

! chain1/chain2 from U234 & down are the same:
 ! (Both chains are required input)

!		\\	\\	\\	\\	\\	\\	\\
CHAIN1	PU242	U238	TH234	PA234M	U234	TH230	RA226	
	RN222	PO218	PB214	BI214	PO214	PB210	<	
CHAIN2	PU238	U234	TH230	RA226	RN222	PO218		
	PB214	BI214	PO214	PB210	<			

! chain3/chain4 from PU239 & down are the same:

CHAIN3	AM243	NP239	PU239	U235	TH231	PA231	AC227	
	TH227	RA223	RN219	PO215	PB211	BI211	TL207	<
CHAIN4	CM243	PU239	U235	TH231	PA231	AC227	TH227	
	RA223	RN219	PO215	PB211	BI211	TL207	<	

! chain5/chain6 from U236 & down are the same:

CHAINS5	CF252	CM248	PU244	PU240	U236	TH232	RA228	
	AC228	TH228	RA224	RN220	PO216	PB212	BI212	
	PO212	<						
CHAIN6	CM244	PU240	U236	TH232	RA228	AC228	TH228	
	RA224	RN220	PO216	PB212	BI212	PO212	<	

CHAIN7	CM245	PU241	AM241	NP237	PA233	U233	TH229	
	RA225	AC225	FR221	AT217	BI213	PO213	PB209	<

CHAIN8 CS137 BA137M <

CHAIN9 PM147 SM147 ND143 <

CHAIN10 SR90 Y90 ZR90 <

! ^ ^ ^ ^ ^ ^ ^ ^

SAVE	AM241	AM243	CF252	CM243	CM244	CM245	CM248	CS137
	NP237	PA231	PB210	PM147	PU238	PU239	PU240	PU241
	PU242	PU244	RA226	RA228	SR90	TH229	TH230	TH232
	U233	U234	U235	U236	U238	<		

TABULAR_DATA

! Example of how the radioisotope data are input:

! ...1st Line: Radionuclide (an asterisk in column 1 follow
 ! by radionuclide name, ex; *AC225)
 ! ...2nd & 3rd line

! ...Field#1 Atomic Weight	(Kg/Mole)	AWT	[REAL]	(3(11x,1pe14.6))
! ...Field#2 Half-Life	(Years)	HALFY	[REAL]	"
! ...Field#3 Activity Conversion	(Ci/Kg)	AWTCNV	[REAL]	"
! ...Field#4 EPA Release Limit	(Ci)	EPAREL	[REAL]	"

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! ...Field#5 Inventory          (Ci)    INVCHD  [REAL]      "
! ...Field#6 Inventory          (Ci)    INVRHD  [REAL]      "
!
!
! *PU241
! xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
!   AWT      2.410000E-01  .HALFY    1.439900E+01  ACTCNV    1.030000E+05
!   EPAREL   1.000000E+07  INVCHD    1.930000E+06  INVRHD    0.000000E+00
!
!
! <TABLE_INPUTS
! *AC225
!   AWT      2.250230E-01  HALFY     2.737909E-02  ACTCNV    5.802700E+07
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *AC227
!   AWT      2.270280E-01  HALFY     2.177335E+01  ACTCNV    7.232300E+04
!   EPAREL   1.000000E+02  INVCHD    0.000000E+00
! *AC228
!   AWT      2.280310E-01  HALFY     6.993710E-04  ACTCNV    2.241700E+09
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *AM241
!   AWT      2.410570E-01  HALFY     4.322347E+02  ACTCNV    3.431200E+03
!   EPAREL   1.000000E+02  INVCHD    2.400000E+05
! *AM243
!   AWT      2.430610E-01  HALFY     7.380313E+03  ACTCNV    1.992900E+02
!   EPAREL   1.000000E+02  INVCHD    0.000000E+00
! *AT217
!   AWT      2.170050E-01  HALFY     1.023547E-09  ACTCNV    1.609500E+15
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *BA137M
!   AWT      1.369070E-01  HALFY     4.851550E-06  ACTCNV    5.382400E+11
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *BI211
!   AWT      2.109870E-01  HALFY     4.049824E-06  ACTCNV    4.184000E+11
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *BI212
!   AWT      2.119910E-01  HALFY     1.151253E-04  ACTCNV    1.464800E+10
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *BI213
!   AWT      2.129940E-01  HALFY     8.679553E-05  ACTCNV    1.933800E+10
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *BI214
!   AWT      2.139990E-01  HALFY     3.783638E-05  ACTCNV    4.415300E+10
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *CF252
!   AWT      2.520820E-01  HALFY     2.638090E+00  ACTCNV    5.375899E+05
!   EPAREL   0.000000E+00  INVCHD    2.960000E+03
! *CM243
!   AWT      2.430610E-01  HALFY     2.850088E+01  ACTCNV    5.160700E+04
!   EPAREL   1.000000E+02  INVCHD    0.000000E+00
! *CM244
!   AWT      2.440630E-01  HALFY     1.811013E+01  ACTCNV    8.088299E+04
!   EPAREL   0.000000E+00  INVCHD    0.000000E+00
! *CM245
!   AWT      2.450650E-01  HALFY     8.498927E+03  ACTCNV    1.716500E+02
!   EPAREL   1.000000E+02  INVCHD    0.000000E+00
! *CM248
!   AWT      2.480720E-01  HALFY     3.390698E+05  ACTCNV    4.250200E+00
!   EPAREL   1.000000E+02  INVCHD    0.000000E+00
! *CS137

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AWT	1.369070E-01	HALFY	2.999975E+01	ACTCNV	8.704300E+04
EPAREL	1.000000E+03	INVCHD	2.070000E+04		
*FR221					
AWT	2.210140E-01	HALFY	9.126364E-06	ACTCNV	1.772400E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*ND143					
AWT	1.430000E-01	HALFY	3.168876E+30	ACTCNV	0.000000E+00
EPAREL	1.000000E+03	INVCHD	0.000000E+00		
*NP237					
AWT	2.370480E-01	HALFY	2.139942E+06	ACTCNV	7.047600E-01
EPAREL	1.000000E+02	INVCHD	6.670000E+01		
*NP239					
AWT	2.390530E-01	HALFY	6.448664E-03	ACTCNV	2.319100E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PA231					
AWT	2.310360E-01	HALFY	3.276618E+04	ACTCNV	4.722500E+01
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*PA233					
AWT	2.330400E-01	HALFY	7.392988E-02	ACTCNV	2.075100E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PA234M					
AWT	2.340430E-01	HALFY	2.224551E-06	ACTCNV	6.866600E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB209					
AWT	2.089810E-01	HALFY	3.764625E-04	ACTCNV	4.544100E+09
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB210					
AWT	2.099840E-01	HALFY	2.229938E+01	ACTCNV	7.634800E+04
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*PB211					
AWT	2.109890E-01	HALFY	6.863786E-05	ACTCNV	2.468600E+10
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB212					
AWT	2.119920E-01	HALFY	1.213680E-03	ACTCNV	1.389500E+09
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PB214					
AWT	2.140000E-01	HALFY	5.095553E-05	ACTCNV	3.278500E+10
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PM147					
AWT	1.469150E-01	HALFY	2.623513E+00	ACTCNV	9.275300E+05
EPAREL	0.000000E+00	INVCHD	5.250000E+02		
*PO212					
AWT	2.119890E-01	HALFY	9.506629E-15	ACTCNV	1.773900E+20
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO213					
AWT	2.129930E-01	HALFY	1.330928E-13	ACTCNV	1.261100E+19
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO214					
AWT	2.139950E-01	HALFY	5.206464E-12	ACTCNV	3.208700E+17
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO215					
AWT	2.149990E-01	HALFY	5.640600E-11	ACTCNV	2.947900E+16
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO216					
AWT	2.160020E-01	HALFY	4.753314E-09	ACTCNV	3.482000E+14
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PO218					
AWT	2.180090E-01	HALFY	5.799044E-06	ACTCNV	2.827800E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*PU238					

AWT	2.380500E-01	HALFY	8.774619E+01	ACTCNV	1.711500E+04
EPAREL	1.000000E+02	INVCHD	4.240000E+06		
*PU239					
AWT	2.390520E-01	HALFY	2.406445E+04	ACTCNV	6.214600E+01
EPAREL	1.000000E+02	INVCHD	3.920000E+05		
*PU240					
AWT	2.400540E-01	HALFY	6.537392E+03	ACTCNV	2.278100E+02
EPAREL	1.000000E+02	INVCHD	6.930000E+04		
*PU241					
AWT	2.410570E-01	HALFY	1.439937E+01	ACTCNV	1.030000E+05
EPAREL	0.000000E+00	INVCHD	1.930000E+06		
*PU242					
AWT	2.420590E-01	HALFY	3.869198E+05	ACTCNV	3.817100E+00
EPAREL	1.000000E+02	INVCHD	4.910000E+04		
*PU244					
AWT	2.440640E-01	HALFY	8.261261E+07	ACTCNV	1.773100E-02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*RA223					
AWT	2.230190E-01	HALFY	3.130533E-02	ACTCNV	5.120600E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RA224					
AWT	2.240200E-01	HALFY	1.001999E-02	ACTCNV	1.592700E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RA225					
AWT	2.250240E-01	HALFY	4.052993E-02	ACTCNV	3.919900E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RA226					
AWT	2.260250E-01	HALFY	1.599966E+03	ACTCNV	9.885801E+02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*RA228					
AWT	2.280310E-01	HALFY	6.699955E+00	ACTCNV	2.340000E+05
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RN219					
AWT	2.190090E-01	HALFY	1.254875E-07	ACTCNV	1.300800E+13
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RN220					
AWT	2.200110E-01	HALFY	1.761895E-06	ACTCNV	9.222600E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*RN222					
AWT	2.220180E-01	HALFY	1.046997E-02	ACTCNV	1.538000E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*SM147					
AWT	1.470000E-01	HALFY	1.059355E+11	ACTCNV	2.295400E-05
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*SR90					
AWT	8.990801E-02	HALFY	2.912197E+01	ACTCNV	1.365400E+05
EPAREL	1.000000E+03	INVCHD	9.850002E+03		
*TH227					
AWT	2.270280E-01	HALFY	5.124073E-02	ACTCNV	3.073200E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TH228					
AWT	2.280290E-01	HALFY	1.913051E+00	ACTCNV	8.195301E+05
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TH229					
AWT	2.290320E-01	HALFY	7.339118E+03	ACTCNV	2.126900E+02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*TH230					
AWT	2.300330E-01	HALFY	7.700370E+04	ACTCNV	2.018300E+01
EPAREL	1.000000E+01	INVCHD	0.000000E+00		
*TH231					

AWT	2.310360E-01	HALFY	2.911247E-03	ACTCNV	5.315200E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TH232					
AWT	2.320380E-01	HALFY	1.405080E+10	ACTCNV	1.096500E-04
EPAREL	1.000000E+01	INVCHD	6.110000E-01		
*TH234					
AWT	2.340440E-01	HALFY	6.597601E-02	ACTCNV	2.315200E+07
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*TL207					
AWT	2.069770E-01	HALFY	9.069325E-06	ACTCNV	1.904500E+11
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*U233					
AWT	2.330400E-01	HALFY	1.585072E+05	ACTCNV	9.678300E+00
EPAREL	1.000000E+02	INVCHD	1.310000E+03		
*U234					
AWT	2.340410E-01	HALFY	2.445105E+05	ACTCNV	6.247300E+00
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*U235					
AWT	2.350440E-01	HALFY	7.038074E+08	ACTCNV	2.161100E-03
EPAREL	1.000000E+02	INVCHD	1.150000E+00		
*U236					
AWT	2.360460E-01	HALFY	2.341483E+07	ACTCNV	6.468300E-02
EPAREL	1.000000E+02	INVCHD	0.000000E+00		
*U238					
AWT	2.380510E-01	HALFY	4.468115E+09	ACTCNV	3.361100E-04
EPAREL	1.000000E+02	INVCHD	2.010000E-01		
*Y90					
AWT	8.990701E-02	HALFY	7.301091E-03	ACTCNV	5.446300E+08
EPAREL	0.000000E+00	INVCHD	0.000000E+00		
*ZR90					
AWT	9.000000E-02	HALFY	3.168876E+30	ACTCNV	0.000000E+00
EPAREL	1.000000E+03	INVCHD	0.000000E+00		

END_TABLES>

!
! END_OF_RADIOISOTOPE_INPUT
!
!
!

END OF CUSP_TEST_INP_CH_REPOSITORY.DAT

The input file listed above was designed specifically to apply to WIPP-site calculations. In principle, CUTTINGS_S could be applied to other sites, although no such applications are foreseen for regulatory calculations. As a convenience to users, the list below specifies those parameters that could be changed to reflect sites other than the WIPP. It is not to be regarded as part of the code's QA documentation.

!Repository Geometry

VARIABLE_name <default value> Only capitalized portion of name is
or required
VARI MATERIAL_NAME:PROPERITY_NAME fetch input from CDB file

!Repository Data/Input

INV_Area <no default> - Area of repository according to the
WIPP TRU waste type (CH or RH)
[REAL].

INV_AR MATERIAL_NAME:PROPERITY_NAME fetch input from CDB file

OUT_MAT <no default> - The CAMDAT material region to
which CUTTINGS_S output variables
are written (CHARACTER*8).

RADWAS <CONTACT_handled> - Type of radioisotope waste form (CHARACTER). Valid
reposes are:

or
REMOTE_handled; WIPP Remote-Handled (RH) TRU waste,
CONTACT_handled; WIPP Contact-Handled (CH) TRU waste,
INEL_wincos; INEL/WINCO HLW/SNF waste(s).

CHAIN <no default> rad_name_1, rad_name_2, rad_name_3, ... <

A list of all the radioisotope names in a decay chain. The order of the list is from parent to daughter, ..., terminating at a stable element. Repeat the CHAIN keyword and list of radioisotopes for as many chains as desired. The half-lives, atomic weights, activity conversions, EPA release limits, and waste-unit information will be retrieved from the generic radioisotope data base. The inventory (in Curies) of each radioisotope will be extracted from the secondary database (CHARACTER).

SAVE <all unique radioisotopes> rad_name_1, rad_name_2, rad_name_3, ... <

A list of all unique radioisotope names for which values are to be written to the output CAMDAT and to the debug/diagnostics file. As a default, all unique radioisotope values will be stored/saved to the output CAMDAT and the debug/diagnostics file.

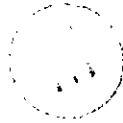
REP_NAME <WIPP> - Name of the repository (CHARACTER). Other valid
responses are: INEL/WINCO.
REP_GEOLOGY <SALT> - Repository geologic medium (CHARACTER). Other
valid responses are: HALITE, or GRANITE.
DISPOSAL_group <1> - Waste Disposal Group number (INTEGER). Valid
waste-disposal group numbers are from 1 to 5. If NAME=WIPP, and GEOLOGY=SALT, the
waste-disposal group number is not used. By specifying a WDG number, radioisotope
inventory data is accessed from the Secondary Database according to the WDG number.

Do not specify PACKAGE_id !!

PACKAGE_id <1> - Waste Package ID (INTEGER). Valid waste package
(WP) IDs are from 1 to 26. If NAME=WIPP, and GEOLOGY=SALT, the waste package ID is

not used. By specifying a WP ID, Radioisotope inventory data is accessed from the Secondary Database according to the WP ID.

Do not specify DISPOSal_group !!



END OF APPENDIX I