7.816E-24
BI213	0.000E+00	1.375E-23	1.776E-23	7.422E-23	7.913E-22	5.655E-21	6.837E-21	5.767E-19
BI214	0.000E+00	9.933E-22	1.510E-21	9.035E-21	1.043E-19	6.562E-19	7.769E-19	2.639E-17
PO210	5.070E-22	3.242E-18	5.673E-18	5.438E-17	1.025E-15	6.449E-15	7.244E-15	2.594E-13
PO211	0.000E+00	7.221E-26	7.811E-26	9.422E-26	1.098E-25	1.374E-25	1.402E-25	5.060E-25
PO212	0.000E+00	2.357E-30	2.141E-30	1.050E-30	6.822E-32	2.347E-34	1.303E-34	4.135E-34
PO213	0.000E+00	2.063E-32	2.664E-32	1.114E-31	1.187E-30	8.484E-30	1.026E-29	8.652E-28
PO214	0.000E+00	1.367E-28	2.078E-28	1.243E-27	1.435E-26	9.028E-26	1.069E-25	3.631E-24
PO215	0.000E+00	8.353E-26	9.035E-26	1.090E-25	1.271E-25	1.589E-25	1.621E-25	5.853E-25
PO216	0.000E+00	1.874E-24	1.703E-24	8.349E-25	5.424E-26	1.866E-28	1.036E-28	3.288E-28
PO218	0.000E+00	1.551E-22	2.359E-22	1.411E-21	1.629E-20	1.025E-19	1.213E-19	4.121E-18
AT217	0.000E+00	1.652E-28	2.133E-28	8.917E-28	9.507E-27	6.794E-26	8.214E-26	6.928E-24
RN219	0.000E+00	1.893E-22	2.048E-22	2.470E-22	2.879E-22	3.601E-22	3.674E-22	1.326E-21
RN220	1.480E-20	7.076E-22	6.428E-22	3.152E-22	2.048E-23	7.045E-26	3.910E-26	1.241E-25
RN222	0.000E+00	2.852E-19	4.337E-19	2.594E-18	2.996E-17	1.884E-16	2.231E-16	7.578E-15
FR221	0.000E+00	1.500E-24	1.937E-24	8.098E-24	8.633E-23	6.170E-22	7.459E-22	6.292E-20
FR223	0.000E+00	8.785E-22	9.489E-22	1.146E-21	1.336E-21	1.671E-21	1.705E-21	6.157E-21
RA223	0.000E+00	4.809E-17	5.201E-17	6.274E-17	7.314E-17	9.147E-17	9.333E-17	3.369E-16
RA224	8.500E-17	4.097E-18	3.722E-18	1.825E-18	1.186E-19	4.080E-22	2.264E-22	7.188E-22
RA225	2.860E-21	6.782E-21	8.759E-21	3.661E-20	3.903E-19	2.790E-18	3.372E-18	2.845E-16
RA226	3.220E-17	4.437E-14	6.747E-14	4.036E-13	4.660E-12	2.931E-11	3.470E-11	1.179E-09
RA228	5.640E-21	2.090E-20	2.141E-20	2.497E-20	3.696E-20	6.334E-20	6.741E-20	4.892E-19
AC225	1.930E-21	4.582E-21	5.917E-21	2.473E-20	2.637E-19	1.884E-18	2.278E-18	1.922E-16
AC227	4.930E-15	3.404E-14	3.677E-14	4.441E-14	5.178E-14	6.476E-14	6.607E-14	2.386E-13
AC228	0.000E+00	2.182E-24	2.235E-24	2.606E-24	3.857E-24	6.611E-24	7.037E-24	5.107E-23
TH227	0.000E+00	7.901E-17	8.547E-17	1.031E-16	1.202E-16	1.503E-16	1.534E-16	5.537E-16
TH228	1.660E-14	7.963E-16	7.232E-16	3.547E-16	2.304E-17	7.928E-20	4.400E-20	1.397E-19
TH229	5.270E-16	1.250E-15	1.614E-15	6.747E-15	7.194E-14	5.141E-13	6.215E-13	5.243E-11
TH230	8.670E-13	2.349E-10	2.931E-10	7.653E-10	2.875E-09	7.681E-09	8.414E-09	7.411E-08

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zr_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

	g/g	44.0YR	54.0YR	128.0YR	412.0YR	1028.0YR	1122.0YR	1.0E+04YR
TH231	2.700E-14	1.431E-16	1.431E-16	1.432E-16	1.433E-16	1.436E-16	1.436E-16	1.470E-16
TH232	4.180E-11	4.573E-11	4.663E-11	5.326E-11	7.886E-11	1.352E-10	1.438E-10	1.044E-09
TH234	9.470E-16	1.611E-16	1.611E-16	1.611E-16	1.611E-16	1.612E-16	1.612E-16	1.612E-16
PA231	6.580E-11	6.726E-11	6.759E-11	7.001E-11	7.924E-11	9.912E-11	1.021E-10	3.653E-10
PA233	5.460E-14	1.874E-14	1.902E-14	2.101E-14	2.687E-14	3.324E-14	3.377E-14	3.692E-14
PA234M	3.190E-20	5.434E-21	5.434E-21	5.434E-21	5.434E-21	5.434E-21	5.434E-21	5.435E-21
PA234	1.430E-20	2.427E-21	2.427E-21	2.427E-21	2.427E-21	2.427E-21	2.427E-21	2.427E-21
U232	3.680E-15	2.968E-14	2.696E-14	1.322E-14	8.586E-16	2.281E-18	9.226E-19	0.000E+00
U233	8.530E-14	7.615E-12	9.384E-12	2.327E-11	8.755E-11	2.637E-10	2.931E-10	3.304E-09
U234	1.740E-06	2.060E-06	2.119E-06	2.434E-06	2.786E-06	2.823E-06	2.823E-06	2.753E-06
U235	3.520E-05	3.520E-05	3.521E-05	3.521E-05	3.525E-05	3.531E-05	3.532E-05	3.616E-05
U236	3.070E-06	3.074E-06	3.075E-06	3.083E-06	3.111E-06	3.169E-06	3.178E-06	3.699E-06
U237	0.000E+00	9.681E-16	5.982E-16	1.698E-17	1.961E-23	6.693E-28	6.642E-28	3.217E-28
U238	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05	1.110E-05
U240	0.000E+00	6.910E-20	8.480E-20	2.010E-19	6.468E-19	1.613E-18	1.760E-18	1.556E-17
NP237	5.200E-07	5.517E-07	5.599E-07	6.187E-07	7.912E-07	9.787E-07	9.943E-07	1.087E-06
NP238	0.000E+00	8.069E-21	7.710E-21	5.502E-21	1.507E-21	9.082E-23	5.916E-23	1.467E-40
NP239	1.260E-19	1.250E-19	1.248E-19	1.240E-19	1.207E-19	1.139E-19	1.129E-19	4.900E-20
NP240M	0.000E+00	6.044E-22	7.418E-22	1.758E-21	5.657E-21	1.411E-20	1.540E-20	1.361E-19
PU236	4.070E-14	9.198E-19	8.089E-20	1.243E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PU238	1.110E-06	7.841E-07	7.245E-07	4.038E-07	4.284E-08	3.300E-10	1.570E-10	8.727E-34
PU239	3.890E-06	3.885E-06	3.884E-06	3.876E-06	3.844E-06	3.777E-06	3.766E-06	2.915E-06
PU240	9.800E-07	9.754E-07	9.744E-07	9.668E-07	9.381E-07	8.788E-07	8.701E-07	3.390E-07
PU241	2.600E-07	3.127E-08	1.932E-08	5.483E-10	6.333E-16	2.165E-20	2.148E-20	1.040E-20
PU242	1.300E-07	1.300E-07	1.300E-07	1.300E-07	1.299E-07	1.298E-07	1.297E-07	1.277E-07
PU243	0.000E+00	1.581E-31	1.935E-31	4.455E-31	1.290E-30	2.594E-30	2.743E-30	4.733E-30
PU244	4.850E-18	3.613E-09	4.434E-09	1.051E-08	3.382E-08	8.432E-08	9.202E-08	8.137E-07
AM241	3.200E-07	5.165E-07	5.201E-07	4.791E-07	3.042E-07	1.133E-07	9.742E-08	6.267E-14
AM242M	5.260E-14	4.304E-14	4.112E-14	2.934E-14	8.037E-15	4.844E-16	3.155E-16	7.828E-34
AM242	6.290E-19	5.148E-19	4.919E-19	3.510E-19	9.614E-20	5.794E-21	3.774E-21	9.363E-39
AM243	1.460E-13	1.454E-13	1.453E-13	1.443E-13	1.405E-13	1.326E-13	1.314E-13	5.701E-14
CM242	1.280E-16	1.041E-16	9.946E-17	7.097E-17	1.944E-17	1.172E-18	7.631E-19	1.899E-36
CM243	2.790E-16	9.569E-17	7.503E-17	1.241E-17	1.234E-20	3.845E-27	3.845E-27	0.000E+00
CM244	2.330E-15	4.325E-16	2.949E-16	1.736E-17	3.303E-22	1.903E-32	1.903E-32	0.000E+00
CM245	1.410E-17	1.405E-17	1.404E-17	1.395E-17	1.363E-17	1.297E-17	1.287E-17	6.231E-18
CM246	1.220E-19	3.809E-15	3.973E-15	4.166E-15	4.001E-15	3.655E-15	3.605E-15	9.801E-16
CM247	0.000E+00	4.435E-21	5.426E-21	1.250E-20	3.620E-20	7.275E-20	7.695E-20	1.327E-19
CM248	4.450E-05	4.450E-05	4.450E-05	4.449E-05	4.446E-05	4.441E-05	4.440E-05	4.360E-05
CF250	4.310E-15	4.187E-16	2.465E-16	4.884E-18	1.423E-24	9.486E-39	9.486E-39	0.000E+00
CF251	1.350E-19	1.305E-19	1.295E-19	1.223E-19	9.822E-20	6.107E-20	5.680E-20	5.097E-23
SF250	0.000E+00	3.361E-10	4.125E-10	9.777E-10	3.146E-09	7.845E-09	8.561E-09	7.570E-08
H 3	6.459E-10	5.465E-11	3.117E-11	4.897E-13	5.845E-20	5.629E-35	5.629E-35	0.000E+00
LI 6	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12	8.684E-12
LI 7	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13	2.207E-13
BE 9	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12	4.441E-12
BE 10	2.913E-12	2.913E-12	2.913E-12	2.913E-12	2.912E-12	2.912E-12	2.912E-12	2.900E-12
C 14	3.505E-09	3.486E-09	3.482E-09	3.451E-09	3.335E-09	3.095E-09	3.060E-09	1.044E-09
ZN 66	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13	1.618E-13
ZN 67	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17	5.976E-17
ZN 68	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12	8.880E-12
GA 69	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15	2.640E-15
ZN 70	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11	3.025E-11
GE 70	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18	1.152E-18
GA 71	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14	1.304E-14
GE 72	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10	1.584E-10
GE 73	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10	5.700E-10
GE 74	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09	1.494E-09
AS 75	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09	3.666E-09
GE 76	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08	1.100E-08
SE 76	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12	9.416E-12
SE 77	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08	2.473E-08
SE 78	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08	5.109E-08
SE 79	1.320E-07	1.319E-07	1.319E-07	1.318E-07	1.314E-07	1.306E-07	1.304E-07	1.186E-07
BR 79	1.198E-11	7.394E-11	8.802E-11	1.921E-10	5.910E-10	1.452E-09	1.583E-09	1.339E-08
SE 80	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07	3.176E-07

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zr_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

	g/g	44.0YR	54.0YR	128.0YR	412.0YR	1028.0YR	1122.0YR	1.0E+04YR
KR 80	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12	1.554E-12
BR 81	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07	5.436E-07
KR 81	1.088E-14	1.088E-14	1.088E-14	1.088E-14	1.087E-14	1.084E-14	1.084E-14	1.053E-14
SE 82	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07	8.601E-07
KR 82	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09	2.216E-09
KR 83	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06	1.378E-06
KR 84	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06	2.764E-06
KR 85	4.192E-07	2.437E-08	1.277E-08	1.067E-10	1.130E-18	5.692E-36	5.692E-36	0.000E+00
RB 85	2.998E-06	3.393E-06	3.404E-06	3.417E-06	3.417E-06	3.417E-06	3.417E-06	3.417E-06
KR 86	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06	5.461E-06
SR 86	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09	1.065E-09
RB 87	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06	7.071E-06
SR 87	4.930E-11	4.930E-11	4.931E-11	4.931E-11	4.934E-11	4.941E-11	4.942E-11	5.034E-11
SR 88	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05	1.019E-05
Y 89	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05	1.344E-05
SR 90	1.820E-05	6.386E-06	5.033E-06	8.648E-07	9.959E-10	4.272E-16	4.559E-17	0.000E+00
Y 90	3.330E-09	1.601E-09	1.262E-09	2.169E-10	2.515E-13	1.071E-19	1.143E-20	0.000E+00
ZR 90	2.376E-02	2.377E-02	2.377E-02	2.378E-02	2.378E-02	2.378E-02	2.378E-02	2.378E-02
ZR 91	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03	5.196E-03
ZR 92	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03	7.939E-03
ZR 93	2.089E-05	2.089E-05	2.089E-05	2.089E-05	2.089E-05	2.088E-05	2.088E-05	2.080E-05
NB 93	4.703E-05	4.703E-05	4.703E-05	4.703E-05	4.703E-05	4.704E-05	4.704E-05	4.712E-05
NB 93M	6.200E-11	1.643E-10	1.691E-10	1.762E-10	1.764E-10	1.763E-10	1.763E-10	1.756E-10
ZR 94	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03	8.047E-03
NB 94	4.287E-08	4.281E-08	4.279E-08	4.268E-08	4.227E-08	4.139E-08	4.126E-08	3.046E-08
MO 95	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05	1.952E-05
ZR 96	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03	1.311E-03
MO 96	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08	4.721E-08
MO 97	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05	1.851E-05
MO 98	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05	1.806E-05
TC 98	8.835E-12	8.835E-12	8.835E-12	8.835E-12	8.834E-12	8.833E-12	8.833E-12	8.820E-12
TC 99	1.855E-05	1.855E-05	1.855E-05	1.854E-05	1.853E-05	1.849E-05	1.848E-05	1.796E-05
RU 99	5.127E-10	3.169E-09	3.772E-09	8.238E-09	2.537E-08	6.246E-08	6.812E-08	5.951E-07
MO100	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05	1.985E-05
RU100	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07	1.947E-07
RU101	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05	1.614E-05
RU102	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05	1.369E-05
RH102	1.786E-13	4.836E-18	4.431E-19	9.227E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH103	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06	9.899E-06
RU104	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06	6.206E-06
PD104	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07	3.415E-07
PD105	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06	3.364E-06
RU106	4.117E-09	2.981E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
RH106	3.870E-15	2.802E-28	2.891E-31	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD106	1.468E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06	1.472E-06
PD107	6.496E-07	6.496E-07	6.496E-07	6.496E-07	6.496E-07	6.495E-07	6.495E-07	6.489E-07
AG107	5.890E-13	3.639E-12	4.332E-12	9.461E-12	2.915E-11	7.184E-11	7.835E-11	6.942E-10
PD108	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07	3.114E-07
AG108	0.000E+00	7.294E-26	6.907E-26	4.612E-26	9.789E-27	3.394E-28	2.032E-28	0.000E+00
AG108M	2.937E-17	2.310E-17	2.187E-17	1.461E-17	3.100E-18	1.075E-19	6.435E-20	5.463E-41
CD108	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14	5.655E-14
AG109	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07	1.490E-07
AG109M	1.196E-25	4.479E-36	4.479E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD109	1.210E-19	4.534E-30	4.534E-30	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PD110	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07	1.130E-07
AG110	1.093E-21	4.763E-41	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
AG110M	7.214E-14	3.146E-33	1.252E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CD110	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09	7.010E-09
CD111	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08	9.190E-08
CD112	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08	6.787E-08
CD113	7.215E-09	7.216E-09	7.216E-09	7.216E-09	7.216E-09	7.216E-09	7.216E-09	7.216E-09
CD113M	8.797E-10	1.088E-10	6.763E-11	2.010E-12	2.775E-18	5.405E-31	5.405E-31	0.000E+00
IN113	1.097E-07	1.105E-07	1.105E-07	1.106E-07	1.106E-07	1.106E-07	1.106E-07	1.106E-07
CD114	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07	1.200E-07
SN114	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05	4.762E-05
IN115	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08	4.725E-08

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zr_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

	g/g	44.0YR	54.0YR	128.0YR	412.0YR	1028.0YR	1122.0YR	1.0E+04YR
SN115	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05	2.613E-05
CD116	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08	6.162E-08
SN116	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03	1.063E-03
SN117	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04	5.633E-04
SN118	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03	1.774E-03
SN119	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04	6.298E-04
SN119M	1.023E-10	1.842E-30	5.998E-35	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN120	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03	2.388E-03
SN121M	1.522E-09	8.267E-10	7.196E-10	2.578E-10	5.018E-12	9.768E-16	2.652E-16	0.000E+00
SB121	3.822E-07	3.829E-07	3.830E-07	3.835E-07	3.837E-07	3.837E-07	3.837E-07	3.837E-07
SN122	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08	7.595E-08
TE122	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09	2.332E-09
SB123	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08	9.069E-08
TE123	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12	5.174E-12
SN124	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07	1.191E-07
TE124	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10	3.496E-10
SB125	1.875E-08	3.098E-13	2.537E-14	2.301E-22	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TE125	1.375E-07	1.565E-07	1.565E-07	1.565E-07	1.565E-07	1.565E-07	1.565E-07	1.565E-07
TE125M	2.623E-10	4.333E-15	3.548E-16	3.218E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SN126	2.872E-07	2.871E-07	2.871E-07	2.869E-07	2.864E-07	2.852E-07	2.850E-07	2.679E-07
SB126	1.364E-14	1.364E-14	1.364E-14	1.363E-14	1.361E-14	1.355E-14	1.354E-14	1.273E-14
SB126M	1.037E-16	1.037E-16	1.037E-16	1.036E-16	1.034E-16	1.030E-16	1.029E-16	9.679E-17
TE126	5.945E-09	6.033E-09	6.052E-09	6.200E-09	6.764E-09	7.984E-09	8.170E-09	2.520E-08
I127	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07	6.369E-07
TE128	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06	1.611E-06
XE128	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09	3.072E-09
I129	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.895E-06	2.894E-06
XE129	3.694E-12	9.318E-12	1.060E-11	2.006E-11	5.636E-11	1.351E-10	1.471E-10	1.283E-09
TE130	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06	6.193E-06
XE130	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08	1.700E-08
XE131	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05	1.154E-05
XE132	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05	1.829E-05
BA132	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12	2.671E-12
CS133	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05	2.795E-05
XE134	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05	3.248E-05
CS134	2.700E-08	1.018E-14	3.530E-16	5.549E-27	0.000E+00	0.000E+00	0.000E+00	0.000E+00
BA134	3.324E-07	3.594E-07	3.594E-07	3.594E-07	3.594E-07	3.594E-07	3.594E-07	3.594E-07
CS135	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.611E-05	1.610E-05	1.606E-05
BA135	6.250E-11	2.761E-10	3.247E-10	6.840E-10	2.063E-09	5.053E-09	5.509E-09	4.860E-08
XE136	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05	3.938E-05
BA136	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08	7.666E-08
CS137	2.170E-05	7.851E-06	6.231E-06	1.127E-06	1.586E-09	1.045E-15	1.190E-16	0.000E+00
BA137	4.716E-06	1.856E-05	2.018E-05	2.529E-05	2.641E-05	2.642E-05	2.642E-05	2.642E-05
BA137M	3.323E-12	1.201E-12	9.533E-13	1.725E-13	2.437E-16	1.598E-22	1.821E-23	0.000E+00
BA138	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05	2.961E-05
LA138	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10	2.454E-10
LA139	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05
CE140	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05	2.827E-05
PR141	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05	2.617E-05
CE142	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05	2.635E-05
ND142	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08	4.278E-08
ND143	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05	2.599E-05
CE144	1.310E-08	1.253E-25	1.699E-29	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144	5.529E-13	5.293E-30	7.173E-34	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PR144M	2.764E-15	2.646E-32	3.586E-36	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
ND144	2.534E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05	2.535E-05
ND145	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05	1.770E-05
ND146	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05	1.388E-05
PM146	7.072E-12	2.762E-14	7.831E-15	6.976E-19	1.993E-34	0.000E+00	0.000E+00	0.000E+00
SM146	9.099E-12	1.171E-11	1.171E-11	1.172E-11	1.172E-11	1.172E-11	1.172E-11	1.171E-11
PM147	1.037E-06	9.268E-12	6.600E-13	2.130E-21	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM147	8.639E-06	9.676E-06	9.676E-06	9.676E-06	9.676E-06	9.676E-06	9.676E-06	9.676E-06
ND148	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06	7.900E-06
SM148	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07	7.509E-07
SM149	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07	3.859E-07
ND150	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06	3.074E-06

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zr_run2.g (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

g/g	44.0YR	54.0YR	128.0YR	412.0YR	1028.0YR	1122.0YR	1.0E+04YR
SM150	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06	4.885E-06
EU150	1.886E-15	8.084E-16	6.668E-16	1.604E-16	6.763E-19	4.777E-24	4.777E-24	0.000E+00
SM151	1.028E-06	7.325E-07	6.782E-07	3.836E-07	4.304E-08	3.744E-10	1.815E-10	0.000E+00
EU151	6.803E-08	3.635E-07	4.178E-07	7.125E-07	1.053E-06	1.096E-06	1.096E-06	1.096E-06
SM152	2.144E-06	2.145E-06	2.145E-06	2.145E-06	2.145E-06	2.145E-06	2.145E-06	2.145E-06
EU152	1.156E-09	1.228E-10	7.375E-11	1.698E-12	8.788E-19	2.039E-32	2.039E-32	0.000E+00
GD152	7.092E-10	9.971E-10	1.011E-09	1.031E-09	1.031E-09	1.031E-09	1.031E-09	1.031E-09
EU153	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07	9.122E-07
GD153	8.217E-16	8.409E-36	2.408E-40	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SM154	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07	3.722E-07
EU154	1.370E-07	3.950E-09	1.764E-09	4.532E-12	5.193E-22	2.158E-43	0.000E+00	0.000E+00
GD154	2.433E-08	1.574E-07	1.596E-07	1.613E-07	1.613E-07	1.613E-07	1.613E-07	1.613E-07
EU155	6.000E-10	1.280E-12	3.163E-13	1.019E-17	5.874E-35	0.000E+00	0.000E+00	0.000E+00
GD155	8.315E-08	8.375E-08	8.375E-08	8.375E-08	8.375E-08	8.375E-08	8.375E-08	8.375E-08
GD156	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07	1.335E-07
GD157	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09	1.763E-09
GD158	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08	5.791E-08
TB159	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09	6.646E-09
GD160	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09	2.654E-09
DY160	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10	1.065E-10
DY161	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10	6.843E-10
DY162	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10	3.772E-10
DY163	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10	1.359E-10
DY164	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11	4.202E-11
HO165	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11	3.132E-11
HO166M	5.026E-14	4.900E-14	4.872E-14	4.668E-14	3.962E-14	2.776E-14	2.629E-14	1.548E-16
ER166	1.169E-11	1.169E-11	1.169E-11	1.169E-11	1.170E-11	1.171E-11	1.171E-11	1.174E-11
ER167	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12	5.859E-12
ER168	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13	8.111E-13
TM169	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16	5.967E-16
ER170	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20	2.058E-20
YB170	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17	1.406E-17
TM171	4.325E-21	5.462E-28	5.462E-28	1.365E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00
YB171	8.994E-20	9.426E-20	9.426E-20	9.426E-20	9.426E-20	9.426E-20	9.426E-20	9.426E-20
YB172	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17	4.405E-17

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Source Listing of Program ELEZR2

```
      PROGRAM ELEZR2

!-------- WRITTEN BY D.R. WENZEL
!          Revised 9/18/02

!            To sum the g/L of coprocess waste and round
!            the output to 2 places of accuracy

      CHARACTER (LEN=2) :: BLANK, ELE, SMBCAP, SMBLC
      CHARACTER (LEN=6) :: NAME, NUCLIDE(29)
      CHARACTER (LEN=85) :: TITLE
      EQUIVALENCE (ELE, NAME)
      LOGICAL :: FIRST, FOUND
      REAL *4 OLD(7), SIGMA(7), TOTAL(7)

      OPEN(3,FILE ='ZR_RUN2.G', STATUS='OLD',FORM='FORMATTED', ERR = 900)
      OPEN(4,FILE ='SYMBOL', STATUS='OLD',FORM='FORMATTED', ERR = 910)
      OPEN(6,FILE ='ZR_RUN2.ELE', STATUS='UNKNOWN', ERR = 920)

      DATA BLANK /'  '/

      DATA NUCLIDE /'AL 27 ','CR 50 ','CR 52 ','CR 53 ','CR 54 ',     &
                    'FE 54 ','FE 56 ','FE 57 ','FE 58 ','NI 58 ',     &
                    'NI 60 ','NI 61 ','NI 62 ','NI 64 ','ZR 90 ',     &
                    'ZR 91 ','ZR 92 ','ZR 94 ','ZR 96 ','SN112 ',     &
                    'SN114 ','SN115 ','SN116 ','SN117 ','SN118 ',     &
                    'SN120 ','SN119 ','SN122 ','SN124 '/


      FIRST = .TRUE.
      SIGMA = 0.

!        Read symbol of element to be summed

   10 READ(4,400) SMBCAP, SMBLC
  400 FORMAT(A2,3X,A2)
      FOUND = .FALSE.
      IF(SMBCAP == BLANK) GO TO 100

!--------- Zero out summary

      TOTAL = 0.

!--------- On the first pass only, modify the name on the first
!          line of data

      READ(3,300) TITLE
  300 FORMAT(A85)
      IF(FIRST) WRITE(6,600)
  600 FORMAT(1X,'ZR_RUN2.ELE     g/g Zr calcine')

!--------- On the first pass only, echo the next line of data

      READ(3,300) TITLE
```

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Source Listing of Program ELEZR2 (continued)

```
      IF(FIRST) WRITE(6,610) TITLE
  610 FORMAT(A85,/,'Element',5X,'2032Jan   2042Jan   2116Jan   2400' &
            'Jan   3016Jan   3110Jan   12000Jan')

!--------- Skip the next 2 lines of data

      READ(3,300) TITLE
      READ(3,300) TITLE
      FIRST = .FALSE.

!--------- Read individual nuclide mass and search for the
!          element to be summed

   60 READ(3,310,END=80) NAME, (OLD(J),J=1,7)
  310 FORMAT(1X,A6,14X,7(1PE10.3))
      IF(ELE /= SMBCAP) GO TO 60

!--------- Bypass sum when nuclide is stable and element measured
!          by analytical analysis

      DO K=1,29
         IF(NAME == NUCLIDE(K)) GO TO 60
      END DO

      FOUND = .TRUE.
      DO J=1,7
         TOTAL(J) = TOTAL(J) + OLD(J)
      END DO

      GO TO 60

!--------- Write element total when element found

   80 REWIND(3)
      IF(.NOT. FOUND) GO TO 10

!--------- Write results with 2 places of accuracy

      IF(TOTAL(1) > 0.) THEN
         WRITE(6,620) SMBLC, (TOTAL(J),J=1,7)
  620    FORMAT(1X,a2,6X,7(1PE10.1))
      ENDIF

!--------- Keep a sum of the total for all elements

      DO J=1,7
         SIGMA(J) = SIGMA(J) + TOTAL(J)
      END DO

      GO TO 10
  100 WRITE(6,630) (SIGMA(J),J=1,7)
  630 FORMAT(1X,/,1X,'Total ',2X,7(1PE10.1))
      GO TO 999
```

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Source Listing of Program ELEZR2 (continued)

```
!-------- ERROR STATEMENTS

  900  WRITE(6,9000)
 9000  FORMAT(2X,'ERROR IN OPENING FILE 3')
       GO TO 999

  910  WRITE(6,9010)
 9010  FORMAT(2X,'ERROR IN OPENING FILE 4')
       GO TO 999

  920  WRITE(6,9020)
 9020  FORMAT(2X,'ERROR IN OPENING FILE 6')
       GO TO 999

!-------- PROGRAM END

  999  CONTINUE
       END PROGRAM ELEZR2
```

See Appendix A-4, pages 4-5, for a listing of file SYMBOL.

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ZR_RUN2.ELE g/g Zr calcine
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
H	5.5E-11	3.1E-11	4.9E-13	5.8E-20	5.6E-35	5.6E-35	0.0E+00
He	6.2E-09	7.4E-09	1.4E-08	2.5E-08	3.2E-08	3.2E-08	7.0E-08
Li	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12	8.9E-12
Be	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.4E-12	7.3E-12
B	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10	4.1E-10
C	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06	7.1E-06
N	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06	9.4E-06
O	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04	5.7E-04
F	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14	8.0E-14
Ne	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19	9.1E-19
Mg	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12	2.6E-12
Si	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10	4.6E-10
P	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25	8.2E-25
Cl	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24	7.5E-24
Ar	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19	2.1E-19
K	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21	6.5E-21
Ca	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12	1.0E-12
Sc	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14	1.7E-14
Ti	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
V	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08	6.3E-08
Mn	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08	2.0E-08
Fe	1.6E-14	1.1E-15	3.0E-24	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Co	1.5E-09	1.5E-09	1.6E-09	1.9E-09	2.6E-09	2.7E-09	1.2E-08
Ni	1.4E-07	1.4E-07	1.4E-07	1.3E-07	1.3E-07	1.3E-07	1.2E-07
Cu	8.2E-09	9.3E-09	1.5E-08	2.3E-08	2.4E-08	2.4E-08	2.4E-08
Zn	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11	3.9E-11
Ga	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14	1.6E-14
Ge	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
As	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09	3.7E-09
Se	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06	1.4E-06
Br	5.4E-07	5.4E-07	5.4E-07	5.4E-07	5.5E-07	5.5E-07	5.6E-07
Kr	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06	9.6E-06
Rb	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Sr	1.7E-05	1.5E-05	1.1E-05	1.0E-05	1.0E-05	1.0E-05	1.0E-05
Y	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05	1.3E-05
Zr	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05	2.1E-05
Nb	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05
Mo	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05	7.6E-05
Tc	1.9E-05	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05
Ru	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.6E-05	3.7E-05
Rh	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06	9.9E-06
Pd	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06	6.3E-06
Ag	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07	1.5E-07
Cd	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07	3.6E-07
In	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07	1.6E-07
Sn	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.9E-07	2.8E-07	2.7E-07
Sb	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07	4.7E-07
Te	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06	8.0E-06
I	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06	3.5E-06
Xe	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04	1.0E-04
Cs	5.2E-05	5.0E-05	4.5E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Ba	4.9E-05	5.0E-05	5.5E-05	5.6E-05	5.6E-05	5.6E-05	5.7E-05

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ZR_RUN2.ELE g/g Zr calcine (continued)
ORIGEN2 V2.1 (8-1-91), Run on 07/09/02 at 22:00:38

Element	2032Jan	2042Jan	2116Jan	2400Jan	3016Jan	3110Jan	12000Jan
La	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05	2.8E-05
Ce	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05	5.5E-05
Pr	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05	2.6E-05
Nd	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Pm	9.3E-12	6.7E-13	7.0E-19	2.0E-34	0.0E+00	0.0E+00	0.0E+00
Sm	1.9E-05	1.9E-05	1.9E-05	1.8E-05	1.8E-05	1.8E-05	1.8E-05
Eu	1.3E-06	1.3E-06	1.6E-06	2.0E-06	2.0E-06	2.0E-06	2.0E-06
Gd	4.4E-07	4.4E-07	4.4E-07	4.4E-07	4.4E-07	4.4E-07	4.4E-07
Tb	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09	6.6E-09
Dy	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09	1.3E-09
Ho	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11	3.1E-11
Er	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11	1.8E-11
Tm	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16	6.0E-16
Yb	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17	6.4E-17
Lu	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08	1.3E-08
Hf	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Ta	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06	4.7E-06
W	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07	1.8E-07
Re	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13	1.1E-13
Os	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16	9.5E-16
Tl	1.4E-20	1.5E-20	1.7E-20	2.0E-20	2.5E-20	2.5E-20	9.1E-20
Pb	5.8E-14	7.1E-14	1.8E-13	8.6E-13	5.8E-12	7.2E-12	2.0E-09
Bi	3.1E-18	4.4E-18	3.0E-17	8.7E-16	1.5E-14	1.9E-14	1.6E-11
Po	3.2E-18	5.7E-18	5.4E-17	1.0E-15	6.4E-15	7.2E-15	2.6E-13
At	1.7E-28	2.1E-28	8.9E-28	9.5E-27	6.8E-26	8.2E-26	6.9E-24
Rn	2.9E-19	4.3E-19	2.6E-18	3.0E-17	1.9E-16	2.2E-16	7.6E-15
Fr	8.8E-22	9.5E-22	1.2E-21	1.4E-21	2.3E-21	2.5E-21	6.9E-20
Ra	4.4E-14	6.8E-14	4.0E-13	4.7E-12	2.9E-11	3.5E-11	1.2E-09
Ac	3.4E-14	3.7E-14	4.4E-14	5.2E-14	6.5E-14	6.6E-14	2.4E-13
Th	2.8E-10	3.4E-10	8.2E-10	3.0E-09	7.8E-09	8.6E-09	7.5E-08
Pa	6.7E-11	6.8E-11	7.0E-11	7.9E-11	9.9E-11	1.0E-10	3.7E-10
U	5.1E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.2E-05	5.4E-05
Np	5.5E-07	5.6E-07	6.2E-07	7.9E-07	9.8E-07	9.9E-07	1.1E-06
Pu	5.8E-06	5.7E-06	5.4E-06	5.0E-06	4.9E-06	4.9E-06	4.2E-06
Am	5.2E-07	5.2E-07	4.8E-07	3.0E-07	1.1E-07	9.7E-08	1.2E-13
Cm	4.5E-05	4.5E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05	4.4E-05
Cf	4.2E-16	2.5E-16	5.0E-18	9.8E-20	6.1E-20	5.7E-20	5.1E-23
Total	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**	**1.5E-03**