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## ACRONYMS

| | |
|---|---|
| AM | arithmetic mean |
| BWR | boiling water reactor |
| BSC | Bechtel SAIC Company |
| CADI | contingent average daily intake |
| CEDE | committed effective dose equivalent |
| DCF | dose conversion factor |
| DIRS | Document Input Reference System |
| DOE | U.S. Department of Energy |
| DTN | data tracking number |
| EDPY | effective number of days per year |
| EPA | U.S. Environmental Protection Agency |
| FGR | Federal Guidance Report |
| FRAMES | Framework for Risk Analysis in Multimedia Environmental System |
| GM | geometric mean |
| GSD | geometric standard deviation |
| HEPA | high-efficiency particulate air [filter] |
| HLW | high-level radioactive waste |
| HTO | tritiated water |
| HVAC | heating, ventilation, and air-conditioning |
| ICRP | International Commission on Radiological Protection |
| IED | information exchange document |
| NRC | U.S. Nuclear Regulatory Commission |
| OBT | organically bound tritium |
| PCSA | preclosure safety analysis |
| PWR | pressurized water reactor |
| RadGrid | Radiological Monitoring Grid |
| RMEI | reasonably maximally exposed individual |
| SD | standard deviation |
| SE | standard error |
| TC | transfer coefficient (for animal product) |
| TDMS | Technical Data Management System |
| TEDE | total effective dose equivalent |
| TF | (soil-to-plant) transfer factor |

| | |
|---|---|
| TSPA | total system performance assessment |
| YMP | Yucca Mountain Project |

# UNITS OF MEASURE

| | |
|---|---|
| A | angstroms (1E-10 meter) |
| Ci | curie |
| cm | centimeter |
| $cm^2$ | square centimeter |
| $cm^3$ | cubic centimeter |
| d | day |
| ft | feet |
| g | gram |
| GWd | gigawatt days |
| hr | hour |
| in. | inch |
| kB | kilobyte |
| kW | kilowatt |
| L | liter |
| m | meter |
| $m^2$ | square meter |
| $m^3$ | cubic meter |
| min | minute |
| mL | milliliter |
| mph | miles per hour |
| mrem | millirem |
| MTHM | metric tons of heavy metal |
| MTU | metric ton uranium |
| rem | roentgen equivalent man |
| s | second |
| Sv | sievert |
| μCi | microcurie |
| μm | micrometer |
| wt | weight |

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# 1. PURPOSE

## 1.1 SCOPE

The objective of this calculation is to develop values for Yucca Mountain Project (YMP) site-specific input parameters for use with the GENII Version 2 (GENIIv2) software package and to prepare default files containing those site-specific values for use with GENIIv2. GENIIv2 is a computer program used to calculate stochastic and deterministic dose to humans from exposure to radionuclides in the environment (Napier 2006 [DIRS 177330], and Napier et al 2006 [DIRS 177331]). The site-specific input parameters developed in this calculation can be used to calculate the potential radiation dose to an individual who works onsite or lives in the vicinity of the Yucca Mountain site.

As required by regulation (10 CFR 63.204) for the preclosure safety analysis (PCSA), the receptor in the general environment is "any real member of the public located beyond the boundary of the site." There are two ways to represent the calculated dose to any real member of the public located beyond the boundary of the site: 1) stochastic and 2) deterministic. For a stochastic dose calculation mean values and distributions for receptor related parameters including food consumption rates, food consumption periods, external and inhalation exposure times can be used. Then, the dose to any real member of the public is the maximum value (e.g. 95$^{th}$ percentile) from the calculated dose distribution.

The alternative method is a deterministic dose calculation with receptor characteristics that would bound those of any real member of the public. In this case, individual parameter values are selected at the 95$^{th}$ percentile level for the receptor related parameters including food consumption rates, food consumption periods, external and inhalation exposure times, instead of using the mean values. The use of the 95$^{th}$ percentile input values for each receptor related parameter provides a conservatively calculated dose, because it represents a maximized combination of receptor characteristics.

Site-specific GENIIv2 input parameter values to support either method, stochastic or deterministic, are developed in this calculation. Site-specific input values that were previously developed for the Biosphere Model (BSC 2004 [DIRS 169460]) for the YMP total system performance assessment (TSPA) are evaluated and selected, if applicable. Because the models for the TSPA and PCSA are not the exactly same, not all input parameters in the Biosphere Model are applicable. On the other hands, input parameters values for all of the radionuclides required in the PCSA are not all available in the Biosphere Model. The parameters values for radionuclides that are not available from the Biosphere Model are developed based on the same methodology used for the Biosphere Model.

Parameter values developed in this document are based on mean, median, best estimate or "expected" values from the technical references. 95$^{th}$ percentile values are also developed for receptor related parameters. For parameters that can be used for sensitivity and uncertainty analyses in GENIIv2 (Napier et al 2006 [DIRS 177331], Appendix E), distributions are evaluated and developed. The available distributions in GENIIv2 are limited to only four types: uniform, loguniform, normal, and lognormal (Napier 2006 [DIRS 177330], Section 5.3).

Therefore, some parameter distributions (e.g. cumulative and triangular) previously developed in the Biosphere Model are converted into one of those four types.

## 1.2 LIMITATIONS

The GENIIv2 parameters and distributions developed in this document are limited to those that are required for an exposure scenario with an airborne radionuclide release and subsequent air dispersion. Only parameters for exposure pathways discussed in Section 3.2.3 that are associated with this scenario are provided by this calculation. The parameters for other pathways that are available in other GENIIv2 scenarios are not evaluated nor discussed.

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2.3.4 70 FR 53313. Implementation of a Dose Standard After 10,000 Years. ACC: Internet Accessible. **178394**

2.3.5 Regulatory Guide 1.109, Rev. 1. 1977. *Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I.* Washington, D.C.: U.S. Nuclear Regulatory Commission. ACC: NNA.19870806.0032. **100067**

2.3.6 Regulatory Guide 1.183. 2000. *Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors.* Washington, D.C.: U.S. Nuclear Regulatory Commission. ACC: MOL.20050518.0242. **173584**

## 2.4 DESIGN OUTPUTS

This calculation does not support any specific engineering drawing, specification, or design list. The results of this calculation will be used as inputs for other preclosure safety analyses.

# 3. ASSUMPTIONS

The following assumptions are used to develop input parameter values and distributions.

## 3.1 ASSUMPTIONS REQUIRING VERIFICATION

The following assumptions are based on the *General Public Atmospheric Dispersion Factors*, a calculation report under development. Author of the report sent his results through email, and the entire email is included in Attachment I. Information from the email is used as assumptions requiring verification, and these assumptions are tracked using the *CalcTrack*.

### 3.1.1 Average Absolute Humidity

The arithmetic mean of the hourly absolute humidity values is 4.08 $g/m^3$ and standard deviation is 2.09 $g/m^3$. A lognormal distribution is recommended with GM of 3.63 $g/m^3$, GSD of 1.63, lower bound of 0.39 $g/m^3$ and upper bound of 16.4 $g/m^3$.

**Rationale:** Average absolute humidity is provided in Attachment I. The calculated average absolute humidity is appropriate for evaluating releases from surface and subsurface facilities, because it is based on the meteorological data from Site 1 located approximately 1 km south-south-west of the North Portal between 2001 and 2005.

**Usage**: The assumption is used to develop the GENIIv2 parameter, *ABSHUM*, *average absolute humidity* in Section 7.6.1.

### 3.1.2 Average Daily Rain Rate

The calculated average daily rain rate is 0.49 mm/day and standard deviation is 2.88 mm/day for those days with precipitation.

**Rationale:** Average daily rain rate is provided in Attachment I. The calculated average daily rain rate is appropriate for evaluating releases from surface and subsurface facilities, because it is based on the meteorological data from Site 1 located approximately 1 km south-south-west of the North Portal between 2001 and 2005. In addition, the calculated daily rain rates for the five years in the spreadsheet, *Absolute_Humidity.xls* as mentioned in Attachment I will be used to calculate the cumulative distribution of rain rate as discussed in Section 7.6.2.

**Usage:** The assumption is used to develop the GENIIv2 parameter, *RAIN*, *average daily rain rate* in Section 7.6.2.

### 3.1.3 Wind Speed

The mean wind speed is 3.64 m/s and its SD is 2.02 m/s with the minimum wind speed of 0.45 m/s, and the maximum wind speed of 17.8 m/s.

**Rationale:** Wind speed is provided in Attachment I. The calculated mean wind speed and its range are appropriate for evaluating releases from surface and subsurface facilities, because they are based on the meteorological data from Site 1 located approximately 1 km south-south-west of the North Portal between 2001 and 2005.

**Usage:** The assumption is used to develop the GENIIv2 parameters: *ARMINRISESPD*, *minimum wind speed during plume rise* and *ARMINWIND*, *maximum wind speed for calm* in Section 7.6.3.

### 3.1.4 Ambient Air Temperature

The mean temperature is 17.04°C and SD of 10.13°C with the minimum of –7.5°C and the maximum of 42.31°C.

**Rationale:** Ambient air temperature is provided in Attachment I. The calculated mean ambient air temperature and its range are appropriate for evaluating releases from surface and subsurface facilities, because they are based on the meteorological data from Site 1 located approximately 1 km south-south-west of the North Portal between 2001 and 2005.

**Usage:** The assumption is used to develop the GENIIv2 parameter, *SIX*, *ambient air temperature* in Section 7.6.4.

## 3.2 ASSUMPTIONS NOT REQUIRING VERIFICATION

### 3.2.1 Worker Status on the Nevada Test Site and the Nellis Air Force Range

Working staff members located on the Nevada Test Site and the Nellis Air Force Range are considered to be members of the public.

**Rationale:** Not all workers on the Nevada Test Site and the Nellis Air Force Range are expected to be radiation workers. Unless an individual's duties specifically involve exposure to radiation or to radioactive material and the individual is trained and monitored as a radiation worker, that individual is considered a member of the public for purposes of radiation protection.

**Usage:** This assumption is used in Section 3.2.2. The individuals considered in this assumption are categorized into the third group below as the offsite public in other than the general environment.

### 3.2.2 Location of Maximally Exposed Individuals

Three categories of individuals are used to evaluate compliance with dose limits: 1) onsite general public, 2) offsite public in the general environment, and 3) offsite public in other than the general environment. The site boundary is defined by the Yucca Mountain Project Withdrawal Area and also identifies the controlled area. Within the site boundary is an area designated as the Geologic Repository Operations Area that also identifies the restricted area.

1) Onsite General Public

The onsite general public may be located within the site boundary and outside the Geologic Repository Operations Area. The maximally exposed onsite public individual is defined as an individual located at the Geologic Repository Operations Area boundary that is also the restricted area boundary. For the purpose of this categorization, the onsite general public category excludes visitors inside the Geologic Repository Operations Area, who would be under direct supervision of repository radiation protection program.

2) Offsite Public in the General Environment

The general environment is defined in Section 4.2.2 as "everywhere outside the Yucca mountain site, the Nellis Air Force Range, and the Nevada Test Site". For releases from the surface or subsurface facilities, the maximum dose to members of the onsite public occurs at the shortest distance from the release point. The maximally exposed offsite public individual in the general environment is defined as an individual located at a distance that corresponds to the approximate distance between the surface facility or the subsurface repository and the nearest point of public access on the repository site boundary, excluding boundaries with the Nellis Air Force Range, and the Nevada Test Site.

3) Offsite Public in Other than the General Environment

The maximally exposed offsite public individual in other than the general environment is defined as an individual located at a distance that corresponds to the approximate distance between the surface facility or the subsurface repository and the nearest point of public access on the repository site boundaries with the Nellis Air Force Range, and the Nevada Test Site.

**Rationale:** The locations define the shortest distances from the surface and subsurface release points to the restricted area and site boundaries to calculate the public doses and are conservative.

**Usage:** This assumption is used in Section 3.2.3.

### 3.2.3 Exposure Pathways

Exposure pathways included in the dose calculations for airborne releases depend on the receptor location. The following four pathways are included in the dose calculations for any location: inhalation of outdoor air from air dispersion, inhalation of resuspended soil, air submersion, and ground shine. Onsite doses are within the controlled area and therefore exclude ingestion pathways, because of no agricultural activities in that area. Offsite doses in other than the general environment are on the Nellis Air Force Range or the Nevada Test Site and also exclude ingestion pathways, because of no agricultural activities in the area. Offsite doses in the general environment do include ingestions from animal products, terrestrial crops, and inadvertent soil ingestion. Water related food and recreational pathways are not considered, due to negligible impacts from airborne releases. Direct shine from contained radiation sources is not calculated within the GENIIv2. The exposure pathways considered in various sites are tabulated in Table 1. There are four subcategories under animal products: meat, poultry, milk, and eggs. There are also four subcategories under crop food: leafy vegetables, root (other) vegetables, fruit, and grains.

**Rationale:** The exposure pathways are appropriate for an airborne release from surface or subsurface facilities and exclude those pathways that are not applicable.

**Usage:** This assumption is used in Sections 8.2.1.1 for selecting control parameters including *ANFOOD* for animal product ingestion, *TFOOD* for terrestrial food crop ingestion, *AQFOOD* for aquatic food ingestion, and *RECRE* for recreational surface water. This assumption is also used in Section 8.2.1.5 for selecting appropriate pathways.

Table 1. Exposure Pathways

| | Public Receptor Location | | |
|---|---|---|---|
| **Pathway** | **Onsite** | **Offsite in General Environment[(c)]** | **Offsite in other than General Environment** |
| Inhalation of outdoor air | X | X | X |
| Inhalation of resuspended soil | X | X | X |
| Air submersion | X | X | X |
| Ground shine | X | X | X |
| Animal product ingestion | - | X | - |
| Terrestrial food crop ingestion | - | X | - |
| Inadvertent soil ingestion | - | X | - |
| Aquatic food ingestion | - | - | - |
| Recreational surface water | - | - | - |
| Drinking water intake | - | - | - |
| Inhalation indoor air (shower)[(b)] | - | - | - |
| Direct shine | X[(a)] | X[(a)] | X[(a)] |

Notes: (a) Direct shine from contained radiation sources may be included, but is not calculated with GENIIv.2.

(b) Inhalation of indoor air pathway in GENIIv2 includes both air from outdoor and water evaporation due to shower. This pathway is not selected, but time exposed from indoor air will include in inhalation of outdoor air pathway.

(c) The general environment is defined in Section 4.2.2 as "everywhere outside the Yucca mountain site, the Nellis Air Force Range, and the Nevada Test Site".

### 3.2.4 Duration of Emplacement Activities

An operational requirement will limit the duration of emplacement activities to 50 years or less.

**Rationale:** Potential repository accidents only pose a hazard to radioactive waste prior to waste employment when the waste is located on the surface. Fifty years is a reasonable upper limit for useful life of surface facilities and allows ample time for waste emplacement. This assumption is consistent with preclosure period for preclosure safety analysis to use 50 years for surface and emplacement activities (BSC 2006 [DIRS 178308], p.170).

**Usage:** This assumption is used in Section 7.5.1 to develop the chronic exposure period.

### 3.2.5 Acute Exposure Period

The acute release period and acute exposure time are equal and set to one hour each. The total duration of exposure is one year to cover the acute release period and a following 1 year period for other pathways, including ingestion pathway if it is applicable.

**Rationale:** An acute release is related to an accident sequence. The cumulative effect from previous years is not considered. The length of the release period has a relatively low impact because the time-integrated amount of radioactivity released and hence acute dose, are the same provided the release and exposure periods are equal and the release rate is equal to the released inventory divided by the release period. A one-hour release period is also consistent with the Gaussian plume model based on one hour based meteorological data. After acute release, one year of chronic exposure is included for other potential pathways.

**Usage:** This assumption is used in Section 8.3.1.1. It is used for the GENIIv2 parameters: *NTKEND, duration of exposure period* (1 year)*; RELEND, end of release period* (1 hour = 0.000114 year); and *ACUTIM, duration of acute exposure* (1 hour = 0.000114 year).

### 3.2.6 Fraction of Plants Roots in Surface Soil

The fraction of plants roots in the surface soil is assumed to be 1.

**Rationale:** Soil in cultivated fields and gardens is divided into two compartments (surface soil and deep soil), and only the surface soil is included in the biosphere model. Because many crops require tilling every year, radionuclides would be uniformly distributed throughout the surface soil over the long term. This assumption is reasonable because 80 to 90 percent of the plant roots occur in the upper 60 to 75 percent of the root zone (Jensen et al. 1990 [DIRS 160001], p. 22). Although crop roots can penetrate into the deep soil compartment, radionuclide concentrations would typically decrease with soil depth due to leaching. This assumption conservatively estimates radionuclide concentrations in the crops because the higher radionuclide concentrations in the surface soil are used for calculating crop root uptake.

**Usage:** This assumption is used in Section 8.2.1.1. It is used for the GENIIv2 parameter *RF1, fraction of plants roots in surface soil*.

### 3.2.7 Animal Feed

Locally grown fresh forage is the only feed given to beef cattle and dairy cows, and locally produced grain is the only feed given to poultry and laying hen.

**Rationale:** Based on the Biosphere Model (BSC 2004 [DIRS 169460], Section 6.3.1.4), this is conservative because it assumes that all animal feed is locally produced and contaminated. In the Amargosa Valley, alfalfa and other hays are the most common crops, and dry hay used for livestock feed is both produced locally and imported from outside the area (Horak and Carns 1997 [DIRS 124149], p. 12). It is reasonable to assume that animals are fed locally grown fresh forage rather than dry hay with water added. In addition, although poultry and laying hens could be fed with other types of feed, locally produced grain is the only feed considered in the model. This approximation is conservative because it assumes that all animal feed is locally produced and contaminated.

**Usage:** This assumption is used in Section 8.2.1.4.7. It is used for the GENIIv2 parameter array: *CONSUM, consumption rate of animal fed*. It is also used as a criterion in developing other animal feed related parameters in Section 7.

### 3.2.8 Animal Feed Storage Time Prior to Consumption

No credit is taken for storage time prior to consumption of animal feed products.

**Rationale:** This is conservative because any storage time would provide for decay of radionuclides contained within the feed products.

**Usage:** This assumption is used in Section 8.2.1.4.8. It is used for the GENIIv2 parameter array *STORTM, storage times for meat, poultry, milk, and eggs animal feed, and meat and milk animal forage*.

### 3.2.9 Fraction of Animal Feed from Contaminated Products

The entire diet of animals is assumed to be from contaminated feed products.

**Rationale:** This is conservative because any other diet combination would reduce the amount of contaminated feed.

**Usage:** This assumption is used in Section 8.2.1.4.9. It is used for the GENIIv2 parameter array: *DIETFR, fraction of diet that is contaminated for meat, poultry, milk, and eggs animal feed, and meat and milk animal forage*.

### 3.2.10 Holdup Time for Crop Food and Animal Products

No credit is taken for holdup time prior to consumption of crop food and animal products by humans.

**Rationale:** Decay and progeny ingrowth may occur between slaughter and consumption of animal products, and between harvest and ingestion of crop food. Conservatively, no decay time credit is taken in this calculation.

**Usage:** This assumption is used in Section 8.2.1.4.16. It is used for the GENIIv2 parameter arrays: *HLDUP, time from harvest to ingestion of leafy vegetables, root vegetables, fruit, and grains*; and *HLDUPA, time from slaughter to ingestion for meat, poultry, milk, and eggs*.

### 3.2.11 Harvest Removal

No credit is taken for radionuclide removal from soil due to harvesting.

**Rationale:** Crop harvest removes radionuclides from cultivated fields. However, radionuclides could be added into the soil due to the use of contaminated manure for fertilizer. It is reasonable to assume that Amargosa Valley farmers will use manure from a dairy for fertilizer because they currently use manure from the dairy for fertilizer (Horak and Carns 1997 [DIRS 124149], p. 10). By not considering the harvest removal, these two processes compensate for each other. This assumption eliminates the need to calculate losses from crop harvest removal and gains from cow manure fertilizer. Applying this assumption to the entire Amargosa Valley is realistic because alfalfa is the major crop grown in Amargosa Valley (BSC 2004 [DIRS 169460], Section 6.3.1.4).

**Usage:** This assumption is used in Section 8.2.1.4.1. It is used to select the GENII control parameter *HARVEST, radionuclide removal due to harvesting*, that should be selected as FALSE to eliminate the radionuclide removal.

### 3.2.12 Soil Resuspension

Soil resuspension is considered separately for cultivated agricultural lands and non-cultivated lands. Radionuclides deposited on cultivated lands from air dispersion are mixed within surface soil thickness, whereas radionuclides deposited on non-cultivated lands are only mixed with a thin layer of soil called as critical thickness.

**Rationale:** After radionuclides release and air dispersion, deposition processes would deposit particles on ground surface. For cultivated land, resuspended particles could deposit on crops.

The deposited particles in the cultivated lands would be uniformly mixed within the surface soil due to tillage. However, resuspended particles that could be inhaled by humans would come from uncultivated lands where most human live, because cultivated lands cover only a small fraction of Amargosa Valley (BSC 2006 [DIRS 177101], Section 6.1). The deposited particles in the uncultivated lands are mixed within only a thin layer of surface dust. This assumption conservatively estimates human inhalation doses because contaminated particles from uncultivated lands have a higher radionuclide concentration due to a lower mixing depth than those from cultivated land.

**Usage:** This assumption is used in Sections 7.3.1, 7.3.7, 7.4.1, and 7.4.2. It is used in the GENII resuspension model parameters: *THICK* or *SURCM, surface soil thickness for crops; LEAFRS, resuspension factor from soil to plant surfaces; XMLF, mass loading factor for resuspension model resuspension;* and *AVASL, depth of top soil available for resuspension*.

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# 4. INPUT DATA

## 4.1 INPUT DATA

The YMP Biosphere Model currently contains ten documents. Among these documents, the *Biosphere Model Report* (BSC 2004 [DIRS 169460]) describes conceptual and mathematical models, as well as model validation and implementation. Five input parameter reports provide input parameter values for the Biosphere Model, including:

1. *Environmental Transport Input Parameters for the Biosphere Model* (BSC 2004 [DIRS 169672])

2. *Soil-Related Input Parameters for the Biosphere Model* (BSC 2006 [DIRS 177400])

3. *Agricultural and Environmental Input Parameters for the Biosphere Model* (BSC 2004 [DIRS 169673])

4. *Characteristics of the Receptor for the Biosphere Model* (BSC 2005 [DIRS 172827])

5. *Inhalation Exposure Input Parameters for the Biosphere Model* (BSC 2006 [DIRS 177101])

The Biosphere Model is designed for the YMP site-specific environment, including resident life style, agricultural practice, and climate. Therefore, most parameter values provided in the five input reports described above are applicable to the PCSA. The outputs of these reports are in the Technical Data Management System (TDMS), which can be accessed by using a Data Tracking Number (DTN). A proposal of "Biosphere model input data to be used for preclosure safety analysis" was initiated, prepared and approved (TMRB-2007-004). The input data included in the relevent DTNs and AMR used as direct inputs to this calculation are listed in the information exchange document (IED), 100-IED-WHS0-00201-000-00B (BSC 2007 [DIRS 179915]). This IED includes following information that is used in Section 4.1.1 to Section 4.1.5:

1. MO0403SPAAEIBM.002. Agricultural and Environmental Input Parameters for the Biosphere Model. Submittal date: 03/22/2004. [DIRS 169392]

2. MO0406SPAETPBM.002. Environmental Transport Input Parameters for the Biosphere Model. Submittal date: 06/24/2004. [DIRS 170150]

3. MO0407SPACRBSM.002. Characteristics of the Receptor for the Biosphere Model. Submittal date: 07/19/2004. [DIRS 170677]

4. MO0605SPAINEXI.003. Inhalation Exposure Input Parameters for the Biosphere Model. Submittal date: 05/04/2006. [DIRS 177172]

5. MO0609SPASRPBM.004. Soil Related Parameters for the Biosphere Model. Submittal date: 09/26/2006. [DIRS 177742]

6. Table 6-20 and Table 6-21 in BSC (Bechtel SAIC Company) 2005. *Characteristics of the Receptor for the Biosphere Model.* ANL-MGR-MD-000005 REV 04. Las Vegas, Nevada: Bechtel SAIC Company. ACC: DOC.20050405.0005. [DIRS 172827]

The items listed above are cited in the approved IED, 100-IED-WHS0-00201-000-00B (BSC 2007 [DIRS 179915]), and therefore, they are appropriate for their intended use in this calculation.

The Biosphere Model does not provide all the required input for this calculation. Other inputs are also evaluated and selected in this document. These inputs and reference sources include site-specific meteorological data and radionuclide dosimetric data. They are discussed in detail in Section 4.1.6 and Section 4.1.7, respectively.

The radionuclides of interest are different in the TSPA and the PCSA. This document includes additional radionuclides of interest in the PCSA. The list of radionuclides in the inventories of pressurized water reactor (PWR), boiling water reactor (BWR), naval fuel, and high-level radioactive waste (HLW) is tabulated in the *Preclosure Consequence Analyses for License Application* (BSC 2005 [DIRS 174261] Tables 4, 17 and 18). In addition, radionuclides from the subsurface annual release are also considered (BSC 2005 [DIRS 172487], Table 13). The entire radionuclide list is included in Table 2. The last column of Table 2 includes chemical elements that correspond to radionuclides in the inventories, as well as a discussion of their inclusion or exclusion in this document. Many input parameters used for calculating doses are chemical element dependent, including soil-to-plant transfer factors, transfer coefficients for animal products, and soil partition coefficients.

There are 43 elements in the list in Table 2. Among them, 17 elements are already included in the Biosphere Model. Another 17 elements (bold font in the last column of Table 2) do not have transfer factors (Section 4.1.1.1), transfer coefficients (Section 4.1.1.2), and soil-water partition coefficients (Section 4.1.2.2) from the Biosphere Model, and their values are determined in this calculation based on the same methodology as used in the Biosphere Model. The last 9 elements are excluded because they either are gas (Ar and Kr) and short-lived (Al, Ba, K, N, Na, and Si), or use a special model (H).

Calcium (Ca) is included in this report, in case it is needed later. In addition, three daughter product radionuclides, whose corresponding elements are not listed in Table 2, are automatically linked with their parent radionuclides. They are $^{210}$Bi, and $^{210}$Po from decay of $^{210}$Pb, and $^{125m}$Te from $^{125}$Sb. When these two parent radionuclides are included in a GENIIv2 run, partition coefficients (Kd values) for their decay products are required (see Section 8.2.1.3.1). Therefore, the three elements, Bi, Po, and Te are added to make total of 21 elements that need calculated partition coefficients. Transfer factors and transfer coefficients are not needed for these three elements.

Table 2. Radionuclide List and Additional Elements Required

| Radionuclides | BWR & PWR Inventory List [a] | Naval Fuel and Crud Releases [b] | HLW Inventory List [c] | Subsurface Release List [d] | Chemical Element |
|---|---|---|---|---|---|
| $^{227}$Ac | x | x | | | Ac [f] |
| $^{28}$Al | | | | x | Al [e] |
| $^{241}$Am | x | x | x | x | Am [f] |
| $^{242}$Am | x | | | | |
| $^{242m}$Am | x | x | x | | |
| $^{243}$Am | x | x | x | x | |
| $^{41}$Ar | | | | x | Ar [e] |
| $^{137m}$Ba | x | x | x | | Ba [e] |
| $^{14}$C | x | x | x | | C [e, f] |
| $^{113m}$Cd | x | x | x | | **Cd** |
| $^{144}$Ce | | | x | | **Ce** |
| $^{252}$Cf | | x | | | **Cf** |
| $^{36}$Cl | x | | | | Cl [f] |
| $^{242}$Cm | x | x | x | | **Cm** |
| $^{243}$Cm | x | x | x | x | |
| $^{244}$Cm | x | x | x | x | |
| $^{245}$Cm | x | x | x | | |
| $^{246}$Cm | x | x | x | | |
| $^{247}$Cm | | x | | | |
| $^{248}$Cm | | x | | | |
| $^{60}$Co | x | x | x | x | **Co** |
| $^{134}$Cs | x | x | x | | Cs [f] |
| $^{135}$Cs | x | x | x | | |
| $^{137}$Cs | x | x | x | x | |
| $^{152}$Eu | | | x | | **Eu** |
| $^{154}$Eu | x | x | x | x | |
| $^{155}$Eu | x | x | x | | |
| $^{55}$Fe | x | x | | x | **Fe** |
| $^{3}$H | x | x | | | H [e] |
| $^{129}$I | x | x | x | | I [f] |
| $^{42}$K | | | | x | K [e] |
| $^{85}$Kr | x | x | | | Kr [e] |
| $^{16}$N | | | | x | N [e] |
| $^{24}$Na | | | | x | Na [e] |
| $^{93m}$Nb | x | x | x | | **Nb** |
| $^{94}$Nb | x | x | | | |
| $^{59}$Ni | x | x | x | | **Ni** |
| $^{63}$Ni | x | x | x | x | |
| $^{237}$Np | x | x | x | | Np [f] |

Table 2. Radionuclide List and Additional Elements Required (Cont'd)

| Radionuclides | BWR & PWR Inventory List [a] | Naval Fuel and Crud Releases [b] | HLW Inventory List [c] | Subsurface Release List [d] | Chemical Element |
|---|---|---|---|---|---|
| **$^{231}$Pa** | x | x | x | | Pa [f] |
| **$^{210}$Pb** | | x | | | Pb [f] |
| **$^{107}$Pd** | x | x | | | **Pd** |
| **$^{147}$Pm** | x | x | x | x | **Pm** |
| **$^{238}$Pu** | x | x | x | x | Pu [f] |
| **$^{239}$Pu** | x | x | x | x | |
| **$^{240}$Pu** | x | x | x | x | |
| **$^{241}$Pu** | x | x | x | x | |
| **$^{242}$Pu** | x | x | x | | |
| **$^{226}$Ra** | | x | | | Ra [f] |
| **$^{228}$Ra** | | x | | | |
| **$^{102}$Rh** | | x | | | **Rh** |
| **$^{106}$Ru** | x | x | x | | **Ru** |
| **$^{125}$Sb** | x | x | x | | **Sb** |
| **$^{79}$Se** | x | x | x | | Se [f] |
| **$^{31}$Si** | | | | x | Si [e] |
| **$^{147}$Sm** | | x | | | **Sm** |
| **$^{151}$Sm** | x | x | x | x | |
| **$^{126}$Sn** | x | x | x | | Sn [f] |
| **$^{90}$Sr** | x | x | x | x | Sr [f] |
| **$^{99}$Tc** | x | x | x | | Tc [f] |
| **$^{229}$Th** | | x | | | Th [f] |
| **$^{230}$Th** | x | x | | | |
| **$^{232}$Th** | | x | | | |
| **$^{232}$U** | x | x | x | | U [f] |
| **$^{233}$U** | x | x | x | | |
| **$^{234}$U** | x | x | x | | |
| **$^{235}$U** | x | x | x | | |
| **$^{236}$U** | x | x | x | | |
| **$^{238}$U** | x | x | x | | |
| **$^{90}$Y** | x | x | x | x | **Y** |
| **$^{93}$Zr** | x | x | x | | **Zr** |
| **Total** | 53 | 61 | 46 | 23 | 43 [g] |

Source: [a] BSC 2005 [DIRS 174261] Table 4, [b] BSC 2005 [DIRS 174261] Table 17, [c] BSC 2005 [DIRS 174261] Table 18, [d] BSC 2005 [DIRS 172487], Table 13.

Notes: [e] Elements either are gas and short-lived, or use a special model. They do not require transfer factors or transfer coefficients, [f] Elements are available in the Biosphere Model, [g] Ca and the daughter elements Bi, Po and Te are added for a total of 47.

### 4.1.1 Environmental Transport Parameters

Environmental transport parameters used for the YMP Biosphere Model are documented in the *Environmental Transport Input Parameters for the Biosphere Model* (BSC 2004 [DIRS 169672]). The parameter values evaluated and selected in this subsection are based on DTN**:** MO0406SPAETPBM.002 [DIRS 170150].

#### 4.1.1.1 Soil-to-Plant Transfer Factors

The term "*soil-to-plant transfer factors* (*TF*)" used in the Biosphere Model relates the dry-weight activity concentration in the edible parts of plants (Bq/kg_dry_plant) to the dry-weight activity concentration in soil (Bq/kg_dry_soil) for an equilibrium condition between the two. The *TF* values are dimensionless, crop-type and element-dependent parameters. The *TF* for sixteen elements with five crop types are available from the DTN: MO0406SPAETPBM.002 [DIRS 170150]. As carbon uses a special model, the *TF* values are not required. Soil-to-plant transfer factors for five crop types are in lognormal distributions, defined by their geometric mean (GM), geometric standard deviation (GSD), a lower bound and an upper bound as tabulated in Table 3 to Table 7.

Per BSC 2004 ([DIRS 169672], page 6-10), the other-vegetable category includes crops like beans, carrots, cucumbers, potatoes, and peppers. This category corresponds to root vegetables in GENIIv2. It should be noted that the name root vegetables is not limited to only vegetables grown in plant roots. The consumption rate for other vegetables includes all vegetables that are not leafy vegetables. The word "root" is used when it refers to the GENIIv2 parameter, and is synonymous with "other" from the related Biosphere Model documents.

Table 3. Soil-to-Plant Transfer Factors for Leafy Vegetables

| Element | Atomic No. | GM (Bq/kg_dry_wt)/(Bq/kg_soil) | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| | | | | (Bq/kg_dry_wt)/(Bq/kg_soil) | |
| Ac | 89 | 4.3E-03 | 2 | 7.2E-04 | 2.6E-02 |
| Am | 95 | 1.2E-03 | 2.5 | 1.2E-04 | 1.3E-02 |
| Cl | 17 | 6.4E+01 | 2 | 1.1E+01 | 3.8E+02 |
| Cs | 55 | 8.5E-02 | 2.5 | 7.7E-03 | 9.4E-01 |
| I | 53 | 2.6E-02 | 9.9 | 7.2E-05 | 9.7E+00 |
| Np | 93 | 5.9E-02 | 4.4 | 1.3E-03 | 2.6E+00 |
| Pa | 91 | 4.6E-03 | 3.8 | 1.4E-04 | 1.4E-01 |
| Pb | 82 | 1.5E-02 | 4.6 | 3.0E-04 | 7.7E-01 |
| Pu | 94 | 2.9E-04 | 2 | 4.9E-05 | 1.7E-03 |
| Ra | 88 | 6.8E-02 | 2.7 | 5.1E-03 | 9.2E-01 |
| Se | 34 | 4.6E-02 | 3.8 | 1.4E-03 | 1.4E+00 |
| Sn | 50 | 3.8E-02 | 2 | 6.4E-03 | 2.3E-01 |
| Sr | 38 | 1.7E+00 | 2 | 2.9E-01 | 1.0E+01 |
| Tc | 43 | 4.6E+01 | 2.6 | 3.8E+00 | 5.5E+02 |
| Th | 90 | 4.3E-03 | 2.8 | 3.2E-04 | 5.9E-02 |
| U | 92 | 1.1E-02 | 2 | 1.8E-03 | 6.6E-02 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 4. Soil-to-Plant Transfer Factors for Other Vegetables

| Element | Atomic No. | GM (Bq/kg_dry_wt)/(Bq/kg_soil) | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| | | | | (Bq/kg_dry_wt)/(Bq/kg_soil) | |
| Ac | 89 | 1.1E-03 | 4.9 | 1.8E-05 | 6.6E-02 |
| Am | 95 | 4.0E-04 | 2.6 | 3.5E-05 | 4.6E-03 |
| Cl | 17 | 6.4E+01 | 2 | 1.1E+01 | 3.8E+02 |
| Cs | 55 | 5.0E-02 | 2 | 8.4E-03 | 3.0E-01 |
| I | 53 | 3.2E-02 | 4.4 | 7.0E-04 | 1.5E+00 |
| Np | 93 | 3.1E-02 | 4.9 | 5.0E-04 | 1.9E+00 |
| Pa | 91 | 1.1E-03 | 10 | 3.0E-06 | 4.3E-01 |
| Pb | 82 | 9.0E-03 | 3.1 | 5.0E-04 | 1.6E-01 |
| Pu | 94 | 1.9E-04 | 2 | 3.3E-05 | 1.1E-03 |
| Ra | 88 | 1.2E-02 | 5.3 | 1.6E-04 | 8.6E-01 |
| Se | 34 | 4.6E-02 | 3.8 | 1.4E-03 | 1.4E+00 |
| Sn | 50 | 1.5E-02 | 3.6 | 5.3E-04 | 4.0E-01 |
| Sr | 38 | 7.9E-01 | 2 | 1.4E-01 | 4.5E+00 |
| Tc | 43 | 4.4E+00 | 3.7 | 1.5E-01 | 1.2E+02 |
| Th | 90 | 4.4E-04 | 5.6 | 5.3E-06 | 3.6E-02 |
| U | 92 | 6.0E-03 | 2.8 | 4.2E-04 | 8.5E-02 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 5. Soil-to-Plant Transfer Factors for Fruit

| Element | Atomic No. | GM (Bq/kg_dry_wt)/(Bq/kg_soil) | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| | | | | (Bq/kg_dry_wt)/(Bq/kg_soil) | |
| Ac | 89 | 8.5E-04 | 3.4 | 3.7E-05 | 2.0E-02 |
| Am | 95 | 5.4E-04 | 2.3 | 6.5E-05 | 4.5E-03 |
| Cl | 17 | 6.4E+01 | 2 | 1.1E+01 | 3.8E+02 |
| Cs | 55 | 5.6E-02 | 2.8 | 3.8E-03 | 8.1E-01 |
| I | 53 | 5.7E-02 | 2.8 | 4.1E-03 | 7.9E-01 |
| Np | 93 | 3.4E-02 | 6.9 | 2.3E-04 | 5.0E+00 |
| Pa | 91 | 1.1E-03 | 10 | 3.0E-06 | 4.3E-01 |
| Pb | 82 | 1.2E-02 | 3.3 | 5.8E-04 | 2.6E-01 |
| Pu | 94 | 1.8E-04 | 3.4 | 7.8E-06 | 4.2E-03 |
| Ra | 88 | 7.3E-03 | 4.3 | 1.6E-04 | 3.2E-01 |
| Se | 34 | 4.6E-02 | 3.8 | 1.4E-03 | 1.4E+00 |
| Sn | 50 | 1.5E-02 | 3.6 | 5.3E-04 | 4.0E-01 |
| Sr | 38 | 2.9E-01 | 2.3 | 3.6E-02 | 2.4E+00 |
| Tc | 43 | 4.3E+00 | 4.6 | 8.7E-02 | 2.1E+02 |
| Th | 90 | 2.9E-04 | 4.9 | 4.8E-06 | 1.7E-02 |
| U | 92 | 6.3E-03 | 2.9 | 3.9E-04 | 1.0E-01 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 6. Soil-to-Plant Transfer Factors for Grain

| Element | Atomic No. | GM (Bq/kg_dry_wt)/ (Bq/kg_soil) | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| | | | | (Bq/kg_dry_wt)/(Bq/kg_soil) | |
| Ac | 89 | 5.4E-04 | 2.9 | 3.6E-05 | 8.0E-03 |
| Am | 95 | 7.5E-05 | 3.2 | 3.8E-06 | 1.5E-03 |
| Cl | 17 | 2.4E+01 | 8.4 | 1.0E-01 | 5.8E+03 |
| Cs | 55 | 2.0E-02 | 2.2 | 2.7E-03 | 1.6E-01 |
| I | 53 | 2.5E-02 | 10 | 6.6E-05 | 9.4E+00 |
| Np | 93 | 4.4E-03 | 6.9 | 3.1E-05 | 6.3E-01 |
| Pa | 91 | 9.5E-04 | 7.2 | 5.9E-06 | 1.5E-01 |
| Pb | 82 | 5.5E-03 | 2.1 | 8.2E-04 | 3.8E-02 |
| Pu | 94 | 1.9E-05 | 4.2 | 4.8E-07 | 7.8E-04 |
| Ra | 88 | 3.1E-03 | 4 | 8.8E-05 | 1.1E-01 |
| Se | 34 | 2.9E-02 | 2 | 4.8E-03 | 1.7E-01 |
| Sn | 50 | 9.2E-03 | 2 | 1.5E-03 | 5.5E-02 |
| Sr | 38 | 1.7E-01 | 2 | 2.8E-02 | 1.0E+00 |
| Tc | 43 | 1.6E+00 | 4.3 | 3.8E-02 | 6.8E+01 |
| Th | 90 | 1.7E-04 | 5.2 | 2.4E-06 | 1.2E-02 |
| U | 92 | 1.1E-03 | 3.6 | 4.1E-05 | 3.1E-02 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 7. Soil-to-Plant Transfer Factors for Forage

| Element | Atomic No. | GM (Bq/kg_dry_wt)/ (Bq/kg_soil) | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| | | | | (Bq/kg_dry_wt)/(Bq/kg_soil) | |
| Ac | 89 | 1.7E-02 | 5.4 | 2.2E-04 | 1.3E+00 |
| Am | 95 | 2.1E-03 | 10 | 5.5E-06 | 7.9E-01 |
| Cl | 17 | 7.5E+01 | 2 | 1.3E+01 | 4.5E+02 |
| Cs | 55 | 1.3E-01 | 3.3 | 6.3E-03 | 2.8E+00 |
| I | 53 | 4.0E-02 | 10 | 1.1E-04 | 1.5E+01 |
| Np | 93 | 5.8E-02 | 5.6 | 6.8E-04 | 4.9E+00 |
| Pa | 91 | 1.9E-02 | 6.7 | 1.4E-04 | 2.5E+00 |
| Pb | 82 | 1.8E-02 | 7 | 1.2E-04 | 2.8E+00 |
| Pu | 94 | 1.0E-03 | 10 | 2.7E-06 | 3.9E-01 |
| Ra | 88 | 8.2E-02 | 3 | 4.9E-03 | 1.4E+00 |
| Se | 34 | 1.5E-01 | 5.5 | 1.9E-03 | 1.3E+01 |
| Sn | 50 | 1.6E-01 | 5.8 | 1.7E-03 | 1.5E+01 |
| Sr | 38 | 2.1E+00 | 2.1 | 3.2E-01 | 1.3E+01 |
| Tc | 43 | 2.7E+01 | 2.7 | 2.1E+00 | 3.5E+02 |
| Th | 90 | 1.0E-02 | 4.2 | 2.5E-04 | 3.9E-01 |
| U | 92 | 1.7E-02 | 6.1 | 1.6E-04 | 1.9E+00 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

*TF* values for elements not included in the Biosphere Model are developed based on the same references cited in BSC 2004 ([DIRS 169672], Tables 4-1 and 4-2) as listed in Table 8. *TF* data from these references are tabulated in Table 9 to Table 20. The data in these tables are the inputs to calculate the GM and GSD for transfer factors, which is the method used in the Biosphere Model, as discussed in Section 7.1.1. These references used as sources of data for development of the values of *TFs* are mainly review reports, compendia of biosphere parameter values, and comprehensive dose assessment reports that included the descriptions of biosphere models and the selection of model input parameter values. References were published by professional organizations producing technically defensible products pertinent to this analysis as indicated in the following discussion. Some of the references are considered sources of established fact data. Evaluation of each reference that is the source of the direct inputs is presented in BSC 2004 ([DIRS 169672], Section 4.1.1.1). The data from these reports are considered appropriate for the intended use (i.e., to develop the environmental transport parameters, including *TF* in this calculation). The calculations of the transfer factors are performed in Section 7.1.1 using the same method as used in BSC 2004 ([DIRS 169672], Section 6.2).

Table 8. Reference Sources for Soil-to-Plant Transfer Factors

| No. | Reference | Table Reference |
|---|---|---|
| 1 | Baes et al. 1984 [DIRS 103766], pp. 10 to 11 | Table 9 |
| 2 | BIOMASS 2001 [DIRS 159468], pp. 82 to 92 | Table 10 |
| 3 | Davis et al. 1993 [DIRS 103767] | No *TF* data provided |
| 4 | IAEA 1994 [DIRS 100458], pp. 17 to 25 | Table 11 |
| 5 | IAEA 2001 [DIRS 158519], pp.67 to 68 | Table 12 |
| 6 | Kennedy and Strenge 1992 [DIRS 103776], pp. 6.25 to 6.27 | Table 13 |
| 7 | LaPlante and Poor 1997 [DIRS 101079], p. 2-13 | Table 14 |
| 8 | Lide and Frederikse 1997 [DIRS 103178] | No *TF* data provided |
| 9 | NCRP 1984 [DIRS 103784], p. 75 | Table 15 |
| 10 | NCRP 1996 [DIRS 101882], pp. 52 to 54 | Table 16 |
| 11 | Peterson 1983 [DIRS 167077], pp. 5-50 to 5-51 | Table 17 |
| 12 | Rittmann 1993 [DIRS 107744], pp. 35 to 36 | Table 18 |
| 13 | Sheppard 1995 [DIRS 103789], pp. 55 to 57 | Table 19 |
| 14 | Sheppard and Evenden 1997 [DIRS 160641], pp. 727 to 733 | No *TF* data provided |
| 15 | Wang et al. 1993 [DIRS 103839], pp. 25 to 26 | Table 20 |

Source: BSC 2004 ([DIRS 169672], Tables 4-1 and 4-2.

Table 9. Soil-to-Plant Transfer Factors for Crops – Reference 1

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy[(a)] | Root[(b)] | Fruit[(b)] | Grain[(b)] | Forage[(a)] |
| Ca | 20 | 3.5E+00 | 3.5E-01 | 3.5E-01 | 3.5E-01 | 3.5E+00 |
| Cd | 48 | 5.5E-01 | 1.5E-01 | 1.5E-01 | 1.5E-01 | 5.5E-01 |
| Ce | 58 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | 8.5E-04 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 8.5E-04 |
| Co | 27 | 2.0E-02 | 7.0E-03 | 7.0E-03 | 7.0E-03 | 2.0E-02 |
| Eu | 63 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Fe | 26 | 4.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-03 | 4.0E-03 |
| Nb | 41 | 2.0E-02 | 5.0E-03 | 5.0E-03 | 5.0E-03 | 2.0E-02 |
| Ni | 28 | 6.0E-02 | 6.0E-02 | 6.0E-02 | 6.0E-02 | 6.0E-02 |
| Pd | 46 | 1.5E-01 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 1.5E-01 |
| Pm | 61 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Rh | 45 | 1.5E-01 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 1.5E-01 |
| Ru | 44 | 7.5E-02 | 2.0E-02 | 2.0E-02 | 2.0E-02 | 7.5E-02 |
| Sb | 51 | 2.0E-01 | 3.0E-02 | 3.0E-02 | 3.0E-02 | 2.0E-01 |
| Sm | 62 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Y | 39 | 1.5E-02 | 6.0E-03 | 6.0E-03 | 6.0E-03 | 1.5E-02 |
| Zr | 40 | 2.0E-03 | 5.0E-04 | 5.0E-04 | 5.0E-04 | 2.0E-03 |

Source: Baes et al. 1984 [DIRS 103766], pp. 10 to 11

Notes: [a] leafy and forage values are taken from vegetation portions of food crops and feed plants, Bv; [b] root, fruit and grain values are from reproductive portions of food crops and feed plants, Br.

Table 10. Soil-to-Plant Transfer Factors for Crops – Reference 2

| Element | Atomic No. | *TF* (Bq/Kg dry weight / Bq/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | - |
| Ce | 58 | - | - | 4.3E-04 | - | - |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | - | - | 4.3E-04 | - | - |
| Co | 27 | - | - | 4.8E-03 | - | - |
| Eu | 63 | - | - | - | - | - |
| Fe | 26 | - | - | - | - | - |
| Nb | 41 | - | - | - | - | - |
| Ni | 28 | - | - | - | - | - |
| Pd | 46 | - | - | | - | - |
| Pm | 61 | - | - | - | - | - |
| Rh | 45 | - | - | - | - | - |
| Ru | 44 | - | - | 1.1E-03 | - | - |
| Sb | 51 | - | - | - | - | - |
| Sm | 62 | - | - | - | - | - |
| Y | 39 | - | - | - | - | - |
| Zr | 40 | - | - | - | - | - |

Source: BIOMASS 2001 [DIRS 159468], pp. 82 to 92

Notes: Values for Ce, Cm, and Ru are calculated GM from individual crops (apple, peach and watermelon) that could be grown in Amargosa Valley.

Table 11. Soil-to-Plant Transfer Factors for Crops – Reference 4

| Element | Atomic No. | *TF* (Bq/Kg dry weight / Bq/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | - |
| Ce | 58 | - | 3.0E-2 | 3.0E-2 | 3.0E-02 | - |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | 7.7E-04 | 5.3E-4 | - | 2.1E-05 | 1.1E-03 |
| Co | 27 | 2.0E-01 | 7.3E-02 | - | 3.7E-03 | 5.4E-02 |
| Eu | 63 | - | - | - | - | - |
| Fe | 26 | - | 4.0E-03 | 4.0E-03 | 4.0E-03 | - |
| Nb | 41 | 5.0E-02 | 1.7E-02 | - | - | - |
| Ni | 28 | - | - | - | 3.0E-02 | 1.8E-01 |
| Pd | 46 | - | - | - | - | - |
| Pm | 61 | - | - | - | - | - |
| Rh | 45 | - | 9.0E-01 | 9.0E-01 | 9.0E-01 | - |
| Ru | 44 | 2.0E-01 | 4.0E-02 | 4.0E-02 | 5.0E-03 | - |
| Sb | 51 | - | 5.6E-04 | - | - | - |
| Sm | 62 | - | - | - | - | - |
| Y | 39 | - | 1.0E-02 | 1.0E-02 | 1.0E-02 | - |
| Zr | 40 | - | 1.0E-03 | 1.0E-03 | 1.0E-03 | - |

Source: IAEA 1994 [DIRS 100458], pp. 17 to 25

Notes: Based on the method used in BSC 2004 [DIRS 169672] Section 6.2.1.2, values for leafy are from mixed greens and forage are from grass, if available, or GM from individual cropsfrom, values for root, fruit and grain are from “not specified” if no other data available, or GM calculated from individual crops.

Table 12. Soil-to-Plant Transfer Factors for Crops – Reference 5

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | 5.0E+00 |
| Ce | 58 | - | - | - | - | 1.0E-01 |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | - | - | - | - | 1.0E-01 |
| Co | 27 | - | - | - | - | 2.0E+00 |
| Eu | 63 | - | - | - | - | 1.0E-01 |
| Fe | 26 | - | - | - | - | 1.0E-01 |
| Nb | 41 | - | - | - | - | 2.0E-01 |
| Ni | 28 | - | - | - | - | 1.0E+00 |
| Pd | 46 | - | - | - | - | 5.0E-01 |
| Pm | 61 | - | - | - | - | 1.0E-01 |
| Rh | 45 | - | - | - | - | 2.0E+00 |
| Ru | 44 | - | - | - | - | 2.0E-01 |
| Sb | 51 | - | - | - | - | 1.0E-01 |
| Sm | 62 | - | - | - | - | - |
| Y | 39 | - | - | - | - | 1.0E-01 |
| Zr | 40 | - | - | - | - | 1.0E-01 |

Source: IAEA 2001 [DIRS 158519], pp.67 to 68

Table 13. Soil-to-Plant Transfer Factors for Crops – Reference 6

| Element | Atomic No. | ***TF*** **(pCi/Kg dry weight / pCi/Kg soil)** | | | | |
|---|---|---|---|---|---|---|
| | | **Leafy** | **Root** | **Fruit** | **Grain** | **Forage** |
| Ca | 20 | 3.5E+00 | 3.5E-01 | 3.5E-01 | 3.5E-01 | 3.5E+00 |
| Cd | 48 | 5.5E-01 | 1.5E-01 | 1.5E-01 | 1.5E-01 | 5.5E-01 |
| Ce | 58 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Cf | 98 | 1.0E-02 | 1.0E-02 | 1.0E-2 | 1.0E-02 | 1.0E-02 |
| Cm | 96 | 3.0E-04 | 2.4E-04 | 1.5E-05 | 2.1E-05 | 3.0E-04 |
| Co | 27 | 8.1E-02 | 4.0E-02 | 7.0E-03 | 3.7E-03 | 8.1E-02 |
| Eu | 63 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Fe | 26 | 4.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-03 | 4.0E-03 |
| Nb | 41 | 2.0E-02 | 5.0E-03 | 5.0E-03 | 5.0E-03 | 2.0E-02 |
| Ni | 28 | 2.8E-01 | 6.0E-02 | 6.0E-02 | 3.0E-02 | 2.8E-01 |
| Pd | 46 | 1.5E-01 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 1.5E-01 |
| Pm | 61 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Rh | 45 | 1.5E-01 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 1.5E-01 |
| Ru | 44 | 5.2E-01 | 2.0E-02 | 2.0E-02 | 5.0E-03 | 5.2E-01 |
| Sb | 51 | 1.3E-04 | 5.6E-04 | 8.0E-05 | 3.0E-02 | 1.3E-04 |
| Sm | 62 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-02 |
| Y | 39 | 1.5E-02 | 6.0E-03 | 6.0E-03 | 6.0E-03 | 1.5E-02 |
| Zr | 40 | 2.0E-03 | 5.0E-04 | 5.0E-04 | 5.0E-04 | 2.0E-03 |

Kennedy and Strenge 1992 [DIRS 103776], pp. 6.25 to 6.27

Notes: Values for forage are from leafy vegetables based on BSC 2004 [DIRS 169672] Section 6.2.1.2.5.

Table 14. Soil-to-Plant Transfer Factors for Crops – Reference 7

| Element | Atomic No. | ***TF*** **(pCi/Kg dry weight / pCi/Kg soil)** | | | | |
|---|---|---|---|---|---|---|
| | | **Leafy** | **Root** | **Fruit** | **Grain** | **Forage** |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | - |
| Ce | 58 | - | - | - | - | - |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | 1.1E-03 | 5.8E-04 | 5.8E-04 | 2.1E-05 | 1.1E-03 |
| Co | 27 | - | - | - | - | - |
| Eu | 63 | - | - | - | - | - |
| Fe | 26 | - | - | - | - | - |
| Nb | 41 | 5.0E-02 | 1.7E-02 | 1.7E-02 | 1.7E-02 | 5.0E-02 |
| Ni | 28 | 1.8E-01 | 3.0E-02 | 3.0E-02 | 3.0E-02 | 1.8E-01 |
| Pd | 46 | 1.5E-01 | 1.5E-01 | 1.5E-01 | 1.5E-01 | 1.5E-01 |
| Pm | 61 | - | - | - | - | - |
| Rh | 45 | - | - | - | - | - |
| Ru | 44 | - | - | - | - | - |
| Sb | 51 | - | - | - | - | - |
| Sm | 62 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 1.0E-02 |
| Y | 39 | - | - | - | - | - |
| Zr | 40 | 1.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-03 |

Source: LaPlante and Poor 1997 [DIRS 101079], p. 2-13

Notes: Values for forage are from leafy vegetables based on BSC 2004 [DIRS 169672] Section 6.2.1.2.5.

Table 15. Soil-to-Plant Transfer Factors for Crops – Reference 9

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil)[(a)] | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | - |
| Ce | 58 | - | - | - | - | - |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | - | - | - | - | - |
| Co | 27 | - | - | - | - | 1.1E+00 |
| Eu | 63 | - | - | - | - | - |
| Fe | 26 | - | - | - | - | - |
| Nb | 41 | - | - | - | - | - |
| Ni | 28 | - | - | - | - | - |
| Pd | 46 | - | - | - | - | - |
| Pm | 61 | - | - | - | - | - |
| Rh | 45 | - | - | - | - | - |
| Ru | 44 | - | - | - | - | 2.7E-01 |
| Sb | 51 | - | - | - | - | - |
| Sm | 62 | - | - | - | - | - |
| Y | 39 | - | - | - | - | - |
| Zr | 40 | - | - | - | - | - |

Source: NCRP 1984 [DIRS 103784], p. 75

Table 16. Soil-to-Plant Transfer Factors for Crops – Reference 10

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | 5.0E+00 |
| Cd | 48 | - | - | - | - | 1.0E+00 |
| Ce | 58 | - | - | - | - | 1.0E-01 |
| Cf | 98 | - | - | - | - | 1.0E-01 |
| Cm | 96 | - | - | - | - | 1.0E-01 |
| Co | 27 | - | - | - | - | 2.0E+00 |
| Eu | 63 | - | - | - | - | 1.0E-01 |
| Fe | 26 | - | - | - | - | 1.0E-01 |
| Nb | 41 | - | - | - | - | 1.0E-01 |
| Ni | 28 | - | - | - | - | 1.0E+00 |
| Pd | 46 | - | - | - | - | 5.0E-01 |
| Pm | 61 | - | - | - | - | 1.0E-01 |
| Rh | 45 | - | - | - | - | 2.0E-01 |
| Ru | 44 | - | - | - | - | 2.0E-01 |
| Sb | 51 | - | - | - | - | 1.0E-01 |
| Sm | 62 | - | - | - | - | 1.0E-01 |
| Y | 39 | - | - | - | - | 1.0E-01 |
| Zr | 40 | - | - | - | - | 1.0E-01 |

Source: NCRP 1996 [DIRS 101882], pp. 52 to 54

Table 17. Soil-to-Plant Transfer Factors for Crops – Reference 11

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | - |
| Ce | 58 | 3.6E-02 | 2.1E-02 | 2.8E-03 | 9.3E-04 | 7.2E-02 |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | - | 8.4E-05 | - | 6.2E-06 | 2.3E-03 |
| Co | 27 | 8.0E-02 | 4.6E-02 | - | 1.7E-02 | 4.0E-02 |
| Eu | 63 | - | - | - | - | - |
| Fe | 26 | - | - | - | - | - |
| Nb | 41 | - | - | - | - | - |
| Ni | 28 | - | - | - | - | - |
| Pd | 46 | - | - | - | - | - |
| Pm | 61 | - | - | - | - | - |
| Rh | 45 | - | - | - | - | - |
| Ru | 44 | 5.6E-02 | 3.2E-02 | 1.2E-02 | 3.1E-03 | 2.7E-01 |
| Sb | 51 | - | - | - | - | - |
| Sm | 62 | - | - | - | - | - |
| Y | 39 | - | - | - | - | - |
| Zr | 40 | 7.2E-03 | 1.6E-03 | 5.4E-04 | - | 1.3E-01 |

Source: Peterson 1983 [DIRS 167077], pp. 5-50 to 5-51
Notes: Based on BSC 2004 [DIRS 169672] Section 6.2.1.2, values of root vegetables are calculated from GM of radish, potato, and bean (three categories); values of grain are calculated from GM of wheat and corn (two categories); and values of forage are from alfalfa category, if available, else values of grass are used.

Table 18. Soil-to-Plant Transfer Factors for Crops – Reference 12

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | 2.0E+00 | 2.0E+00 | 2.0E+00 | 2.0E+00 | 2.0E+00 |
| Cd | 48 | 2.0E+00 | 2.0E+00 | 2.0E+00 | 6.0E-01 | 2.0E+00 |
| Ce | 58 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 4.0E-03 | 4.0E-02 |
| Cf | 98 | 2.5E-03 | 2.5E-03 | 2.5E-03 | 2.5E-03 | 2.5E-03 |
| Cm | 96 | 2.0E-03 | 2.0E-03 | 2.0E-03 | 2.0E-04 | 2.0E-03 |
| Co | 27 | 1.0E-01 | 1.0E-01 | 1.0E-01 | 4.0E-03 | 1.0E-01 |
| Eu | 63 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 2.0E-03 | 1.0E-02 |
| Fe | 26 | 2.0E-02 | 2.0E-02 | 2.0E-02 | 5.0E-03 | 2.0E-02 |
| Nb | 41 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 8.0E-03 | 4.0E-02 |
| Ni | 28 | 1.0E-01 | 1.0E-01 | 1.0E-01 | 5.0E-02 | 1.0E-01 |
| Pd | 46 | 3.0E-01 | 3.0E-01 | 3.0E-01 | 5.0E-02 | 3.0E-01 |
| Pm | 61 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 1.0E-03 | 1.0E-02 |
| Rh | 45 | 5.0E+01 | 5.0E+01 | 5.0E+01 | 5.0E+00 | 5.0E+01 |
| Ru | 44 | 2.0E-01 | 2.0E-01 | 2.0E-01 | 2.0E-01 | 2.0E-01 |
| Sb | 51 | 5.0E-02 | 5.0E-02 | 5.0E-02 | 5.0E-02 | 5.0E-02 |
| Sm | 62 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 2.0E-03 | 1.0E-02 |
| y | 39 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 1.0E-03 | 1.0E-02 |
| Zr | 40 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 4.0E-02 |

Source: Rittmann 1993 [DIRS 107744], pp. 35 to 36
Notes: Values for forage are from leafy vegetables based on BSC 2004 [DIRS 169672] Section 6.2.1.2.5.

Table 19. Soil-to-Plant Transfer Factors for Crops – Reference 13

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil)[(a)] | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | - | - | - | - | - |
| Cd | 48 | - | - | - | - | - |
| Ce | 58 | 2.4E-01 | 1.4E-01 | - | 1.8E-02 | 1.2E-01 |
| Cf | 98 | - | - | - | - | - |
| Cm | 96 | 9.3E-04 | 5.7E-04 | - | 7.0E-05 | 4.8E-04 |
| Co | 27 | 1.2E-01 | 7.5E-02 | - | 9.0E-03 | 6.3E-02 |
| Eu | 63 | - | - | - | - | - |
| Fe | 26 | - | - | - | - | - |
| Nb | 41 | - | - | - | - | - |
| Ni | 28 | 4.1E-01 | 2.5E-01 | - | 3.1E-02 | 2.1E-01 |
| Pd | 46 | - | - | - | - | - |
| Pm | 61 | - | - | - | - | - |
| Rh | 45 | - | - | - | - | - |
| Ru | 44 | 3.1E-01 | 1.8E-01 | - | 2.7E-02 | 1.6E-01 |
| Sb | 51 | 1.1E-03 | 6.7E-04 | - | 8.6E-05 | 5.7E-04 |
| Sm | 62 | - | - | - | - | - |
| Y | 39 | - | - | - | - | - |
| Zr | 40 | - | - | - | - | - |

Source: Sheppard 1995 [DIRS 103789], pp. 55 to 57

Notes: The values selected are for 5% clay.

Table 20. Soil-to-Plant Transfer Factors for Crops – Reference 15

| Element | Atomic No. | *TF* (pCi/Kg dry weight / pCi/Kg soil) | | | | |
|---|---|---|---|---|---|---|
| | | Leafy | Root | Fruit | Grain | Forage |
| Ca | 20 | 3.5E+00 | 3.5E-01 | 3.5E-01 | 3.5E-01 | 5.0E+00 |
| Cd | 48 | 5.5E-01 | 1.5E-01 | 1.5E-01 | 1.5E-01 | 1.0E+00 |
| Ce | 58 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-01 |
| Cf | 98 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 1.0E-02 | 1.0E-01 |
| Cm | 96 | 8.5E-04 | 9.2E-04 | 9.2E-04 | 9.2E-04 | 4.0E-03 |
| Co | 27 | 8.1E-02 | 1.7E-02 | 1.7E-02 | 1.7E-02 | 4.0E-01 |
| Eu | 63 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-01 |
| Fe | 26 | 4.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-03 | 3.0E-03 |
| Nb | 41 | 2.0E-02 | 5.0E-03 | 5.0E-03 | 5.0E-03 | 1.0E-01 |
| Ni | 28 | 2.8E-01 | 6.0E-02 | 6.0E-02 | 6.0E-02 | 1.1E-01 |
| Pd | 46 | 1.5E-01 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 5.0E-01 |
| Pm | 61 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-01 |
| Rh | 45 | 1.5E-01 | 4.0E-02 | 4.0E-02 | 4.0E-02 | 2.0E-01 |
| Ru | 44 | 2.0E-01 | 1.5E-02 | 1.5E-02 | 1.5E-02 | 2.0E-01 |
| Sb | 51 | 5.0E-02 | 3.0E-02 | 3.0E-02 | 3.0E-02 | 1.0E-01 |
| Sm | 62 | 1.0E-02 | 4.0E-03 | 4.0E-03 | 4.0E-03 | 1.0E-01 |
| Y | 39 | 1.5E-02 | 6.0E-03 | 6.0E-03 | 6.0E-03 | 1.0E-01 |
| Zr | 40 | 2.0E-03 | 1.8E-03 | 1.8E-03 | 1.8E-03 | 1.0E-01 |

Source: Wang et al. 1993 [DIRS 103839], pp. 25 to 26

**Suitability for Use:** The *soil-to-plant transfer factors* that are developed for the Biosphere Model for the post-closure dose assessment are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. For those elements that are not available in the Biosphere Model, the same references and same method as the Biosphere Model are used to develop parameter values.

The parameters correspond to six GENIIv2 plant transfer factors: *CLBVLV* for leafy vegetables; *CLBVRV* for root vegetables; *CLBVFR* for fruit; *CLBVCL* for cereal; *CLBVAF* for animal forage; and *CLBVAG* for animal grain. Plant transfer factors for those elements that are not available in the Biosphere Model are developed in Section 7.1.1.

#### 4.1.1.2 Transfer Coefficients for Animal Products

The term "*transfer coefficients for animal products* (*TC*)" used in the Biosphere Model is the fraction of the animal's daily intake of a radionuclide (Bq/day) that is transferred to 1 kilogram of animal product at equilibrium or at the time of slaughter (Bq/kg). The *TC* values are in units of day per kg (or day per L for milk) animal product, and are element dependent parameters. The *TC* values for sixteen elements with four animal products each are available from the DTN: MO0406SPAETPBM.002 [DIRS 170150]. The transfer coefficients are in lognormal distributions, defined by their GM, GSD, a lower bound and an upper bound as tabulated in Table 21 to Table 24. Similar to transfer factor in Section 4.1.1.1, carbon uses a special model and the *TC* values are not required.

Table 21. Transfer Coefficients for Beef

| Element | Atomic No. | GM (day/kg) | GSD | Lower Truncation Limit (day/kg) | Upper Truncation Limit (day/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 7.9E-05 | 8.2 | 3.5E-07 | 1.8E-02 |
| Am | 95 | 3.4E-05 | 9 | 1.2E-07 | 9.9E-03 |
| Cl | 17 | 4.6E-02 | 2 | 7.7E-03 | 2.7E-01 |
| Cs | 55 | 2.4E-02 | 2.6 | 2.1E-03 | 2.7E-01 |
| I | 53 | 1.0E-02 | 2.8 | 6.8E-04 | 1.5E-01 |
| Np | 93 | 3.4E-04 | 8.8 | 1.3E-06 | 9.0E-02 |
| Pa | 91 | 6.6E-05 | 10 | 1.8E-07 | 2.5E-02 |
| Pb | 82 | 6.3E-04 | 2.6 | 5.4E-05 | 7.5E-03 |
| Pu | 94 | 1.3E-05 | 10 | 3.3E-08 | 4.7E-03 |
| Ra | 88 | 8.1E-04 | 2.1 | 1.1E-04 | 5.7E-03 |
| Se | 34 | 8.8E-02 | 5.8 | 9.6E-04 | 8.0E+00 |
| Sn | 50 | 1.9E-02 | 4.6 | 3.8E-04 | 9.9E-01 |
| Sr | 38 | 1.4E-03 | 4.4 | 3.1E-05 | 6.2E-02 |
| Tc | 43 | 1.1E-03 | 7.2 | 6.9E-06 | 1.8E-01 |
| Th | 90 | 1.1E-04 | 10 | 2.8E-07 | 4.0E-02 |
| U | 92 | 4.8E-04 | 3 | 2.9E-05 | 7.8E-03 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 22. Transfer Coefficients for Poultry

| Element | Atomic No. | GM (day/kg) | GSD | Lower Truncation Limit (day/kg) | Upper Truncation Limit (day/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 4.0E-03 | 2 | 6.7E-04 | 2.4E-02 |
| Am | 95 | 1.8E-03 | 10 | 4.8E-06 | 6.7E-01 |
| Cl | 17 | 3.0E-02 | 2 | 5.0E-03 | 1.8E-01 |
| Cs | 55 | 2.6E+00 | 9.8 | 7.2E-03 | 9.3E+02 |
| I | 53 | 5.5E-02 | 9.7 | 1.6E-04 | 1.9E+01 |
| Np | 93 | 3.6E-03 | 2 | 6.0E-04 | 2.1E-02 |
| Pa | 91 | 3.0E-03 | 2 | 5.1E-04 | 1.8E-02 |
| Pb | 82 | 2.5E-02 | 10 | 6.6E-05 | 9.3E+00 |
| Pu | 94 | 1.2E-03 | 10 | 3.2E-06 | 4.6E-01 |
| Ra | 88 | 1.7E-02 | 10 | 4.4E-05 | 6.3E+00 |
| Se | 34 | 5.1E+00 | 3.6 | 1.9E-01 | 1.4E+02 |
| Sn | 50 | 3.5E-02 | 10 | 9.4E-05 | 1.3E+01 |
| Sr | 38 | 3.1E-02 | 5.8 | 3.4E-04 | 2.9E+00 |
| Tc | 43 | 6.3E-02 | 10 | 1.7E-04 | 2.4E+01 |
| Th | 90 | 5.9E-03 | 8 | 2.7E-05 | 1.3E+00 |
| U | 92 | 2.4E-01 | 10 | 6.5E-04 | 9.2E+01 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 23. Transfer Coefficients for Milk

| Element | Atomic No. | GM (day/L) | GSD | Lower Truncation Limit (day/L) | Upper Truncation Limit (day/L) |
|---|---|---|---|---|---|
| Ac | 89 | 7.6E-06 | 4.1 | 2.0E-07 | 2.9E-04 |
| Am | 95 | 1.6E-06 | 4.2 | 3.9E-08 | 6.3E-05 |
| Cl | 17 | 1.8E-02 | 2 | 2.9E-03 | 1.0E-01 |
| Cs | 55 | 7.7E-03 | 2 | 1.3E-03 | 4.6E-02 |
| I | 53 | 9.1E-03 | 2 | 1.5E-03 | 5.4E-02 |
| Np | 93 | 6.3E-06 | 2 | 1.0E-06 | 3.9E-05 |
| Pa | 91 | 4.4E-06 | 2 | 7.4E-07 | 2.6E-05 |
| Pb | 82 | 1.7E-04 | 3 | 1.0E-05 | 2.9E-03 |
| Pu | 94 | 2.3E-07 | 7.7 | 1.2E-09 | 4.4E-05 |
| Ra | 88 | 5.8E-04 | 2 | 1.0E-04 | 3.4E-03 |
| Se | 34 | 5.7E-03 | 2.5 | 5.5E-04 | 6.0E-02 |
| Sn | 50 | 1.1E-03 | 2 | 1.8E-04 | 6.3E-03 |
| Sr | 38 | 1.7E-03 | 2 | 2.8E-04 | 1.0E-02 |
| Tc | 43 | 2.1E-03 | 6 | 2.0E-05 | 2.1E-01 |
| Th | 90 | 4.4E-06 | 2 | 7.4E-07 | 2.6E-05 |
| U | 92 | 4.9E-04 | 2 | 8.1E-05 | 2.9E-03 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

Table 24. Transfer Coefficients for Eggs

| Element | Atomic No. | GM (day/kg) | GSD | Lower Truncation Limit (day/kg) | Upper Truncation Limit (day/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 2.9E-03 | 2.3 | 3.4E-04 | 2.5E-02 |
| Am | 95 | 4.9E-03 | 2 | 8.2E-04 | 2.9E-02 |
| Cl | 17 | 4.4E-02 | 10 | 1.2E-04 | 1.7E+01 |
| Cs | 55 | 3.5E-01 | 5.8 | 3.7E-03 | 3.3E+01 |
| I | 53 | 2.6E+00 | 2 | 4.4E-01 | 1.6E+01 |
| Np | 93 | 3.4E-03 | 2.4 | 3.4E-04 | 3.3E-02 |
| Pa | 91 | 2.0E-03 | 2 | 3.4E-04 | 1.2E-02 |
| Pb | 82 | 5.6E-02 | 10 | 1.5E-04 | 2.1E+01 |
| Pu | 94 | 1.7E-03 | 7.4 | 9.7E-06 | 2.9E-01 |
| Ra | 88 | 3.9E-04 | 10 | 1.0E-06 | 1.5E-01 |
| Se | 34 | 7.3E+00 | 2 | 1.2E+00 | 4.4E+01 |
| Sn | 50 | 8.7E-02 | 10 | 2.3E-04 | 3.3E+01 |
| Sr | 38 | 2.7E-01 | 2 | 4.5E-02 | 1.6E+00 |
| Tc | 43 | 2.4E+00 | 2 | 4.0E-01 | 1.4E+01 |
| Th | 90 | 3.5E-03 | 7.3 | 2.0E-05 | 5.9E-01 |
| U | 92 | 6.3E-01 | 2.5 | 6.0E-02 | 6.7E+00 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

*TC* values for elements not in the Biosphere Model are developed based on the original references cited in BSC 2004 ([DIRS 169672], Table 4-7) as listed in Table 25. *TC* data from those references are tabulated Table 26 to Table 40. The data in these tables are the inputs to calculate the GM and GSD for transfer coefficients, which is the method used in the Biosphere Model, as discussed in Section 7.1.2. These references used as sources of data for development of the values of *TCs* are mainly review reports, compendia of biosphere parameter values, and comprehensive dose assessment reports that included the descriptions of biosphere models and the selection of model input parameter values. References were published by professional organizations producing technically defensible products pertinent to this analysis as indicated in the following discussion. Some of the references are considered sources of established fact data. Evaluation of each document that is the source of the direct input is presented in BSC 2004 ([DIRS 169672], Section 4.1.1.1). The data from these references are considered appropriate for the intended use (i.e., to develop the environmental transport parameters, including *TC* in this calculation). The calculations the transfer factors are performed in Section 7.1.2 using the same method as used in BSC 2004 ([DIRS 169672], Section 6.3).

Table 25. Reference Sources for Transfer Coefficients for Animal Products

| No. | Reference | Table Reference |
|---|---|---|
| 1 | Baes et al. 1984 [DIRS 103766], p. 50-51 | Table 26 |
| 2 | Davis et al. 1993 [DIRS 103767], pp. 233 to 234 | Table 27 |
| 3 | IAEA 1994 [DIRS 100458], pp. 35 to 41 | Table 28 |
| 4 | IAEA 2001 [DIRS 158519], pp.67 to 68 | Table 29 |
| 5 | Kennedy and Strenge 1992 [DIRS 103776], pp. 6.29 to 6.31 | Table 30 |
| 6 | LaPlante and Poor 1997 [DIRS 101079], p. 2-13 | Table 31 |
| 7 | Mills et al. 1983 [DIRS 103781], pp. 145 to 146 | Table 32 |
| 8 | NCRP 1984 [DIRS 103784], p. 85 and pp. 82 to 83 | Table 33 |
| 9 | NCRP 1996 [DIRS 101882], pp. 52 to 54 | Table 34 |
| 10 | Ng 1982 [DIRS 160322], pp. 57 to 71 | Table 35 |
| 11 | Peterson 1983 [DIRS 167077], pp. 5-86 to 5-87 | Table 36 |
| 12 | Rittmann 1993 [DIRS 107744], pp. 35 to 36 | Table 37 |
| 13 | Regulatory Guide 1.109, Rev. 1 1977 [DIRS 100067], p. 1.109-37 | Table 38 |
| 14 | Smith et al. 1996 [DIRS 101085], pp. 5-27 to 5-29 | Table 39 |
| 15 | Wang et al. 1993 [DIRS 103839], pp. 27 to 34, Yu et al. 2001 [DIRS 159465], p. D-16 | Table 40 |

Source: BSC 2004 ([DIRS 169672], Tables 4-7.

Table 26. Animal Product Transfer Coefficients – Reference 1

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | 7.0E-04 | - | 1.0E-02 | - |
| Cd | 48 | 5.5E-04 | - | 1.0E-03 | - |
| Ce | 58 | 7.5E-04 | - | 2.0E-05 | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | 3.5E-06 | - | 2.0E-05 | - |
| Co | 27 | 2.0E-02 | - | 2.0E-03 | - |
| Eu | 63 | 5.0E-03 | - | 2.0E-05 | - |
| Fe | 26 | 2.0E-02 | - | 2.5E-04 | - |
| Nb | 41 | 2.5E-01 | - | 2.0E-02 | - |
| Ni | 28 | 6.0E-03 | - | 1.0E-03 | - |
| Pd | 46 | 4.0E-03 | - | 1.0E-02 | - |
| Pm | 61 | 5.0E-03 | - | 2.0E-05 | - |
| Rh | 45 | 2.0E-03 | - | 1.0E-02 | - |
| Ru | 44 | 2.0E-03 | - | 6.0E-07 | - |
| Sb | 51 | 1.0E-03 | - | 1.0E-04 | - |
| Sm | 62 | 5.0E-03 | - | 2.0E-05 | - |
| Y | 39 | 3.0E-04 | - | 2.0E-05 | - |
| Zr | 40 | 5.5E-03 | - | 3.0E-05 | - |

Baes et al. 1984 [DIRS 103766], p. 50-51

Table 27. Animal Product Transfer Coefficients – Reference 2

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | **Beef** | **Poultry** | **Milk (day/l)** | **Eggs** |
| Ca | 20 | 1.6E-03 | 4.4E-01 | 1.1E-02 | 4.4E-01 |
| Cd | 48 | 3.5E-04 | 8.4E-01 | 1.5E-03 | 8.4E-01 |
| Ce | 58 | - | - | - | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | - | - | - | - |
| Eu | 63 | - | - | - | - |
| Fe | 26 | - | - | - | - |
| Nb | 41 | 2.5E-01 | 3.0E-03 | 2.0E-02 | 3.0E-03 |
| Ni | 28 | 2.0E-03 | 2.0E-01 | 1.0E-03 | 2.0E-01 |
| Pd | 46 | 4.0E-03 | 4.0E-01 | 1.0E-02 | 4.0E-01 |
| Pm | 61 | - | - | - | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | - | - | - | - |
| Sb | 51 | 1.0E-03 | 1.0E-01 | 1.1E-04 | 1.0E-01 |
| Sm | 62 | 5.0E-03 | 5.0E-01 | 2.0E-05 | 5.0E-01 |
| Y | 39 | 3.0E-04 | 3.0E-02 | 2.0E-05 | 3.0E-02 |
| Zr | 40 | 2.0E-02 | 2.0E+00 | 3.0E-05 | 2.0E+00 |

Source: Davis et al. 1993 [DIRS 103767], pp. 233 to 234
Notes: Same value for BIRD used for poultry and eggs based on BSC 2004 [DIRS 169672] Section 6.3.3.4.

Table 28. Animal Product Transfer Coefficients – Reference 3

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | **Beef** | **Poultry** | **Milk (day/l)** | **Eggs** |
| Ca | 20 | 2.0E-03 | 4.0E-02 | 3.0E-03 | 4.0E-01 |
| Cd | 48 | 4.0E-04 | 8.0E-01 | - | 1.0E-01 |
| Ce | 58 | 2.0E-05 | 4.0E-03 | 3.0E-05 | 9.0E-05 |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | 1.0E-02 | 2.0E+00 | 3.0E-04 | 1.0E-01 |
| Eu | 63 | - | - | - | - |
| Fe | 26 | 2.0E-02 | 1.0E+00 | 3.0E-05 | 1.0E+00 |
| Nb | 41 | 3.0E-07 | 3.0E-04 | 4.1E-07 | 1.0E-03 |
| Ni | 28 | 5.0E-03 | - | 1.6E-02 | - |
| Pd | 46 | - | - | - | - |
| Pm | 61 | - | 2.0E-03 | - | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | 4.0E-01 | 8.0E+00 | 3.3E-06 | 5.0E-03 |
| Sb | 51 | 4.0E-05 | - | 2.5E-05 | - |
| Sm | 62 | - | - | - | - |
| Y | 39 | 1.0E-03 | 1.0E-02 | - | 2.0E-03 |
| Zr | 40 | 1.0E-06 | 6.0E-05 | 5.5E-07 | 2.0E-04 |

Source: IAEA 1994 [DIRS 100458], pp. 35 to 41
Notes: Maximum values selected when multiple values

Table 29. Animal Product Transfer Coefficients – Reference 4

| Element | Atomic No. | ***TC* (day/kg)** | | | |
|---|---|---|---|---|---|
| | | **Beef** | **Poultry** | **Milk (day/l)** | **Eggs** |
| Ca | 20 | - | - | - | - |
| Cd | 48 | 1.0E-03 | - | 2.0E-02 | - |
| Ce | 58 | 2.0E-04 | - | 3.0E-04 | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | 2.0E-05 | - | 2.0E-06 | - |
| Co | 27 | 7.0E-02 | - | 1.0E-02 | - |
| Eu | 63 | 2.0E-03 | - | 6.0E-05 | - |
| Fe | 26 | 5.0E-02 | - | 3.0E-04 | - |
| Nb | 41 | 3.0E-06 | - | 4.0E-06 | - |
| Ni | 28 | 5.0E-02 | - | 2.0E-01 | - |
| Pd | 46 | 2.0E-04 | - | 1.0E-04 | - |
| Pm | 61 | 2.0E-03 | - | 6.0E-05 | - |
| Rh | 45 | 2.0E-03 | - | 5.0E-04 | - |
| Ru | 44 | 5.0E-02 | - | 3.0E-05 | - |
| Sb | 51 | 5.0E-03 | - | 2.5E-04 | - |
| Sm | 62 | - | - | - | - |
| Y | 39 | 1.0E-02 | - | 6.0E-05 | - |
| Zr | 40 | 1.0E-05 | - | 6.0E-06 | - |

Source: IAEA 2001 [DIRS 158519], pp.67 to 68

Table 30. Animal Product Transfer Coefficients – Reference 5

| Element | Atomic No. | ***TC* (day/kg)** | | | |
|---|---|---|---|---|---|
| | | **Beef** | **Poultry** | **Milk (day/l)** | **Eggs** |
| Ca | 20 | 7.0E-04 | 4.4E-02 | 1.0E-02 | 4.4E-01 |
| Cd | 48 | 5.5E-04 | 8.4E-01 | 1.0E-03 | 1.0E-01 |
| Ce | 58 | 7.5E-04 | 1.0E-02 | 2.0E-05 | 5.0E-03 |
| Cf | 98 | 5.0E-03 | 4.0E-03 | 7.5E-07 | 2.0E-03 |
| Cm | 96 | 3.5E-06 | 4.0E-03 | 2.0E-05 | 2.0E-03 |
| Co | 27 | 2.0E-02 | 5.0E-01 | 2.0E-03 | 1.0E-01 |
| Eu | 63 | 5.0E-03 | 4.0E-03 | 2.0E-05 | 7.0E-03 |
| Fe | 26 | 2.0E-02 | 1.5E+00 | 2.5E-04 | 1.3E+00 |
| Nb | 41 | 2.5E-01 | 3.1E-04 | 2.0E-02 | 1.3E-03 |
| Ni | 28 | 6.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-01 |
| Pd | 46 | 4.0E-03 | 3.0E-04 | 1.0E-02 | 4.0E-03 |
| Pm | 61 | 5.0E-03 | 2.0E-03 | 2.0E-05 | 2.0E-02 |
| Rh | 45 | 2.0E-03 | 5.0E-01 | 1.0E-02 | 1.0E-01 |
| Ru | 44 | 2.0E-03 | 7.0E-03 | 6.0E-07 | 6.0E-03 |
| Sb | 51 | 1.0E-03 | 6.0E-03 | 1.0E-04 | 7.0E-02 |
| Sm | 62 | 5.0E-03 | 4.0E-03 | 2.0E-05 | 7.0E-03 |
| Y | 39 | 3.0E-04 | 1.0E-02 | 2.0E-05 | 2.0E-03 |
| Zr | 40 | 5.5E-03 | 6.4E-05 | 3.0E-05 | 1.9E-04 |

Source: Kennedy and Strenge 1992 [DIRS 103776], pp. 6.29 to 6.31

Table 31. Animal Product Transfer Coefficients – Reference 6

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | - | - | - | - |
| Cd | 48 | - | - | - | - |
| Ce | 58 | - | - | - | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | 3.5E-06 | - | 2.0E-05 | 2.0E-03 |
| Co | 27 | - | - | - | - |
| Eu | 63 | - | - | - | - |
| Fe | 26 | - | - | - | - |
| Nb | 41 | 3.0E-07 | - | 4.1E-07 | 1.0E-03 |
| Ni | 28 | 5.0E-03 | - | 1.6E-02 | 1.0E-01 |
| Pd | 46 | 4.0E-03 | - | 1.0E-02 | 4.0E-03 |
| Pm | 61 | - | - | - | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | - | - | - | - |
| Sb | 51 | - | - | - | - |
| Sm | 62 | 5.0E-03 | - | 2.0E-05 | 7.0E-03 |
| Y | 39 | - | - | - | - |
| Zr | 40 | 1.0E-06 | - | 6.0E-07 | 2.0E-04 |

Source: LaPlante and Poor 1997 [DIRS 101079], p. 2-13

Table 32. Animal Product Transfer Coefficients – Reference 7

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | 3.3E-03 | 3.3E-03 | 8.0E-03 | 1.0E+00 |
| Cd | 48 | 1.6E-02 | 1.5E-02 | 5.2E-05 | 9.9E-04 |
| Ce | 58 | 1.0E-03 | 6.0E-04 | 1.0E-05 | 3.0E-03 |
| Cf | 98 | 5.0E-03 | 4.0E-03 | 7.5E-07 | 2.0E-03 |
| Cm | 96 | 5.0E-03 | 4.0E-03 | 2.5E-06 | 2.0E-03 |
| Co | 27 | 1.0E-03 | 1.0E-03 | 5.0E-04 | 1.0E-01 |
| Eu | 63 | 5.0E-03 | 4.0E-03 | 2.5E-06 | 7.0E-03 |
| Fe | 26 | 2.0E-02 | 1.0E-03 | 6.0E-04 | 1.0E-01 |
| Nb | 41 | 5.0E-04 | 1.0E-04 | 1.2E-03 | 1.2E-03 |
| Ni | 28 | 1.0E-03 | 1.0E-03 | 3.4E-03 | 1.0E-01 |
| Pd | 46 | 1.0E-03 | 3.0E-04 | 5.0E-03 | 4.0E-03 |
| Pm | 61 | 5.0E-03 | 1.0E-04 | 2.5E-06 | 7.0E-03 |
| Rh | 45 | 1.0E-03 | 3.0E-04 | 5.0E-03 | 4.0E-03 |
| Ru | 44 | 1.0E-03 | 3.0E-04 | 5.0E-07 | 4.0E-03 |
| Sb | 51 | 3.0E-03 | 6.0E-03 | 7.5E-04 | 7.9E-02 |
| Sm | 62 | 5.0E-03 | 4.0E-03 | 2.5E-06 | 7.0E-03 |
| Y | 39 | 5.0E-03 | 5.0E-04 | 5.0E-06 | 5.0E-04 |
| Zr | 40 | 5.0E-04 | 1.0E-04 | 2.5E-06 | 1.2E-03 |

Source: Mills et al. 1983 [DIRS 103781], pp. 145 to 146

Table 33. Animal Product Transfer Coefficients – Reference 8

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | - | - | - | - |
| Cd | 48 | - | - | - | - |
| Ce | 58 | - | - | - | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | - | - | 2.9E-03 | - |
| Eu | 63 | - | - | - | - |
| Fe | 26 | - | - | - | - |
| Nb | 41 | - | - | - | - |
| Ni | 28 | - | - | - | - |
| Pd | 46 | - | - | - | - |
| Pm | 61 | - | - | - | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | 2.0E-03 | - | 6.1E-07 | - |
| Sb | 51 | - | - | - | - |
| Sm | 62 | - | - | - | - |
| Y | 39 | - | - | - | - |
| Zr | 40 | - | - | - | - |

Source: NCRP 1984 [DIRS 103784], p. 85 and pp. 82 to 83

Table 34. Animal Product Transfer Coefficients – Reference 9

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | 2.0E-03 | - | 3.0E-03 | - |
| Cd | 48 | 1.0E-03 | - | 2.0E-03 | - |
| Ce | 58 | 2.0E-05 | - | 3.0E-05 | - |
| Cf | 98 | 6.0E-05 | - | 2.0E-06 | - |
| Cm | 96 | 2.0E-05 | - | 2.0E-06 | - |
| Co | 27 | 3.0E-02 | - | 2.0E-03 | - |
| Eu | 63 | 2.0E-03 | - | 6.0E-05 | - |
| Fe | 26 | 3.0E-02 | - | 3.0E-04 | - |
| Nb | 41 | 3.0E-07 | - | 2.0E-06 | - |
| Ni | 28 | 5.0E-03 | - | 2.0E-02 | - |
| Pd | 46 | 2.0E-04 | - | 1.0E-04 | - |
| Pm | 61 | 2.0E-03 | - | 6.0E-05 | - |
| Rh | 45 | 2.0E-03 | - | 5.0E-04 | - |
| Ru | 44 | 2.0E-03 | - | 2.0E-05 | - |
| Sb | 51 | 1.0E-03 | - | 1.0E-04 | - |
| Sm | 62 | 2.0E-03 | - | 6.0E-05 | - |
| Y | 39 | 2.0E-03 | - | 6.0E-05 | - |
| Zr | 40 | 1.0E-06 | - | 6.0E-07 | - |

Source: NCRP 1996 [DIRS 101882], pp. 52 to 54

Table 35. Animal Product Transfer Coefficients – Reference 10

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | - | - | 1.1E-02 | - |
| Cd | 48 | - | - | 1.5E-03 | - |
| Ce | 58 | 7.5E-04 | - | 6.0E-05 | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | - | - | 2.9E-03 | - |
| Eu | 63 | - | - | - | - |
| Fe | 26 | - | - | 2.7E-04 | - |
| Nb | 41 | - | - | - | - |
| Ni | 28 | - | - | 1.0E-03 | - |
| Pd | 46 | - | - | - | - |
| Pm | 61 | - | - | - | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | 2.0E-03 | - | 3.3E-06 | 4.0E-03 |
| Sb | 51 | 1.2E-03 | - | 1.1E-04 | - |
| Sm | 62 | - | - | - | - |
| Y | 39 | - | - | - | - |
| Zr | 40 | - | - | 3.0E-05 | - |

Source: Ng 1982 [DIRS 160322], p. 62 to 63

Table 36. Animal Product Transfer Coefficients – Reference 11

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | 1.6E-03 | 4.4E-02 | 1.1E-02 | 4.4E-01 |
| Cd | 48 | - | - | - | - |
| Ce | 58 | 2.9E-04 | - | 2.0E-05 | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | 1.2E-02 | - | 2.0E-03 | - |
| Eu | 63 | 2.9E-04 | - | 2.0E-05 | - |
| Fe | 26 | 2.1E-02 | 1.5E+00 | 5.9E-05 | 1.3E+00 |
| Nb | 41 | 2.0E-03 | 2.0E-03 | 2.0E-02 | 3.0E-03 |
| Ni | 28 | 2.0E-03 | - | 1.0E-02 | - |
| Pd | 46 | - | - | - | - |
| Pm | 61 | 2.9E-04 | - | 2.0E-05 | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | 2.0E-03 | 7.0E-03 | 6.1E-07 | 6.0E-03 |
| Sb | 51 | 1.2E-03 | - | - | - |
| Sm | 62 | 2.9E-04 | - | 2.0E-05 | - |
| Y | 39 | 1.0E-03 | 1.0E-02 | 2.0E-05 | 2.0E-03 |
| Zr | 40 | 2.1E-02 | - | 8.0E-02 | - |

Source: Peterson 1983 [DIRS 167077], pp. 5-86 to 5-87

Table 37. Animal Product Transfer Coefficients – Reference 12

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | 1.6E-03 | 4.4E-02 | 8.0E-03 | 4.4E-01 |
| Cd | 48 | 4.0E-04 | 8.4E-01 | 1.2E-04 | 1.0E-01 |
| Ce | 58 | 2.0E-03 | 1.0E-02 | 4.0E-05 | 5.0E-03 |
| Cf | 98 | 5.0E-03 | 4.0E-03 | 7.5E-07 | 2.0E-03 |
| Cm | 96 | 5.0E-03 | 4.0E-03 | 3.0E-07 | 2.0E-03 |
| Co | 27 | 2.0E-02 | 5.0E-01 | 1.0E-04 | 1.0E-01 |
| Eu | 63 | 6.0E-03 | 4.0E-03 | 2.0E-05 | 7.0E-03 |
| Fe | 26 | 2.0E-02 | 1.5E+00 | 5.0E-05 | 1.3E+00 |
| Nb | 41 | 2.6E-07 | 3.1E-04 | 4.1E-07 | 1.3E-03 |
| Ni | 28 | 2.0E-03 | 1.0E-03 | 1.0E-03 | 1.0E-01 |
| Pd | 46 | 1.0E-03 | 3.0E-04 | 5.0E-03 | 4.0E-03 |
| Pm | 61 | 5.0E-03 | 2.0E-03 | 2.5E-06 | 2.0E-02 |
| Rh | 45 | 1.0E-03 | 3.0E-04 | 5.0E-03 | 4.0E-03 |
| Ru | 44 | 2.0E-03 | 7.0E-03 | 6.0E-07 | 6.0E-03 |
| Sb | 51 | 1.0E-03 | 6.0E-03 | 7.5E-04 | 7.0E-02 |
| Sm | 62 | 5.0E-03 | 4.0E-03 | 2.0E-05 | 7.0E-03 |
| Y | 39 | 1.0E-03 | 1.0E-02 | 5.0E-06 | 2.0E-03 |
| Zr | 40 | 1.2E-06 | 6.4E-05 | 5.5E-07 | 1.9E-04 |

Source: Rittmann 1993 [DIRS 107744], pp. 35 to 36

Table 38. Animal Product Transfer Coefficients – Reference 13

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | - | - | - | - |
| Cd | 48 | - | - | - | - |
| Ce | 58 | 1.2E-03 | - | 1.0E-04 | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | 1.3E-02 | - | 1.0E-03 | - |
| Eu | 63 | - | - | - | - |
| Fe | 26 | 4.0E-02 | - | 1.2E-03 | - |
| Nb | 41 | 2.8E-01 | - | 2.5E-03 | - |
| Ni | 28 | 5.3E-02 | - | 6.7E-03 | - |
| Pd | 46 | - | - | - | - |
| Pm | 61 | - | - | - | - |
| Rh | 45 | 1.5E-03 | - | 1.0E-02 | - |
| Ru | 44 | 4.0E-01 | - | 1.0E-06 | - |
| Sb | 51 | - | - | - | - |
| Sm | 62 | - | - | - | - |
| Y | 39 | 4.6E-03 | - | 1.0E-05 | - |
| Zr | 40 | 3.4E-02 | - | 5.0E-06 | - |

Source: Regulatory Guide 1.109, Rev. 1 1977 [DIRS 100067], p. 1.109-37

Table 39. Animal Product Transfer Coefficients – Reference 14

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | - | - | - | - |
| Cd | 48 | - | - | - | - |
| Ce | 58 | - | - | - | - |
| Cf | 98 | - | - | - | - |
| Cm | 96 | - | - | - | - |
| Co | 27 | - | - | - | - |
| Eu | 63 | - | - | - | - |
| Fe | 26 | - | - | - | - |
| Nb | 41 | 2.0E-04 | 4.0E-02 | 2.0E-02 | 2.2E-02 |
| Ni | 28 | - | - | - | - |
| Pd | 46 | - | - | - | - |
| Pm | 61 | - | - | - | - |
| Rh | 45 | - | - | - | - |
| Ru | 44 | - | - | - | - |
| Sb | 51 | - | - | - | - |
| Sm | 62 | - | - | - | - |
| Y | 39 | - | - | - | - |
| Zr | 40 | - | - | - | - |

Source: Smith et al. 1996 [DIRS 101085], p. 5-27 to 5-29

Table 40. Animal Product Transfer Coefficients – Reference 15

| Element | Atomic No. | *TC* (day/kg) | | | |
|---|---|---|---|---|---|
| | | Beef | Poultry | Milk (day/l) | Eggs |
| Ca | 20 | 1.6E-03 | - | 3.0E-03 | - |
| Cd | 48 | 4.0E-04 | - | 1.0E-03 | - |
| Ce | 58 | 2.0E-05 | - | 3.0E-05 | - |
| Cf | 98 | 6.0E-05 | - | 7.5E-07 | - |
| Cm | 96 | 2.0E-05 | - | 2.0E-06 | - |
| Co | 27 | 2.0E-02 | - | 2.0E-03 | - |
| Eu | 63 | 2.0E-03 | - | 2.0E-05 | - |
| Fe | 26 | 2.0E-02 | - | 3.0E-04 | - |
| Nb | 41 | 3.0E-07 | - | 2.0E-06 | - |
| Ni | 28 | 5.0E-03 | - | 2.0E-02 | - |
| Pd | 46 | 1.0E-03 | - | 5.0E-03 | - |
| Pm | 61 | 2.0E-03 | - | 2.0E-05 | - |
| Rh | 45 | 1.0E-03 | - | 5.0E-03 | - |
| Ru | 44 | 2.0E-03 | - | 3.3E-06 | - |
| Sb | 51 | 1.0E-03 | - | 1.0E-04 | - |
| Sm | 62 | 2.0E-03 | - | 2.0E-05 | - |
| Y | 39 | 2.0E-03 | - | 2.0E-05 | - |
| Zr | 40 | 1.0E-06 | - | 6.0E-07 | - |

Source: Wang et al. 1993 [DIRS 103839], pp. 27 to 34, and Yu et al. 2001 [DIRS 159465], p. D-16

**Suitability for Use:** The *transfer coefficients for animal products* that are developed for the Biosphere Model for the post-closure dose assessment are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. For those elements that are not available in the Biosphere Model, the same references and same method used in the Biosphere Model are to be used to develop the parameter values. The parameters correspond to the GENIIv2 transfer coefficient parameters: *CLFMT* for Meat; *CLFMK* for milk; *CLFPL* for Poultry; and *CLFEG* for eggs.

#### 4.1.1.3 Translocation Factors

The *translocation factors for crops* used in the Biosphere Model (BSC 2004 [DIRS 169672], Section 6.2.2.2 and Table 6-36) relates the fraction of a chemical element initially deposited on the leaf surface that is retained and translocated to the edible plant parts. Translocation factors for five types of crops are tabulated in Table 41. Among them, a fixed value was used for two crop types, while a distribution was assigned for three crop types. A median value can be used for a deterministic calculation in the GENIIv2.

Table 41. Translocation Factors for Crops

| Crop Type | Translocation Factor (distribution/value) |
|---|---|
| Leafy vegetables | 1.0 |
| Root vegetables | Piece-wise linear: (0.05, 0%), (0.1, 50%), (0.3, 100%) |
| Fruit | Piece-wise linear: (0.05, 0%), (0.1, 50%), (0.3, 100%) |
| Grain | Piece-wise linear: (0.05, 0%), (0.1, 50%), (0.3, 100%) |
| Fresh forage for beef cattle and diary cows | 1.0 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

**Suitability for Use:** The translocation factors for crops that are developed for the Biosphere Model for the post-closure dose assessment are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. However, because a piece-wise linear distribution is not available in the GENIIv2, the distribution is converted to an accepted distribution in Section 7.1.3. The translocation factors correspond to the GENIIv2 parameters for each crop type: *TRANS* and *TRANSA*.

#### 4.1.1.4 Weathering Half-Half or Weathering Rate Constant

The *weathering half-life* (or *weathering half-time*) describes the time for the amount of contaminant deposited on a plant to be reduced to one-half of its initial value (BSC 2004 [DIRS 169672], Section 6.2.2.3). A piece-wise linear distribution with the following values: (5 days; 0%), (14 days; 50%), (30 days; 100%) is provided in DTN: MO0406SPAETPBM.002 [DIRS 170150] for weathering half-life. A median value, 14 days, can be used for a deterministic calculation in the GENIIv2.

The weathering rate constant is defined in the Biosphere Model (BSC 2004 [DIRS 169672], Section 6.2.2.3). The relationship between the weathering half-life and weathering rate constant is given in BSC 2004 ([DIRS 169672], Equation 6-7):

$$T = \frac{\ln 2}{\lambda w} \qquad \text{Equation 1}$$

where:

$T$ = weathering half-life, day

$\lambda w$ = weathering rate constant, $day^{-1}$

For a weathering half-life of 14 days, the weathering rate constant, $\lambda w$ is 0.0495 $day^{-1}$ (18.1 $y^{-1}$) from:

$$\lambda w = \frac{\ln 2}{T} = \frac{\ln 2}{14\,d} = 0.0495\,d^{-1} \qquad \text{Equation 2}$$

**Suitability for Use:** The *weathering half-life* developed for the Biosphere Model for the post-closure dose assessment is appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. It corresponds to the GENIIv2 parameter *WTIM, weathering rate constant*. Note that the definition of weathering rate constant in GENIIv2 corresponds the weathering half-life in the Biosphere Model with the relation defined in Equation 1. The parameter distribution is converted to an GENIIv2 accepted distribution in Section 7.1.4.

#### 4.1.1.5 Dry Deposition Velocity for Soil Resuspension

Deposition is an atmospheric removal process involving the transport of matter from the atmosphere to environmental surfaces. The deposition velocity is usually defined as the ratio of the deposition flux divided by the airborne particle concentration per unit volume, at some height above the surface. It has dimensions of distance per unit time, and its value may vary with environmental conditions, such as the presence of the turbulence and eddies in the near-surface atmospheric layer. The deposition velocities for particles depend on particle size and density and also on other variables such as wind speed and surface roughness (BSC 2004 [DIRS 169672], Section 6.2.2.1). The dry deposition velocity for soil resuspension in the Biosphere Model is represented by a piece-wise linear cumulative distribution represented as tabulated in Table 42. The median value of 8 x $10^{-3}$ m/s at 50 percent cumulative distribution that corresponds to 4 μm particle can be used for a deterministic calculation.

Table 42. Dry deposition Velocity fro Soil Resuspension

| No. | Particle Size (μm) | Percent | Dry Deposition Velocity (m/s) |
|---|---|---|---|
| 1 | 0.06 | 0 | 3E-4 |
| 2 | 0.8 | 16 | 1E-3 |
| 3 | 4.0 | 50 | 8E-3 |
| 4 | 20 | 84 | 3E-2 |
| 5 | 250 | 100 | 3E-1 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

**Suitability for Use:** The *dry deposition velocity* developed for the Biosphere Model for the post-closure dose assessment is appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. It corresponds to GENIIv2 parameter:

*DPVRES*, *deposition velocity from soil to plant surface*. This parameter value may be used for the *CLVD*, *atmospheric deposition velocity*, if a particle size distribution is in a range shown in Table 42. The parameter distribution is converted to an GENIIv2 accepted distribution in Section 7.1.5.

#### 4.1.1.6 Animal Feed and Soil Consumption Rates

The animal feed and soil consumption rate categories are beef cattle, dairy cows, poultry and laying hens in the Biosphere Model (BSC 2004 [DIRS 169672], Section 6.3) and are the same as used for the GENIIv2. In the Biosphere Model grazing animals (beef cattle and dairy cows) are on a diet of fresh pasture grass only; and laying hens and poultry are fed with grain only (BSC 2004 [DIRS 169672], Section 6.3.1). This is conservative as discussed in BSC 2004 ([DIRS 169460] Section 6.3.1.4). It is used as an assumption in this calculation (Section 3.2.7). Animal feed, water, and soil consumption rates are tabulated in Table 43 as provided in DTN: MO0406SPAETPBM.002 [DIRS 170150]. A uniform distribution for all consumption rates is recommended, and maximum and minimum rates are provided. Mean values were calculated in Section 7.1.6 for a deterministic calculation in the GENIIv2.

Table 43. Animal Feed and Soil Consumption Rates

| Animal Type | Feed | | Feed (Kg wet/day) | Water (L/day) | Soil (Kg/day) |
|---|---|---|---|---|---|
| Beef cattle | Forage | Minimum | 29 | 60 | 0.4 |
| | | Maximum | 68 | | 1.0 |
| Dairy cow | Forage | Minimum | 50 | 60 | 0.8 |
| | | Maximum | 73 | 100 | 1.1 |
| Poultry | Grain | Minimum | 0.12 | 0.5 | 0.01 |
| | | Maximum | 0.4 | | 0.03 |
| Laying hen | Grain | Minimum | 0.12 | 0.5 | 0.01 |
| | | Maximum | 0.4 | | 0.03 |

Source: DTN: MO0406SPAETPBM.002 [DIRS 170150]

**Suitability for Use:** The animal feed and soil consumption rates developed for the Biosphere Model for the post-closure dose assessment are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. The rates correspond to the GENIIv2 parameters: *CONSUM*, *animal feed consumption rate; DWATER*, *animal intake rate of water;* and *SLCON, animal daily soil consumption rate*.

#### 4.1.1.7 Depth of Top Soil Available for Resuspension

The critical thickness is developed in the Biosphere Model for the volcanic ash exposure scenario to predict contaminant concentration in air for the inhalation pathway. The function of this parameter is to allow for mixing of the contaminant deposited on the ground surface with the surface soil for thin sources, and to allow for partial resuspension of deposited activity for thick sources (BSC 2004 [DIRS 169672], Section 6.8). The critical thickness is represented by a uniform distribution with a minimum of 1 mm and a maximum of 3 mm in DTN: MO0406SPAETPBM.002 [DIRS 170150].

**Suitability for Use:** The critical thickness concept of a resuspendable layer thickness is the same as the GENIIv2 parameter *AVALSL*, *depth of top soil available for resuspension*. It is used in the soil resuspension for inhalation model as discussed in Section 7.4.2.

### 4.1.2 Soil-Related Parameters

Biosphere Model soil related parameters are documented in the *Soil-Related Input Parameters for the Biosphere Model* (BSC 2006 [DIRS 177400]). The parameter values evaluated and selected in this subsection are based on DTN: MO0609SPASRPBM.004 [DIRS 177742].

#### 4.1.2.1 Soil Bulk Density

The soil bulk density describes the physical characteristics of the surface soil. The parameter developed in the Biosphere Model is representative of Amargosa Valley soil (BSC 2006 [DIRS 177400], Section 6.1). The mean soil bulk density is 1.5 g $cm^{-3}$. The distribution is a triangular distribution over the density range of 1.3 g $cm^{-3}$ and 1.7 g $cm^{-3}$ with a mode at 1.5 g $cm^{-3}$ (DTN: MO0609SPASRPBM.004 [DIRS 177742]).

**Suitability for Use:** The *soil bulk density* developed for the Biosphere Model is appropriate for the use of the PCSA, because of the same environment for the receptor. The GENIIv2 parameters are *BULKD, surface soil bulk density*; and *SLDN, density of contaminated soil/sediment layer*. The triangular distribution is converted to a distribution GENIIv2 can accept in Section 7.2.1.

#### 4.1.2.2 Soil-Water Partition Coefficient

The *partition coefficient* (*Kd*) is the ratio of the mass of the solute in the solid phase per unit mass of the solid phase to the concentration of the solute in the solution at equilibrium. The partition coefficient values used in the Biosphere Model are based on the distributions of *Kd* recommended by Sheppard and Thibault (1990 [DIRS 109991], Table 3) with appropriate soil types presented in the vicinity of Lathrop Wells, Amargosa Valley (BSC 2006 [DIRS 177400], Section 6.2). For the seventeen elements used in the Biosphere Model, the GM, GSD, lower and upper truncation limits are shown in Table 44. If a deterministic value for the partition coefficient is required, the GM should be used (DTN: MO0609SPASRPBM.004 [DIRS 177742]).

Table 44. Soil-Water Partition Coefficients for Elements in the Biosphere Model

| Element | Parameter Values for a Lognormal Distribution | | | |
|---|---|---|---|---|
| | GM (L/kg) | GSD | Lower Truncation Limit (L/kg) | Upper Truncation Limit (L/kg) |
| Ac | 1.5E+03 | 6.0E+00 | 4.3E+01 | 5.0E+04 |
| Am | 2.0E+03 | 1.4E+01 | 1.2E+01 | 3.3E+05 |
| C | 1.8E+01 | 6.0E+00 | 5.3E-01 | 6.2E+02 |
| Cl | 1.4E-01 | 6.0E+00 | 1.3E-03 | 1.4E+01 |
| Cs | 4.4E+03 | 3.7E+00 | 1.6E+02 | 1.3E+05 |
| I | 4.5E+00 | 7.4E+00 | 8.9E-02 | 2.3E+02 |
| Np | 2.5E+01 | 3.3E+00 | 2.3E+00 | 2.6E+02 |
| Pa | 1.8E+03 | 6.0E+00 | 5.3E+01 | 6.2E+04 |
| Pb | 1.6E+04 | 4.1E+00 | 1.0E+03 | 2.5E+05 |
| Pu | 1.2E+03 | 3.3E+00 | 1.2E+02 | 1.3E+04 |
| Ra | 3.6E+04 | 2.2E+01 | 8.3E+01 | 1.6E+07 |
| Se | 1.5E+02 | 6.0E+00 | 4.4E+00 | 5.1E+03 |
| Sn | 4.5E+02 | 6.0E+00 | 1.3E+01 | 1.5E+04 |
| Sr | 2.0E+01 | 5.5E+00 | 7.2E-01 | 5.6E+02 |
| Tc | 1.4E-01 | 6.0E+00 | 1.3E-03 | 1.4E+01 |
| Th | 3.0E+03 | 8.2E+00 | 4.9E+01 | 1.8E+05 |
| U | 3.3E+01 | 2.5E+01 | 6.3E-01 | 1.8E+04 |

Source: DTN: MO0609SPASRPBM.004 [DIRS 177742]

The partition coefficients for those elements that are not available in the Biosphere Model, as discussed in Section 4.1 and Table 2, are calculated in Section 7.2.2 using the same input source and same method as used in the Biosphere Model (BSC 2006 [DIRS 177400], Section 6.2). Data from Sheppard and Thibault (1990 [DIRS 109991], Tables A-1 and A-2), the source for the Biosphere Model inputs (BSC 2006 [DIRS 177400], Section 6.3), are tabulated in Table 45 for sandy and loam soils. This reference, *Default Soil Solid/Liquid Partition Coefficients, Kds, for Four Major Soil Types: A Compendium*, is an article presenting the results of a review and synthesis of previously published element $K_d$ data for radionuclides of importance in nuclear waste management. The article was published in *Health Physics*, a scientific journal with international distribution. Prior to acceptance for publication, the article was subjected to rigorous scientific/technical peer review. More detailed evaluation of this reference is presented in BSC 2006 ([DIRS 177400], Section 4.1.2). Therefore, this reference source is considered appropriate for the intended use (i.e., to develop the partition coefficients in this calculation).

The partition coefficients for four elements (Cf, Eu, Pm, and Rh) are not available in Sheppard and Thibault (1990 [DIRS 109991]). These parameter values are taken from Baes et al. (1984 [DIRS 103766], p.58) and Yu et al (1993 [DIRS 160561], p.107). These references are reliable sources that are already used in this document for their values of transfer factors and transfer coefficients (Sections 4.1.1.1 and 4.1.1.2). Sheppard and Thibault (1990 [DIRS 109991], p.472) used the transfer factors from Baes et al. (1984 [DIRS 103766]) to develop their recommended values for those elements that are not commonly available. Yu et al (1993 [DIRS 160561], p.107) provides RESRAD *Kd* values based on Sheppard and Thibault (1990 [DIRS 109991]) *Kd* range. Therefore, data from these reports are considered appropriate for the intended use (i.e., to develop the partition coefficients in this calculation).

Table 45. Soil-Water Partition Coefficients for Elements not in the Biosphere Model

| Element | Atomic No. | Sand Soil [a] | | Loam Soil [a] | | Unspecified Soil Type | |
|---|---|---|---|---|---|---|---|
| | | Mean of $\ln(K_d)$ | SD of $\ln(K_d)$ | Mean of $\ln(K_d)$ | SD of $\ln(K_d)$ | GM of ($K_d$) | GSD of ($K_d$) |
| | | Natural logarithms of the value in units of L/kg | | Natural logarithms of the value in units of L/kg | | Value in units of L/kg | |
| Bi | 83 | 4.6 | - | 6.1 | - | - | - |
| Ca | 20 | 1.8 | - | 3.4 | - | - | - |
| Cd | 48 | 4.3 | 1.5 | 3.7 | 1.6 | - | - |
| Ce | 58 | 6.2 | 1.6 | 9.0 | 1.5 | - | - |
| Cf | 98 | - | - | - | - | 200 [c] | - |
| Cm | 96 | 8.4 | 2.4 | 9.8 | 0.7 | - | - |
| Co | 27 | 4.1 | 2.8 | 7.2 | 1.3 | - | - |
| Eu | 63 | - | - | - | - | 650 [b] | - |
| Fe | 26 | 5.4 | 2.6 | 6.7 | 0.7 | - | - |
| Nb | 41 | 5.1 | - | 6.3 | - | - | - |
| Ni | 28 | 6.0 | 1.5 | 5.7 | - | - | - |
| Pd | 46 | 4.0 | - | 5.2 | - | - | - |
| Pm | 61 | - | - | - | - | 650 [b] | - |
| Po | 84 | 5.0 | 1.6 | 6.0 | 1.3 | - | - |
| Rh | 45 | - | - | - | - | 60 [b] | - |
| Ru | 44 | 4.0 | 1.4 | 6.9 | - | - | - |
| Sb | 51 | 3.8 | - | 5.0 | - | - | - |
| Sm | 62 | 5.5 | - | 6.7 | - | - | - |
| Te | 52 | 4.8 | - | 6.3 | - | - | - |
| Y | 39 | 5.1 | - | 6.6 | - | - | - |
| Zr | 40 | 6.4 | - | 7.7 | - | - | - |

Source: [a] Sheppard and Thibault (1990 [DIRS 109991], Tables A-1 and A-2), [b] Baes et al. (1984 [DIRS 103766], p.58), and [c] Yu et al (1993 [DIRS 160561], p107).

**Suitability for Use:** The *partition coefficients* developed for the Biosphere Model for the post-closure dose assessment are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. The *partition coefficients* for those elements that are not available in the Biosphere Model, the same methods and references are used to develop parameter values. The *partition coefficients* correspond to the *surface soil distribution coefficient* or *soil adsorption coefficient* in the GENIIv2 (Napier et al 2006 [DIRS 177331], Section 7.2.5 and Appendix E). The GENIIv2 parameter for each element is *SOILKD, soil adsorption coefficients.*

### 4.1.2.3 Soil Water Content

The *soil water content* at field capacity developed in the Biosphere Model is representative of the Amargosa Valley soil (BSC 2006 [DIRS 177400], Section 6.5). It is a parameter used for calculating the leaching rate constant. As suggested by the DTN: MO0609SPASRPBM.004 [DIRS 177742], if a deterministic value for the soil water content at field capacity is required then the value is 0.20. The distribution is a uniform distribution over the range of 0.15 to 0.28.

**Suitability for Use:** The *soil water content* developed for the Biosphere Model for the post-closure dose assessment are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. The GENIIv2 parameter is *MOISTC, surface soil moisture content*.

### 4.1.3 Agricultural Input Parameters

Biosphere Model agricultural and environmental related parameters are documented in the *Agricultural and Environmental Input Parameters for the Biosphere Model* (BSC 2004 [DIRS 169673]). The parameter values evaluated and selected in this subsection are based on DTN: MO0403SPAAEIBM.002 [DIRS 169392].

#### 4.1.3.1 Surface Soil Depth

The Biosphere Model determines the tillage depth, as the depth of the soil layer where mechanical plowing or tilling occurs (BSC 2004 [DIRS 169673], Section 6.10). A tillage depth has a uniform distribution between 0.05 and 0.30 m with a recommended single value of 0.25 m (DTN: MO0403SPAAEIBM.002 [DIRS 169392]). This value is the most common conventional tillage depth. The Biosphere Model selects the tilling depth as surface soil depth (BSC 2004 [DIRS 169460], Table 6.6-3). The parameter is used to calculate the radionuclide leaching removal constant, and to estimate the surface soil areal density when multiplied by the soil bulk density (Section 7.2.4).

**Suitability for Use:** The Biosphere Model uses soil tillage depth as the surface soil depth for the post-closure dose assessment. This parameter is appropriate for the use in the preclosure safety analysis, because both consider the same environment for the receptor. The GENIIv2 parameters are: *THICK, surface soil thickness;* and *SURCM, surface soil layer thickness used for density*.

#### 4.1.3.2 Annual Overwatering Rate

In the Biosphere Model, the annual *overwatering rate* is the amount of irrigation water intentionally applied to soil to leach salts, and the amount of precipitation that percolates below the root zone. The parameter has a cumulative distribution as shown in Table 46 with a mean of 0.079 m/yr (DTN: MO0403SPAAEIBM.002 [DIRS 169392]).

Table 46. Annual Overwatering Rate

| No. | Percent | Overwatering Rate (m/yr) |
|---|---|---|
| 1 | 0 | 0.009 |
| 2 | 19 | 0.030 |
| 3 | 38 | 0.045 |
| 4 | 57 | 0.077 |
| 5 | 76 | 0.129 |
| 6 | 95 | 0.233 |
| 7 | 100 | 0.275 |

Source: DTN: MO0403SPAAEIBM.002 [DIRS 169392]

**Suitability for Use:** The *annual overwatering rate* developed for the Biosphere Model for the TSPA are considered appropriate for the use of the PCSA, because both consider the same environment for the receptor. The Biosphere Model developed this parameter for two climates: current and future climates. The annual overwatering rate developed for the present day climate is applicable to the PCSA. The GENIIv2 parameter is *VLEACH*, *total infiltration rate*.

#### 4.1.3.3 Crop Dry Biomass

The *dry biomass* is a measure of the total, above-ground standing crop biomass per unit area, for each crop type. It is used in the Biosphere Model to calculate water and dust interception fractions. It represents the amount of plant material available to intercept contaminated water or dust (BSC 2004 [DIRS 169673], Section 6.1.2). Crop dry biomass developed using site-specific information is given in Table 47 (BSC 2004 ([DIRS 169673], Table 6.1-1 and Table 6.1-2) for each crop.

Table 47. Crop Dry Biomass

| Crop Type | Mean | Cumulative Distribution | |
|---|---|---|---|
| | | Percent | Dry Biomass (kg dry/m$^2$) |
| Leafy vegetables | 0.21 | 0 | 0.10 |
| | | 5 | 0.13 |
| | | 20 | 0.14 |
| | | 35 | 0.15 |
| | | 50 | 0.16 |
| | | 65 | 0.18 |
| | | 80 | 0.30 |
| | | 95 | 0.42 |
| | | 100 | 0.50 |
| Other vegetables | 0.43 | 0 | 0.30 |
| | | 5 | 0.40 |
| | | 28 | 0.41 |
| | | 51 | 0.43 |
| | | 73 | 0.44 |
| | | 95 | 0.46 |
| | | 100 | 0.60 |
| Fruits | 0.62 | 0 | 0.10 |
| | | 5 | 0.56 |
| | | 35 | 0.60 |
| | | 65 | 0.65 |
| | | 95 | 0.68 |
| | | 100 | 1.30 |
| Grains | 1.13 | 0 | 0.50 |
| | | 5 | 0.61 |
| | | 35 | 0.74 |
| | | 65 | 1.20 |
| | | 95 | 1.97 |
| | | 100 | 2.20 |
| Cattle Forage | 0.48 | 0 | 0.10 |
| | | 5 | 0.23 |
| | | 73 | 0.34 |
| | | 95 | 1.38 |
| | | 100 | 1.50 |

Source: DTN: MO0403SPAAEIBM.002 [DIRS 169392]

**Suitability for Use:** The *crop dry biomass* developed in the Biosphere Model is appropriate for the use in the preclosure safety analysis, because both consider the same environment for the receptor. It is used to calculate the GENIIv2 parameters: *BIOMAS, standing biomass (wet)* for human food crops; and *BIOMA2*, *standing animal feed biomass (wet)* for animal feed crops. The calculations of wet biomass from the crop dry biomass are documented in Section 7.3.3.

#### 4.1.3.4 Crop Dry-to-Wet Ratios

The *dry-to-wet ratio* developed in the Biosphere Model is a measure of the ratio of dry mass to wet mass of edible foodstuffs per crop type (BSC 2004 [DIRS 169673], Section 6.2). The parameter was developed based on site-specific Amargosa Valley data. The crop dry-to-wet weight ratio has a cumulative distribution for each crop type and is tabulated in Table 48.

Table 48. Crop Dry-to-Wet Ratios

| Crop Type | Mean | Cumulative Distribution | |
|---|---|---|---|
| | | Percent | Dry-to-Wet Weight Ratio (kg dry / kg wet) |
| Leafy vegetables | 0.070 | 0 | 0.041 |
| | | 17 | 0.054 |
| | | 33 | 0.060 |
| | | 50 | 0.078 |
| | | 67 | 0.081 |
| | | 83 | 0.084 |
| | | 100 | 0.093 |
| Other vegetables | 0.103 | 0 | 0.035 |
| | | 17 | 0.063 |
| | | 33 | 0.078 |
| | | 50 | 0.080 |
| | | 67 | 0.103 |
| | | 83 | 0.122 |
| | | 100 | 0.240 |
| Fruits | 0.120 | 0 | 0.062 |
| | | 25 | 0.084 |
| | | 50 | 0.102 |
| | | 75 | 0.155 |
| | | 100 | 0.194 |
| Grains | 0.903 | 0 | 0.891 |
| | | 33 | 0.896 |
| | | 67 | 0.906 |
| | | 100 | 0.918 |
| Cattle Forage | 0.220 | 0 | 0.182 |
| | | 75 | 0.227 |
| | | 100 | 0.238 |

Source: DTN: MO0403SPAAEIBM.002 [DIRS 169392]

**Suitability for Use:** The *dry-to-wet ratio* developed in the Biosphere Model is appropriate for the use in the preclosure safety analysis, because both consider the same environment for the receptor. The GENIIv2 parameters: *DRYFRC, dry/wet ratio* (human food); and *DRYFR2,* *animal feed dry/wet ratio*. They are used to convert dry biomass to wet biomass required in the GENIIv2 as discussed in Section 7.3.3.

#### 4.1.3.5 Crop Wet Yields

The *crop yield* developed in the Biosphere Model is a measure of the wet mass of the edible portion of each crop type per unit crop area. It represents the amount of foodstuffs into which the radionuclides are concentrated (BSC 2004 [DIRS 169673], Section 6.11). The crop yield developed for the Biosphere Model has a cumulative distribution for each crop type, as tabulated in Table 49.

Table 49. Crop Yield

| Crop Type | Mean | Cumulative Distribution | |
|---|---|---|---|
| | | Percent | Crop Yield (kg wet/m$^2$) |
| Leafy vegetables | 3.30 | 0 | 1.08 |
| | | 5 | 1.46 |
| | | 20 | 1.78 |
| | | 35 | 2.01 |
| | | 50 | 2.98 |
| | | 65 | 3.25 |
| | | 80 | 3.83 |
| | | 95 | 7.79 |
| | | 100 | 7.85 |
| Other vegetables | 4.13 | 0 | 2.80 |
| | | 5 | 3.37 |
| | | 28 | 3.56 |
| | | 51 | 3.64 |
| | | 72 | 4.92 |
| | | 95 | 5.15 |
| | | 100 | 6.61 |
| Fruits | 2.75 | 0 | 0.73 |
| | | 5 | 1.51 |
| | | 28 | 2.67 |
| | | 51 | 2.92 |
| | | 72 | 3.00 |
| | | 95 | 3.63 |
| | | 100 | 6.89 |
| Grains | 0.59 | 0 | 0.27 |
| | | 5 | 0.28 |
| | | 35 | 0.44 |
| | | 65 | 0.54 |
| | | 95 | 1.10 |
| | | 100 | 1.22 |
| Cattle Forage | 2.14 | 0 | 0.69 |
| | | 5 | 1.02 |
| | | 73 | 1.87 |
| | | 95 | 5.78 |
| | | 100 | 6.28 |

Source: DTN: MO0403SPAAEIBM.002 [DIRS 169392]

**Suitability for Use:** The *crop yield* developed in the Biosphere Model is appropriate for the use in the preclosure safety analysis, because both consider the same environment for the receptor. This GENIIv2 parameters are: *YELD, yield (wet)* for human food and *YELDA, yield for animal food*. The conversion of the parameter distribution is discussed in Section 7.3.5.

#### 4.1.3.6 Crop Growing Time

The *crop growing time* in the Biosphere Model is a measure of the amount of time crops are growing and potentially exposed to contaminated material. It is used to calculate the uptake of radionuclides deposited on the plant surface via interception. The parameter was developed based on site-specific Amargosa Valley data for two climates: current and future climates (BSC 2004 [DIRS 169673], Section 6.4). The growing time for the present day climate is selected in this document. Only fixed values were developed for the Biosphere Model as tabulated in Table 50, because of low sensitivity for the model (BSC 2004 [DIRS 169673], Section 6.4.2).

Table 50. Crop Growing Time

| Crop Type | Growing Time (days) |
|---|---|
| Leafy vegetables | 75 |
| Other vegetables | 80 |
| Fruits | 160 |
| Grains | 200 |
| Cattle forage | 75 |

Source: DTN: MO0403SPAAEIBM.002 [DIRS 169392]

**Suitability for Use:** The *crop growing time* developed in the Biosphere Model is appropriate for the use in the preclosure safety analysis, because both consider the same environment for the receptor. The GENIIv2 parameters are: *GRWP, growing period* for human food crops; and *GRWPA, animal feed growing period*.

#### 4.1.3.7 Number of Alfalfa Cuttings Per Year

Six cuttings per year for alfalfa crop was used for developing alfalfa related agricultural parameters in the Biosphere Model (BSC 2004 [DIRS 169673], p.6-25). This value was cited from the growing season information for alfalfa given by the local farmer for an arid climate (LeStrange 1997 [DIRS 125429]). "The first cutting of alfalfa occurs about April 20. The last cutting occurs mid to late November. The total number of cuttings is 6 or 7 per year" (LeStrange 1997 [DIRS 125429]). This value was considered a qualified input, because it is based on local growing season information and agrees with the growing season for alfalfa in semi-arid climates recommended in Schmierer et al. (1997 [DIRS 160479], pp. 9 through 18), based on the site-specific agricultural practice discussed in the Biosphere Model (BSC 2004 [DIRS 169673], p.4-9).

**Suitability for Use:** This value is used to develop GENIIv2 parameter, *FRACFR, the acute fresh forage intake fraction* in Section 7.3.8.

### 4.1.4 Inhalation Exposure Input Parameters

Biosphere Model inhalation exposure related parameters are documented in the *Inhalation Exposure Input Parameters for the Biosphere Model* (BSC 2006 [DIRS 177101]). The parameter values evaluated and selected in this subsection are based on DTN: MO0605SPAINEXI.003 [DIRS 177172].

#### 4.1.4.1 Mass Loading for Crops

The mass loading for crops is used to estimate soil concentration in air around the crops for the deposition of resuspended soil on crop surfaces. The mass loading for crops is developed in the Biosphere Model based on mass loading in fields and gardens where crops are growing. It is based on the crops grown and farming practices in Amargosa Valley, and therefore is consistent with the current conditions in the Yucca Mountain region (BSC 2006 [DIRS 177101], Section 6.2.5). The mass loading is similar to or higher than that in the inactive outdoor environment, with a minimum value equal to the minimum value of the inactive outdoor environment, and a modal and maximum value twice that of the inactive outdoor environment. The distribution values are provided in DTN: MO0605SPAINEXI.003 [DIRS 177172], as shown in Table 51.

Table 51. Mass Loading for Crops

| Parameter Name | Type of Distribution | Mass Loading ($mg/m^3$) | | |
|---|---|---|---|---|
| | | Mode | Minimum | Maximum |
| Mass Loading for Crops | Triangular | 0.120 | 0.025 | 0.200 |

Source: DTN: MO0605SPAINEXI.003 [DIRS 177172].

**Suitability for Use:** The mass loading for crops developed in the Biosphere Model is appropriate for the use in the PCSA, because both consider the same environment for the receptor. This parameter is not input directly in the GENIIv2, but is used to develop the parameter *LEAFRS*, *resuspension factor from soil to plant surface*, discussed in Section 7.3.7.

#### 4.1.4.2 Mass Loading for Inhalation Exposure

The mass loading for inhalation pathway is used in the Biosphere Model to calculate radionuclide concentrations in air at the receptor (reasonably maximally exposed individual (RMEI)) environments from resuspended contaminated soil. Different environments are considered to capture different level of dustiness for the receptor. The parameter distribution and values for the nominal condition are tabulated in Table 52.

Table 52. Mass Loading for Inhalation Exposure

| Environment | Type of Distribution | Mass Loading ($mg/m^3$) | | |
|---|---|---|---|---|
| | | Mode | Minimum | Maximum |
| Active Outdoors ($mg/m^3$) | Triangular | 3.000 | 1.000 | 10.000 |
| Inactive Outdoors ($mg/m^3$) | Triangular | 0.060 | 0.025 | 0.100 |
| Active Indoors ($mg/m^3$) | Triangular | 0.100 | 0.060 | 0.175 |
| Asleep Indoors ($mg/m^3$) | Triangular | 0.030 | 0.010 | 0.050 |

Source: DTN: MO0605SPAINEXI.003 [DIRS 177172].

Based on BSC 2006 [DIRS 177101], Section 6.1.1), the five environments are described as following:

1. Active Outdoors—This environment is representative of conditions that occur when a person is outdoors in the contaminated environment conducting dust-generating activities.
2. Inactive Outdoors—This environment included outdoor locations within potentially contaminated areas where the RMEI is not conducting soil-disturbing activities.
3. Active Indoors—This environment included locations indoors in areas that may contain radionuclides where the RMEI would spend time active, including working.
4. Asleep (Inactive) Indoors—This environment included locations where the RMEI would spend time sleeping indoors in areas that may contain radionuclides.
5. Away from Potentially Contaminated Area—This environment encompassed locations that would not contain radionuclides released from the repository, including commuting routes to work as well as work and other locations outside of contaminated areas.

**Suitability for Use:** The mass loading values for inhalation developed in the Biosphere Model are appropriate for the use in the PCSA, because both consider the same environment for the receptor. Two sets of data, for nominal condition and post volcanic condition, were developed in the Biosphere Model. The nominal condition is selected for the preclosure safety analysis, because the post volcanic condition applies to a short period after volcanic eruption in additional to the nominal condition (BSC 2006 [DIRS 177101], Section 7.1), which is not consistent with the preclosure condition. The Biosphere Model determines mass loadings for different normal condition environments based on activity levels. These are converted to a single average condition for use in the preclosure safety analysis as discussed in Section 7.4.1. The GENIIv2 parameter is *XMLF, mass loading factor for resuspension model*, that is entered when the resuspension model is selected as mass loading method (*IRES*).

### 4.1.5 Characteristics of the Receptor

Biosphere Model parameters related to the characteristics of the receptor are documented in the *Characteristics of the Receptor for the Biosphere Model* (BSC 2005 [DIRS 172827]). The parameter values evaluated and selected in this subsection are based on DTN: MO0407SPACRBSM.002 [DIRS 170677]. There is another DTN: MO0503SPADCESR.000 [DIRS 172896] generated from the report (BSC 2005 [DIRS 172827]) that provides updated dose coefficients from the ICRP-60/72 methodologies. That DTN is not used in this document, because the dose coefficients with the decay products considered in the Biosphere Model and the PCSA are treated differently. The GENIIv2 already provides a database for all dose coefficients for the radionuclides of interest.

#### 4.1.5.1 Annual Consumption Rates of Locally Produced Foods

GENIIv2 uses daily food consumption rates and consumption period in a year (number of days per year that food is consumed) for each food category. The site-specific annual consumption rates of locally produced foods for the Amargosa Valley are determined from a 1997 regional survey of Amargosa Valley residents, as described in *Characteristics of the Receptor for the*

*Biosphere Model* (BSC 2005 [DIRS 172827], Section 6.4). The food consumption rates were developed based on the required characteristics of the RMEI defined in 10 CFR 63.312. Consumption rates of locally produced food for the RMEI are represented by log-normal distributions with the means and standard errors shown in Table 53.

Table 53. Annual Consumption Rates of Locally Produced Food for the RMEI

| Food Type | Annual consumption rate (kg/y) | | Distribution |
|---|---|---|---|
| | Mean | Standard Error | |
| Leafy vegetables | 3.78 | 0.88 | Log-normal |
| Other vegetables | 4.73 | 0.67 | Log-normal |
| Fruit | 12.68 | 1.36 | Log-normal |
| Grain | 0.23 | 0.11 | Log-normal |
| Meat | 2.85 | 0.65 | Log-normal |
| Poultry | 0.42 | 0.13 | Log-normal |
| Milk | 4.66 | 1.68 | Log-normal |
| Eggs | 5.30 | 0.83 | Log-normal |

Source: DTN: MO0407SPACRBSM.002 [DIRS 170677]

The annual consumption rates for the RMEI were developed in BSC 2005 ([DIRS 172827], Section 6.4.2) based on the contingent average daily intake (CADI). CADI values are provided by gender and by food group from national average data rather than site-specific. CADI is the average amount of food from each food group consumed by individuals when they consume food from that group. The CADI values are represented by the arithmetic mean (AM) and standard error (SE) as tabulated in Table 54 from BSC 2005 ([DIRS 172827], Table 6-20). The SE of CADI represents the confidence of the mean based on the survey.

The second component used to determine the annual consumption rates is the effective number of days per year (EDPY) when locally produced food is consumed. EDPY is based on the results of site-specific surveys of consumption frequency of locally produced food for a given individual and a given food group. It is numerically equal to the number of days in a year at 100 percent consumption of locally produced food from a given food group by a given individual. The EDPY is represented by the arithmetic mean (AM), and standard deviation (SD), as tabulated in Table 54 from BSC 2005 ([DIRS 172827], Table 6-21). The values of EDPY are YMP site-specific, and the SD of EDPY represents the variance of the mean based on the site-specific survey.

**Suitability for Use:** The consumption rates for the RMEI do not apply directly to the "real member of the public" receptor that is required for the preclosure standard in 10 CFR 63.111, because the RMEI is based on the mean values of the dietary and lifestyle characteristics. Therefore, the consumption rates representative of the range for real members of the public were developed based on that site-specific survey data. Using the site-specific survey of consumption frequency of locally produced food (EDPY) addresses the variation in the number of days per year when locally produced food is consumed. The western United States averaged CADI is represented by mean and standard error, which does not address the variations among the individuals. However, the parameter developed using the CADI is a daily averaged value for entire year, which has a relatively narrow range. The combination of EDPY and CADI can provide site-specific annual consumption rates for GENIIv2. The four GENIIv2 parameters are:

*UCRP, daily crop food consumption rates; TCRP, number of days that crop food consumed per year; UAMN, daily animal product consumption rates;* and *TAMN, number of days that animal products consumed per year*. More discussions and the parameter development are provided in Sections 7.5.6 and 7.5.7.

Table 54. CADI and EDPY Based on the Survey Food Group

| Food Group | Gender | Population Fraction | Contingent Average Daily Intake (g/day) | | Effective Number of Days Per Year (EDPY) When Locally Produced Food is Consumed (day/yr) | |
|---|---|---|---|---|---|---|
| | | | Mean | SE | Mean | SD |
| Leafy Vegetables | M | 0.522 | 126.2 | 34.4 | 30.7 | 60.1 |
| | F | 0.478 | 120.3 | 25.9 | 30.5 | 60.4 |
| Other Vegetables | M | 0.522 | 158.3 | 16.4 | 30.8 | 49.6 |
| | F | 0.478 | 122.9 | 10.2 | 37.2 | 58.7 |
| Fruit | M | 0.522 | 362.6 | 26.9 | 22.2 | 38.0 |
| | F | 0.478 | 300.2 | 27.8 | 35.9 | 55.1 |
| Tomatoes | M | 0.522 | 96.2 | 5.0 | 33.2 | 47.3 |
| | F | 0.478 | 67.8 | 6.3 | 51.2 | 89.3 |
| Grain | M | 0.522 | 392.6 | 18.7 | 0.0 | 0.0 |
| | F | 0.478 | 274.8 | 12.5 | 1.8 | 8.9 |
| Beef | M | 0.522 | 143.4 | 17.7 | 19.3 | 61.1 |
| | F | 0.478 | 87.6 | 12.1 | 17.6 | 54.3 |
| Pork | M | 0.522 | 71.0 | 12.9 | 7.6 | 31.1 |
| | F | 0.478 | 45.5 | 9.0 | 11.6 | 37.3 |
| Wild Game | M | 0.522 | 166.7 | 128.0 | 0.7 | 3.3 |
| | F | 0.478 | 100.0 | 107.7 | 1.5 | 7.8 |
| Poultry | M | 0.522 | 134.9 | 15.9 | 4.3 | 13.9 |
| | F | 0.478 | 82.1 | 12.0 | 2.9 | 11.3 |
| Milk | M | 0.522 | 389.1 | 24.0 | 13.0 | 59.9 |
| | F | 0.478 | 302.1 | 24.4 | 14.0 | 56.3 |
| Eggs | M | 0.522 | 121.3 | 15.8 | 34.8 | 69.5 |
| | F | 0.478 | 95.2 | 12.2 | 67.9 | 94.7 |

Source: BSC 2005 [DIRS 172827], Tables 6-20 and 6-21, which is listed in the IED document, 100-IED-WHS0-00201-000-00B (BSC 2007 [DIRS 179915]).

### 4.1.5.2 Inadvertent Soil Ingestion Rate

In the Biosphere Model, inadvertent ingestion of soil may be a result of swallowing dirt or dust accompanying mouth breathing, via food items contaminated with soil, as well as from mouthing of dirty hands or other contaminated non-food items BSC 2005 ([DIRS 172827], Section 6.4.3). The inadvertent soil ingestion rate provided by the DTN: MO0407SPACRBSM.002 [DIRS 170677] is represented by a piece-wise cumulative probability distribution with the following characteristic: (50 mg/day, 0 percent), (100 mg/day, 50 percent), and (200 mg/day, 100 percent). As this soil ingestion rate is based on every day, it is assumed that soil ingestion period, or soil contact days in GENIIv2 is 365 day.

**Suitability for Use:** Inadvertent soil ingestion rate in the Biosphere Model is based on a thorough review of applicable information and the data are appropriately justified and suitable for that application (BSC 2005 [DIRS 172827], Section 4.1.8). The Biosphere Model recommendations are appropriate for the use of the preclosure safety analysis, because both consider the same environment for the receptor. This parameter corresponds the two GENIIv2 parameters: *USOIL, inadvertent soil ingestion rate* and *TSOIL, soil contact days*.

#### 4.1.5.3 Building Shielding Factors

Shielding afforded by the floors and walls of a structure when indoors varies depending on the type of construction, height above ground, and other factors. BSC 2005 ([DIRS 172827], Section 6.6) provides four values of shielding factors (0.1, 0.2, 0.3 and 0.4) for radionuclides of interest depending on relative penetrability of their emissions (energy and type of radiation emitted). The most conservative indoor shielding factor is 0.4 for high penetration radiations (gamma emitters of energy > 100 keV). Shielding from external exposure is not considered when outside a building, that is the outdoor shielding factor is 1.

**Suitability for Use:** The use of an indoor shielding factor of 0.4 is conservative, because it is based on highly penetrating gamma radiations and its suitability is discussed in BSC 2005 ([DIRS 172827], Section 4.1.10). The GENIIv2 parameters are: *SHIN, indoor shielding factor* and *SHOUT, outdoor shielding factor*. Although these parameters are available for the sensitivity and uncertainty analyses in the GENIIv2 (Napier 2006 [DIRS 177330], Appendix E.10), only a single value is provided.

#### 4.1.5.4 Daily Exposure Times

The lifestyle characteristics of Amargosa Valley population groups are documented in BSC 2005 ([DIRS 172827], Section 6.3). Four population groups (non-workers, commuters, local indoor worker, and local outdoor workers) are identified to characterize the RMEI daily exposure times for external exposure and inhalation exposure. Estimates of the proportion of the adult population in the Amargosa Valley within each of the four categories were developed from 2000 census data (Bureau of the Census 2002 [DIRS 159728]) on employment and commuting time of people in the Amargosa Valley census county division (BSC 2005 [DIRS 172827], Section 6.3.2).

Similar to the consumption rates discussed in Section 4.1.5.1, the mean lifestyle characteristics of the people in the four population groups do not directly apply to any real member of the public that is required for the preclosure standard in 10 CFR 63.111. The *local outdoor workers group* is identified as a group that spends the most hours per day outside. This group is considered suitable for the receptor used for the preclosure dose calculation.

Daily exposure times for various environments developed in the Biosphere Model are for two scenarios: groundwater release and volcanic ash release. The main difference between the two scenarios is in the commuting time. Commuting time in the groundwater release scenario is considered to be in the uncontaminated area, where as commuting time in the volcanic ash release is considered to be in the contaminated area. The volcanic ash release scenario being an airborne release is more like the preclosure air dispersion. Therefore, the daily exposure times for local outdoor worker in the five environments (away from the Amargosa Valley, active outdoors, inactive outdoors, asleep indoors, and inactive indoors) for volcanic ash release are selected. The parameter has a lognormal distribution defined by arithmetic mean, standard error, lower bound and upper bound, as tabulated in Table 55. The detailed five environments are described in Section 4.1.4.2.

Table 55. Daily Exposure Times for Local Outdoor Workers

| Environment | Daily Exposure Time – Lognormal Distribution (hours/day) | | | |
|---|---|---|---|---|
| | Mean | SE | Min | Max |
| Away | 2.0 | 0.4 | 1.2 | 3.3 |
| Active Outdoors | 3.1 | 0.2 | 2.6 | 3.7 |
| Inactive Outdoors | 4.2 | 0.3 | 3.5 | 5.0 |
| Asleep Indoors | 8.3 | 0.1 | 8.0 | 8.6 |
| Active Indoors [a] | 6.4 | - | - | - |

Source: DTN: MO0407SPACRBSM.002 [DIRS 170677]

Notes: [a] Calculated as 24 hours minus the sum of the other four times, and a SE and distribution is not presented.

**Suitability for Use:** This parameter is not directly used in the GENIIv2, because the GENIIv2 does not consider the external and inhalation exposures dependent on various environments. This parameter is used to develop several exposure time related parameters in GENIIv2, as discussed in Sections 7.5.2 and 7.5.5.

### 4.1.5.5 Inhalation Rates

The breathing rates developed by the Biosphere Model are population group and environment dependent (BSC 2005 [DIRS 172827], Section 6.3.3). The breathing rates are represented by fixed values, as shown in Table 56. The breathing rates are used to develop the distribution of inhalation rates by weighing the daily exposure times in the corresponding environment in Section 7.5.4.

Table 56. Breathing Rates ($m^3$/hr) by Population Group and Environment

| Population Group | Active Outdoors | Inactive Outdoors | Asleep Indoors | Active Indoors |
|---|---|---|---|---|
| Commuters<br>Local Outdoor Workers<br>Local Indoor Workers<br>Non-workers | 1.57 | 1.08 | 0.39 | 1.08 |

Source: DTN: MO0407SPACRBSM.002 [DIRS 170677]

For annual doses from routine releases, the air inhalation rate for an average adult individual is given in Regulatory Guide 1.109 ([DIRS 100067], Table E-4) as 8000 $m^3$/yr. That corresponds to 8000 $m^3$/yr / 365 day/yr = 21.9 $m^3$/day. The inhalation rate recommended in Regulatory Guide 1.109 is accepted for use in calculating annual doses from normal operations for regulatory compliance evaluations.

For offsite dose consequences from design basis accidents, the air inhalation rate given in Regulatory Guide 1.183 ([DIRS 173584], Section 4.1.3) is $3.5\times10^{-4}$ $m^3$/sec (30.2 $m^3$/day) for the first 8 hour, $1.8\times10^{-4}$ $m^3$/sec (15.6 $m^3$/day) for next 8-24 hours, and $2.3\times10^{-4}$ $m^3$/sec (19.9 $m^3$/day) for the remainder of the accident time. The inhalation rate recommended in

Regulatory Guide 1.183 is accepted for use in calculating short-term doses from accident releases for regulatory compliance evaluations.

**Suitability for Use:** The breathing rates by population group and environment developed in the Biosphere Model are converted to a weighted average inhalation rate that can be used in GENIIv2. They are compared with the recommended values from Regulatory Guides in Section 7.5.4. The GENIIv2 parameters are: *UINH*, *air inhalation rate* and *UINHR*, *resuspended soil inhalation rate*.

#### 4.1.6 Site Meteorological Data

Site metrological data were measured and used to develop the general public atmospheric dispersion factors, which is documented in a calculation under development. Some meteorological data are required in order to use GENIIv2 to calculate atmospheric dispersion factors. The author of the report sent his preliminary results through email, and the entire email is included in Attachment I. These inputs are not used to calculate or develop a new parameter in this document, rather they are used to develop YMP site-specific GENIIv2 default files.

##### 4.1.6.1 Average Absolute Humidity

This is a placeholder for the assumption in Section 3.1.1 once it is verified.

##### 4.1.6.2 Average Daily Rain Rate

This is a placeholder for the assumption in Section 3.1.2 once it is verified.

##### 4.1.6.3 Wind Speed

This is a placeholder for the assumption in Section 3.1.3 once it is verified.

##### 4.1.6.4 Ambient Air Temperature

This is a placeholder for the assumption in Section 3.1.4 once it is verified.

##### 4.1.6.5 Transfer Resistance

Transfer resistances are usually associated with the characteristics of the depositing material and surface type (Ramsdell et al. 1996 [DIRS 177811], p.570). The transfer resistance is used as a mathematical device to establish an upper limit on the deposition velocity. The user can enter transfer resistance, but as a default, 10 and 100 s/m are assumed for gas (iodine) and particles, respectively (Ramsdell et al. 1996 [DIRS 177811], p.571, and Napier et al. 2006 [DIRS 177331], Section 5.3.5.1). The parameter values are also used to calculate atmospheric dispersion factors as discussed in Attachment I.

**Suitability for Use**: As the parameter is an empirical value to fit the mathematical model for the dry deposition velocity and this model is provided as an option in GENIIv2, the default parameter values are appropriate to use. By using these values, the mathematical model for the dry deposition velocities are consistent with experimentally determined deposition velocities

(Molenkamp et al. 2004 [DIRS 177808], p.13). The GENIIv2 parameter is *ARTRANSRESIST*, *transfer resistance* that will be further discussed in Section 7.6.5.

#### 4.1.6.6 Meteorological Data File

A meteorological data file for the Yucca Mountain site is generated for the years 2001 to 2005 consistent with the GENIIv2 input data format for meteorological data, as discussed in Attachment I. The file, *ymp01-05.met* contains date, time, stability class, wind direction, wind speed, temperature, mixing height, precipitation code, precipitation rate, and weight in the GENIIv2 format (Napier 2006 [DIRS 177330] Appendix B, pages 140 and 141).

**Suitability for Use:** The meteorological data file, *ymp01-05.met*, is based on 5-years of meteorological data from Site 1 located approximately 1 km south-south-west of the North Portal. It is based on current meteorological data for the years 2001 to 2005 and is appropriate for evaluating releases from surface and subsurface facilities.

### 4.1.7 Radionuclide Specific Parameters

This section contains some default files from software package of GENII V.2.02 (2006. STN: 11211-2.02-00 [DIRS 177605]). These files are also shown in Attachment H and included in the attached CD.

#### 4.1.7.1 List of Radionuclides

Radionuclides of interest in the PCSA are listed in Table 2. The list is covered by GENIIv2's radionuclide master data library (*RMDLIB.DAT*), which contains all radiological decay data for GENIIv2 (Napier et al 2006 [DIRS 177331], Sections 3.2, and B.1). The list of radionuclides included in the *RMDLIB.DAT* data library is tabulated in Attachment A.

#### 4.1.7.2 Implicit Daughters

Decay of very short-lived radionuclides within the decay chains of longer-lived radionuclides is treated implicitly (Napier et al 2006 [DIRS 177331], Section 3.2). External and internal dose conversion factors account for the implicit daughters within the dose factors assigned for the explicit parent radionuclides (Napier et al 2006 [DIRS 177331], Sections 3.4.2 and 3.4.3). The list of radionuclides that are implicit daughters and their parent decay chains are tabulated in Attachment B.

#### 4.1.7.3 External Dose Coefficients

For external exposures two external exposure pathways are considered: air submersion and external exposure to contaminated soil (ground shine) as discussed in Section 3.2.3. GENIIv2 provides two options to select dose coefficients and to calculate radiation doses: 1) using ICRP-60 factors and 2) using ICRP-30/48 factors. The external dose coefficients for exposure of adults are provided in GENIIv2 files and database in terms of the effective dose for an individual and, for ICRP-60, equivalent dose to specific organs.

1) ICRP-60 Factors

Under this option, organ equivalent and effective dose coefficients for air submersion and for external exposure to soil surface and an infinite contaminated layer are from Federal Guidance Report (FGR)-13 (EPA 2002 [DIRS 175544]). FGR-13 provides complete organ dose coefficients for 25 ICRP Publication 60 (ICRP 1991 [DIRS 101836]) organs. It is the source for each of the three GENIIv2 external dose conversion factors files. Dose coefficients for air submersion are included in the GENIIv2 file *F12TIII1.EXT* and dose coefficients for external exposure to soil are included in two GENIIv2 files, *F12TIII3.EXT* for surface contamination, and *F12TIII7.EXT* for infinite contamination layer (Napier et al 2006 [DIRS 177331], Section B.2). Each of GENIIv2 files contains dose coefficients for 825 radionuclides, which covers all radionuclides in the file of *RMDLIB.DAT* discussed in Section 4.1.7.1, and 25 organs or tissues in the body (Napier et al 2006], Section B.2). Dose coefficients for external exposure to contaminated soil are selected in GENIIv2 based on the input thickness of contaminated soil, *THICK*.

2) ICRP-30/48 Factors

Under this option, effective dose coefficients for air submersion are taken from FGR-12 (Eckerman and Ryman 1993 [DIRS 107684], Table III.1). Effective dose coefficients for external exposure to soil at surface, 1-cm, 5-cm, 15-cm and infinite contaminated layer are taken from FGR-12 (Eckerman and Ryman 1993 [DIRS 107684], Table III.3 to Table III.7). These effective dose coefficients are included in the GENIIv2 database file *GENII.mdb*. Note that for FGR-12 only effective dose coefficients, not organ coefficients, are included in the database.

**Suitability for Use:** This input is suitable, because FGR-12 (Eckerman and Ryman 1993 [DIRS 107684]) and FGR-13 (EPA 2002 [DIRS 175544]) are the regulatory recommended sources for dose coefficients air submersion and external exposure to contaminated soil.

#### 4.1.7.4 Internal Dose Coefficients

The internal dose includes two pathways: inhalation and ingestion as discussed in Section 3.2.3. GENIIv2 provides two methods to select dose coefficients and to calculate radiation doses: 1) using ICRP-60 factors and 2) using ICRP-30/48 factors.

1) ICRP-60 Factors

Under this option, dosimetric inputs consistent with ICRP Publication 72 (ICRP 1996 [DIRS 152446]) are based on the concepts recommended in ICRP Publication 60 (ICRP 1991 [DIRS 101836]), which uses an expanded list of tissues and organs and revised values of tissue and organ weighting factors. In addition, biokinetic and dosimetric models were updated to include new information that became available since ICRP Publication 30. A new set of age-dependent dose coefficients for intakes of radionuclides by members of the public was developed and documented in a series of reports compiled in ICRP Publication 72 (ICRP 1996 [DIRS 152446]). This approach is consistent with the individual protection standard defined in terms of effective dose. Dose coefficients in FGR-13 (EPA 2002 [DIRS 175544]) are based on ICRP-60/72.

The values of dose coefficients for inhalation based on ICRP-60/72 methodologies are included in the GENIIv2 file, *FGR13INH.HDB*. The file provides age-depended radiation doses for radionuclides for an inhaled particle size of one micron AMAD, ICRP lung transfer classes (Fast, Medium, or Slow), and gut-to-blood transfer factor (f1). The ages for which data are specified are 100 days, 1 year, 5 years, 10 years, 15 years, and 20 years. Data are provided for 33 organs, tissues, or lung compartments in the ICRP models (Napier et al 2006 [DIRS 177331], Section B.4).

The values of dose coefficients for ingestion based on ICRP-60/72 methodologies are included in the GENIIv2 file, *FGR13ING.GDB*. The file provides age-dependent radiation doses for radionuclides for various values of the gut-to-blood transfer factor (f1). The ages for which data are specified are 100 days, 1 year, 5 years, 10 years, 15 years, and 20 years. Data are provided for 33 organs, tissues, or lung compartments in the ICRP models (Napier et al 2006 [DIRS 177331], Section B.3).

2) ICRP-30/48 Factors

Under this option, dosimetric inputs consistent with ICRP Publication 30 (ICRP 1979 [DIRS 110386]; ICRP 1980 [DIRS 110351]; ICRP 1981 [DIRS 110352]) are based on the concepts recommended in ICRP Publication 26 (ICRP 1977 [DIRS 101075]) and the dosimetric methods for intakes of radionuclides by workers outlined in ICRP Publication 30. This approach is consistent with the individual protection standard defined in terms of total effective dose equivalent. Dose coefficients in FGR-11 (Eckerman et al. 1988 [DIRS 101069], Table 2.1 for inhalation and Table 2.2 for ingestion) are based on ICRP-30 with updated metabolic information for only a few radionuclides provided by ICRP-48 (Eckerman et al. 1988 [DIRS 101069], pp.3-4). These effective dose coefficients are included in the GENIIv2 database file *GENII.mdb*. Note that for FGR-11 only effective dose coefficients, not organ coefficients, are included in the database.

**Suitability for Use:** FGR-13 based on ICRP-60/72 methodologies contains the most current dosimetric model and provides compilation of dose coefficients for inhalation and ingestion of radionuclides for intakes of radionuclides by members of the public. The dose coefficients for adult are appropriate for the preclosure safety analysis receptor that is an adult member of the public consistent with 10 CFR 63.312 [DIRS 176544]. A 50-year committed period is considered for the effective dose coefficients in FGR-13. An 1.0 micron particle size is the appropriate default particulate aerosol size for releases to the general public. AMAD (Activity Median Aerodynamic Diameter) means 50% of the activity in the aerosol is associated with particles of aerodynamic diameter greater than the AMAD. FGR-11 contains dose conversion factors for inhalation and ingestion that are still used in the U.S. for the regulatory compliance by radiation workers.

#### 4.1.7.5 Selection of Dose Coefficients for Inhalation

Dose coefficients for inhalation are included in the GENIIv2 file, *FGR13INH.HDB,* and the database *GENII.mdb* for several ICRP lung transfer classes (Fast, Medium, or Slow), and gut-to-blood transfer factor (f1). The lung transfer classes are determined by chemical composition of particles inhaled by human. Selecting an appropriate class for preclosure safety analyses is documented in the *ICRP-72 Dose Conversion Factor Input File for MACCS2* (BSC 2005 [DIRS 174424]).

Per BSC 2005 [DIRS 174424], Section 3.9.4), oxides are the predominant chemical form of radionuclides released from spent fuel based on the information available on chemical compositions of spent nuclear fuel, and from HLW based on the information available on chemical compositions of HLW. This information was used for selecting inhalation dose coefficients when a radionuclide has multiple lung absorption types.

Dose coefficients for four specific chemical elements are selected based on their special features. Hydrogen is in the HTO (tritiated water) chemical form; carbon is in the $CO_2$ chemical form; uranium is in an oxide chemical form; and plutonium is in an oxide chemical form BSC 2005 [DIRS 174424], Section 3.9.5). The organically bound tritium (OBT) is treated as *slow* lung absorption class.

The available lung absorption types for each element are shown in Table 57, and the selected types are identified with a shaded box. For elements with multiple lung absorption types, the lung absorption type is selected based on the following prioritization (BSC 2005 [DIRS 174424], Section 3.9.3):

(1) Type is recommended from fuel fission or activation product release data

(2) Type is recommended for the oxide form of the element

(3) Default type as recommended by ICRP-72 (ICRP 1996 [DIRS 152446], Table 2)

(4) Type with highest effective dose coefficient.

**Suitability for Use:** The selected lung absorption types for inhalation are appropriate for the waste forms in which oxides are predominate chemical forms. This GENIIv2 parameter is *CLLCLAS, lung solubility class,* in the database file *GENII.mdb*. It is also *SOLUBIL, lung transfer inhalation class,* in the GENIIv2 screen menu. Further discussion of use the inputs is in Section 7.7.

Table 57. Lung Absorption Type Selection

| Atomic No. | Element | Symbol | Lung Absorption Type | | | Selection Basis from Reference |
|---|---|---|---|---|---|---|
| | | | [a]**F** | [b]**M** | [c]**S** | |
| 1 | Hydrogen | H | F | M | S | HTO use SR-2 |
| 4 | Beryllium | Be | | M | [e]**S** | Y(S) for oxides |
| 6 | Carbon | C | F | M | S | $CO_2$ use SR-2 |
| 9 | Fluorine | F | F | M | [e]**S** | Use maximum |
| 11 | Sodium | Na | [e]**F** | – | – | [g]See NOTES |
| 12 | Magnesium | Mg | F | [e]**M** | – | W(M) for oxides |
| 13 | Aluminum | Al | F | [e]**M** | – | W(M) for oxides |
| 14 | Silicon | Si | F | [e]**M** | S | W(M) for oxides |
| 15 | Phosphorus | P | [e]**F** | M | – | D(F) for all except W(M) for phosphates |
| 16 | Sulfur | S | [e]**F** | M | S | $SO_2$ use SR-1 and F |
| 17 | Chlorine | Cl | F | [e]**M** | – | Use maximum |
| 19 | Potassium | K | [e]**F** | – | – | [g]See NOTES |
| 20 | Calcium | Ca | F | [e]**M** | S | M for all compounds |
| 21 | Scandium | Sc | – | – | [e]**S** | [g]See NOTES |
| 22 | Titanium | Ti | F | [e]**M** | S | W(M) for oxides |
| 23 | Vanadium | V | F | [e]**M** | – | W(M) for oxides |
| 24 | Chromium | Cr | F | M | [e]**S** | Y(S) for oxides |
| 25 | Manganese | Mn | F | [e]**M** | – | W(M) for oxides |
| 26 | Iron | Fe | F | [e]**M** | S | M for oxides |
| 27 | Cobalt | Co | F | M | [e]**S** | S for oxides |
| 28 | Nickel | Ni | F | [e]**M** | S | M for oxides |
| 29 | Copper | Cu | F | M | [e]**S** | Y(S) for oxides |
| 30 | Zinc | Zn | F | M | [e]**S** | S for oxides |
| 31 | Gallium | Ga | F | [e]**M** | – | W(M) for oxides |
| 32 | Germanium | Ge | F | [e]**M** | – | W(M) for oxides |
| 33 | Arsenic | As | – | [e]**M** | – | [g]See NOTES |
| 34 | Selenium | Se | [e]**F** | M | S | F for all compounds |
| 35 | Bromine | Br | F | [e]**M** | – | Use maximum |
| 37 | Rubidium | Rb | [e]**F** | – | – | [g]See NOTES |
| 38 | Strontium | Sr | F | [e]**M** | S | M for reactor fuel activities |
| 39 | Yttrium | Y | – | M | [e]**S** | Y(S) for oxides |
| 40 | Zirconium | Zr | F | [e]**M** | S | M for fuel release |
| 41 | Niobium | Nb | F | [e]**M** | S | M for fuel release |
| 42 | Molybdenum | Mo | F | [e]**M** | S | M for oxides |
| 43 | Technetium | Tc | F | [e]**M** | S | M for oxides |
| 44 | Ruthenium | Ru | F | [e]**M** | S | M for fuel release |
| 45 | Rhodium | Rh | F | M | [e]**S** | Y(S) for oxides |
| 46 | Palladium | Pd | F | M | [e]**S** | Y(S) for oxides |
| 47 | Silver | Ag | F | [e]**M** | S | M for activated corrosion products |
| 48 | Cadmium | Cd | F | M | [e]**S** | Y(S) for oxides |
| 49 | Indium | In | F | [e]**M** | – | W(M) for oxides |
| 50 | Tin | Sn | F | [e]**M** | – | W(M) for oxides |

Table 57. Lung Absorption Type Selection (Cont'd)

| Atomic No. | Element | Symbol | Lung Absorption Type | | | Selection Basis from Reference |
|---|---|---|---|---|---|---|
| | | | [a]F | [b]M | [c]S | |
| 51 | Antimony | Sb | F | [e]**M** | S | M for oxides |
| 52 | Tellurium | Te | F | [e]**M** | S | M for oxides |
| 53 | Iodine | I | [e]**F** | M | S | F no data to support M or S |
| 55 | Cesium | Cs | [e]**F** | M | S | F for fuel release |
| 56 | Barium | Ba | F | [e]**M** | S | M for default |
| 57 | Lanthanum | La | F | [e]**M** | – | W(M) for oxides |
| 58 | Cerium | Ce | F | [e]**M** | S | M for fuel release |
| 59 | Praseodymium | Pr | – | M | [e]**S** | Y(S) for oxides |
| 60 | Neodymium | Nd | – | M | [e]**S** | Y(S) for oxides |
| 61 | Promethium | Pm | – | M | [e]**S** | Y(S) for oxides |
| 62 | Samarium | Sm | – | [e]**M** | – | [g]See NOTES |
| 63 | Europium | Eu | – | [e]**M** | – | [g]See NOTES |
| 64 | Gadolinium | Gd | F | [e]**M** | – | W(M) for oxides |
| 65 | Terbium | Tb | – | [e]**M** | – | [g]See NOTES |
| 66 | Dysprosium | Dy | – | [e]**M** | – | [g]See NOTES |
| 67 | Holmium | Ho | – | [e]**M** | – | [g]See NOTES |
| 68 | Erbium | Er | – | [e]**M** | – | [g]See NOTES |
| 69 | Thulium | Tm | – | [e]**M** | – | [g]See NOTES |
| 70 | Ytterbium | Yb | – | M | [e]**S** | Y(S) for oxides |
| 71 | Lutetium | Lu | – | M | [e]**S** | Y(S) for oxides |
| 72 | Hafnium | Hf | F | [e]**M** | – | W(M) for oxides |
| 73 | Tantalum | Ta | – | M | [e]**S** | Y(S) for oxides |
| 74 | Tungsten | W | [e]**F** | – | – | [g]See NOTES |
| 75 | Rhenium | Re | F | [e]**M** | – | W(M) for oxides |
| 76 | Osmium | Os | F | M | [e]**S** | Y(S) for oxides |
| 77 | Iridium | Ir | F | M | [e]**S** | Y(S) for oxides |
| 78 | Platinum | Pt | [e]**F** | – | – | [g]See NOTES |
| 79 | Gold | Au | F | M | [e]**S** | Y(S) for oxides |
| 80 | Mercury | Hg | F | [e]**M** | – | W(M) for oxides |
| 81 | Thallium | Tl | [e]**F** | – | – | [g]See NOTES |
| 82 | Lead | Pb | F | [e]**M** | S | M for default |
| 83 | Bismuth | Bi | F | [e]**M** | – | W(M) for all except nitrates |
| 84 | Polonium | Po | F | [e]**M** | S | M for default |
| 85 | Astatine | At | F | [e]**M** | – | Use maximum |
| 87 | Francium | Fr | [e]**F** | – | – | [g]See NOTES |
| 88 | Radium | Ra | F | [e]**M** | S | M for all compounds |
| 89 | Actinium | Ac | F | M | [e]**S** | Y(S) for oxides |
| 90 | Thorium | Th | F | M | [e]**S** | Y for oxides |
| 91 | Protactinium | Pa | – | M | [e]**S** | Y(S) for oxides |
| 92 | Uranium | U | F | M | [e]**S** | [j]Y(S) for oxide f1 per ICRP-68 |
| 93 | Neptunium | Np | F | [e]**M** | S | M for all compounds |
| 94 | Plutonium | Pu | F | M | [e]**S** | [j]Y(S) for oxide f1 per ICRP-68 |
| 95 | Americium | Am | F | [e]**M** | S | M for all compounds |

Table 57. Lung Absorption Type Selection (Cont'd)

| Atomic No. | Element | Symbol | Lung Absorption Type | | | Selection Basis from Reference |
|---|---|---|---|---|---|---|
| | | | [a]F | [b]M | [c]S | |
| 96 | Curium | Cm | F | [e]**M** | S | M for oxides |
| 97 | Berkelium | Bk | – | [e]**M** | – | [g]See NOTES |
| 98 | Californium | Cf | – | [e]**M** | – | [g]See NOTES |
| 99 | Einsteinium | Es | – | [e]**M** | – | [g]See NOTES |
| 100 | Fermium | Fm | – | [e]**M** | – | [g]See NOTES |
| 101 | Mendelevium | Md | – | [e]**M** | – | [g]See NOTES |

Source: BSC 2005 [DIRS 174424], Table 8.

NOTES: [a] F is the lung absorption type for deposited materials that are readily absorbed into body fluids from the respiratory tract (Fast absorption) (ICRP 1996 [DIRS 152446], page xii).

[b] M is the lung absorption type for deposited materials that have intermediate rates of absorption into body fluids from the respiratory tract (Moderate absorption) (ICRP 1996 [DIRS 152446], page xii).

[c] S is the lung absorption type for deposited materials that are relatively insoluble in the respiratory tract (Slow absorption) (ICRP 1996 [DIRS 152446], page xii).

[d] ICRP Publication 71 (ICRP 1995 [DIRS 172751]).

[e] Selected lung absorption types for elements are shown in the shaded boxes.

[f] ICRP Publication 30, Part 3 (ICRP 1981 [DIRS 110352]).

[g] Only one single lung absorption class.

[h] ICRP Publication 30, Part 1 (ICRP 1979 [DIRS 110386]).

[i] ICRP Publication 30, Part 2 (ICRP 1980 [DIRS 110351]).

[j] ICRP Publication 68 (ICRP 1995 [DIRS 172721]).

[K] HTO is tritiated water.

#### 4.1.7.6 Selection of Dose Coefficients for Ingestion

Ingestion dose coefficients from FGR-13 are included in the GENIIv2 file, *FGR13ING.GDB.* For most radionuclides, FGR-13 provides only one ingestion dose coefficient set. However, the radionuclides $^{3}$H, $^{35}$S, and many Hg isotopes have more than one set of ingestion dose coefficients. For $^{3}$H, the first set is applicable to HTO, and the second set is for organically bound tritium (OBT). For other radionuclides with more than one set of ingestion dose coefficients, GENIIv2 pre-selects the first set as default values because the first set corresponds to its inorganic form, which is the most common chemical form in nuclear industry.

**Suitability for Use:** Ingestion dose coefficients for inorganic form are appropriate, because inorganic form is most common chemical form in nuclear industry.

#### 4.1.7.7 Tritiated Water Inhalation Dose Coefficient with Skin Absorption

As discussed in Section 4.1.7.5, inhalation dose coefficient for hydrogen is selected as the HTO (tritiated water vapor) chemical form. Per ICRP-71 (ICRP 1995 [DIRS 172751], p. 33 para. 92), absorption through the skin contributes approximately one-third of the total HTO intake for a given air concentration and the inhalation dose coefficient for tritiated water do not explicitly include that contribution. The inhalation dose coefficient is therefore conservatively multiplied by 1.5 to account for skin absorption. The inhalation dose coefficient for HTO for all organs is $1.8\times10^{-11}$ (Sv/Bq) per ICRP-71 (ICRP 1995 [DIRS 172751], Table 5.1.2(d)). A value of

$2.7\times10^{-11}$ (Sv/Bq) (i.e. $1.8\times10^{-11}$ (Sv/Bq) $\times$ 1.5) is used for HTO inhalation dose coefficient for all organs in this calculation.

**Suitability for Use:** The use of a multiplier of 1.5 to account for skin absorption of tritium is consistent with ICRP-71 recommendations.

## 4.2 REGULATORY REQUIREMENTS

### 4.2.1 Preclosure Performance Objectives

Preclosure performance objectives are delineated in 10 CFR 63 [DIRS 176544]:

<u>Normal Operation and Category 1 Event Sequences</u>

1) 10 CFR 63.111(a)

10 CFR 63.111(a) requires protection against radiation exposures and releases of radioactive material. "(1) The geologic repository operations area must meet the requirements of Part 20 of this chapter. (2) During normal operations, and for Category 1 event sequences, the annual TEDE {total effective dose equivalent} (hereafter referred to as "dose") to any <u>real member of the public located beyond the boundary of the site</u> may not exceed the preclosure standard specified at § 63.204."

2) 10 CFR 63.204

10 CFR 63.204 states: "DOE (Department of Energy) must ensure that no <u>member of the public in the general environment</u> receives more that an annual dose of 0.15 mSv (15 mrem) …".

3) 10 CFR 20 [DIRS 176618]

10 CFR 20 stipulates the dose limits for workers (Subpart C) and for members of the public (Subpart D), including the as low as reasonably achievable requirements of 10 CFR 20.1101.

> Subpart C, 10 CFR 20.1201 Occupational dose limits for adult: "(a) The licensee shall control the occupational dose to individual adults, except for planned special exposures under § 20.1206, to the following dose limits. (1) An annual limit, which is the more limiting of— (i) The total effective dose equivalent being equal to 5 rems (0.05 Sv); or (ii) The sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue other than the lens of the eye being equal to 50 rems (0.5 Sv). (2) The annual limits to the lens of the eye, to the skin of the whole body, and to the skin of the extremities, which are: (i) A lens dose equivalent of 15 rems (0.15 Sv), and (ii) A shallow-dose equivalent of 50 rems (0.5 Sv) to the skin of the whole body or to the skin of any extremity."

> Subpart D, 10 CFR 20.1301 Dose limits for individual members of the public: "(a) Each licensee shall conduct operations so that — (1) The total effective dose equivalent to individual members of the public from the licensed operation does not exceed 0.1 rem (1 mSv) in a year, exclusive of the dose contributions from background radiation, from any medical administration the individual has received, from exposure to individuals

administered radioactive material and released under § 35.75, from voluntary participation in medical research programs, and from the licensee's disposal of radioactive material into sanitary sewerage in accordance with § 20.2003, and (2) The dose in any unrestricted area from external sources, exclusive of the dose contributions from patients administered radioactive material and released in accordance with § 35.75, does not exceed 0.002 rem (0.02 mSv) in any one hour."

Category 2 Event Sequences

1) 10 CFR 63.111(b)

10 CFR 63.111(b) requires numerical guides for design objectives.

"(1) The geologic repository operations area must be designed so that, taking into consideration Category 1 event sequences and until permanent closure has been completed, the aggregate radiation exposures and the aggregate radiation levels in both restricted and unrestricted areas, and the aggregate releases of radioactive materials to unrestricted areas, will be maintained within the limits specified in paragraph (a) of this section.

(2) The geologic repository operations area must be designed so that, taking into consideration any single Category 2 event sequence and until permanent closure has been completed, no individual located on, or beyond, any point on the boundary of the site will receive, as a result of the single Category 2 event sequence, the more limiting of a TEDE of 0.05 Sv (5 rem), or the sum of the deep dose equivalent and the committed dose equivalent to any individual organ or tissue (other than the lens of the eye) of 0.5 Sv (50 rem). The lens dose equivalent may not exceed 0.15 Sv (15 rem), and the shallow dose equivalent to skin may not exceed 0.5 Sv (50 rem)."

### 4.2.2 Definitions Applicable to Receptors

10 CFR 63.202 defines: "*Member of the public* means anyone who is not a radiation worker for purposes of worker protection."

10 CFR 63.202 defines: "*General environment* means everywhere outside the Yucca Mountain site, the Nellis Air Force Range, and the Nevada Test Site."

40 CFR 197.2 defines: "*Committed effective dose equivalent* means the effective dose equivalent received over a period of time (e.g., 30 years), as determined by Nuclear Regulatory Commission (NRC), by an individual from radionuclides internal to the individual following a one-year intake of those radionuclides."

### 4.2.3 Organ (Tissue) Weighting Factors

NRC Proposed rule 10 CFR 63.2 (70 FR 53313 [DIRS 178394]) defines weighting factors and, for calculating the effective dose equivalent, requires the use of tissue or organ weighting factor values in Appendix A of EPA proposed rule 40 CFR 197 (70 FR 49014 [DIRS 177357]). Proposed rule 40 CFR 197 (70 FR 49014 [DIRS 177357], Appendix A) requires that the effective dose equivalent dose calculation methodology be compatible with that established in

ICRP-26/30 (ICRP 1977 [DIRS 101075], and ICRP 1978 [DIRS 101076]) and continued in ICRP-60/72 (ICRP 1991 [DIRS 101836], and ICRP 1996 [DIRS 152446]).

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# 5. METHODOLOGY

## 5.1 QUALITY ASSURANCE

This calculation report is prepared in accordance with EG-PRO-3DP-G04B-00037, *Calculations and Analyses* (Reference 2.1.4). The developed input values for GENIIv2 will be used to support consequence analysis for the License Application. Therefore, this calculation is subject to the *Quality Management Directive* (Reference 2.1.8). The *Desktop Information for Format of Calculations and Analyses and Treatment of Inputs and Assumptions* as procedure EG-DSK-3003 (Reference 2.1.2) is used as guidance. The organization process procedure LS-PRO-0201, *Preclosure Safety Analyses Process* (Reference 2.1.6), is also followed in the preparation of the document. Input data are identified and tracked in accordance with PA-PRO-0301, *Managing Technical Product Inputs* (Reference 2.1.7), because most of inputs in this document are currently located in Document Input Reference System (DIRS). Per Section 3.3.2.F of EG-PRO-3DP-G04B-00037, input links are developed for those references located within Infoworks. Data obtained from scientific investigations were controlled through information exchange document 100-IED-WHS0-00201-000-00B in accordance with CC-PRO-2001, *Technical Interface Control* (Reference 2.1.1). Software used in the calculation is tracked in accordance with IT-PRO-0011, *Software Management* (Reference 2.1.5). The assumption requiring verification is tracked in accordance with EG-DSK-3014, *Using CalcTrac* (Reference 2.1.3).

## 5.2 USE OF COMPUTER SOFTWARE

Some parameter distributions are developed, and visually checked using the GoldSim Graphical Simulation Environment, a graphical, object-oriented computer program for carrying out dynamic, probabilistic simulations (GoldSim Technology Group 2003 [DIRS 166226]). GoldSim 8.02.500 is a version of the software qualified under the Office of Civilian Radioactive Waste Management, Quality Assurance program for use on the Yucca Mountain Project (GoldSim V8.02.500. 2005. STN: 10344-8.02-05 [DIRS 174650]). The software was appropriate for the intended use, because it is the program used to perform stochastic sampling and calculations (DOE 2005 [DIRS 174693]). It is also used for the graphical representations in Section 7 for the distribution comparison, which is verified by visual inspection. The software was used within the range of validation in accordance with procedure IT-PRO-0011, *Software Management*. GoldSim was installed by Software Configuration Management on a DELL computer (CRWMS M&O 501422), and run under the Windows 2000 operating system.

The Microsoft Excel 2000 spreadsheet program is used to perform simple calculations as documented in Section 7 and Attachment D. User-defined formulas, input, and results are documented in sufficient detail in Section 7 to allow for independent duplication of various computations without recourse to the originator. Excel is classified as Level 2 software usage per IT-PRO-0011, *Software Management* that is not required to be qualified in accordance with IT-PRO-0011. The calculations were verified with hand calculations.

The Microsoft Access 2000 is used to update the YMP default database as described in Attachment F. Some default values in GENIIv2 databse are replaced with the values developed in Section 7. Access 2000 is classified as Level 2 software usage per IT-PRO-0011, *Software*

*Management* that is not required to be qualified in accordance with IT-PRO-0011. The database update was verified with visual comparison.

GENII Version 2 (GENIIv2) (Napier et al 2006 [DIRS 177331]) is a computer program used to calculate stochastic and deterministic dose to humans from exposure to radionuclides in the environment. It is a version of the software qualified under the Office of Civilian Radioactive Waste Management, Quality Assurance program for use on the Yucca Mountain Project (GENII V.2.02. 2006. STN: 11211-2.02-00 [DIRS 177605]). The software is not used in this document to provide any dose calculations, but its default files are used to verify the requirements of inputs that are developed in this document, and to construct the YMP site-specific default files.

## 5.3 GENIIv2 INPUT PARAMETER DEVELOPMENT

The purpose of the document is to provide site-specific input values for GENIIv2 to calculate radiation doses for the preclosure safety analysis. This section provides a list of input parameters applicable to the preclosure safety analysis dose calculations and also provides the general method to develop site-specific input values for those parameters.

### 5.3.1 List of GENIIv2 Input Parameters with Site-Specific Values

The complete list of input parameters for GENIIv2 is given in the description (DES) text files distributed with the GENIIv2 software package. Input parameter descriptions in the DES files include the parameter type, units, minimum and maximum values. The type identifies the parameter as not stochastic or continuous. Continuous parameters can be used in GENIIv2 to perform sensitivity analyses. The eight DES files listed in Table 58 contain all of the parameters applicable to preclosure safety analysis dose calculations. Parameters in other GENIIv2 DES files are not used in the dose calculations.

Table 58. GENIIv2 Files Containing Site-Specific Inputs Parameters

| GENIIv2 File | Parameter Category | Number of Variables | Evaluation in |
|---|---|---|---|
| *FuiAFF.des* | Air emission parameters | 18 | Table 112 |
| *ACPlume.des* | Acute plume release parameters | 29 | Table 113 |
| *CHPlume.des* | Chronic plume release parameters | 24 | Table 113 |
| *Gen_Act.des* | Acute exposure parameters | 101 | Table 114 |
| *Gen_Exp.des* | Chronic exposure parameters | 93 | Table 114 |
| *Gen_Rcp.des* | Receptor parameters | 51 | Table 115 |
| *Gen_hei.des* | Health impact parameters | 16 | Table 116 |
| *Genii.des* | Database parameters | 133 | Table 117 |

In order to identify the parameters that require site-specific values or distributions and also the parameters required to select a release and dose scenario model applicable to the preclosure safety analyses, the parameters in these eight DES files are classified in Attachment C into five categories:

1. *Distribution* - parameters with input values requiring a distribution,
2. *Fixed value* - parameters with fixed input values or with values retrieved from the GENIIv2 database, *GENII.mdb*,
3. *User model* - parameters used to select a release and dose model,

4. *Data from design/scenario* - parameters with values dependent on specific design features and/or release scenarios, and
5. *Not used* - parameters not used in the dose calculation due to either pathways not applicable or other alternative model used.

Parameters that require development of site-specific numerical values or distributions are tabulated in Table 59. They include parameters in the first category, *Distribution*, and parameters in the second category *Fixed value*, excluding those parameters that use default values retrieved directly from the *GENII.mdb* database. There are 80 parameters listed in Table 59. Since many parameters contain multiple input values due to their dependence on number of elements, crop types, and food types, a total of 519 individual inputs are developed, including 93 fixed values and 426 distributions in this document. Values for these parameters are developed in Section 7.

Parameters in the other categories are either selection parameters used to select a release or dose model, or are design specific and do not have site-specific values. Each of these parameters is discussed in Section 8 with the GENIIv2 module where that parameter is input.

Table 59. GENII Parameters Requiring Site-Specific Input Values or Distributions

| No. | GENIIv2 Parameter | Parameter Description | Parameter Type | Value Type | In Section | No. Input |
|---|---|---|---|---|---|---|
| **FuiAFF.des (1 Distribution)** | | | | | | |
| 1 | six | Ambient air temperature | Continuous | Distribution | 7.6.3 | 1 |
| **ACPlume.des, and CHPlume.des (4 Fixed)** | | | | | | |
| 2 | ARMINRISESPD | Minimum wind speed during plume rise | Not Stochastic | Fixed value | 7.6.3 | 1 |
| 3 | ARTRANSRESIST | Transfer resistance | Not Stochastic | Fixed values | 7.6.5 | 2 |
| 4 | ARMINWIND | Maximum wind speed for 'calm' | Not Stochastic | Fixed value | 7.6.3 | 1 |
| 5 | ARMETFILE | Path and Name of Meteorological Data File | Not Stochastic | Filename | 7.6.6 | - |
| 6 | ARCLDSHNLIB | Path and Name of Cloud Shine Library | Not Stochastic | Filename | 7.6.6 | - |
| **Gen_Exp.des and Gen_Act.des (52 Distributions and 34 Fixed)** | | | | | | |
| 7 | ABSHUM | Absolute humidity, used only for tritium model | Continuous | Distribution | 7.6.1 | 1 |
| 8 | ACUTIM | The exposure time period | Not Stochastic | Fixed value | 3.2.5 | 1 |
| 9 | AVALSL | Depth of top soil available for resuspension | Continuous | Distribution | 7.4.2 | 1 |
| 10 | BEFAIR | Air deposition time prior to exposure | Not Stochastic | Fixed value | 7.5.1 | 1 |
| 11 | BEFORE | Time from start to exposure | Not Stochastic | Fixed value | 7.5.1 | 1 |
| 12 | BIOMA2 | Standing animal feed biomass (wet) | Continuous | Distributions | 7.3.3 | 4 |
| 13 | BIOMAS | Standing biomass (wet) | Continuous | Distributions | 7.3.3 | 4 |
| 14 | BULKD | Surface soil bulk density | Continuous | Distribution | 7.2.1 | 1 |
| 15 | CONSUM | Consumption rate | Continuous | Distributions | 7.1.6 | 4 |
| 16 | DIETFR | Fraction of diet | Continuous | Fixed values | 3.2.7 | 6 |
| 17 | DPVRES | Deposition velocity from soil to plant surfaces | Continuous | Distribution | 7.1.5 | 1 |
| 18 | DRYFA2 | Animal feed dry/wet ratio | Continuous | Distributions | 7.3.4 | 4 |
| 19 | DRYFAC | Dry/wet ratio | Continuous | Distributions | 7.3.4 | 4 |
| 20 | FRACFR [a] | Fraction of animal diet that is fresh forage in autumn | Continuous | Fixed value | 7.3.8 | 1 |
| 21 | GRWP | Crop Growing period | Continuous | Fixed values | 7.3.6 | 4 |
| 22 | GRWPA | Animal feed growing period | Continuous | Fixed values | 7.3.6 | 4 |
| 23 | HLDUP | Time from harvest to ingestion | Continuous | Fixed values | 3.2.10 | 4 |
| 24 | HLDUPA | Time from harvest to animal ingestion | Continuous | Fixed values | 3.2.10 | 4 |
| 25 | LEAFRS | Resuspension factor from soil to plant surfaces | Continuous | Distribution | 7.3.7 | 1 |
| 26 | MOISTC | Surface soil moisture content | Continuous | Distribution | 7.2.3 | 1 |
| 27 | NTKEND | Duration of exposure period | Not Stochastic | Fixed value | 3.2.5 & 7.5.1 | 1 |
| 28 | RAIN | Average daily rain rate | Continuous | Distribution | 7.6.2 | 1 |

Table 59. GENII Parameters Requiring Site-Specific Input Values or Distributions (Cont'd)

| No. | GENIIv2 Parameter | Parameter Description | Parameter Type | Value Type | In Section | No. Input |
|---|---|---|---|---|---|---|
| 29 | RELEND | End of release period | Not Stochastic | Fixed value | 3.2.5 & 7.5.1 | 1 |
| 30 | RF1 | Fraction of plants roots in surface soil | Continuous | Fixed value | 3.2.6 | 1 |
| 31 | SLCONA | Animal daily soil consumption rate | Continuous | Distributions | 7.1.6 | 4 |
| 32 | SLDN | Surface soil areal density | Continuous | Distribution | 7.2.4 | 1 |
| 33 | SOILKD | Soil adsorption coefficient | Continuous | Same as CLKD | 7.2.2 | - |
| 34 | SSLDN | Surface soil density | Continuous | Same as BULKD | 7.2.1 | - |
| 35 | STORTM | Storage time | Continuous | Fixed values | 3.2.8 | 6 |
| 36 | SURCM | Surface soil layer thickness used for density | Continuous | Distribution | 7.3.1 | 1 |
| 37 | THICK | Surface soil thickness | Continuous | Same as SURCM | 7.3.1 | - |
| 38 | TRANS | Translocation factor | Continuous | Distributions | 7.1.3 | 4 |
| 39 | TRANSA | Translocation factor for animal feed | Continuous | Distributions | 7.1.3 | 4 |
| 40 | VLEACH | Total infiltration rate | Continuous | Distribution | 7.3.2 | 1 |
| 41 | WTIM | Weathering rate constant from plants | Continuous | Distribution | 7.1.4 | 1 |
| 42 | XMLF | Mass loading factor for resuspension model | Continuous | Distribution | 7.4.1 | 1 |
| 43 | YELD | Yield | Continuous | Distributions | 7.3.5 | 4 |
| 44 | YELDA | Yield for animal feed | Continuous | Distributions | 7.3.5 | 4 |
| **Gen_Rcp.des (29 Distributions and 11 Fixed)** | | | | | | |
| 45 | FRINH | Fraction of a day inhalation occurs | Continuous | Distributions | 7.5.5 & 7.5.9 | 2 |
| 46 | FRINHR | Fraction of a day inhalation occurs for resuspension | Continuous | Distributions | 7.5.5 & 7.5.9 | 2 |
| 47 | FTIN | Fraction of time spent indoors | Continuous | Distribution | 7.5.2 & 7.5.9 | 1 |
| 48 | FTOUT | Fraction of time spent outdoors | Continuous | Distribution | 7.5.2 & 7.5.9 | 1 |
| 49 | SHIN | Indoor shielding factor | Continuous | Fixed value | 7.5.3 | 1 |
| 50 | SHOUT | Outdoor shielding factor | Continuous | Fixed value | 7.5.3 | 1 |
| 51 | TANM | Animal product consumption period | Continuous | Distributions | 7.5.6 & 7.5.9 | 4 |
| 52 | TCRP | Crop consumption period | Continuous | Distributions | 7.5.6,7.5.9 | 4 |
| 53 | TEXAIR | Yearly plume immersion exposure time | Continuous | Fixed values | 7.5.2 & 7.5.9 | 2 |
| 54 | TEXGRD | Yearly external ground exposure time | Continuous | Fixed values | 7.5.2 & 7.5.9 | 2 |
| 55 | TINH | Air inhalation period | Continuous | Fixed values | 7.5.5,7.5.9 | 2 |
| 56 | TINHR | Resuspended soil inhalation period | Continuous | Fixed values | 7.5.5 & 7.5.9 | 2 |
| 57 | TSOIL | Soil contact days | Continuous | Fixed value | 7.5.8 & 7.5.9 | 1 |

Table 59. GENII Parameters Requiring Site-Specific Input Values or Distributions (Cont'd)

| No. | GENIIv2 Parameter | Parameter Description | Parameter Type | Value Type | In Section | No. Input |
|---|---|---|---|---|---|---|
| 58 | UANM | Animal product consumption rate | Continuous | Distributions | 7.5.7 & 7.5.9 | 4 |
| 59 | UCRP | Crop consumption rate | Continuous | Distributions | 7.5.7 & 7.5.9 | 4 |
| 60 | UEXAIR | Daily plume immersion exposure time | Continuous | Distributions | 7.5.2 & 7.5.9 | 2 |
| 61 | UEXGRD | Daily external ground exposure time | Continuous | Distributions | 7.5.2 & 7.5.9 | 2 |
| 62 | UINH | Air inhalation rate | Continuous | Distribution | 7.5.4 & 7.5.9 | 1 |
| 63 | UINHR | Resuspended soil inhalation rate | Continuous | Distribution | 7.5.4 & 7.5.9 | 1 |
| 64 | USOIL | Inadvertent soil ingestion rate | Continuous | Distribution | 7.5.8 & 7.5.9 | 1 |
| **Gen_hei.des (43 Fixed)** | | | | | | |
| 65 | SOILT | Thickness of contaminated soil/sediment layer | Continuous | Same as SURCM | 7.3.1 | - |
| 66 | SSLDN [b] | Density of contaminated soil/sediment layer | Continuous | Same as BULKD | 7.2.1 | - |
| 67 | SOLUBIL | Lung transfer inhalation class | Not Stochastic | Fixed values | 7.7 | 43 |
| **Genii.des (344 distributions)** | | | | | | |
| 68 | CLBVAF | Bioconcentration in Wet Animal Forage from Soil | Continuous | Distributions | 7.1.1 | 34 |
| 69 | CLBVAG | Bioconcentration in Wet Animal Grain from Soil | Continuous | Same as CLBVCL | 7.1.1 | - |
| 70 | CLBVCL | Bioconcentration in Wet Cereal from Soil | Continuous | Distributions | 7.1.1 | 34 |
| 71 | CLBVFR | Bioconcentration in Wet Fruit from Soil | Continuous | Distributions | 7.1.1 | 34 |
| 72 | CLBVLV | Bioconcentration in Wet Leafy Vegetables from Soil | Continuous | Distributions | 7.1.1 | 34 |
| 73 | CLBVRV | Bioconcentration in Wet Root Vegetables from Soil | Continuous | Distributions | 7.1.1 | 34 |
| 74 | CLFEG | Feed to Egg Transfer Factor | Continuous | Distributions | 7.1.2 | 34 |
| 75 | CLFMK | Feed to Milk Transfer Factor | Continuous | Distributions | 7.1.2 | 34 |
| 76 | CLFMT | Feed to Meat Transfer Factor | Continuous | Distributions | 7.1.2 | 34 |
| 77 | CLFPL | Feed to Poultry Transfer Factor | Continuous | Distributions | 7.1.2 | 34 |
| 78 | CLKD | The dry soil-water partition coefficient | Continuous | Distributions | 7.2.2 | 38 |
| 79 | CLVD | The atmospheric deposition velocity | Continuous | Refer to DPVRES | 7.1.5 | - |
| 80 | CLLCLAS | The Lung Solubility Class | Not Stochastic | Same as SOLUBIL | 7.7 | - |

Note: [a] The parameter FRACFR in this table replaces the parameter FRACUT in the files, because FRACUT is no long used.

[b] The description file uses SLDN for density of contaminated soil/sediment layer. The symbol SLDN has been used for surface soil areal density in *Gen_Exp.des* and *Gen_Act.des*. To eliminate the confusion, the symbol is modified to SSLDN here, because this parameter is the same as surface soil density (SSLDN) in the document.

### 5.3.2 Methods of Parameter Distribution Development

Site-specific input values that were previously developed by the Biosphere Model (BSC 2004 [DIRS 169460]) for the YMP total system performance assessment (TSPA) are evaluated and used as appropriate in this document. Some of these input parameters are used without any modifications. However, some parameters developed in the Biosphere Model cannot be used directly, because their distributions are not compatible with GENIIv2, which only allows four distribution types. Therefore, distribution conversions are performed, and comparisons of each converted distribution to its original distribution is performed to ensure the difference between the two distributions is reasonable, and acceptable.

Some parameters are element dependent. For those elements that are not available in the Biosphere Model, the same references and the same method used in the Biosphere Model are used to develop the parameter values. As mentioned Section 5.2, parameter development is performed in the Excel and GoldSim software. The related files are described in Attachment D. All calculation files are listed in Attachment H and the electronic files are included in the attached CD.

## 5.4 GENII YMP Default Input files

The developed input parameter values are site-specific for the Yucca Mountain project. These parameter values are used to create several new GENIIv2 default files. These default files can be read directly by the GENIIv2 software to avoid manually entering each individual parameter value.

Three site-specific parameter files are used by GENIIv2: 1) *GNDFLcud.def* - for chronic exposure 2) *GNDFLaud.def* - for acute exposure, and 3) *GNDFLiud.def* - for receptor intake. Because three receptors are considered for the Yucca Mountain project (Section 3.2.3), default files are generated for the three different receptors and are identified by their extensions: (*.onsite*) for onsite, (*.GE*) for offsite general environment, and (*.nonGE*) for offsite other than the general environment. The files are identified in Table 60 and discussed in Attachment E.

Table 60. YMP Receptor Dependent Site-Specific Default Files

| | GENIIv2 | YMP Receptor Dependent Site-Specific Files | | |
|---|---|---|---|---|
| **Parameters** | **Default File Name** | **Onsite** | **Offsite GE** | **Offsite Non-GE** |
| **Chronic Exposure** | *GNDFLcud.def* | *GNDFLcud.onsite* | *GNDFLcud.GE* | *GNDFLcud.nonGE* |
| **Acute Exposure** | *GNDFLaud.def* | *GNDFLaud.onsite* | *GNDFLaud.GE* | *GNDFLaud.nonGE* |
| **Receptor Intake** | *GNDFLiud.def* | *GNDFLiud.onsite* | *GNDFLiud.GE* | *GNDFLiud.nonGE* |

Additionally, a site-specific nuclide dependent database file *YMPGENII.mdb* is generated to include nuclide-specific plant transfer factor, animal transfer coefficients, soil water partition coefficients, and lung transfer inhalation class as discussed in Attachment F.

An updated inhalation dose coefficient file – *FGR13INH.ymp* is also created to increase tritium water vapor phase dose coefficient by a factor of 1.5 to all organs to account for skin absorption, as discussed in Attachment G.

All YMP site-specific default files are listed in Attachment H and the electronic files are included in the attached CD.

# 6. LIST OF ATTACHMENTS

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# 7. CALCULATIONS

The general methodology for input parameter development is discussed in Section 5.3.2. The parameters developed in this section are listed in Section 5.3.1. This section provides detailed calculations and analyses to determine site-specific values and distributions of those parameters.

## 7.1 CALCULATIONS OF ENVIRONMENTAL PARAMETERS

### 7.1.1 Soil-to-Plant Transfer Factors for Crops

The distribution values of transfer factors, *TF*, for leafy vegetables, other vegetables, fruit, grain, and forage used in the Biosphere Model are tabulated in Section 4.1.1.1 for the 16 elements. Transfer factors for additional elements are taken from the same references used in the Biosphere Model as listed in Table 9 to Table 20. The same methodology used in the Biosphere Model is used here to develop the distribution values of transfer factors for these additional elements in this section. An Excel file named as *Calculation_TF_TC_Kd.xls* is used to perform the calculations (see Attachment D). The Excel file, originally used for developing the *TF* in the Biosphere Model, contains calculations of *TF* for the elements used in the Biosphere Model. The description of the calculation can be found in BSC 2004 ([DIRS 169672], Appendix A). The calculation method is used in the Excel file *Calculation_TF_TC_Kd.xls* as described below.

There are five worksheets for the *TF* calculations: *Leafy*, *Other*, *Fruit*, *Grain,* and *Forage* for five different types of crops. In each worksheet, Column C to Column T were added for the additional elements copied from Table 9 to Table 20, while Column V to Column AK contains the elements used for the Biosphere Model. The inputs from Table 9 to Table 20 are copied into Row 4 to Row 13 in the *Leafy*, *Other*, *Fruit*, and *Grain* worksheets, and Row 4 to Row 16 in *Forage* worksheet. Calculations of geometric mean (GM), geometric standard deviations (GSD), and truncation limits for the TF were copied from a column where an element is used in the Biosphere Model. As explained in BSC 2004 ([DIRS 169672], Section 6.2.1.1.5), when the GSD of the published values was less than 2, it was assumed to be 2, and if it was greater than 10, it was assumed to be 10. A lognormal distribution defined by a GM and GSD with a truncation limit and an upper truncation limit is used for transfer factors for all crop types as well as all elements.

Transfer factors for a total of 34 elements of interest are tabulated in Table 61 to Table 65 for Leafy, Other, Fruit, Grain, and Forage, respectively. These tables combine the calculation results in the Excel file of *Calculation_TF_TC_Kd.xls* with the 16 elements already in the Biosphere Model discussed in Section 4.1.1.1.

Table 61. Transfer Factors of Leafy Vegetables for All Elements of Interest

| Element | Atomic No. | GM | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| Ac | 89 | 4.3E-03 | 2.0 | 7.2E-04 | 2.6E-02 |
| Am | 95 | 1.2E-03 | 2.5 | 1.2E-04 | 1.3E-02 |
| Ca | 20 | 3.0E+00 | 2.0 | 5.1E-01 | 1.8E+01 |
| Cd | 48 | 7.6E-01 | 2.0 | 1.3E-01 | 4.5E+00 |
| Ce | 58 | 2.6E-02 | 3.5 | 1.0E-03 | 6.8E-01 |
| Cf | 98 | 6.3E-03 | 2.2 | 8.0E-04 | 5.0E-02 |
| Cl | 17 | 6.4E+01 | 2.0 | 1.1E+01 | 3.8E+02 |
| Cm | 96 | 8.6E-04 | 2.0 | 1.4E-04 | 5.1E-03 |
| Co | 27 | 8.2E-02 | 2.0 | 1.3E-02 | 5.0E-01 |
| Cs | 55 | 8.5E-02 | 2.5 | 7.7E-03 | 9.4E-01 |
| Eu | 63 | 1.0E-02 | 2.0 | 1.7E-03 | 6.0E-02 |
| Fe | 26 | 6.0E-03 | 2.2 | 7.5E-04 | 4.8E-02 |
| I | 53 | 2.6E-02 | 9.9 | 7.2E-05 | 9.7E+00 |
| Nb | 41 | 3.0E-02 | 2.0 | 5.1E-03 | 1.8E-01 |
| Ni | 28 | 1.8E-01 | 2.1 | 2.8E-02 | 1.2E+00 |
| Np | 93 | 5.9E-02 | 4.4 | 1.3E-03 | 2.6E+00 |
| Pa | 91 | 4.6E-03 | 3.8 | 1.4E-04 | 1.4E-01 |
| Pb | 82 | 1.5E-02 | 4.6 | 3.0E-04 | 7.7E-01 |
| Pd | 46 | 1.7E-01 | 2.0 | 2.9E-02 | 1.0E+00 |
| Pm | 61 | 1.0E-02 | 2.0 | 1.7E-03 | 6.0E-02 |
| Pu | 94 | 2.9E-04 | 2.0 | 4.9E-05 | 1.7E-03 |
| Ra | 88 | 6.8E-02 | 2.7 | 5.1E-03 | 9.2E-01 |
| Rh | 45 | 6.4E-01 | 10.0 | 1.7E-03 | 2.4E+02 |
| Ru | 44 | 1.8E-01 | 2.2 | 2.4E-02 | 1.3E+00 |
| Sb | 51 | 9.4E-03 | 10.0 | 2.5E-05 | 3.5E+00 |
| Se | 34 | 4.6E-02 | 3.8 | 1.4E-03 | 1.4E+00 |
| Sm | 62 | 1.0E-02 | 2.0 | 1.7E-03 | 6.0E-02 |
| Sn | 50 | 3.8E-02 | 2.0 | 6.4E-03 | 2.3E-01 |
| Sr | 38 | 1.7E+00 | 2.0 | 2.9E-01 | 1.0E+01 |
| Tc | 43 | 4.6E+01 | 2.6 | 3.8E+00 | 5.5E+02 |
| Th | 90 | 4.3E-03 | 2.8 | 3.2E-04 | 5.9E-02 |
| U | 92 | 1.1E-02 | 2.0 | 1.8E-03 | 6.6E-02 |
| Y | 39 | 1.4E-02 | 2.0 | 2.3E-03 | 8.1E-02 |
| Zr | 40 | 3.6E-03 | 3.8 | 1.2E-04 | 1.1E-01 |

Source: Table 3, Table 9 to Table 20, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 62. Transfer Factors of Root Vegetables for All Elements of Interest

| Element | Atomic No. | GM | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| Ac | 89 | 1.1E-03 | 4.9 | 1.8E-05 | 6.6E-02 |
| Am | 95 | 4.0E-04 | 2.6 | 3.5E-05 | 4.6E-03 |
| Ca | 20 | 5.4E-01 | 2.4 | 5.7E-02 | 5.1E+00 |
| Cd | 48 | 2.9E-01 | 3.7 | 1.0E-02 | 8.1E+00 |
| Ce | 58 | 1.6E-02 | 4.1 | 4.2E-04 | 5.8E-01 |
| Cf | 98 | 6.3E-03 | 2.2 | 8.0E-04 | 5.0E-02 |
| Cl | 17 | 6.4E+01 | 2.0 | 1.1E+01 | 3.8E+02 |
| Cm | 96 | 3.2E-04 | 4.7 | 5.9E-06 | 1.7E-02 |
| Co | 27 | 3.8E-02 | 2.6 | 3.3E-03 | 4.4E-01 |
| Cs | 55 | 5.0E-02 | 2.0 | 8.4E-03 | 3.0E-01 |
| Eu | 63 | 5.0E-03 | 2.0 | 8.4E-04 | 3.0E-02 |
| Fe | 26 | 2.4E-03 | 3.8 | 7.8E-05 | 7.4E-02 |
| I | 53 | 3.2E-02 | 4.4 | 7.0E-04 | 1.5E+00 |
| Nb | 41 | 1.1E-02 | 2.4 | 1.1E-03 | 1.0E-01 |
| Ni | 28 | 7.4E-02 | 2.0 | 1.2E-02 | 4.6E-01 |
| Np | 93 | 3.1E-02 | 4.9 | 5.0E-04 | 1.9E+00 |
| Pa | 91 | 1.1E-03 | 10.0 | 3.0E-06 | 4.3E-01 |
| Pb | 82 | 9.0E-03 | 3.1 | 5.0E-04 | 1.6E-01 |
| Pd | 46 | 7.8E-02 | 2.6 | 6.8E-03 | 8.9E-01 |
| Pm | 61 | 5.0E-03 | 2.0 | 8.4E-04 | 3.0E-02 |
| Pu | 94 | 1.9E-04 | 2.0 | 3.3E-05 | 1.1E-03 |
| Ra | 88 | 1.2E-02 | 5.3 | 1.6E-04 | 8.6E-01 |
| Rh | 45 | 3.1E-01 | 10.0 | 8.2E-04 | 1.2E+02 |
| Ru | 44 | 4.3E-02 | 2.9 | 2.8E-03 | 6.7E-01 |
| Sb | 51 | 4.6E-03 | 9.5 | 1.4E-05 | 1.5E+00 |
| Se | 34 | 4.6E-02 | 3.8 | 1.4E-03 | 1.4E+00 |
| Sm | 62 | 5.8E-03 | 2.0 | 9.7E-04 | 3.4E-02 |
| Sn | 50 | 1.5E-02 | 3.6 | 5.3E-04 | 4.0E-01 |
| Sr | 38 | 7.9E-01 | 2.0 | 1.4E-01 | 4.5E+00 |
| Tc | 43 | 4.4E+00 | 3.7 | 1.5E-01 | 1.2E+02 |
| Th | 90 | 4.4E-04 | 5.6 | 5.3E-06 | 3.6E-02 |
| U | 92 | 6.0E-03 | 2.8 | 4.2E-04 | 8.5E-02 |
| Y | 39 | 7.4E-03 | 2.0 | 1.2E-03 | 4.4E-02 |
| Zr | 40 | 1.6E-03 | 4.5 | 3.4E-05 | 7.7E-02 |

Source: Table 4, Table 9 to Table 20, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 63. Transfer Factors of Fruit for All Elements of Interest

| Element | Atomic No. | GM | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| Ac | 89 | 8.5E-04 | 3.4 | 3.7E-05 | 2.0E-02 |
| Am | 95 | 5.4E-04 | 2.3 | 6.5E-05 | 4.5E-03 |
| Ca | 20 | 5.4E-01 | 2.4 | 5.7E-02 | 5.1E+00 |
| Cd | 48 | 2.9E-01 | 3.7 | 1.0E-02 | 8.1E+00 |
| Ce | 58 | 5.1E-03 | 4.6 | 1.0E-04 | 2.6E-01 |
| Cf | 98 | 6.3E-03 | 2.2 | 8.0E-04 | 5.0E-02 |
| Cl | 17 | 6.4E+01 | 2.0 | 1.1E+01 | 3.8E+02 |
| Cm | 96 | 2.2E-04 | 8.4 | 8.9E-07 | 5.3E-02 |
| Co | 27 | 1.3E-02 | 3.4 | 5.6E-04 | 3.1E-01 |
| Cs | 55 | 5.6E-02 | 2.8 | 3.8E-03 | 8.1E-01 |
| Eu | 63 | 5.0E-03 | 2.0 | 8.4E-04 | 3.0E-02 |
| Fe | 26 | 2.4E-03 | 3.8 | 7.8E-05 | 7.4E-02 |
| I | 53 | 5.7E-02 | 2.8 | 4.1E-03 | 7.9E-01 |
| Nb | 41 | 9.7E-03 | 2.6 | 8.3E-04 | 1.1E-01 |
| Ni | 28 | 5.8E-02 | 2.0 | 9.7E-03 | 3.4E-01 |
| Np | 93 | 3.4E-02 | 6.9 | 2.3E-04 | 5.0E+00 |
| Pa | 91 | 1.1E-03 | 10.0 | 3.0E-06 | 4.3E-01 |
| Pb | 82 | 1.2E-02 | 3.3 | 5.8E-04 | 2.6E-01 |
| Pd | 46 | 7.8E-02 | 2.6 | 6.8E-03 | 8.9E-01 |
| Pm | 61 | 5.0E-03 | 2.0 | 8.4E-04 | 3.0E-02 |
| Pu | 94 | 1.8E-04 | 3.4 | 7.8E-06 | 4.2E-03 |
| Ra | 88 | 7.3E-03 | 4.3 | 1.6E-04 | 3.2E-01 |
| Rh | 45 | 3.1E-01 | 10.0 | 8.2E-04 | 1.2E+02 |
| Ru | 44 | 1.8E-02 | 4.7 | 3.3E-04 | 9.9E-01 |
| Sb | 51 | 7.7E-03 | 10.0 | 2.1E-05 | 2.9E+00 |
| Se | 34 | 4.6E-02 | 3.8 | 1.4E-03 | 1.4E+00 |
| Sm | 62 | 5.8E-03 | 2.0 | 9.7E-04 | 3.4E-02 |
| Sn | 50 | 1.5E-02 | 3.6 | 5.3E-04 | 4.0E-01 |
| Sr | 38 | 2.9E-01 | 2.3 | 3.6E-02 | 2.4E+00 |
| Tc | 43 | 4.3E+00 | 4.6 | 8.7E-02 | 2.1E+02 |
| Th | 90 | 2.9E-04 | 4.9 | 4.8E-06 | 1.7E-02 |
| U | 92 | 6.3E-03 | 2.9 | 3.9E-04 | 1.0E-01 |
| Y | 39 | 7.4E-03 | 2.0 | 1.2E-03 | 4.4E-02 |
| Zr | 40 | 1.4E-03 | 4.7 | 2.5E-05 | 7.6E-02 |

Source: Table 5, Table 9 to Table 20, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 64. Transfer Factors of Grain for All Elements of Interest

| Element | Atomic No. | GM | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| Ac | 89 | 5.4E-04 | 2.9 | 3.6E-05 | 8.0E-03 |
| Am | 95 | 7.5E-05 | 3.2 | 3.8E-06 | 1.5E-03 |
| Ca | 20 | 5.4E-01 | 2.4 | 5.7E-02 | 5.1E+00 |
| Cd | 48 | 2.1E-01 | 2.0 | 3.6E-02 | 1.3E+00 |
| Ce | 58 | 5.4E-03 | 3.1 | 2.8E-04 | 1.0E-01 |
| Cf | 98 | 6.3E-03 | 2.2 | 8.0E-04 | 5.0E-02 |
| Cl | 17 | 2.4E+01 | 8.4 | 1.0E-01 | 5.8E+03 |
| Cm | 96 | 4.3E-05 | 4.6 | 8.2E-07 | 2.2E-03 |
| Co | 27 | 7.2E-03 | 2.0 | 1.2E-03 | 4.3E-02 |
| Cs | 55 | 2.0E-02 | 2.2 | 2.7E-03 | 1.6E-01 |
| Eu | 63 | 3.4E-03 | 2.0 | 5.6E-04 | 2.0E-02 |
| Fe | 26 | 1.8E-03 | 2.3 | 2.2E-04 | 1.5E-02 |
| I | 53 | 2.5E-02 | 10.0 | 6.6E-05 | 9.4E+00 |
| Nb | 41 | 7.0E-03 | 2.0 | 1.2E-03 | 4.2E-02 |
| Ni | 28 | 4.0E-02 | 2.0 | 6.6E-03 | 2.4E-01 |
| Np | 93 | 4.4E-03 | 6.9 | 3.1E-05 | 6.3E-01 |
| Pa | 91 | 9.5E-04 | 7.2 | 5.9E-06 | 1.5E-01 |
| Pb | 82 | 5.5E-03 | 2.1 | 8.2E-04 | 3.8E-02 |
| Pd | 46 | 5.4E-02 | 2.0 | 9.1E-03 | 3.2E-01 |
| Pm | 61 | 2.8E-03 | 2.0 | 4.7E-04 | 1.7E-02 |
| Pu | 94 | 1.9E-05 | 4.2 | 4.8E-07 | 7.8E-04 |
| Ra | 88 | 3.1E-03 | 4.0 | 8.8E-05 | 1.1E-01 |
| Rh | 45 | 2.0E-01 | 9.6 | 5.8E-04 | 6.6E+01 |
| Ru | 44 | 1.4E-02 | 4.1 | 3.7E-04 | 5.5E-01 |
| Sb | 51 | 1.0E-02 | 10.0 | 2.7E-05 | 3.9E+00 |
| Se | 34 | 2.9E-02 | 2.0 | 4.8E-03 | 1.7E-01 |
| Sm | 62 | 4.2E-03 | 2.0 | 7.0E-04 | 2.5E-02 |
| Sn | 50 | 9.2E-03 | 2.0 | 1.5E-03 | 5.5E-02 |
| Sr | 38 | 1.7E-01 | 2.0 | 2.8E-02 | 1.0E+00 |
| Tc | 43 | 1.6E+00 | 4.3 | 3.8E-02 | 6.8E+01 |
| Th | 90 | 1.7E-04 | 5.2 | 2.4E-06 | 1.2E-02 |
| U | 92 | 1.1E-03 | 3.6 | 4.1E-05 | 3.1E-02 |
| Y | 39 | 4.6E-03 | 2.4 | 4.7E-04 | 4.6E-02 |
| Zr | 40 | 1.6E-03 | 5.2 | 2.3E-05 | 1.1E-01 |

Source: Table 6, Table 9 to Table 20, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 65. Transfer Factors of Forage for All Elements of Interest

| Element | Atomic No. | GM | GSD | Lower Truncation Limit | Upper Truncation Limit |
|---|---|---|---|---|---|
| Ac | 89 | 1.7E-02 | 5.4 | 2.2E-04 | 1.3E+00 |
| Am | 95 | 2.1E-03 | 10.0 | 5.5E-06 | 7.9E-01 |
| Ca | 20 | 3.6E+00 | 2.0 | 6.1E-01 | 2.2E+01 |
| Cd | 48 | 1.2E+00 | 2.3 | 1.4E-01 | 1.1E+01 |
| Ce | 58 | 4.9E-02 | 2.8 | 3.4E-03 | 7.2E-01 |
| Cf | 98 | 2.2E-02 | 6.2 | 2.1E-04 | 2.4E+00 |
| Cl | 17 | 7.5E+01 | 2.0 | 1.3E+01 | 4.5E+02 |
| Cm | 96 | 2.8E-03 | 7.6 | 1.5E-05 | 5.2E-01 |
| Co | 27 | 1.8E-01 | 5.5 | 2.3E-03 | 1.5E+01 |
| Cs | 55 | 1.3E-01 | 3.3 | 6.3E-03 | 2.8E+00 |
| Eu | 63 | 3.2E-02 | 3.5 | 1.2E-03 | 8.1E-01 |
| Fe | 26 | 1.5E-02 | 5.1 | 2.2E-04 | 9.8E-01 |
| I | 53 | 4.0E-02 | 10.0 | 1.1E-04 | 1.5E+01 |
| Nb | 41 | 5.5E-02 | 2.4 | 5.9E-03 | 5.2E-01 |
| Ni | 28 | 2.2E-01 | 2.6 | 1.8E-02 | 2.7E+00 |
| Np | 93 | 5.8E-02 | 5.6 | 6.8E-04 | 4.9E+00 |
| Pa | 91 | 1.9E-02 | 6.7 | 1.4E-04 | 2.5E+00 |
| Pb | 82 | 1.8E-02 | 7.0 | 1.2E-04 | 2.8E+00 |
| Pd | 46 | 2.8E-01 | 2.0 | 4.7E-02 | 1.7E+00 |
| Pm | 61 | 3.2E-02 | 3.5 | 1.2E-03 | 8.1E-01 |
| Pu | 94 | 1.0E-03 | 10.0 | 2.7E-06 | 3.9E-01 |
| Ra | 88 | 8.2E-02 | 3.0 | 4.9E-03 | 1.4E+00 |
| Rh | 45 | 6.7E-01 | 10.0 | 1.8E-03 | 2.5E+02 |
| Ru | 44 | 2.1E-01 | 2.0 | 3.5E-02 | 1.2E+00 |
| Sb | 51 | 1.8E-02 | 10.0 | 4.9E-05 | 7.0E+00 |
| Se | 34 | 1.5E-01 | 5.5 | 1.9E-03 | 1.3E+01 |
| Sm | 62 | 2.2E-02 | 3.3 | 1.0E-03 | 4.6E-01 |
| Sn | 50 | 1.6E-01 | 5.8 | 1.7E-03 | 1.5E+01 |
| Sr | 38 | 2.1E+00 | 2.1 | 3.2E-01 | 1.3E+01 |
| Tc | 43 | 2.7E+01 | 2.7 | 2.1E+00 | 3.5E+02 |
| Th | 90 | 1.0E-02 | 4.2 | 2.5E-04 | 3.9E-01 |
| U | 92 | 1.7E-02 | 6.1 | 1.6E-04 | 1.9E+00 |
| Y | 39 | 3.6E-02 | 3.1 | 2.0E-03 | 6.5E-01 |
| Zr | 40 | 1.9E-02 | 8.3 | 8.4E-05 | 4.5E+00 |

Source: Table 7, Table 9 to Table 20, and attached Excel file *Calculation_TF_TC_Kd.xls*

### 7.1.2 Transfer Coefficients for Animal Products

The distribution values of transfer coefficients, *TC*, for beef, milk, poultry and eggs used in the Biosphere Model are tabulated in Section 4.1.1.2. Transfer coefficients for additional elements are taken from the same references used in the Biosphere Model as listed in Table 26 to Table 40. The same methodology used in the Biosphere Model is used here to develop the distribution values of transfer coefficients for these additional elements in this section. The same Excel file of *Calculation_TF_TC_Kd.xls* used for the transfer factors is used to perform the calculations. As mentioned before, the Excel file, originally used for developing the *TC* in the Biosphere Model, contains calculations of *TC* for those elements used in the Biosphere Model.

There are four worksheets for the *TC* calculations: *Meat*, *Poultry*, *Milk*, and *Eggs* for four different types of animal products. In each worksheet, Column C to Column T were added for the additional elements copied from Table 26 to Table 40, while Column V to Column AK contains the elements used for the Biosphere Model. The inputs from Table 26 to Table 40 are copied into Row 3 to Row 19 in the *Meat* and *Milk* worksheets, Row 4 to Row 13 in *Poultry* worksheet, and Row 4 to Row 14 in *Eggs* worksheet. Calculation of GM, GSD, and truncation limits for the *TC*s were copied from a column where an element is used for the Biosphere Model. As explained in BSC 2004 ([DIRS 169672], Section 6.2.1.1.5), when the GSD of the published values was less than 2, it was assumed to be 2, and if it was greater than 10, it was assumed to be 10. A lognormal distribution defined by GM and GSD with a lower truncation and an upper truncation is used for transfer coefficients for all animal products as well as all elements.

Transfer coefficients for a total of 34 elements of interest are tabulated in Table 66 to Table 69 for beef, poultry, milk and eggs, respectively. These tables combine the calculation results in the Excel file of *Calculation_TF_TC_Kd.xls* with the 16 elements already in the Biosphere Model discussed in Section 4.1.1.2.

Table 66. Beef Transfer Coefficients for All Elements of Interest

| Element | Atomic No. | GM (day/kg) | GSD | Lower Truncation Limit (day/kg) | Upper Truncation Limit (day/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 7.9E-05 | 8.2 | 3.5E-07 | 1.8E-02 |
| Am | 95 | 3.4E-05 | 9.0 | 1.2E-07 | 9.9E-03 |
| Ca | 20 | 1.5E-03 | 2.0 | 2.5E-04 | 9.0E-03 |
| Cd | 48 | 7.8E-04 | 3.3 | 3.6E-05 | 1.7E-02 |
| Ce | 58 | 2.7E-04 | 6.4 | 2.3E-06 | 3.1E-02 |
| Cf | 98 | 8.5E-04 | 10.0 | 2.3E-06 | 3.2E-01 |
| Cl | 17 | 4.6E-02 | 2.0 | 7.7E-03 | 2.7E-01 |
| Cm | 96 | 4.1E-05 | 10.0 | 1.1E-07 | 1.6E-02 |
| Co | 27 | 1.5E-02 | 3.2 | 7.5E-04 | 2.9E-01 |
| Cs | 55 | 2.4E-02 | 2.6 | 2.1E-03 | 2.7E-01 |
| Eu | 63 | 2.5E-03 | 2.7 | 1.9E-04 | 3.3E-02 |
| Fe | 26 | 2.5E-02 | 2.0 | 4.1E-03 | 1.5E-01 |
| I | 53 | 1.0E-02 | 2.8 | 6.8E-04 | 1.5E-01 |
| Nb | 41 | 1.4E-04 | 10.0 | 3.6E-07 | 5.1E-02 |
| Ni | 28 | 5.3E-03 | 2.7 | 3.9E-04 | 7.1E-02 |
| Np | 93 | 3.4E-04 | 8.8 | 1.3E-06 | 9.0E-02 |
| Pa | 91 | 6.6E-05 | 10.0 | 1.8E-07 | 2.5E-02 |
| Pb | 82 | 6.3E-04 | 2.6 | 5.4E-05 | 7.5E-03 |
| Pd | 46 | 1.3E-03 | 3.4 | 5.3E-05 | 3.1E-02 |
| Pm | 61 | 2.5E-03 | 2.7 | 2.0E-04 | 3.1E-02 |
| Pu | 94 | 1.3E-05 | 10.0 | 3.3E-08 | 4.7E-03 |
| Ra | 88 | 8.1E-04 | 2.1 | 1.1E-04 | 5.7E-03 |
| Rh | 45 | 1.5E-03 | 2.0 | 2.5E-04 | 8.9E-03 |
| Ru | 44 | 6.0E-03 | 7.4 | 3.4E-05 | 1.0E+00 |
| Sb | 51 | 9.9E-04 | 3.5 | 3.8E-05 | 2.6E-02 |
| Se | 34 | 8.8E-02 | 5.8 | 9.6E-04 | 8.0E+00 |
| Sm | 62 | 3.0E-03 | 2.6 | 2.5E-04 | 3.5E-02 |
| Sn | 50 | 1.9E-02 | 4.6 | 3.8E-04 | 9.9E-01 |
| Sr | 38 | 1.4E-03 | 4.4 | 3.1E-05 | 6.2E-02 |
| Tc | 43 | 1.1E-03 | 7.2 | 6.9E-06 | 1.8E-01 |
| Th | 90 | 1.1E-04 | 10.0 | 2.8E-07 | 4.0E-02 |
| U | 92 | 4.8E-04 | 3.0 | 2.9E-05 | 7.8E-03 |
| Y | 39 | 1.3E-03 | 3.3 | 6.1E-05 | 2.9E-02 |
| Zr | 40 | 1.1E-04 | 10.0 | 2.9E-07 | 4.1E-02 |

Source: Table 21, Table 26 to Table 40, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 67. Poultry Transfer Coefficients for All Elements of Interest

| Element | Atomic No. | GM (day/kg) | GSD | Lower Truncation Limit (day/kg) | Upper Truncation Limit (day/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 4.0E-03 | 2.0 | 6.7E-04 | 2.4E-02 |
| Am | 95 | 1.8E-03 | 10.0 | 4.8E-06 | 6.7E-01 |
| Ca | 20 | 4.1E-02 | 4.7 | 7.6E-04 | 2.2E+00 |
| Cd | 48 | 3.7E-01 | 6.0 | 3.7E-03 | 3.8E+01 |
| Ce | 58 | 3.9E-03 | 3.8 | 1.3E-04 | 1.2E-01 |
| Cf | 98 | 4.0E-03 | 2.0 | 6.7E-04 | 2.4E-02 |
| Cl | 17 | 3.0E-02 | 2.0 | 5.0E-03 | 1.8E-01 |
| Cm | 96 | 4.0E-03 | 2.0 | 6.7E-04 | 2.4E-02 |
| Co | 27 | 1.5E-01 | 10.0 | 4.0E-04 | 5.6E+01 |
| Cs | 55 | 2.6E+00 | 9.8 | 7.2E-03 | 9.3E+02 |
| Eu | 63 | 4.0E-03 | 2.0 | 6.7E-04 | 2.4E-02 |
| Fe | 26 | 3.2E-01 | 10.0 | 8.5E-04 | 1.2E+02 |
| I | 53 | 5.5E-02 | 9.7 | 1.6E-04 | 1.9E+01 |
| Nb | 41 | 9.5E-04 | 7.6 | 5.1E-06 | 1.8E-01 |
| Ni | 28 | 3.8E-03 | 10.0 | 1.0E-05 | 1.4E+00 |
| Np | 93 | 3.6E-03 | 2.0 | 6.0E-04 | 2.1E-02 |
| Pa | 91 | 3.0E-03 | 2.0 | 5.1E-04 | 1.8E-02 |
| Pb | 82 | 2.5E-02 | 10.0 | 6.6E-05 | 9.3E+00 |
| Pd | 46 | 1.8E-03 | 10.0 | 4.8E-06 | 6.8E-01 |
| Pm | 61 | 9.5E-04 | 4.5 | 2.0E-05 | 4.5E-02 |
| Pu | 94 | 1.2E-03 | 10.0 | 3.2E-06 | 4.6E-01 |
| Ra | 88 | 1.7E-02 | 10.0 | 4.4E-05 | 6.3E+00 |
| Rh | 45 | 3.6E-03 | 10.0 | 9.4E-06 | 1.3E+00 |
| Ru | 44 | 1.5E-02 | 10.0 | 4.0E-05 | 5.7E+00 |
| Sb | 51 | 1.2E-02 | 5.1 | 1.8E-04 | 8.0E-01 |
| Se | 34 | 5.1E+00 | 3.6 | 1.9E-01 | 1.4E+02 |
| Sm | 62 | 1.3E-02 | 10.0 | 3.6E-05 | 5.0E+00 |
| Sn | 50 | 3.5E-02 | 10.0 | 9.4E-05 | 1.3E+01 |
| Sr | 38 | 3.1E-02 | 5.8 | 3.4E-04 | 2.9E+00 |
| Tc | 43 | 6.3E-02 | 10.0 | 1.7E-04 | 2.4E+01 |
| Th | 90 | 5.9E-03 | 8.0 | 2.7E-05 | 1.3E+00 |
| U | 92 | 2.4E-01 | 10.0 | 6.5E-04 | 9.2E+01 |
| Y | 39 | 7.3E-03 | 4.0 | 2.1E-04 | 2.6E-01 |
| Zr | 40 | 5.5E-04 | 10.0 | 1.5E-06 | 2.1E-01 |

Source: Table 22, Table 26 to Table 40, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 68. Milk Transfer Coefficients for All Elements of Interest

| Element | Atomic No. | GM (day/L) | GSD | Lower Truncation Limit (day/L) | Upper Truncation Limit (day/L) |
|---|---|---|---|---|---|
| Ac | 89 | 7.6E-06 | 4.1 | 2.0E-07 | 2.9E-04 |
| Am | 95 | 1.6E-06 | 4.2 | 3.9E-08 | 6.3E-05 |
| Ca | 20 | 6.9E-03 | 2.0 | 1.2E-03 | 4.1E-02 |
| Cd | 48 | 9.4E-04 | 5.4 | 1.2E-05 | 7.4E-02 |
| Ce | 58 | 3.7E-05 | 2.5 | 3.4E-06 | 4.0E-04 |
| Cf | 98 | 9.1E-07 | 2.0 | 1.5E-07 | 5.4E-06 |
| Cl | 17 | 1.8E-02 | 2.0 | 2.9E-03 | 1.0E-01 |
| Cm | 96 | 3.8E-06 | 4.6 | 7.7E-08 | 1.9E-04 |
| Co | 27 | 1.4E-03 | 3.3 | 6.1E-05 | 3.1E-02 |
| Cs | 55 | 7.7E-03 | 2.0 | 1.3E-03 | 4.6E-02 |
| Eu | 63 | 2.0E-05 | 2.7 | 1.6E-06 | 2.5E-04 |
| Fe | 26 | 2.1E-04 | 3.0 | 1.2E-05 | 3.5E-03 |
| I | 53 | 9.1E-03 | 2.0 | 1.5E-03 | 5.4E-02 |
| Nb | 41 | 1.4E-04 | 10.0 | 3.8E-07 | 5.4E-02 |
| Ni | 28 | 5.5E-03 | 5.3 | 7.4E-05 | 4.2E-01 |
| Np | 93 | 6.3E-06 | 2.0 | 1.0E-06 | 3.9E-05 |
| Pa | 91 | 4.4E-06 | 2.0 | 7.4E-07 | 2.6E-05 |
| Pb | 82 | 1.7E-04 | 3.0 | 1.0E-05 | 2.9E-03 |
| Pd | 46 | 2.9E-03 | 6.9 | 2.0E-05 | 4.1E-01 |
| Pm | 61 | 1.6E-05 | 3.4 | 6.6E-07 | 3.7E-04 |
| Pu | 94 | 2.3E-07 | 7.7 | 1.2E-09 | 4.4E-05 |
| Ra | 88 | 5.8E-04 | 2.0 | 1.0E-04 | 3.4E-03 |
| Rh | 45 | 3.6E-03 | 3.6 | 1.4E-04 | 9.5E-02 |
| Ru | 44 | 1.8E-06 | 4.3 | 4.0E-08 | 7.7E-05 |
| Sb | 51 | 1.5E-04 | 2.5 | 1.4E-05 | 1.5E-03 |
| Se | 34 | 5.7E-03 | 2.5 | 5.5E-04 | 6.0E-02 |
| Sm | 62 | 1.8E-05 | 2.3 | 2.2E-06 | 1.5E-04 |
| Sn | 50 | 1.1E-03 | 2.0 | 1.8E-04 | 6.3E-03 |
| Sr | 38 | 1.7E-03 | 2.0 | 2.8E-04 | 1.0E-02 |
| Tc | 43 | 2.1E-03 | 6.0 | 2.0E-05 | 2.1E-01 |
| Th | 90 | 4.4E-06 | 2.0 | 7.4E-07 | 2.6E-05 |
| U | 92 | 4.9E-04 | 2.0 | 8.1E-05 | 2.9E-03 |
| Y | 39 | 1.8E-05 | 2.4 | 1.9E-06 | 1.6E-04 |
| Zr | 40 | 7.7E-06 | 10.0 | 2.0E-08 | 2.9E-03 |

Source: Table 23, Table 26 to Table 40, and attached Excel file *Calculation_TF_TC_Kd.xls*

Table 69. Eggs Transfer Coefficients for All Elements of Interest

| Element | Atomic No. | GM (day/kg) | GSD | Lower Truncation Limit (day/kg) | Upper Truncation Limit (day/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 2.9E-03 | 2.3 | 3.4E-04 | 2.5E-02 |
| Am | 95 | 4.9E-03 | 2.0 | 8.2E-04 | 2.9E-02 |
| Ca | 20 | 5.0E-01 | 2.0 | 8.3E-02 | 3.0E+00 |
| Cd | 48 | 6.1E-02 | 10.0 | 1.6E-04 | 2.3E+01 |
| Ce | 58 | 1.6E-03 | 6.9 | 1.1E-05 | 2.4E-01 |
| Cf | 98 | 2.0E-03 | 2.0 | 3.4E-04 | 1.2E-02 |
| Cl | 17 | 4.4E-02 | 10.0 | 1.2E-04 | 1.7E+01 |
| Cm | 96 | 2.0E-03 | 2.0 | 3.4E-04 | 1.2E-02 |
| Co | 27 | 1.0E-01 | 2.0 | 1.7E-02 | 6.0E-01 |
| Cs | 55 | 3.5E-01 | 5.8 | 3.7E-03 | 3.3E+01 |
| Eu | 63 | 7.0E-03 | 2.0 | 1.2E-03 | 4.2E-02 |
| Fe | 26 | 7.4E-01 | 3.1 | 4.1E-02 | 1.3E+01 |
| I | 53 | 2.6E+00 | 2.0 | 4.4E-01 | 1.6E+01 |
| Nb | 41 | 2.1E-03 | 2.8 | 1.4E-04 | 3.1E-02 |
| Ni | 28 | 1.1E-01 | 2.0 | 1.9E-02 | 6.8E-01 |
| Np | 93 | 3.4E-03 | 2.4 | 3.4E-04 | 3.3E-02 |
| Pa | 91 | 2.0E-03 | 2.0 | 3.4E-04 | 1.2E-02 |
| Pb | 82 | 5.6E-02 | 10.0 | 1.5E-04 | 2.1E+01 |
| Pd | 46 | 1.0E-02 | 7.8 | 5.0E-05 | 2.0E+00 |
| Pm | 61 | 1.4E-02 | 2.0 | 2.4E-03 | 8.4E-02 |
| Pu | 94 | 1.7E-03 | 7.4 | 9.7E-06 | 2.9E-01 |
| Ra | 88 | 3.9E-04 | 10.0 | 1.0E-06 | 1.5E-01 |
| Rh | 45 | 1.2E-02 | 6.4 | 9.7E-05 | 1.4E+00 |
| Ru | 44 | 5.1E-03 | 2.0 | 8.5E-04 | 3.0E-02 |
| Sb | 51 | 7.9E-02 | 2.0 | 1.3E-02 | 4.7E-01 |
| Se | 34 | 7.3E+00 | 2.0 | 1.2E+00 | 4.4E+01 |
| Sm | 62 | 1.6E-02 | 6.7 | 1.2E-04 | 2.2E+00 |
| Sn | 50 | 8.7E-02 | 10.0 | 2.3E-04 | 3.3E+01 |
| Sr | 38 | 2.7E-01 | 2.0 | 4.5E-02 | 1.6E+00 |
| Tc | 43 | 2.4E+00 | 2.0 | 4.0E-01 | 1.4E+01 |
| Th | 90 | 3.5E-03 | 7.3 | 2.0E-05 | 5.9E-01 |
| U | 92 | 6.3E-01 | 2.5 | 6.0E-02 | 6.7E+00 |
| Y | 39 | 2.5E-03 | 3.8 | 7.9E-05 | 7.8E-02 |
| Zr | 40 | 1.2E-03 | 10.0 | 3.3E-06 | 4.6E-01 |

Source: Table 24, Table 26 to Table 40, and attached Excel file *Calculation_TF_TC_Kd.xls*

### 7.1.3 Translocation Factors

Input values for the translocation factors are shown in Table 41. For leafy vegetables and forage, a fixed value of 1.0 is used. For other types of crop, a piece-wise linear distribution of (0.05, 0%), (0.1, 50%), (0.3, 100%) is suggested. However, GENIIv2 does not accept that type of distribution (Napier 2006 [DIRS 177330], Section 5.3). The closest distribution that can be used in GENIIv2 is a loguniform distribution with minimum of 0.05 and maximum of 0.30. This conversion was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the original distribution is *Translocation_Cumulative_Dist*, whose output was then copied into the *ET_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells A1003:D1009). Several different distributions were tested in the GoldSim before the final selection. Comparison of cumulative distribution function curves in GoldSim element of *Translocation* between the original distribution (GoldSim element: *Translocation_Cumulative_Dist*) and developed distribution (GoldSim element *Translocation_LogUniform_Dist*) is shown in Figure 1.

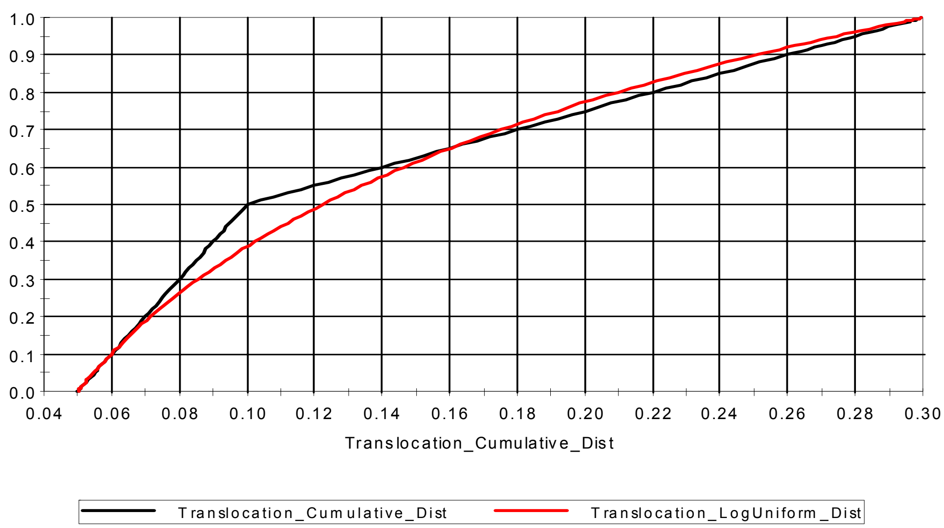


Figure 1. Comparison of Distributions for Translocation Factors

Based on the assumption in Section 3.2.7, locally grown fresh forage is the only feed given to beef cattle and dairy cows, and locally produced grain is the only feed given to poultry and laying hens (BSC 2004 [DIRS 169460], Section 6.1.3.4). Therefore, translocation factors used for animal feed are selected accordingly for the GENIIv2 as tabulated in Table 70.

Table 70. Translocation Factors for Crops Used in the GENIIv2

| Crop Type | GENIIv2 Parameter Symbol | Translocation Factor (Deterministic Value) | Translocation Factor (Distribution and Value) |
|---|---|---|---|
| Leafy vegetables | *TRANS* | 1.0 | 1.0 |
| Root vegetables | *TRANS* | 0.1 | Loguniform distribution<br>Min = 0.05 and Max = 0.3 |
| Fruit | *TRANS* | 0.1 | Loguniform distribution<br>Min = 0.05 and Max = 0.3 |
| Grain | *TRANS* | 0.1 | Loguniform distribution<br>Min = 0.05 and Max = 0.3 |
| Fresh forage for beef cattle | *TRANSA* | 1.0 | 1.0 |
| Grain for poultry | *TRANSA* | 0.1 | Loguniform distribution<br>Min = 0.05 and Max = 0.3 |
| Fresh forage for diary cows | *TRANSA* | 1.0 | 1.0 |
| Grain for eggs | *TRANSA* | 0.1 | Loguniform distribution<br>Min = 0.05 and Max = 0.3 |

Source: Section 4.1.1.3 and Table 41

### 7.1.4 Weathering Rate Constant

As discussed in Section 4.1.1.4, the *weathering rate constant* in the GENIIv2 is equivalent to the weathering half-life in the Biosphere Model. A piece-wise linear distribution with the following values: (5 days; 0%), (14 days; 50%), (30 days; 100%) is shown as inputs for weathering half-life in Section 4.1.1.4. The closest distribution that can be used in the GENIIv2 is a lognormal distribution with geometric mean of 14 days, geometric standard deviation of 1.65, minimum of 5 days, and maximum of 30 days. This conversion was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the original distribution is *Weathering_Cumulative_Dist*, whose output was then copied into the *ET_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells F1003:I1009). Several different distributions were tested in the GoldSim before the final selection. Comparison of cumulative distribution function curves in GoldSim element of *Weathering* between the original distribution (GoldSim element: *Weathering_Cumulative_Dist*) and developed distribution (GoldSim element *Weathering_LogNormal_Dist*) is shown in Figure 2. Distribution values and a deterministic value used in the GENIIv2 are shown in Table 71.

Table 71. Weathering Rate Constant Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Weathering Rate Constant (day) (Deterministic Value) | Weathering Rate Constant (day) (Distribution and Value) |
|---|---|---|---|
| Weathering Rate Constant | *WTIM* | 14 | Lognormal Distribution:<br>GM = 14, GSD = 1.65,<br>Min = 5 and Max = 30 |

Source: Section 4.1.1.4

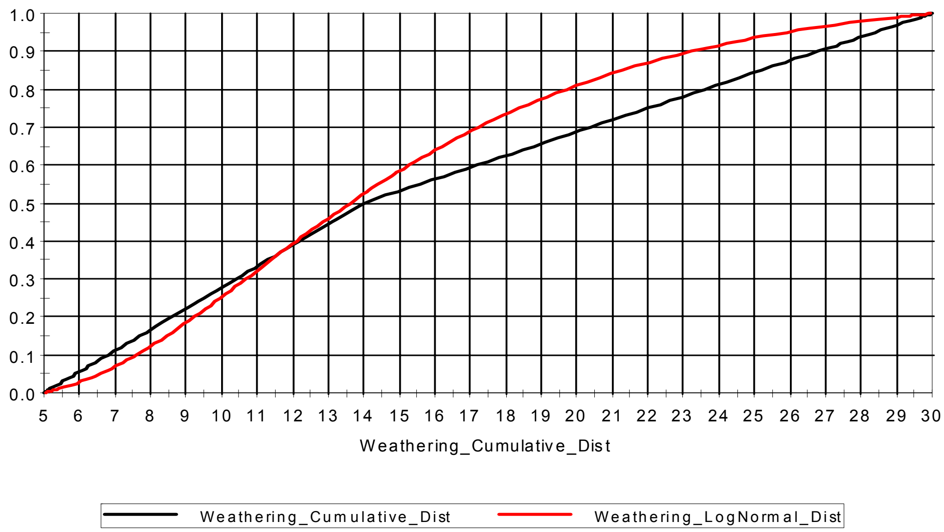


Figure 2. Comparison of Distributions for Weathering Rate Constant

### 7.1.5 Deposition Velocity from Soil To Plant Surface

The dry deposition velocity in the Biosphere Model is for soil particle resuspension, which is used for resuspension deposition from soil to plant surface in the GENIIv2. It is represented by a piece-wise linear cumulative distribution as tabulated in Table 42. This distribution is converted to a distribution that GENIIv2 can accept. The closest distribution is a lognormal distribution with geometric mean of 0.008 m/s, geometric standard deviation of 5.6, minimum of 0.0003 m/s, and maximum of 0.3 m/s. This conversion was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the original distribution is *Deposition_Cumulative_Dist*, whose output was then copied into the *ET_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells K1003:N1009). Several different distributions were tested in the GoldSim before the final selection. Comparison of cumulative distribution function curves in GoldSim element of *Deposition* between the original distribution (GoldSim element: *Deposition_Cumulative_Dist*) and developed distribution (GoldSim element *Deposition_LogNormal_Dist*) is shown in Figure 3. Distribution values and a deterministic value used in the GENIIv2 are shown in Table 72.

As mentioned in Section 4.1.1.5, this parameter may also be used for the GENIIv2 parameter *CLVD*, *atmospheric deposition velocity*. Located in GENIIv2 database, this parameter is used to calculate deposition of particles transported through air dispersion. However, *CLVD* is not used if it is calculated from particle size and density in air transport module, as discussed in Section 7.6.5.

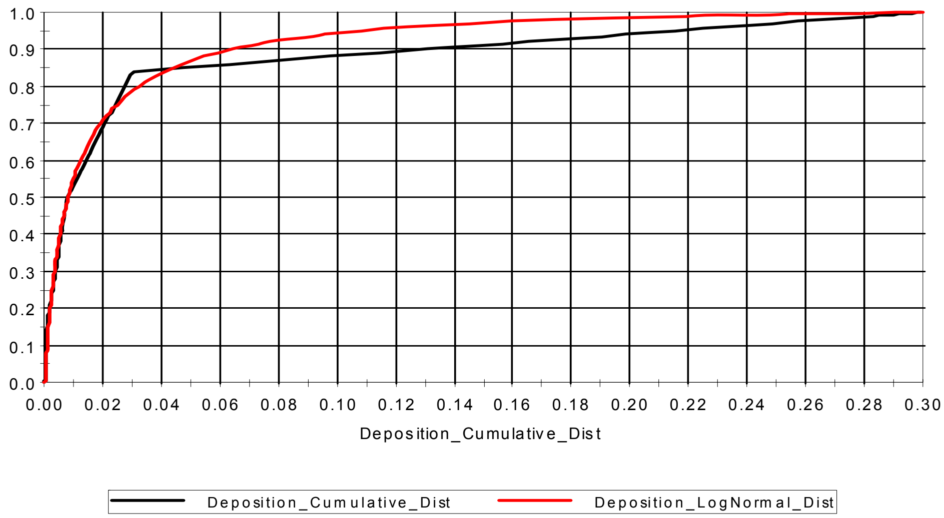


Figure 3. Comparison of Distributions for Deposition Velocity From Soil To Plant Surface

Table 72. Deposition Velocity from Soil to Plant Surface Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Deposition Velocity (m/s) (Deterministic Value) | Deposition Velocity (m/s) (Distribution and Value) |
|---|---|---|---|
| Deposition Velocity From Soil To Plant Surface | *DPVRES* or *CLVD* | 0.008 | Lognormal Distribution: GM = 0.008, GSD = 5.6, Min = 0.0003 and Max = 0.3 |

Source: Section 4.1.1.5 and Table 42.

### 7.1.6 Animal Feed and Soil Consumption Rates

The inputs for the animal feed and soil consumption rates are given by a uniform distribution as shown in Section 4.1.1.6. The calculated means from the uniform distributions are tabulated in Table 73 and Table 74.

Table 73. Consumption Rates Used in the GENIIv2

| Animal Type – Feed Type | GENIIv2 Parameter Symbol | Feed (Kg wet/day) (Deterministic Value) | Feed (Kg wet/day) (Distribution and Value) |
|---|---|---|---|
| Beef cattle – Forage | *CONSUM* | 48.5 | Uniform distribution Min = 29 and Max = 68 |
| Dairy cow – Forage | *CONSUM* | 61.5 | Uniform distribution Min = 50 and Max = 73 |
| Poultry – Grain | *CONSUM* | 0.26 | Uniform distribution Min = 0.12 and Max = 0.40 |
| Laying hen – Grain | *CONSUM* | 0.26 | Uniform distribution Min = 0.12 and Max = 0.40 |

Source: Section 4.1.1.6 and Table 43.

Table 74. Animal Daily Soil Consumption Rates Used in the GENIIv2

| Animal Type | GENIIv2 Parameter Symbol | Soil (Kg/day) (Deterministic Value) | Soil (Kg/day) (Distribution and Value) |
|---|---|---|---|
| Beef cattle | *SLCONA* | 0.70 | Uniform distribution<br>Min = 0.4 and Max = 1.0 |
| Dairy cow | *SLCONA* | 0.95 | Uniform distribution<br>Min = 0.8 and Max = 1.1 |
| Poultry | *SLCONA* | 0.02 | Uniform distribution<br>Min = 0.01 and Max = 0.03 |
| Laying hen | *SLCONA* | 0.02 | Uniform distribution<br>Min = 0.01 and Max = 0.03 |

Source: Section 4.1.1.6 and Table 43.

## 7.2 CALCULATIONS OF SOIL-RELATED PARAMETERS

### 7.2.1 Surface Soil Bulk Density

The surface soil bulk density provided in Section 4.1.2.1 is a triangular distribution over the density range of 1.3 g/cm$^3$ and 1.7 g/cm$^3$ with a mode at 1.5 g/cm$^3$. This distribution is converted to a distribution that GENIIv2 can accept. The closest distribution is a normal distribution with a mean of 1.5 g/cm$^3$, a standard deviation of 0.082 g/cm$^3$, minimum of 1.3 g/cm$^3$, and maximum of 1.7 g/cm$^3$. This conversion was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the original distribution is *SoilDensity_Triangular_Dist*, whose output was then copied into the *SR_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells A1003:D1009). Several different distributions were tested in the GoldSim before the final selection. Comparison of cumulative distribution function curves in GoldSim element of *SoilDensity* between the original distribution (GoldSim element: *SoilDensity_Triangular_Dist*) and developed distribution (GoldSim element *SoilDensity_Normal_Dist*) is shown in Figure 4. Distribution values and a deterministic value used in the GENIIv2 are shown in Table 75.

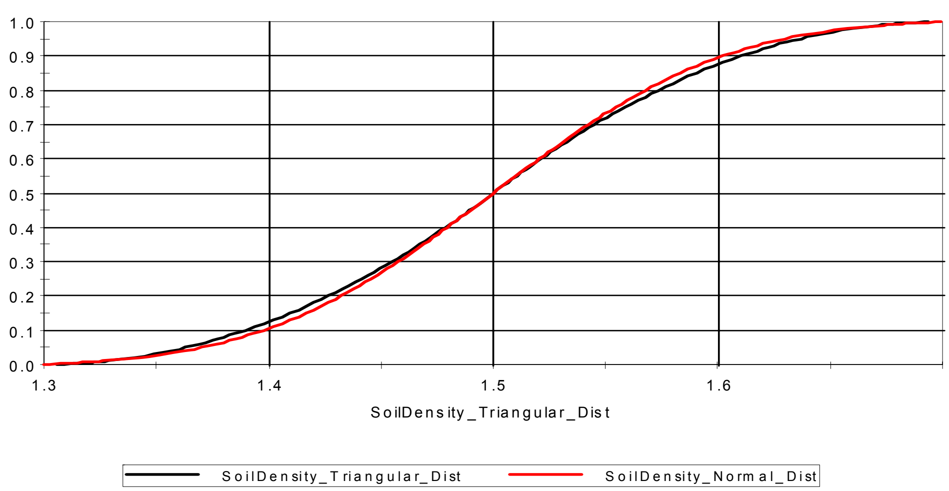


Figure 4. Comparison of Distributions for Soil Bulk Density

Table 75. Surface Soil Bulk Density Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Soil Density (kg/m$^3$) (Deterministic Value) | Soil Density (kg/m$^3$) (Distribution and Value) |
|---|---|---|---|
| Surface soil bulk density, Surface soil density, or Density of contaminated soil/sediment layer | *BULKD* or *SSLDN* | 1500 | Normal Distribution: Mean = 1500, SD = 82, Min = 1300 and Max = 1700 |

Source: Section 4.1.2.1, and Excel file of *Distribution_Comparison.xls*

### 7.2.2 Soil-Water Partition Coefficients

The soils in Amargosa Valley have been classified as sand or sandy loam per BSC 2006 ([DIRS 177400], Table 6.2-1). Geometric mean and standard deviation of soil-water partition coefficients for 17 elements are shown in Table 44 as inputs for this document. The partition coefficients for additional 21 elements not used in the Biosphere Model are listed in Table 45. The same methodology used BSC 2006 ([DIRS 177400], Section 6.3.2) are used to select the appropriate partition coefficients.

The first step is to calculate arithmetic mean of partition coefficients from sandy and loam soils in Table 45 using Equation 3 below:

$$\mu = \exp\left(\lambda + 0.5\,\zeta^2\right) \qquad \text{Equation 3}$$

where,

| | | |
|---|---|---|
| $\mu$ | = | arithmetic mean |
| $\lambda$ | = | mean of the natural logarithm of the observed values x |
| $\zeta$ | = | standard deviation of ln(x) |

The second step is to select a higher calculated arithmetic mean $\mu$ from sandy or loam soils, and add a standard deviation of ln(*Kd*) = ζ. If it is not available, the value of ζ = 1.8 is assigned, as used in BSC 2006 ([DIRS 177400], Section 6.3.2), which is also the same as calculated through available standard deviations of ln(*Kd*).

The third step is to calculate the geometric mean and geometric standard deviation for *Kd* by using the formula for the value of $\mu$ and ζ:

$$GM_{Kd} = \exp(\mu); \quad GSD_{Kd} = \exp(\zeta) \qquad \text{Equation 4}$$

The calculation and selection of partition coefficients are performed in *Kd* worksheet under Excel file of *Calculation_TF_TC_Kd.xls*.

Table 76. Calculated Partition Coefficients for Elements not Used in the Biosphere Model

| Element | Atomic No. | Step 1: Calculated using Equation 3 | | Step 2: Selected ln(Kd) and SD of ln(kd) | | Step 3: Calculated GM and GSD of Kd | |
|---|---|---|---|---|---|---|---|
| | | Sandy Soil (L/kg) | Loam Soil (L/kg) | Mean of ln(Kd) | SD of ln(Kd) | GM of (Kd) (L/kg) | GSD of (Kd) |
| Bi | 83 | 9.9E+01 | 4.5E+02 | 6.1 | 1.8 | 4.5E+02 | 6.0 |
| Ca | 20 | 6.0E+00 | 3.0E+01 | 3.4 | 1.8 | 3.0E+01 | 6.0 |
| Cd | 48 | 2.3E+02 | 1.5E+02 | 4.3 | 1.5 | 7.4E+01 | 4.5 |
| Ce | 58 | 1.8E+03 | 2.5E+04 | 9.0 | 1.5 | 8.1E+03 | 4.5 |
| Cf | 98 | 2.0E+02 | | 5.3 | 1.8 | 2.0E+02 | 6.0 |
| Cm | 96 | 7.9E+04 | 2.3E+04 | 8.4 | 2.4 | 4.4E+03 | 11.0 |
| Co | 27 | 3.0E+03 | 3.1E+03 | 7.2 | 1.3 | 1.3E+03 | 3.7 |
| Eu | 63 | 6.5E+02 | | 6.5 | 1.8 | 6.5E+02 | 6.0 |
| Fe | 26 | 6.5E+03 | 1.0E+03 | 5.4 | 2.6 | 2.2E+02 | 13.5 |
| Nb | 41 | 1.6E+02 | 5.4E+02 | 6.3 | 1.8 | 5.4E+02 | 6.0 |
| Ni | 28 | 1.2E+03 | 3.0E+02 | 6.0 | 1.5 | 4.0E+02 | 4.5 |
| Pd | 46 | 5.5E+01 | 1.8E+02 | 5.2 | 1.8 | 1.8E+02 | 6.0 |
| Pm | 61 | 6.5E+02 | | 6.5 | 1.8 | 6.5E+02 | 6.0 |
| Po | 84 | 5.3E+02 | 9.4E+02 | 6.0 | 1.3 | 4.0E+02 | 3.7 |
| Rh | 45 | 6.0E+01 | | 4.1 | 1.8 | 6.0E+01 | 6.0 |
| Ru | 44 | 1.5E+02 | 9.9E+02 | 6.9 | 1.8 | 9.9E+02 | 6.0 |
| Sb | 51 | 4.5E+01 | 1.5E+02 | 5.0 | 1.8 | 1.5E+02 | 6.0 |
| Sm | 62 | 2.4E+02 | 8.1E+02 | 6.7 | 1.8 | 8.1E+02 | 6.0 |
| Te | 52 | 1.2E+02 | 5.4E+02 | 6.3 | 1.8 | 5.4E+02 | 6.0 |
| Y | 39 | 1.6E+02 | 7.4E+02 | 6.6 | 1.8 | 7.4E+02 | 6.0 |
| Zr | 40 | 6.0E+02 | 2.2E+03 | 7.7 | 1.8 | 2.2E+03 | 6.0 |

Source: Table 45 and attached Excel file: *Calculation_TF_TC_Kd.xls*

Combining Table 44 and Table 76, the partition coefficients for total of 38 elements can be obtained, as shown in Table 77. The distribution of partition coefficients is a lognormal distribution with geometric mean, geometric standard deviation, a lower bound and an upper bound. The lower and upper bounds are calculated using the 95 percent confidence limits of GM $\times$ $GSD^{\pm 1.96}$ as suggested in BSC 2006 ([DIRS 177400], Section 6.3.2). The calculations are performed in the *Kd* worksheet in the Excel file of *Calculation_TF_TC_Kd.xls*.

Table 77. Partition Coefficients for All Elements of Interest

| Element | Atomic No. | GM (L/kg) | GSD | Lower Bound (L/kg) | Upper Bound (L/kg) |
|---|---|---|---|---|---|
| Ac | 89 | 1.5E+03 | 6.0E+00 | 4.3E+01 | 5.0E+04 |
| Am | 95 | 2.0E+03 | 1.4E+01 | 1.2E+01 | 3.3E+05 |
| Bi | 83 | 4.5E+02 | 6.0E+00 | 1.3E+01 | 1.5E+04 |
| C | 14 | 1.8E+01 | 6.0E+00 | 5.3E-01 | 6.2E+02 |
| Ca | 20 | 3.0E+01 | 6.0E+00 | 8.8E-01 | 1.0E+03 |
| Cd | 48 | 7.4E+01 | 4.5E+00 | 3.9E+00 | 1.4E+03 |
| Ce | 58 | 8.1E+03 | 4.5E+00 | 4.3E+02 | 1.5E+05 |
| Cf | 98 | 2.0E+02 | 6.0E+00 | 5.9E+00 | 6.8E+03 |
| Cl | 17 | 1.4E-01 | 6.0E+00 | 1.3E-03 | 1.4E+01 |
| Cm | 96 | 4.4E+03 | 1.1E+01 | 4.0E+01 | 4.9E+05 |
| Co | 27 | 1.3E+03 | 3.7E+00 | 1.0E+02 | 1.7E+04 |
| Cs | 55 | 4.4E+03 | 3.7E+00 | 1.6E+02 | 1.3E+05 |
| Eu | 63 | 6.5E+02 | 6.0E+00 | 1.9E+01 | 2.2E+04 |
| Fe | 26 | 2.2E+02 | 1.3E+01 | 1.4E+00 | 3.6E+04 |
| I | 53 | 4.5E+00 | 7.4E+00 | 8.9E-02 | 2.3E+02 |
| Nb | 41 | 5.4E+02 | 6.0E+00 | 1.6E+01 | 1.9E+04 |
| Ni | 28 | 4.0E+02 | 4.5E+00 | 2.1E+01 | 7.6E+03 |
| Np | 93 | 2.5E+01 | 3.3E+00 | 2.3E+00 | 2.6E+02 |
| Pa | 91 | 1.8E+03 | 6.0E+00 | 5.3E+01 | 6.2E+04 |
| Pb | 82 | 1.6E+04 | 4.1E+00 | 1.0E+03 | 2.5E+05 |
| Pd | 46 | 1.8E+02 | 6.0E+00 | 5.3E+00 | 6.2E+03 |
| Pm | 61 | 6.5E+02 | 6.0E+00 | 1.91E+01 | 2.21E+04 |
| Po | 84 | 4.0E+02 | 3.7E+00 | 3.2E+01 | 5.2E+03 |
| Pu | 94 | 1.2E+03 | 3.3E+00 | 1.2E+02 | 1.3E+04 |
| Ra | 88 | 3.6E+04 | 2.2E+01 | 8.3E+01 | 1.6E+07 |
| Rh | 45 | 6.0E+01 | 6.0E+00 | 1.8E+00 | 2.0E+03 |
| Ru | 44 | 9.9E+02 | 6.0E+00 | 2.9E+01 | 3.4E+04 |
| Sb | 51 | 1.5E+02 | 6.0E+00 | 4.4E+00 | 5.1E+03 |
| Se | 34 | 1.5E+02 | 6.0E+00 | 4.4E+00 | 5.1E+03 |
| Sm | 62 | 8.1E+02 | 6.0E+00 | 2.4E+01 | 2.8E+04 |
| Sn | 50 | 4.5E+02 | 6.0E+00 | 1.3E+01 | 1.5E+04 |
| Sr | 38 | 2.0E+01 | 5.5E+00 | 7.2E-01 | 5.6E+02 |
| Tc | 43 | 1.4E-01 | 6.0E+00 | 1.3E-03 | 1.4E+01 |
| Te | 52 | 5.4E+02 | 6.0E+00 | 1.6E+01 | 1.9E+04 |
| Th | 90 | 3.0E+03 | 8.2E+00 | 4.9E+01 | 1.8E+05 |
| U | 92 | 3.3E+01 | 2.5E+01 | 6.3E-01 | 1.8E+04 |
| Y | 39 | 7.4E+02 | 6.0E+00 | 2.2E+01 | 2.5E+04 |
| Zr | 40 | 2.2E+03 | 6.0E+00 | 6.5E+01 | 7.5E+04 |

Source: Table 44, Table 76 and Excel file of *Calculation_TF_TC_Kd.xls*

### 7.2.3 Soil Water Content

The soil water content provided in Section 4.1.2.3 can be directly used in GENIIv2 for both deterministic value and distribution as shown in Table 78.

Table 78. Soil Water Content Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Soil Water Content (Deterministic Value) | Soil Water Content (Distribution and Value) |
|---|---|---|---|
| Soil Water Content | *MOISTC* | 0.20 | Uniform Distribution: Min = 0.15 and Max = 0.28 |

Source: Section 4.1.2.3

### 7.2.4 Surface Soil Areal Density

This parameter is used as an input to soil model in GENIIv2. It is the product of soil bulk density (*BULKD* – Section 4.1.2.1) and surface soil thickness (*THICK* – Section 4.1.3.1).

$$SLDN = BULKD \times THICK \qquad \text{Equation 5}$$

where,

$SLDN$ = surface soil areal density (kg/m$^2$)
$BULKD$ = soil bulk density (kg/m$^3$)
$THICK$ = surface soil thickness (m)

The deterministic value can be calculated using mean values of the two parameters: 1500 kg/m$^3$ × 0.25 m = 375 kg/m$^2$. However, distribution of the parameter needs to be developed by using distributions of these two parameters. This calculation was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *AreaDensity_Calculated*, whose output was then copied into the *SR_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells F1003:I1009). Several different distributions were tested in the GoldSim before the final selection. Comparison of cumulative distribution function curves in GoldSim element of *AreaDensity* between the original distribution (GoldSim element: *AreaDensity_Calculated*) and developed distribution (GoldSim element *AreaDensity_Normal_Dist*) is shown in Figure 5. Distribution values and a deterministic value used in the GENIIv2 are shown in Table 79.

Table 79. Surface Soil Area Density Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Area Density (kg/m$^2$) (Deterministic Value) | Area Density (kg/m$^2$) (Distribution and Value) |
|---|---|---|---|
| Surface Soil Area Density | *SLDN* | 375 | Normal Distribution: Mean = 262, SD = 109, Min = 69 and Max = 488 |

Source: Section 4.1.2.1 and Section 4.1.3.1, and Excel file of *Distribution_Comparison.xls*

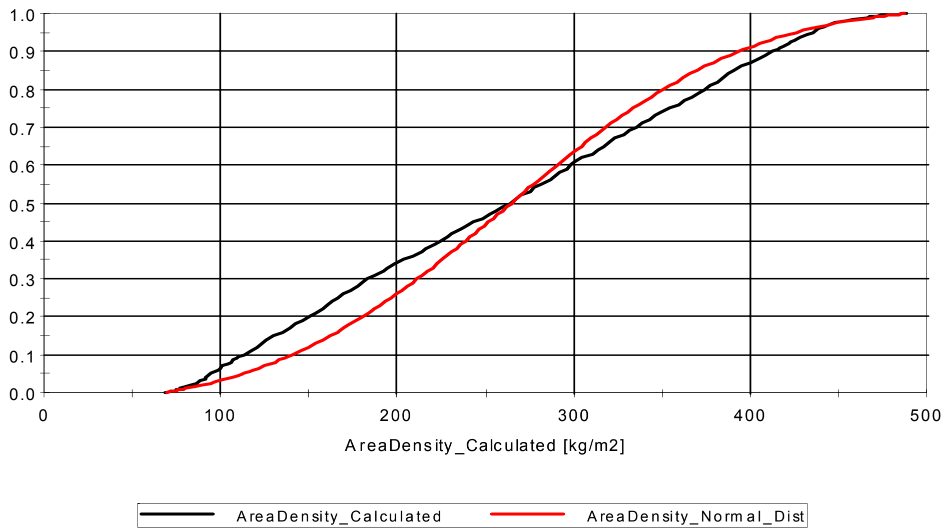


Figure 5. Comparison of Distributions for Surface Soil Area Density

## 7.3 CALCULATIONS OF AGRICULTURAL PARAMETERS

### 7.3.1 Surface Soil Thickness

Surface soil thickness is the same as surface soil depth provided in Section 4.1.3.1, which is based on the tillage depth developed in the Biosphere Model. It is the soil depth for plant whose roots are in that layer. It is a uniform distribution with minimum of 5 cm and maximum of 30 cm. It must be noted that the mean used for stochastic calculation is not the same as the mean from the distribution used for stochastic calculation. The parameter values for surface soil depth are listed in Table 80. The surface soil thickness is for cultivated agricultural lands, where radionuclides deposited are mixed in the entire layer as discussed in Section 3.2.12.

Table 80. Surface Soil Thickness Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Surface Soil Thickness (cm) (Deterministic Value) | Surface Soil Thickness (cm) (Distribution and Value) |
|---|---|---|---|
| Surface Soil Thickness | *THICK, SOILT, and SURCM* | 25 | Uniform Distribution: Min = 5 and Max = 30 |

Source: Section 4.1.3.1

### 7.3.2 Total Infiltration Rate

Total infiltration rate used in the GENIIv2 is the annual overwatering rate provided in Section 4.1.3.2. It is a cumulative distribution, which is converted to a distribution that GENIIv2 can accept. The closest distribution a lognormal distribution with a geometric mean of 0.064 m/yr, geometric standard deviation of 2.34, minimum of 0.009 m/yr, and maximum of 0.275 m/yr. This conversion was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the original distribution is *OverwaterRate_Cumulative_Dist*, whose output was then copied into the *AG_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells A1003:D1009). Several different distributions were tested in the GoldSim before the final selection. Comparison of cumulative distribution function curves in GoldSim element of *OverwaterRate* between the original distribution (GoldSim element: *OverwaterRate_Cumulative_Dist*) and developed distribution (GoldSim element *OverwaterRate_LogNormal_Dist*) is shown in Figure 6. Distribution values and a deterministic value used in the GENIIv2 are shown in Table 81.

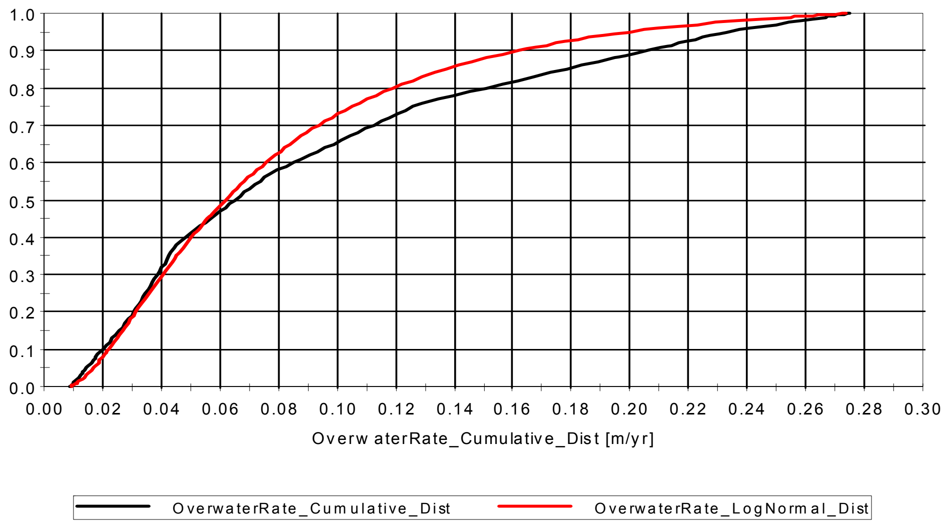


Figure 6. Comparison of Distributions for Infiltration Rate

Table 81. Total Infiltration Rate Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Overwatering Rate (cm/yr) (Deterministic Value) | Overwatering Rate (cm/yr) (Distribution and Value) |
|---|---|---|---|
| Annual Overwatering Rate | *VLEACH* | 7.9 | Lognormal Distribution: GM = 6.4, GSD = 2.34, Min = 0.9 and Max = 27.5 |

Source: Section 4.1.3.2, and Excel file of *Distribution_Comparison.xls*

### 7.3.3 Crop Wet Biomass

Crop dry biomass provided in Section 4.1.3.3 is the product of crop wet biomass and dry wet ratio of biomass. Dry wet ratio of biomass is not the same as dry-to-wet ratio discussed in Section 4.1.3.4, because dry-to-wet ratio is for crop yield that is edible part of plant. Biomass is the plant mass above surface soil, which may or may not be edible. For leafy vegetables and forage, they are the same, but not for root vegetables, fruit, and grain. Therefore, wet yield is the same as wet biomass for leafy vegetables and forage (see Section 7.3.5), which is used in this document.

GENIIv2 uses the crop wet biomass multiply crop dry/wet ratio to calculate airborne particles deposited on crop surface (Napier et al 2006 ([DIRS 177331], Section 9.4). This part of the model is equivalent to crop dry biomass in the Biosphere Model (BSC 2004 [DIRS 169460]), Section 6.4.3). However, the GENIIv2 does not have two separate parameters: dry wet ratio of crop and wet ratio for biomass. Therefore, the wet biomass can be calculated as a ratio of crop dry biomass (Section 4.1.3.3) to crop dry/wet ratio (Section 4.1.3.4) for root vegetables, fruit, and grain.

$$BIOMAS_j = \frac{DRYMAS_j}{DRYFRC_j} \qquad \text{Equation 6}$$

where,

*BIOMAS* = wet biomass for crop type *j* (kg-wet/m$^2$)
*DRYMAS* = dry biomass for crop type *j* (kg-dry/m$^2$)
*DRYFRC* = dry to wet ratio for crop type *j* (kg-dry/kg-wet)
*j* = crop type, including root vegetables, fruit, and grain

The mean values of crop wet biomass can be calculated from a ratio of the means from the two inputs (Table 47 and Table 48). The distribution of crop wet biomass are developed using GoldSim software. This calculation was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim elements for the calculation are *WetBiomOther_Calculated*, *WetBiomFruit_Calculated*, and *WetBiomGrain_Calculated*. The outputs of these elements were then copied into the *AG_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells F1003:AC1009). However, it is found that the ranges of calculated wet biomass for root vegetables and fruit are very large, mainly due to extreme values of the two parameters sampled in some realizations. Therefore, 5$^{th}$ percentile and 95$^{th}$ percentile values are selected to be lower and upper bound for the distribution values, as shown in Table 82.

Comparison of cumulative distribution function curves for the calculated distribution (GoldSim elements: *WetBiomOther_Calculated*, *WetBiomFruit_Calculated,* and *WetBiomGrain_Calculated*) and developed distribution (GoldSim element *WetBiomOther_LogNormal_Dist*, *WetBiomFruit_LogNormal_Dist*, and *WetBiomGrain_LogNormal_Dist*) are shown in Figure 7 to Figure 9.

Based on the assumption in Section 3.2.7, locally grown fresh forage is the only feed given to beef cattle and dairy cows, and locally produced grain is the only feed given to poultry and laying hens. Therefore, grain feeds for beef cattle and dairy cow are not considered and their values are not listed in the results of this section. Wet biomasses used for animal feed are selected accordingly for the GENIIv2 as tabulated in Table 82.

Table 82. Crop Wet Biomass Used in the GENIIv2

| Crop Type | GENIIv2 Parameter Symbol | Crop Wet Biomass ($kg\text{-}wet/m^2$) (Deterministic Value) | Crop Wet Biomass ($kg\text{-}wet/m^2$) (Distribution and Value) |
|---|---|---|---|
| Leafy vegetables | *BIOMAS* | 3.30 | Lognormal distribution: GM = 2.83, GSD = 1.65, Min = 1.08 and Max = 7.85 |
| Root (Other) vegetables | *BIOMAS* | 4.17 | Lognormal distribution: GM = 4.81, GSD = 1.54, Min = 2.11 and Max = 9.82 |
| Fruit | *BIOMAS* | 5.17 | Lognormal distribution: GM = 5.54, GSD = 1.50, Min = 3.18 and Max = 9.51 |
| Grain | *BIOMAS* | 1.25 | Lognormal distribution: GM = 1.12, GSD = 1.50, Min = 0.67 and Max = 2.19 |
| Fresh forage for beef cattle | *BIOMAS2* | 2.14 | Lognormal distribution: GM = 1.83, GSD = 1.72, Min = 0.69 and Max = 6.28 |
| Grain for poultry | *BIOMAS2* | 1.25 | Lognormal distribution: GM = 1.12, GSD = 1.50, Min = 0.67 and Max = 2.19 |
| Fresh forage for diary cows | *BIOMAS2* | 2.14 | Lognormal distribution: GM = 1.83, GSD = 1.72, Min = 0.69 and Max = 6.28 |
| Grain for eggs | *BIOMAS2* | 1.25 | Lognormal distribution: GM = 1.12, GSD = 1.50, Min = 0.67 and Max = 2.19 |

Source: Table 47, Table 48 and Excel file of *Distribution_Comparison.xls*

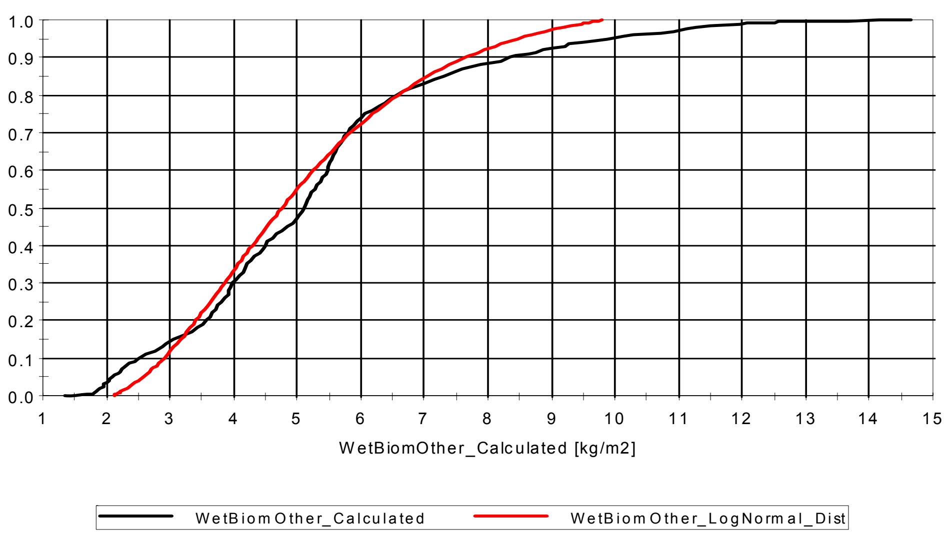


Figure 7. Comparison of Distributions for Wet Biomass for Root Vegetables

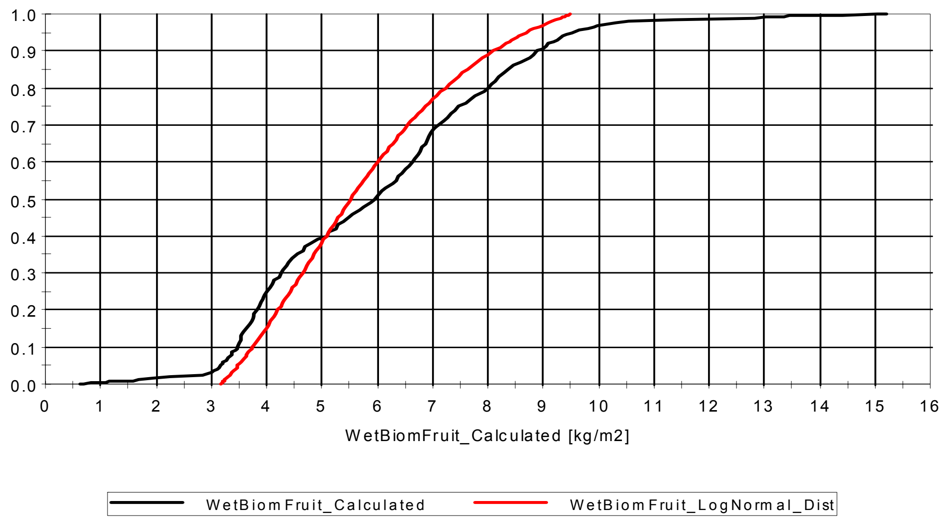


Figure 8. Comparison of Distributions for Wet Biomass for Fruit

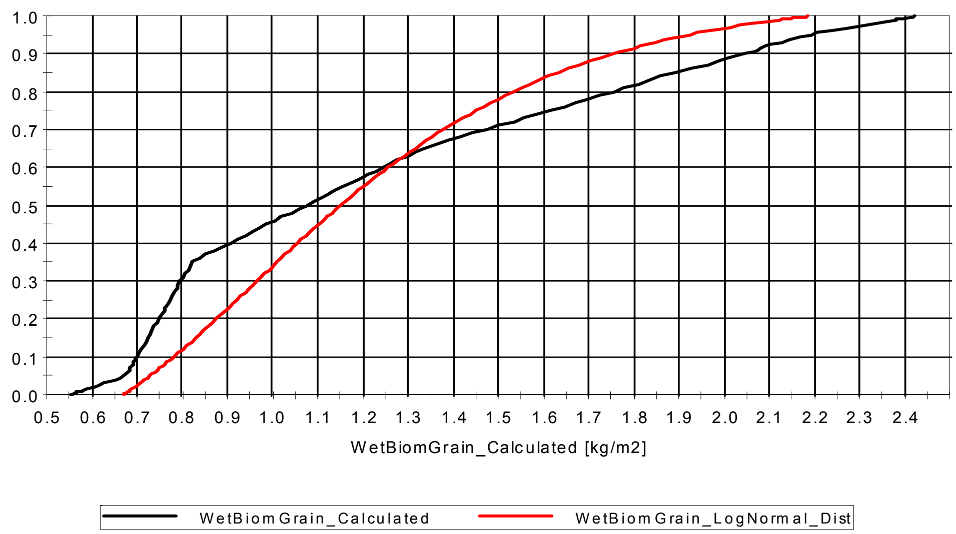


Figure 9. Comparison of Distributions for Wet Biomass for Grain

### 7.3.4 Crop Dry-to-Wet Ratios

Dry-to-wet weight ratios provided in Section 4.1.3.4 are for five crop types. The parameter distribution for all crop types is a cumulative distribution that is converted to a distribution that GENIIv2 can accept. The closest distributions for the five crop types are tabulated in Table 83. This calculation was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The original distributions are in the GoldSim elements of *DryWetLeafy_Cumulative_Dist*, *DryWetOther_Cumulative_Dist*, *DryWetFruit_Cumulative_Dist*, *DryWetGrain_Cumulative_Dist*, and

*DryWetForage_Cumulative_Dist*. The outputs of these elements were copied into the *AG_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells AE1003:BB1009). Comparison of cumulative distribution function curves in GoldSim element of *DryWetLeafy* between the original distribution (GoldSim elements: *DryWetLeafy_Cumulative_Dist*) and developed distribution (GoldSim element *DryWetLeafy_Normal_Dist*) is shown in Figure 10. Similarly, comparison of cumulative distribution function curves in GoldSim elements of *DryWetOther, DryWetFruit, DryWetGrain, DryWetForage* between the original distributions (GoldSim elements: *DryWetOther_Cumulative_Dist, DryWetFruit_Cumulative_Dist*, *DryWetGrain_Cumulative_Dist*, *DryWetForage_Cumulative_Dist*) and developed distributions (GoldSim elements: *DryWetOther_LogNormal_Dist*, *DryWetFruit_LogUniforml_Dist*, *DryWetGrain_Uniform_Dist*, and *DryWetForage_Uniform_Dist*) for root vegetables, fruit, grain, and forage are shown in Figure 11 to Figure 14, respectively.

Based on the assumption in Section 3.2.7, locally grown fresh forage is the only feed given to beef cattle and dairy cows, and locally produced grain is the only feed given to poultry and laying hens. Dry/wet ratios used for animal feed are selected accordingly for the GENIIv2 as tabulated in Table 83.

Table 83. Crop Dry/Wet Ratio Used in the GENIIv2

| Crop Type | GENIIv2 Parameter Symbol | Crop Dry/Wet Ratio (Deterministic Value) | Crop Dry/Wet Ratio (Distribution and Value) |
|---|---|---|---|
| Leafy vegetables | *DRYFAC* | 0.07 | Normal Distribution: Mean =0.071, SD = 0.015, Min = 0.041 and Max =0.093 |
| Root (Other) vegetables | *DRYFAC* | 0.103 | Lognormal distribution: GM = 0.089, GSD = 1.52, Min = 0.035 and Max = 0.24 |
| Fruit | *DRYFAC* | 0.12 | Loguniform distribution with Min = 0.062 and Max = 0.194 |
| Grain | *DRYFAC* | 0.903 | Uniform distribution with Min = 0.891 and Max = 0.918 |
| Fresh forage for beef cattle | *DRYFA2* | 0.220 | Uniform distribution with Min = 0.182 and Max = 0.238 |
| Grain for poultry | *DRYFA2* | 0.903 | Uniform distribution with Min = 0.891 and Max = 0.918 |
| Fresh forage for diary cows | *DRYFA2* | 0.220 | Uniform distribution with Min = 0.182 and Max = 0.238 |
| Grain for eggs | *DRYFA2* | 0.903 | Uniform distribution with Min = 0.891 and Max = 0.918 |

Source: Section 4.1.3.4, Table 48, and Excel file of *Distribution_Comparison.xls*

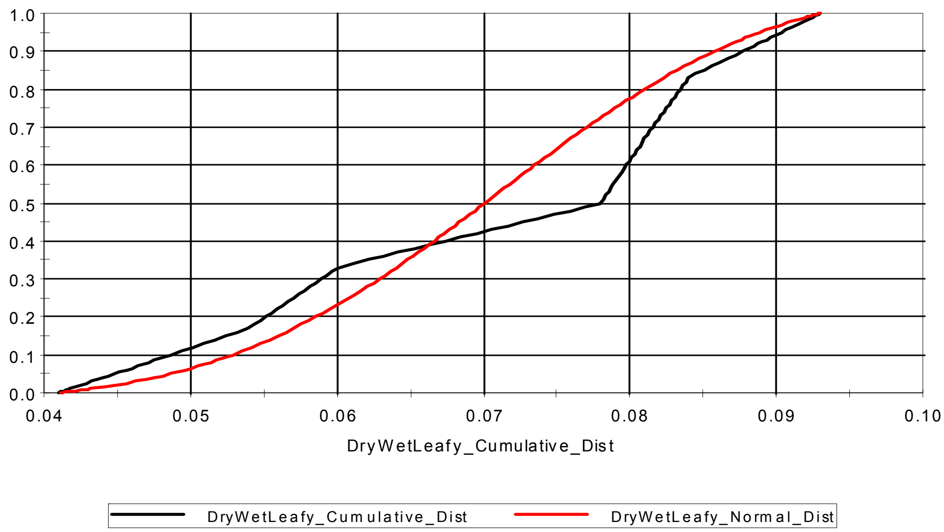


Figure 10. Comparison of Distributions for Dry/Wet Ratio for Leafy Vegetables

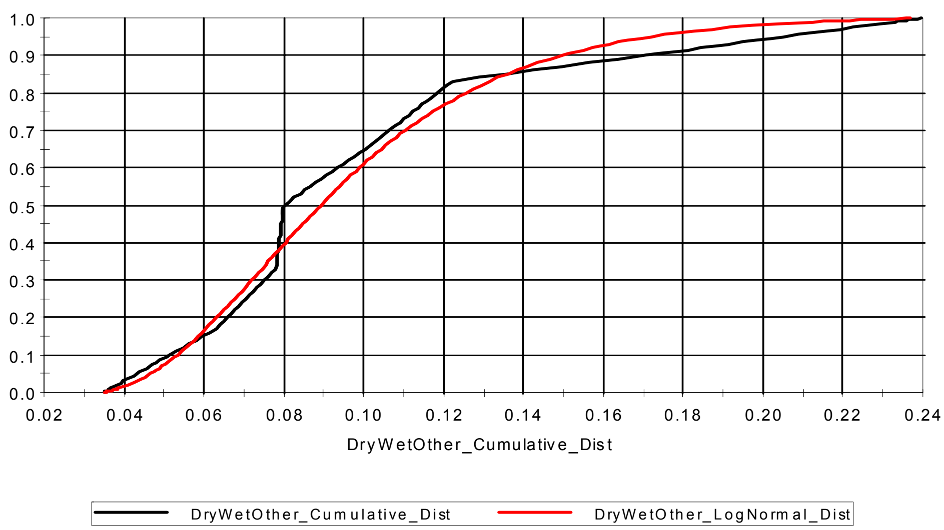


Figure 11. Comparison of Distributions for Dry/Wet Ratio for Root Vegetables

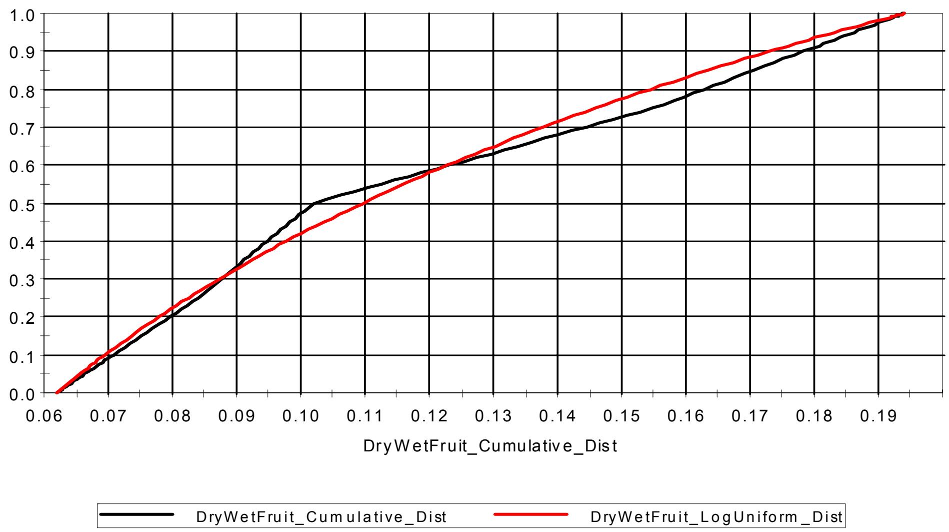


Figure 12. Comparison of Distributions for Dry/Wet Ratio for Fruit

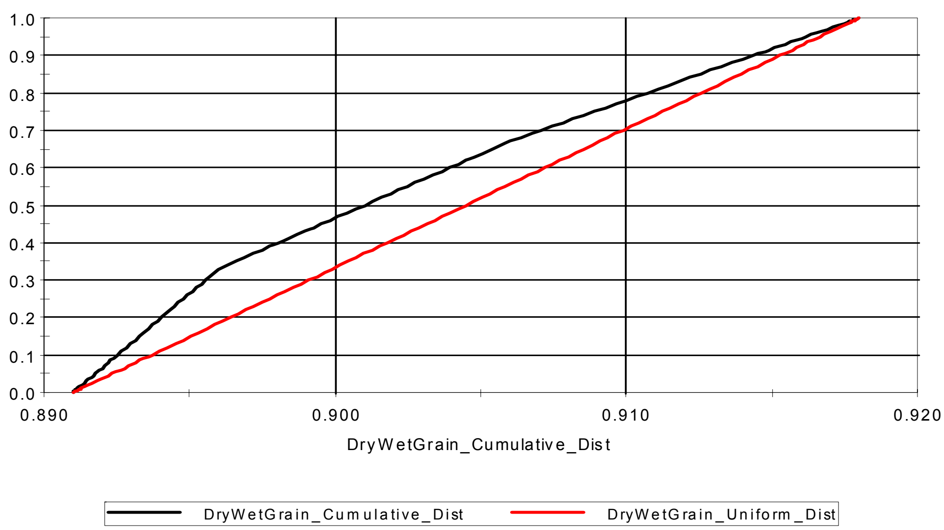


Figure 13. Comparison of Distributions for Dry/Wet Ratio for Grain

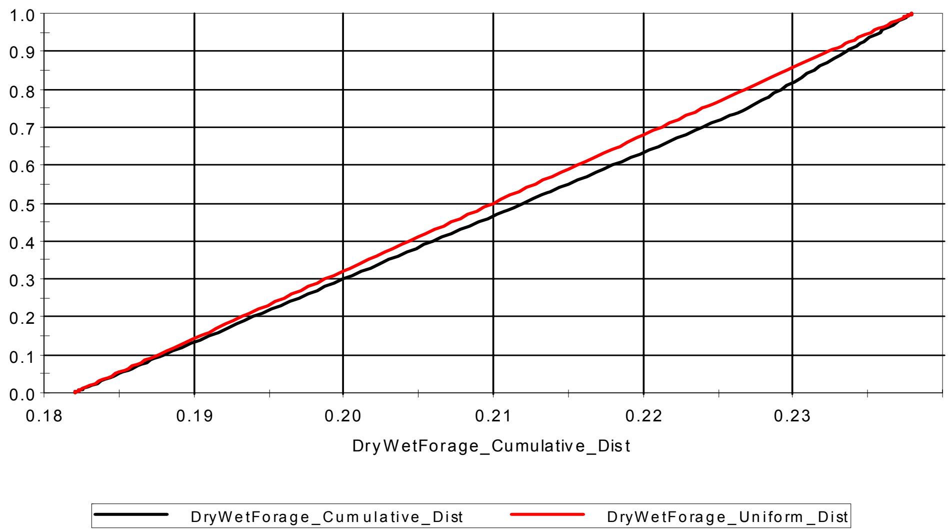


Figure 14. Comparison of Distributions for Dry/Wet Ratio for Forage

### 7.3.5 Crop Yields

Crop wet yields provided in Section 4.1.3.5 are for five crop types. The parameter distribution for all crop types is a cumulative distribution that is converted to a distribution that GENIIv2 can accept. The closest distributions for the five crop types are tabulated in Table 84. The conversion was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The original distributions are in the GoldSim elements of *YieldLeafy_Cumulative_Dist*, *YieldRoot_Cumulative_Dist*, *YieldFruit_Cumulative_Dist*, *YieldGrain_Cumulative_Dist*, and *YieldForage_Cumulative_Dist*. The outputs of these elements were copied into the *AG_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values (see cells BD1003:CA1009). Comparison of cumulative distribution function curves in GoldSim elements of *YieldLeafy*, *YieldRoot, YieldFruit, YieldGrain,* and *YieldForage* between the original distributions (GoldSim elements: *YieldLeafy_Cumulative_Dist*, *YieldOther_Cumulative_Dist,* *YieldFruit_Cumulative_Dist*, *YieldGrain_Cumulative_Dist*, *YieldForage_Cumulative_Dist*) and developed distributions (GoldSim elements: *YieldLeafy_LogNormal_Dist*, *YieldOther_LogNormal_Dist*, *YieldFruit_LogNormal_Dist*, *YieldGrain_LogNormal_Dist*, and *YieldtForage_LogNormal_Dist*) for leafy vegetables, root vegetables, fruit, grain, and forage, respectively, are shown in Figure 15 and Figure 19, respectively.

Based on the assumption in Section 3.2.7, locally grown fresh forage is the only feed given to beef cattle and dairy cows, and locally produced grain is the only feed given to poultry and laying hens. Crop yields used for animal feed are selected accordingly for the GENIIv2 as tabulated in Table 84.

Table 84. Crop Yields Used in the GENIIv2

| Crop Type | GENIIv2 Parameter Symbol | Crop Yield (kg-wet/m$^2$) (Deterministic Value) | Crop Yield (kg-wet/m$^2$) (Distribution and Value) |
|---|---|---|---|
| Leafy vegetables | *YELD* | 3.30 | Lognormal distribution: GM = 2.83, GSD = 1.65, Min = 1.08 and Max = 7.85 |
| Root (Other) vegetables | *YELD* | 4.13 | Lognormal distribution: GM = 4.06, GSD = 1.20, Min = 2.80 and Max = 6.61 |
| Fruit | *YELD* | 2.75 | Lognormal distribution: GM = 2.70, GSD = 1.37, Min = 0.73 and Max = 6.89 |
| Grain | *YELD* | 0.59 | Lognormal distribution: GM = 0.52, GSD = 1.51, Min = 0.27 and Max = 1.22 |
| Fresh forage for beef cattle | *YELDA* | 2.14 | Lognormal distribution: GM = 1.83, GSD = 1.72, Min = 0.69 and Max = 6.28 |
| Grain for poultry | *YELDA* | 0.59 | Lognormal distribution: GM = 0.52, GSD = 1.51, Min = 0.27 and Max = 1.22 |
| Fresh forage for diary cows | *YELDA* | 2.14 | Lognormal distribution: GM = 1.83, GSD = 1.72, Min = 0.69 and Max = 6.28 |
| Grain for eggs | *YELDA* | 0.59 | Lognormal distribution: GM = 0.52, GSD = 1.51, Min = 0.27 and Max = 1.22 |

Source: Section 4.1.3.5, Table 49, and Excel file of *Distribution_Comparison.xls*

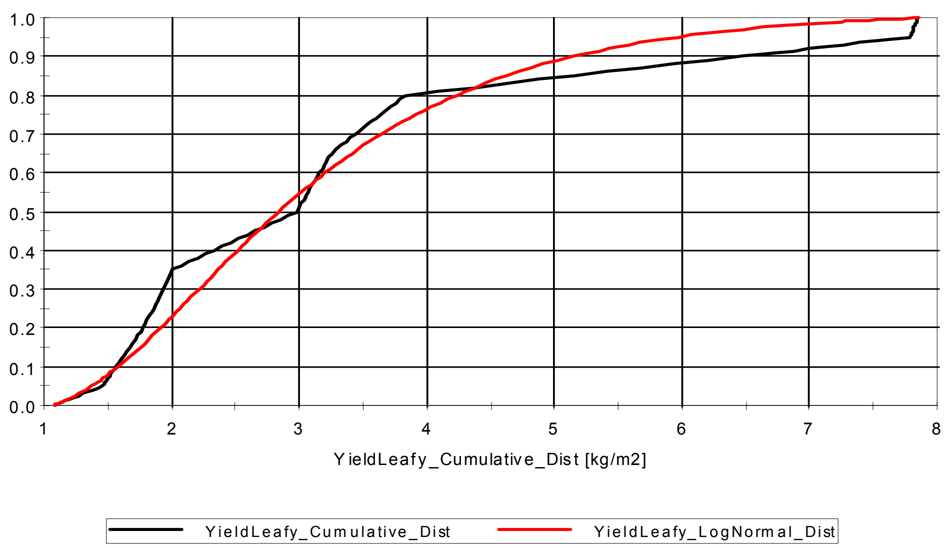


Figure 15. Comparison of Distributions for Leafy Vegetables Yield

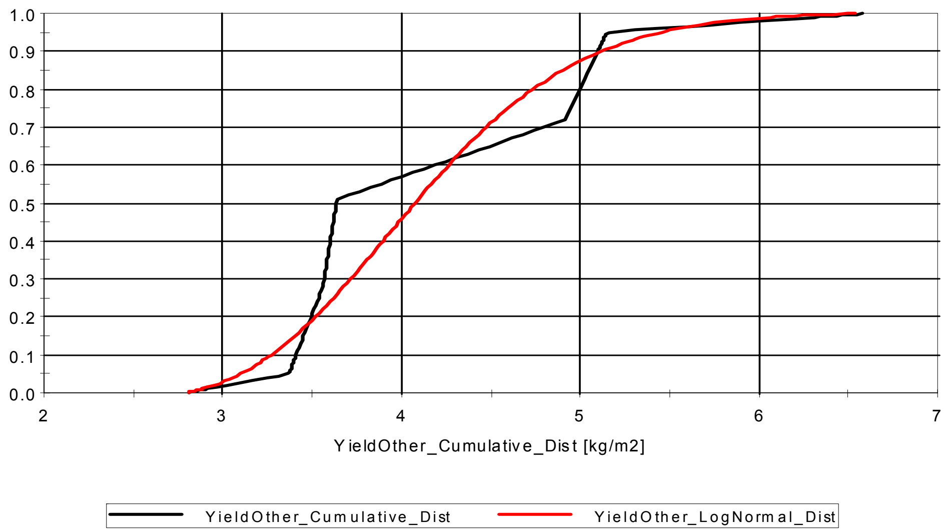


Figure 16. Comparison of Distributions for Root Vegetables Yield

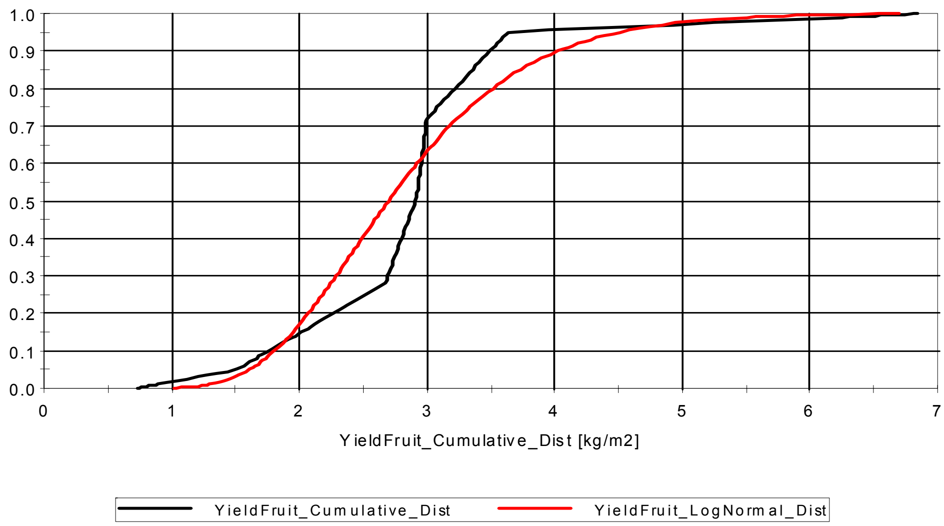


Figure 17. Comparison of Distributions for Fruit Yield

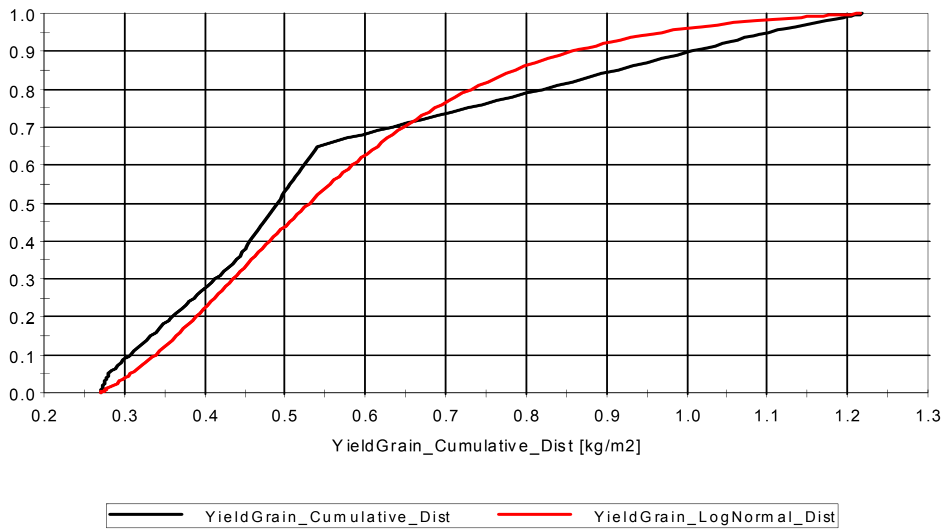


Figure 18. Comparison of Distributions for Grain Yield

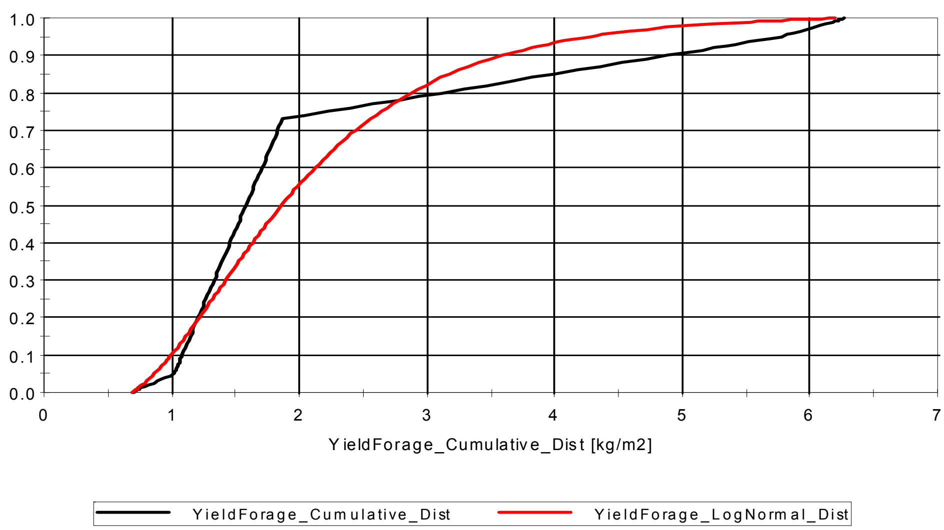


Figure 19. Comparison of Distributions for Forage Yield

### 7.3.6 Crop Growing Periods

Crop growing periods and animal feed growing periods used in GENIIv2 are provided in Section 4.1.3.6. The growing times for five types of crops used in the Biosphere Model are fixed values. Based on the assumption 3.2.7, locally grown fresh forage is the only feed given to beef cattle and dairy cows, and locally produced grain is the only feed given to poultry and laying hens. Growing periods used for animal feed are selected accordingly for the GENIIv2 as tabulated in Table 85.

Table 85. Growing Periods Used in the GENIIv2

| Crop Type | GENIIv2 Parameter Symbol | Growing Period (day) (Deterministic Value) | Growing Period (day) (Distribution and Value) |
|---|---|---|---|
| Leafy vegetables | *GRWP* | 75 | None |
| Root (Other) vegetables | *GRWP* | 80 | None |
| Fruit | *GRWP* | 160 | None |
| Grain | *GRWP* | 200 | None |
| Fresh forage for beef cattle | *GRWPA* | 75 | None |
| Grain for poultry | *GRWPA* | 200 | None |
| Fresh forage for diary cows | *GRWPA* | 75 | None |
| Grain for eggs | *GRWPA* | 200 | None |

Source: Section 4.1.3.6 and Table 50

### 7.3.7 Resuspension Factor from Soil to Plant Surfaces

Resuspension factor from soil to plant surface relates the radionuclide concentration in soil (per unit area) to the concentration in air (Napier et al 2006 [DIRS 177331], Section 9.4.1.5). The parameter can be calculated from a ratio of mass loading for crops provided in Section 4.1.4.1 to surface soil areal concentration calculated in Section 7.2.4, based on the fact that radionuclide mass concentration is the same in soil and in air. The resuspension factor for food crop and animal product pathway is representative of conditions on farmland, which may be different from the resuspension factor for the inhalation exposure pathway. Resuspension factor is in units of per meter.

$$LEAFRS = \frac{MLFC}{SLDN} \qquad \text{Equation 7}$$

where,

$LEAFRS$ = resuspension factor from soil to plant surface (1/m)

$MLFC$ = mass loading for crops ($kg/m^3$)

$SLDN$ = surface soil areal density ($kg/m^2$)

The deterministic value can be calculated directly to be $3.2\times10^{-10}$ ($m^{-1}$) = 0.12 $mg/m^3$ ÷ 375 $kg/m^2$. However, distribution of the parameter needs to be developed by using distributions of above two parameters. This calculation was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *Resupension_Calculated*, whose output was copied into *Inh_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum for distribution values, which is shown in Table 86. The comparison of cumulative distribution function curves (GoldSim element: *Resupension*) for the calculated distribution (GoldSim element: *Resupension_Calculated*) and developed distribution (GoldSim element *Resupension_LogNormal_Dist*) is shown in Figure 20.

Table 86. Resuspension Factor From Soil To Plant Surface Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Resuspension Factor ($m^{-1}$) (Deterministic Value) | Resuspension Factor ($m^{-1}$) (Distribution and Value) |
|---|---|---|---|
| Resuspension factor from soil to plant surface | *LEAFRS* | 3.2E-10 | Lognormal Distribution: GM = 4.59E-10, GSD = 1.83, Min = 8.37E-11 and Max = 2.52E-9 |

Source: Section 4.1.4.1, Section 7.2.4 and Excel file of *Distribution_Comparison.xls*

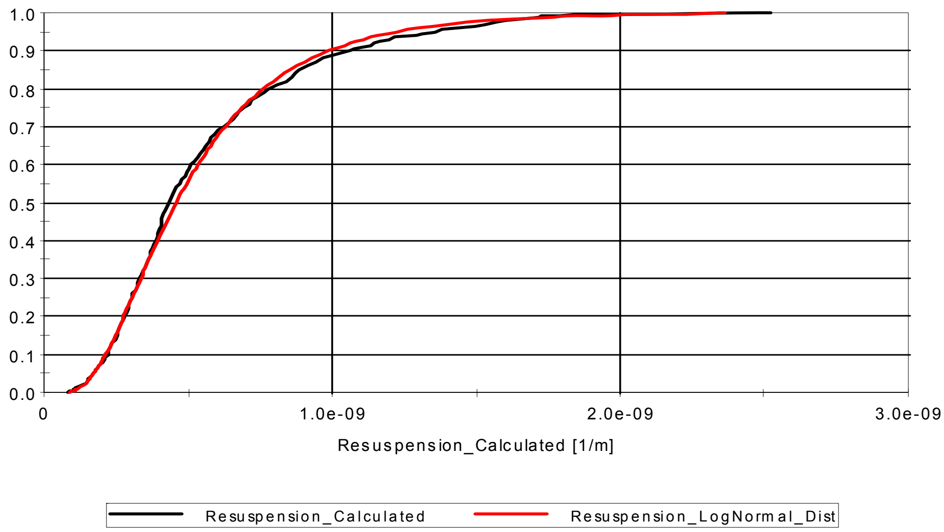


Figure 20. Comparison of Distributions for Resuspension Factor

### 7.3.8 Acute Fresh Forage Intake Fraction

The current GENIIv2 model conservatively assumes that there is no weathering for the fresh forage if an accident occurs in autumn (Napier et al 2006 [DIRS 177331], p.131), and that cattle and cows are fed with the contaminated forage that is harvested immediately after an accident for an entire year. This method is conservative because site-specific agricultural practice uses multiple alfalfa cuttings as specified in Section 4.1.3.7. A new parameter, the acute fresh forage intake fraction can model the fraction of animal diet that comes from fresh forage and stored forage. The fraction of 1 means all animal feed is the fresh forage, while the fraction of 0 means all animal feed is the stored forage. After an initial acute release, the meat or milk concentration of a radionuclide will be reduced as this fraction is increased, because fresh forage is weathered, but stored forage is not.

Based on Section 4.1.3.7, there are six cuttings per year for alfalfa between April and November. The contaminated alfalfa from a single cutting after an accident is not sufficient for the entire year, because it only provides one sixth of the animal feed supply based on the conservative assumption that all animal feed is locally produced (Section 3.2.7). Therefore, it is reasonably conservative to use 0.17 (1/6) as a stored forage fraction, and 0.83 as an acute fresh forage intake fraction (fraction of animal diet that is fresh forage in autumn), *FRACFR*.

## 7.4 CALCULATIONS OF INHALATION PARAMETERS

### 7.4.1 Mass Loading Factor for Resuspension Model

The mass loading for inhalation pathway used in the Biosphere Model is environment dependent, which is non-cultivated lands as discussed in Section 3.2.12. Five different environments are considered to capture different level of dustiness for the receptor, as discussed in Section 4.1.4.2. Time spend in each environment are provided in Section 4.1.5.4.

Because the GENIIv2 does not provide the capability of an environmental dependent inhalation pathway, a time-weighted mass loading is calculated for inhalation of resuspension as:

$$XMLF = \frac{\sum_k S_k \times T_k}{\sum_k T_k} \qquad \text{Equation 8}$$

where,

$XMLF$ = weighted mass loading factor (g/m$^3$)

$S_k$ = mass loading for environment $k$ (g/m$^3$)

$T_k$ = daily exposure time at environment k (hr/day)

$k$ = environment index, including active outdoors, inactive outdoors, inactive indoors, asleep indoors, and away.

The calculation of mass loading was performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *MassLoading_Calculated*, which uses mass loading and daily exposure time for four environments. As mass loading at the away environment is not considered as contaminated, it is not included in the calculation in the *MassLoading_Calculated*. The output of the *MassLoading_Calculated* was copied into the *Inh_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum for distribution values (see cells K1003:N1009). The best distribution is a lognormal and its values are shown in Table 87. The comparison of cumulative distribution function curves in the GoldSim element, *MassLoading* between the calculated distribution (GoldSim element: *MassLoading_Calculated*) and developed distribution (GoldSim element *MassLoading_LogNormal_Dist*) is shown in Figure 21.

Table 87. Mass Loading for Resuspension Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Mass Loading for Resuspension (g/m$^3$) (Deterministic Value) | Mass Loading for Resuspension (g/m$^3$) (Distribution and Value) |
|---|---|---|---|
| Mass loading factor for resuspension model resuspension | *XMLF* | 0.0006 | Lognormal Distribution: GM = 0.0006, GSD = 1.50, Min = 0.0002 and Max = 0.0014 |

Source: Section 4.1.4.2, Section 4.1.5.4, and Excel file of *Distribution_Comparison.xls*

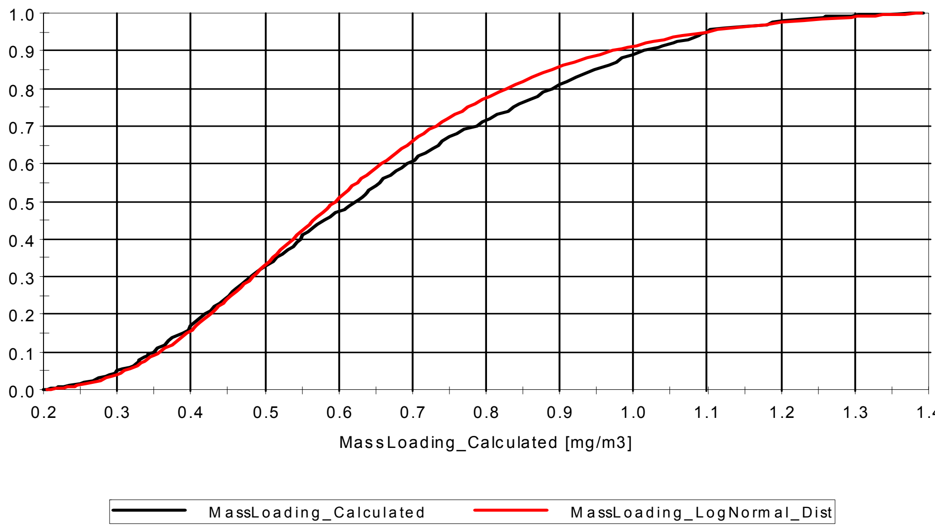


Figure 21. Comparison of Distributions for Mass Loading factor

### 7.4.2 Depth of Top Soil Available for Resuspension

Critical thickness (a hypothetical layer of soil from which soil particles would be more readily resuspended) is provided in Section 4.1.1.7. Resuspension caused by the wind relates only to the material the wind stress can act upon, which might be within the top millimeter or so of a soil surface (Sehmel 1980 [DIRS 163178], p. 110). In general, the range of surface soil thickness that may be used for characterizing the resuspension source strength is from about 1 mm to 1 cm (Sehmel 1984 [DIRS 158693], p. 574). Thus, the values and distribution provided for critical thickness is suitable for the depth of top soil available for resuspension used in the GENIIv2. The values and distribution are given in Table 88.

This parameter is also used for the thickness of contaminated soil/sediment layer to calculate external exposure. It is expected that only small amount of contaminated particles be transported and deposited on the ground surface. Then the contaminated particles would be mixed with soil due to resuspension, which causes external exposure as well.

Table 88. Depth of Top Soil Available for Resuspension Used in the GENIIv2

| Parameter Name | GENIIv2 Parameter Symbol | Resuspension Depth (cm) (Deterministic Value) | Resuspension Factor (cm) (Distribution and Value) |
|---|---|---|---|
| Depth of top soil available for resuspension | *AVASL* | 0.2 | Uniform Distribution: Min = 0. 1 and Max = 0.3 |

Source: Section 4.1.1.7.

## 7.5 CALCULATIONS OF RECEPTOR PARAMETERS

Characteristics of the receptor in the TSPA are based on the RMEI concept, defined in 10 CFR 63.312. The related REMI parameters developed in the Biosphere Model are based on the mean value of entire Amargosa Valley. However, the receptor for the PCSA is based on any real member of public, as required 10 CFR 63.211. Therefore, some of the receptor parameters developed by the Biosphere Model are not used directly in the PCSA without modification.

### 7.5.1 Chronic Exposure Period

In order to include the cumulative effect of all previous years' chronic releases during the 50-year emplacement period (see Section 3.2.4), a 50-year chronic release period is included in the dose calculation. Although the exposure period starts at the beginning of $50^{th}$ year and has duration of one year, chronic releases over the previous 49 years are included, and represent the annual exposure in the final year of a 50-year emplacement period. It includes the effects of continual buildup of soil contamination over the entire emplacement period.

Chronic airborne releases due to normal operations are modeled to occur continuously over a 50-year period beginning at time 0 and ending at 50 year (*RELEND*). In order to include the cumulative effect of contamination buildup from all previous years' chronic releases during the emplacement period, the 1-year exposure period begins at time 49 year (*BEFORE*) and has a duration of 1 year (*NTKEND*). Deposition for 49 years (*BEFAIR*) occurs prior to the current year's release and the 1-year exposure period. Figure 22 shows the relationship among these four parameters. It is not in scale and for general purpose. A dash line in the figure means time expandable.

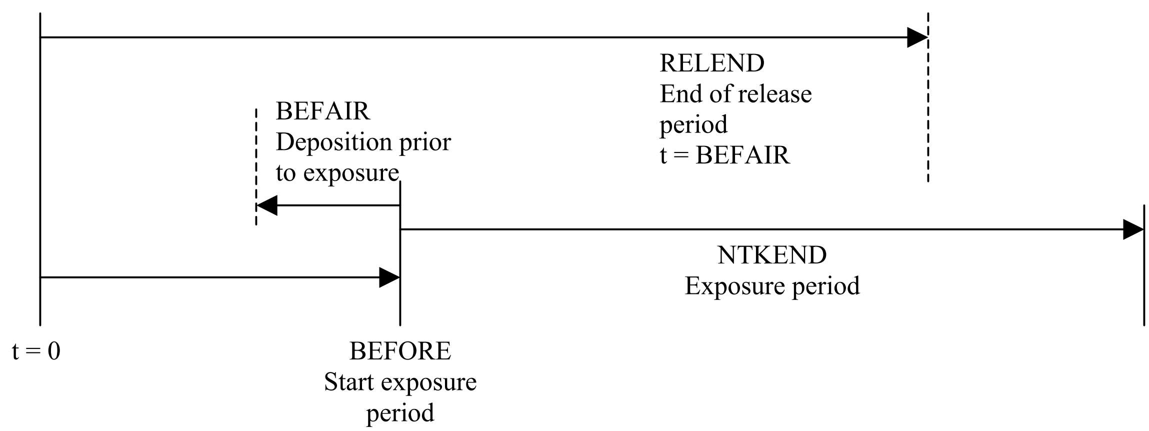


Figure 22. Exposure and Release Time Parameters

### 7.5.2 External Exposure Times

#### 7.5.2.1 External Exposure Period

The daily exposure times for various environments provided in Section 4.1.5.4 are the basis to develop external exposure time, as well as a fraction of daily time spent outdoors and indoors. A continuous full time residential occupancy is reasonable for an offsite individual, that is, 365 days per year of external exposure period can be used for both air submersion and ground shine. However, an individual spends average 2 hrs each day (Table 55) away from Amargosa Valley, where it is considered an uncontaminated area (BSC 2005 [DIRS 172827], Section 6.3). The total daily exposure time for air submersion and ground shine is then 22 hours per day on average. The distribution of this parameter was performed stochastically in the GoldSim file:

*Distribution_Comparison.gsm*. The GoldSim element for the calculation is *DailyTime_Calculated* using

$$T_{ex} = 24(\text{hr/day}) - T_{away} \qquad \text{Equation 9}$$

where,

$T_{away}$ = daily exposure time at away environment (hr/day)

The output of the *DailyTime_Calculated* was then copied into the *Inh_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum for distribution values (see cells P1003:S1009). The most appropriate distribution is normal and its values are shown in Table 89. The comparison of cumulative distribution function curves in the GoldSim element, *DailyTime* between the calculated distribution (GoldSim element: *DailyTime _Calculated*) and developed distribution (GoldSim element *DailyTime_Normal_Dist*) is shown in Figure 23.

The time away from the ground shine in GENIIv2 is entered as the fraction of daily time spent outdoors or fraction of daily time spent indoors (see parameter development below), the exposure time is set to entire day (24 hr/day) in order to avoid double counting of the away time.

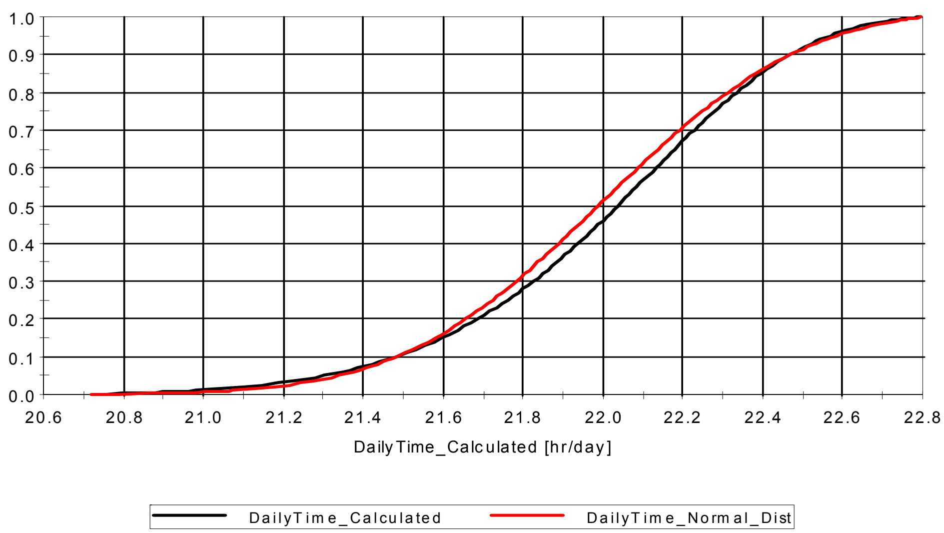


Figure 23. Comparison of Distributions for Daily Exposure Time

The exposure time parameters for an onsite individual is for a full time worker. Based on a work environment of 8 hr/day and 250 day/yr or a full time 40 hr/week and 50 week/yr work schedule, the daily exposure time is 8.5 hr/day including a lunch break. A uniform distribution with minimum of 8 hr/day and maximum of 9 hr/day is a used for the distribution. The annual exposure period is 250 days per year on average, with a uniform distribution minimum of 225 day/yr and maximum of 275 day/yr. That covers individual worker time off or 10% overtime. The external exposure periods to be used in the GENIIv2 are given in Table 89.

Table 89. External Exposure Period

| Individual | Category | GENIIv2 Parameter Symbol | External Exposure Period (Mean Value) | External Exposure Period (Distribution and Value) |
|---|---|---|---|---|
| Offsite Public | Yearly external exposure period for offsite individual | *TEXAIR or TEXGRD* | 365 (day/yr) | None |
| | Daily external exposure period for offsite individual | *UEXAIR* | 22 (hr/day) | Normal Distribution:<br>Mean = 22.0, SD = 0.4<br>Min = 20.7 and Max = 22.8 |
| | Daily external exposure period for offsite individual | *UEXGRD* | 24 (hr/day) | None |
| Onsite Worker | Yearly External exposure period for onsite individual | *TEXAIR or TEXGRD* | 250 (day/yr) | Uniform Distribution:<br>Min = 225 and Max = 275 |
| | Daily external exposure period for onsite individual | *UEXAIR or UEXGRD* | 8.5 (hr/day) | Uniform Distribution:<br>Min = 8.0 and Max = 9.0 |

Source: Section 4.1.5.4, and Excel file of *Distribution_Comparison.xls*

### 7.5.2.2 Fraction of Daily Time Spent Outdoors

The fraction of daily time spent outdoors is the sum of time spent in two environments: outdoors_active and outdoors_inactive. The mean is calculated as 0.304 = (3.1 + 4.2) hr / 24 hr. To be consistent with total exposure fraction (22 hr / 24 hr = 0.92), the calculated mean of the fraction of daily time spent outdoors is conservatively rounded to 0.31. The distribution of the parameter is developed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *OutdoorFraction_Calculated*, whose output is copied into the *Rpt_Param* worksheet in the Excel file: *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values, which are shown in Table 90. The comparison of cumulative distribution function curves for the calculated distribution (GoldSim element: *OutdoorFraction_Calculated*) and developed distribution (GoldSim element *OutdoorFraction_LogNormal_Dist*) is shown in Figure 24.

Table 90. Fraction of Daily Time Spent Outdoors

| Parameter Name | GENIIv2 Parameter Symbol | Outdoor Fraction (Mean Value) | Outdoor Fraction (Distribution and Value) |
|---|---|---|---|
| Fraction of daily time spent outdoors | *FTOUT* | 0.31 | Normal Distribution:<br>Mean = 0.31, SD = 0.014<br>Min = 0.27 and Max = 0.35 |

Source: Section 4.1.5.4 and Excel file of *Distribution_Comparison.xls*

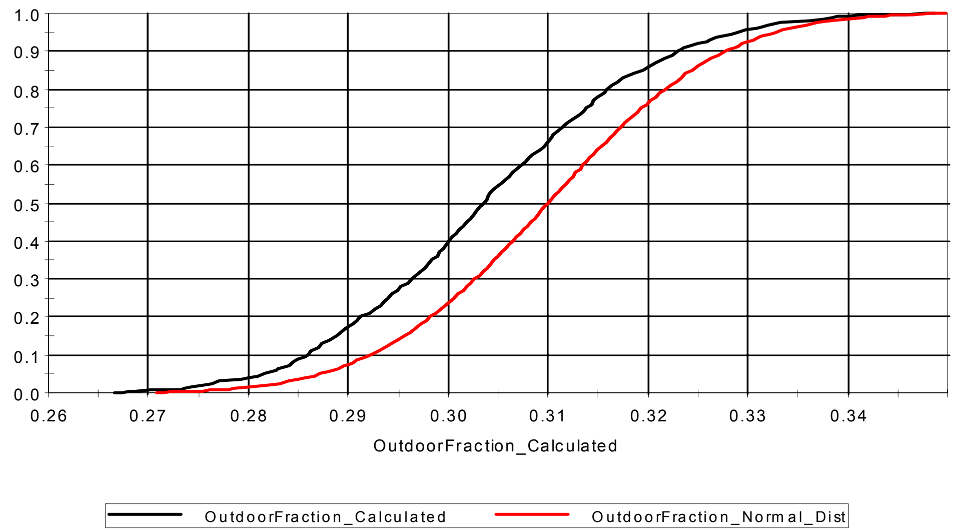


Figure 24. Comparison of Distributions for Outdoor Fraction

#### 7.5.2.3 Fraction of Daily Time Spent Indoors

The fraction of daily time spent indoors is the sum of time spent in two environments: indoors_asleep and indoors_inactive. The mean is calculated as 0.61 = (6.4 + 8.3) hr / 24 hr. The distribution of the parameter is developed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *IndoorFraction_Calculated*, whose output was then copied into the *Rpt_Param* worksheet in the Excel file: *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum values, which are shown in Table 91. The comparison of cumulative distribution function curves for the calculated distribution (GoldSim element: *IndoorFraction_Calculated*) and developed distribution (GoldSim element *IndoorFraction_LogNormal_Dist*) is shown in Figure 25.

Table 91. Fraction of Daily Time Spent Indoors

| Parameter Name | GENIIv2 Parameter Symbol | Indoor Fraction (Mean Value) | Indoor Fraction (Distribution and Value) |
|---|---|---|---|
| Fraction of daily time spent indoors | *FTIN* | 0.61 | Normal Distribution:<br>Mean = 0.61, SD = 0.022<br>Min = 0.54 and Max = 0.67 |

Source: Section 4.1.5.4 and Excel file of *Distribution_Comparison.xls*

An individual spends an average of 2 hrs each day (Table 55) away from Amargosa Valley, where it is considered an uncontaminated area. This would make the total of indoor and outdoor fractions not equal to 1. As above for the offsite individual fractions, the parameters for an onsite individual should be 1 for outdoor fraction and 0 for indoor fraction based on the assumption that a worker is at outdoor for their entire work schedule.

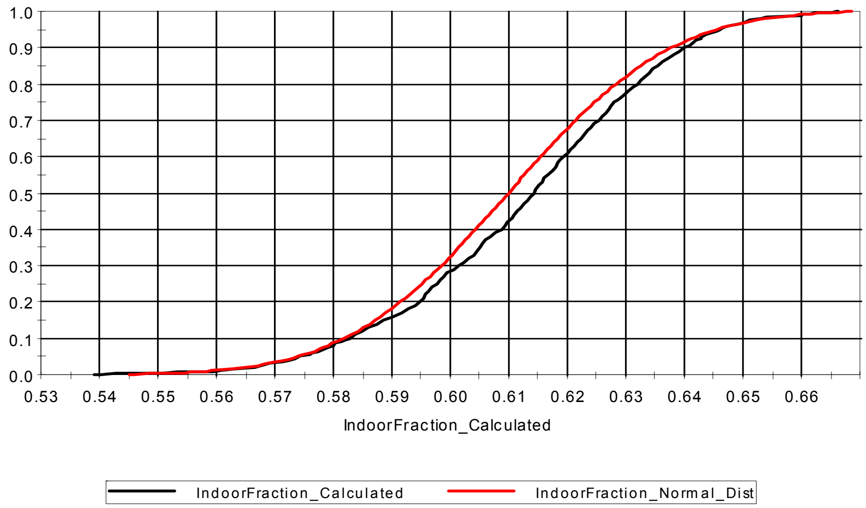


Figure 25. Comparison of Distributions for Indoor Fraction

### 7.5.3 Building Shielding Factors

Building shielding factors provided in Section 4.1.5.3 are used to shield external exposure when an individual stays indoors. There is no shielding when an individual stays outdoors. Building shielding factors are tabulated in Table 92.

Table 92. Building Shielding Factor

| Parameter Name | GENIIv2 Parameter Symbol | Shielding Factor (Mean Value) | Shielding Factor (Distribution and Value) |
|---|---|---|---|
| Indoor shielding factor | *SHIN* | 0.4 | None |
| Outdoor shielding factor | *SHOUT* | 1 | None |

Source: Section 4.1.5.3

### 7.5.4 Inhalation Rates

Three types of inhalation are included in GENIIv2: outdoor air, resuspended soil, and indoor air due to water usage (volatile radionuclides) (Napier et al 2006 [DIRS 177331], Section 10.4). Based on the exposure pathways considered in the preclosure dose calculation (Section 3.2.3), the third inhalation is not applicable, and no parameter value is developed in this document.

The breathing rates for various environments developed for the Biosphere Model are provided in Section 4.1.5.5. Because the GENIIv2 does not consider inhalation dependent on the environments, a distribution of inhalation rate is calculated by weighing the distribution of daily exposure time (Section 4.1.5.4) in corresponding environments with the breathing rates:

$$UINH = \sum_k Br_k \times T_k \qquad \text{Equation 10}$$

where,

$UINH$ = weighted inhalation rate (m$^3$/day)

$Br_k$ = breathing rate in environment $k$ ($m^3$/hr)

$T_k$ = daily exposure time at environment k (hr/day)

$k$ = environment index, including active outdoors, inactive outdoors, inactive indoors, asleep indoors, and away.

The breathing rate for away is assigned to be breathing rate at inactive outdoors. The calculated mean is 21.7 $m^3$/day, which agrees with 21.9 $m^3$/day for an average adult individual given in Regulatory Guide 1.109. The calculated inhalation rate is for a chronic exposure scenario. For offsite doses consequences from design basis accidents, the inhalation rate given in Regulatory Guide 1.183 ([DIRS 173584], Section 4.1.3) is $3.5\times10^{-4}$ $m^3$/sec (30.2 $m^3$/day) for the first 8 hour, $1.8\times10^{-4}$ $m^3$/sec (15.6 $m^3$/day) for next 8-24 hours, and $2.3\times10^{-4}$ $m^3$/sec (19.9 $m^3$/day) for the remainder of the accident time. Therefore, inhalation rate of 30.2 $m^3$/day is used for an acute exposure scenario, assumed to last one hour (Section 3.2.5).

This calculation of inhalation rate is performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *InhalationRate_Calculated*, whose output is then copied into the *Inh_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate mean, standard deviation, minimum and maximum for distribution values, which are shown in Table 93. The comparison of cumulative distribution function curves in GoldSim element of *InhalationRate* between the calculated distribution (GoldSim element: *InhalationRate_Calculated*) and developed distribution (GoldSim element *InhalationRate_Normal_Dist*) is shown in Figure 26.

Table 93. Inhalation Rate

| Parameter Name | GENIIv2 Parameter Symbol | Inhalation Rate ($m^3$/day) (Mean Value) | Inhalation Rate ($m^3$/day) (Distribution and Value) |
|---|---|---|---|
| Inhalation rate for chronic exposure | *UINH* and *UINHR* | 21.7 | Normal Distribution:<br>Mean = 21.7, SD = 0.12<br>Min = 21.3 and Max = 22.1 |
| Inhalation rate for acute exposure | *UINH* | 30.2 | Fixed value |

Source: Sections 4.1.5.4 and 4.1.5.5, and Excel file of *Distribution_Comparison.xls*

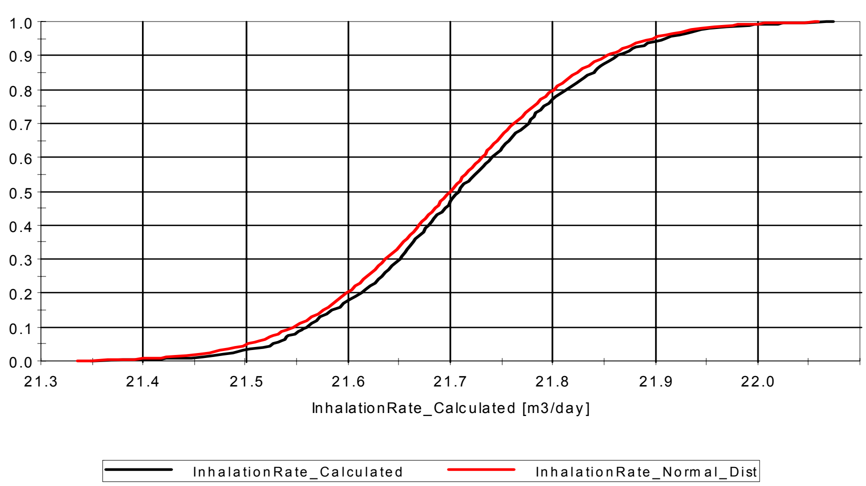


Figure 26. Comparison of Distributions for Inhalation Rate

### 7.5.5 Inhalation Exposure Period

The inhalation exposure period applies to inhalation of outdoor air and resuspended soil. It is equal to the external exposure time, discussed in Section 7.5.2. Similar to external exposure, two parameters are used, one for the duration of the inhalation period (days), and one for the fraction of time inhalation occurs in any day.

The inhalation periods to be used in the GENIIv2 are the same as the yearly external exposure period shown in Table 89. The parameter distribution values are shown in Table 94.

Table 94. Inhalation Period

| Category | GENIIv2 Parameter Symbol | Inhalation Period (day/year) (Mean Value) | Inhalation Period (day/year) (Distribution and Value) |
|---|---|---|---|
| Air inhalation period for offsite individual | *TINH* | 365 | None |
| Resuspended soil inhalation period for offsite individual | *TINHR* | 365 | None |
| Air inhalation period for onsite individual | *TINH* | 250 | Uniform Distribution: Min = 225 and Max = 275 |
| Resuspended soil inhalation period for onsite individual | *TINHR* | 250 | Uniform Distribution: Min = 225 and Max = 275 |

Source: Section 4.1.5.4, and Excel file of *Distribution_Comparison.xls*

Indoor air for an offsite individual contains the same contamination level as outdoor air due to house ventilation (BSC 2005 ([DIRS 172827], Section 6.3.4). Therefore, fraction of a day outdoor inhalation occurs is conservatively selected the same as the total daily external exposure period for offsite individual shown in Table 89. Because resuspension only occurs outdoors, the fraction of a day resuspension inhalation occurs is the same as the fraction of time spent outdoors as shown in Table 90.

The parameters for an onsite individual are the same as the daily external exposure period for an onsite individual shown in Table 89 for both outdoor air and resuspended soil. Daily hours are converted into a fraction of a day. The parameter values for fraction of a day inhalation occurs to be used in the GENIIv2 are given in Table 95.

Table 95. Fraction of a Day Inhalation Occurs

| Category | GENIIv2 Parameter Symbol | Fraction Of A Day Outdoor Inhalation Occurs (Mean Value) | Fraction Of A Day Outdoor Inhalation Occurs (Distribution and Value) |
|---|---|---|---|
| Air inhalation for offsite individual | *FRINH* | 0.92 | Normal Distribution: Mean = 0.92, SD = 0.02 Min = 0.86 and Max = 0.95 |
| Resuspended soil inhalation for offsite individual | *FRINHR* | 0.31 | Normal Distribution: Mean = 0.31, SD = 0.014 Min = 0.27 and Max = 0.35 |
| Air inhalation for onsite individual | *FRINH* | 0.35 | Uniform Distribution: Min = 0.33 and Max = 0.38 |
| Resuspended soil inhalation for onsite individual | *FRINHR* | 0.35 | Uniform Distribution: Min = 0.33 and Max = 0.38 |

Source: Section 4.1.5.4, and Excel file of *Distribution_Comparison.xls*

### 7.5.6 Food Consumption Period

The effective number of days per year (EDPY) when locally produced food is consumed is provided in Table 54. As discussed in Section 4.1.5.1, EDPY is numerically equal to the number of days in a year at 100 percent consumption of locally produced food from a given food group by a given individual. This input has the same meaning as the food consumption periods used in the GENIIv2. The EDPY is represented by the AM and SD, which represents the variance of the mean based on the site-specific survey on consumption frequency of locally produced food for a given individual and a given food group. The distribution of the food consumption period is lognormal, because its SD is larger than the AM. In addition, the EDPY in Table 54 is dependent on gender and food group, which includes more food types considered in the GENIIv2.

To calculate food consumption periods from the EDPY, the first step is to calculate the mean and SD of the weighed EDPY by gender fraction. The mean for each food group is calculated by

$$EDPY_{wt} = EDPY_m \times F_m + EDPY_f \times F_f \qquad \text{Equation 11}$$

where,

$EDPY_{wt}$ = weighted EDPY by gender fraction (day/yr)

$EDPY_m$ = EDPY by male individual (day/yr)

$F_m$ = fraction of male individual

$EDPY_f$ = EDPY by female individual (day/yr)

$F_f$ = fraction of female individual

The SD for each food group is calculated by using the general formula for propagating errors (BSC 2005 [DIRS 172827], Eq.6.4-3)

$$SD_{EDPY_{wt}} = \sqrt{(SD_{EDPY_m} \times F_m)^2 + (SD_{EDPY_f} \times F_f)^2} \qquad \text{Equation 12}$$

The second step is to sum the food groups belonging to the food types considered in the GENIIv2. Food groups of tomato and fruit are combined to food type of fruit, and food groups of beef, pork and wild game are combined to food type of meat (BSC 2005 [DIRS 172827], Section 6.4.2). The mean is simply added those food groups together. For the food type of fruit, the AM is calculated as:

$$EDPY_{wt,fruit\_type} = EDPY_{wt,tomato} + EDPY_{wt,fruit} \qquad \text{Equation 13}$$

The SD is calculated as:

$$SD_{EDPY_{wt,fruit\_type}} = \sqrt{(SD_{EDPY_{wt,tomato}})^2 + (SD_{EDPY_{wt,fruit}})^2} \qquad \text{Equation 14}$$

The third step is to calculate GM and GSD using the AM and SD with assuming a lognormal distribution (GoldSim Technology Group 2003 [DIRS 166226], pp. 524-525).

$$GM = e^{\lambda} \qquad \text{Equation 15}$$

$$GSD = e^{\zeta} \qquad \text{Equation 16}$$

$$\zeta^2 = \ln\left[1 + \left(\frac{SD}{AM}\right)^2\right] \qquad \text{Equation 17}$$

$$\lambda = \ln(AM) - \frac{1}{2}\zeta^2 \qquad \text{Equation 18}$$

The last step is to set a lower bound and an upper bound. To check the range of food consumption periods from the lognormal distribution determined by using above equations, the 99 percent confidence interval is used (BSC 2005 [DIRS 172827], Eq.6.3-6)

$$LB = \frac{GM}{GSD^{2.576}} \qquad \text{Equation 19}$$

$$UB = GM \times GSD^{2.576} \qquad \text{Equation 20}$$

The calculation is performed in the Excel file of *Consumption_Rate_Period.xls*. Columns O to Q are data taken from Table 54. Columns R and S are calculated using Equation 11 and Equation 12, respectively. Column T and U is to combine tomato and fruit for new fruit, and beef, pork and wide game for meat, which are calculated using Equation 13 and Equation 14. Columns V and W are calculated using Equation 15 to Equation 18. Columns X and Y are calculated using Equation 19 and Equation 20. It is found that out of eight food types, six of them have food consumption period more 200 days per year, and some are close to 365 days per year. Therefore, minimum and maximum values are selected as 0 and 365 day per year, respectively, for all food types. The calculated GM and GSD are used for the distribution values are shown in Table 96. The GM is also reported for the mean value used as deterministic calculation, as shown in Table 96.

Table 96. Food Consumption Period

| Food Type | GENIIv2 Parameter Symbol | Food Consumption Period (day/yr) (Mean Value) | Food Consumption Period (day/yr) (Lognormal Distribution and Values) |
|---|---|---|---|
| Leafy Vegetables | *TCRP* | 17.9 | GM = 17.9, GSD = 2.82<br>Min = 0 and Max = 365 |
| Root Vegetables | *TCRP* | 22.5 | GM = 22.5, GSD = 2.47<br>Min = 0 and Max = 365 |
| Fruit | *TCRP* | 54.0 | GM = 54.0, GSD = 2.08<br>Min = 0 and Max = 365 |
| Grain | *TCRP* | 0.16 | GM = 0.16, GSD = 6.10<br>Min = 0 and Max = 365 |
| Meat | *TANM* | 15.1 | GM = 15.1, GSD = 3.14<br>Min = 0 and Max = 365 |
| Poultry | *TANM* | 1.4 | GM = 1.4, GSD = 4.07<br>Min = 0 and Max = 365 |
| Milk | *TANM* | 4.2 | GM = 4.2, GSD = 4.61<br>Min = 0 and Max = 365 |
| Eggs | *TANM* | 33.3 | GM = 33.3, GSD = 2.50<br>Min = 0 and Max = 365 |

Source: Section 4.1.5.1, Table 54, and *Consumption_Rate_Period.xls*

### 7.5.7 Food Consumption Rates

The contingent average daily intake (CADI) is in provided in Table 54. As discussed in Section 4.1.5.1, CADI is the average amount of food from each group consumed by individuals when they consumed some food from that group. The CADI values are not site-specific, rather from the averages in the western United States (BSC 2005 [DIRS 172827], Section 6.4). The CADI is represented by the arithmetic mean (AM) and standard error (SE). Similar to the EDPY provided in Table 54, the CADI values are also food group and gender dependent. The CADI values are used to develop the food consumption rates for the GENIIv2.

The methods used to calculate food consumption rates from the CADI values are very similar to the method used to calculate food consumption period from the EDPY discussed in Section 7.5.6, except a normal distribution is assigned to the consumption rates, because inputs are based on large survey data and represent the mean and variation of the mean. The calculation was performed in the Excel file of *Consumption_Rate_Period.xls*. Columns C to E are data taken from Table 54.

The first step is to calculate the AM and SE of the weighed CADI by gender fraction using Equation 11 (see Column F) and Equation 12 (see Column G). The second step is to combine the food groups belonging to the food types considered in the GENIIv2. Because the EDPY is calculated by simply adding the different food groups, the consumption rate for that food type must be weighted using its corresponding food groups for their EDPY (see Column H):

$$CADI_{wt} = \frac{\sum_{k} CADI_k \times EDPY_k}{\sum_{k} EDPY_k} \qquad \text{Equation 21}$$

To simplify the calculation, the SE of combined food groups are calculated using Equation 12 with a weighing factor being a fraction of corresponding EDPY on Equation 21 (see Column I). The third step is to calculate GM and GSD using the AM and SD with assuming a lognormal distribution using Equation 15 to Equation 18 (see Columns J and K). The calculated GM and GDS are not used, but verify the normal distribution for consumption rates, because GSD are close to 1. The last step is to calculate a lower bound and an upper bound using Equation 22 and Equation 23 for a normal distribution (see Columns L and M):

$$LB = AM - 2.576 \times SE \qquad \text{Equation 22}$$

$$UB = AM + 2.576 \times SE \qquad \text{Equation 23}$$

The daily food consumption rates shown in Table 97 are based on the CADI with AM and SE. The mean of CADI is comparable with the EPA suggestion with 188 g/day for total vegetables and 173 g/day for fruit (EPA 1997 [DIRS 152549], Table 9-19 and 9-18). However, the range of CADI is much narrower than the EPA suggestion, in which a ratio of about 3 is observed between the 95th percentile value and the mean for meat consumption (EPA 1997 [DIRS 152549], Section 9.3). The EPA report also states that the data are collected over a 3-day period and may not necessarily reflect the long-term distribution of average daily intake rates. This implies that the upper percentiles shown here will tend to overestimate the corresponding percentiles of the true long-term distribution (EPA 1997 [DIRS 152549], Section 9.3). Therefore, the food consumption rates developed here are reasonable covering the variation on an annual average as required by the GENIIv2. A large variation observed by the EPA survey is likely due to consumption rates based on a daily average. In addition, there are eight food categories considered in the model, and it is also unlikely that a receptor consumes all food categories at the high rates. Furthermore, a very large range for the consumption period, as discussed in 7.5.6, compensates the relatively narrow range in consumption rates.

Table 97. Food Consumption Rates

| Food Type | GENIIv2 Parameter Symbol | Food Consumption Rates (kg/day) (Mean Value) | Food Consumption Rates (kg/day) (Normal Distribution and Values) |
|---|---|---|---|
| Leafy Vegetables | *UCRP* | 0.123 | AM = 0.123, SE = 0.022<br>Min = 0.067 and Max = 0.180 |
| Root Vegetables | *UCRP* | 0.141 | AM = 0.141, SE = 0.010<br>Min = 0.116 and Max = 0.167 |
| Fruit | *UCRP* | 0.185 | AM = 0.185, SE = 0.008<br>Min = 0.163 and Max = 0.206 |
| Grain | *UCRP* | 0.336 | AM = 0.336, SE = 0.011<br>Min = 0.307 and Max = 0.366 |
| Meat | *UANM* | 0.098 | AM = 0.098, SE = 0.008<br>Min = 0.078 and Max = 0.119 |
| Poultry | *UANM* | 0.110 | AM = 0.110, SE = 0.010<br>Min = 0.084 and Max = 0.136 |
| Milk | *UANM* | 0.348 | AM = 0.348, SE = 0.017<br>Min = 0.303 and Max = 0.392 |
| Eggs | *UANM* | 0.109 | AM = 0.109, SE = 0.010<br>Min = 0.083 and Max = 0.135 |

Source: Section 4.1.5.1, Table 54, and *Consumption_Rate_Period.xls*

### 7.5.8 Inadvertent Soil Ingestion Rate

Inadvertent soil ingestion rate provided in Section 4.1.5.2 is represented by a piece-wise cumulative probability distribution, which is converted to a distribution that GENIIv2 can accept. The conversion is performed stochastically in the GoldSim file: *Distribution_Comparison.gsm*. The GoldSim element for the calculation is *SoiConsump_Cumulative_Dist*, whose output is copied into the *Rpt_Param* worksheet in the Excel file of *Distribution_Comparison.xls* to calculate geometric mean, and geometric standard deviation (see cells K1003:N1009). The original minimum and maximum values from the cumulative distribution are selected for a lower bound and an upper bound for the developed distribution values, which are shown in Table 98. The comparison of cumulative distribution function curves for the calculated distribution (GoldSim element: *SoiConsump_Cumulative_Dist*) and developed distribution (GoldSim element *SoiConsump_LogNorma_Dist*) is shown in Figure 27.

Table 98. Inadvertent Soil Ingestion Rate

| Parameter Name | GENIIv2 Parameter Symbol | Soil Ingestion Rate (mg/day) (Mean Value) | Soil Ingestion Rate (mg/day) (Distribution and Value) |
|---|---|---|---|
| Soil Ingestion Rate | *USOIL* | 104 | Lognormal Distribution:<br>GM = 104, GSD = 1.49<br>Min = 50 and Max = 200 |

Source: Section 4.1.5.2, and Excel file of *Distribution_Comparison.xls*

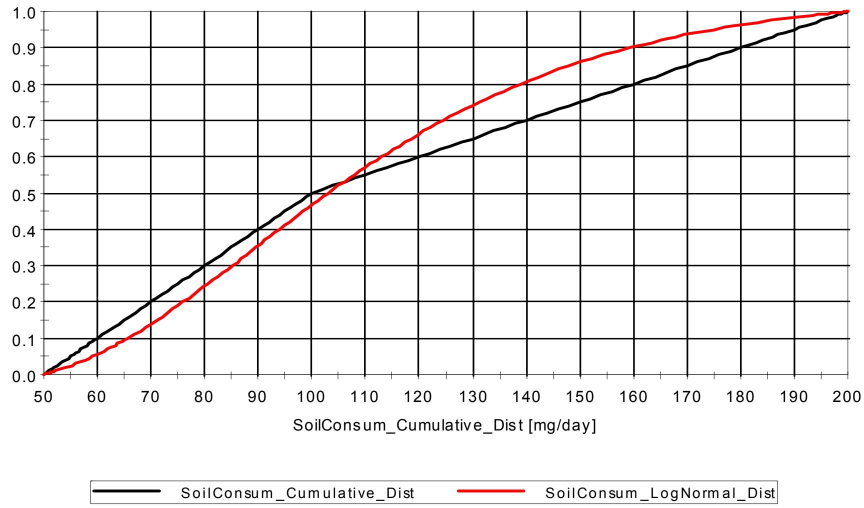


Figure 27. Comparison of Distributions for Inadvertent Soil Ingestion Rate

Inadvertent soil ingestion rate developed in the Biosphere Model is based on an average daily rate continuously throughout entire year (BSC 2005 [DIRS 172827], Section 6.4.3). The parameter of soil contact days used in the GENIIv2 is a fixed value as shown in Table 99.

Table 99. Soil Contact Days

| Parameter Name | GENIIv2 Parameter Symbol | Soil Contact Day (day/yr) (Mean Value) | Soil Contact Day (day/yr) (Distribution and Value) |
|---|---|---|---|
| Soil Contact Days | *TSOIL* | 365 | None |

Source: Section 4.1.5.2

### 7.5.9 Receptor Parameters for 95$^{th}$ Percentile Deterministic Calculations

As required by regulation (10 CFR 63.204) for the preclosure safety analysis, the receptor for the offsite in the general environment is "any real member of the public located beyond the boundary of the site." One method to demonstrate compliance is to perform a deterministic dose calculation with receptor characteristics that bound those of any real member of the public. In this case, individual parameter values are selected at the 95$^{th}$ percentile level instead of using the mean values for the receptor related parameters including food consumption rates, food consumption periods, external and inhalation exposure times. The use of the 95$^{th}$ percentile input values for each parameter provides a conservatively calculated dose, because it represents a maximized combination of receptor characteristics.

The 95$^{th}$ percentile values are calculated using the following equations for normal and lognormal distributions, respectively:

$$95^{th} = AM + 1.645 \times SE \qquad \text{Equation 24}$$

$$95^{th} = GM \times GSD^{1.645} \qquad \text{Equation 25}$$

The calculation of food consumption rates and food consumption periods is performed in the Columns N and Z in the file of *Consumption_Rate_Period.xls*, respectively. The results are shown in Table 100.

Table 100. Food Consumption Rates and Periods – 95th Percentile

| Food Type | GENIIv2 Parameter Symbol | Food Consumption Rates (kg/day) (95th Percentile Value) | Food Consumption Period (day/yr) (95th Percentile Value) |
|---|---|---|---|
| Leafy Vegetables | *UCRP* and *TCRP* | 0.159 | 99 |
| Root Vegetables | *UCRP* and *TCRP* | 0.158 | 100 |
| Fruit | *UCRP* and *TCRP* | 0.198 | 180 |
| Grain | *UCRP* and *TCRP* | 0.355 | 3 |
| Meat | *UANM* and *TANM* | 0.112 | 99 |
| Poultry | *UANM* and *TANM* | 0.126 | 14 |
| Milk | *UANM* and *TANM* | 0.376 | 52 |
| Eggs | *UANM* and *TANM* | 0.125 | 150 |

Source: Table 96, Table 97, and *Consumption_Rate_Period.xls*

The 95th percentile values for other receptor related parameters discussed previously are calculated using Equation 24 and Equation 25 for normal and lognormal distributions. A fixed value is considered as bounding and is used directly for the deterministic calculation as shown in Table 101.

Table 101. The 95th Percentile Values for Other Receptor Related Parameters

| Parameter | GENIIv2 Parameter Symbol | Units | 95th Percentile Value |
|---|---|---|---|
| **Soil Ingestion:** | | | |
| Soil Ingestion Rate | *USOIL* | mg/day | 193 |
| Soil Contact Days | *TSOIL* | day | 365 |
| | | | |
| **External Exposure:** | | | |
| Yearly exposure period for air submersion | *TEXAIR* | day/yr | 365 |
| Yearly exposure period for ground shine | *TEXGRD* | day/yr | 365 |
| Daily exposure period for air submersion | *UEXAIR* | hr/day | 22.7 |
| Daily exposure period for ground shine | *UEXGRD* | hr/day | 24 |
| Fraction of daily time spent indoors | *FTIN* | - | 0.65 |
| Fraction of daily time spent outdoors | *FTOUT* | - | 0.33 |
| | | | |
| **Inhalation Pathway:** | | | |
| Air inhalation period | *TINH* | day/yr | 365 |
| Resuspended soil inhalation period | *TINHR* | day/yr | 365 |
| Air inhalation fraction | *FRINH* | - | 0.95 |
| Resuspended soil inhalation fraction | *FRINHR* | - | 0.33 |
| Inhalation rate for chronic exposure | *UINH* and *UINHR* | $m^3$/day | 21.9 |
| Inhalation rate for acute exposure | *UINH* and *UINHR* | $m^3$/day | 30.2 |

Source: Table 89 to Table 91, Table 93 to Table 95, and Table 99.

## 7.6 METEOROLOGICAL RELATED PARAMETERS

### 7.6.1 Absolute Humidity

Absolute humidity is used to calculate tritium concentration in food pathways. The parameter is developed using site-specific meteorological data discussed in Section 3.1.1. Values and distributions for the absolute humidity are summarized in Table 102.

Table 102. Average Absolute Humidity

| Parameter Name | GENIIv2 Parameter Symbol | Absolute Humidity (kg/m$^3$) (Deterministic Value) | Absolute Humidity (kg/m$^3$) (Distribution and Value) |
|---|---|---|---|
| Average Absolute Humidity | *ABSHUM* | 4.08E-3 | Lognormal Distribution:<br>GM = 3.63E-3, GSD = 1.63<br>Min = 3.9E-4 and Max = 1.64E-2 |

Source: Section 3.1.1

### 7.6.2 Average Daily Rain Rate

Average daily rain rate is used to estimate the interception fraction from rain when wet deposition rates are determined in an atmospheric transport module, and the user has selected the option to allow the code to calculate the wet deposition interception fraction.

Although the screen on the chronic exposure module asks the average daily rain rate when raining, it is actually a yearly total average rate. The annual average interception fraction for vegetation is estimated using that rainfall rate. The deposition on crops is then treated as a continuous process, similarly to what is done for dry deposition (Napier et al. 2004 [DIRS 177331], Section 9.4.1.4).

Using method provided in Section 7.5.6, the calculated mean of 0.49 mm/day and SD of 2.88 mm/day provided in Section 3.1.2 is converted to GM of 0.10 mm/day and GSD of 6.62 when a lognormal distribution is assumed. The calculation is performed in the cells G2:J3 in the *Rain_Rate* worksheet of Excel file of *Distribution_Comparison.xls*. A lower bound of 0 mm/day is selected for no precipitation. An upper bound of 100 mm/day is selected based on the measured maximum value (52.07 mm/day, cell B1813 in the *Rain_Rate* worksheet of Excel file of *Distribution_Comparison.xls*). The suggested average daily rain rate is shown in Table 103.

A cumulative distribution using calculated daily rain rate is constructed in the *Rain_Rate* worksheet of Excel file of *Distribution_Comparison.xls*. Column B in the *Rain_Rate* worksheet is copied from the Column *Daily Precip (mm/day)* in the *MetData* worksheet of the Excel file *Absolute_Humidity.xls* mentioned in Attachment I. The data are sorted and percentile values are assigned for each daily rain rate. Values of the cumulative distribution are listed in Column D and Column E in the *Rain_Rate* worksheet of Excel file of *Distribution_Comparison.xls*.

The comparison of cumulative distribution function curves in the GoldSim element of *RainRate* between the cumulative distribution in GoldSim element of *RainRate_Cumulative_Dist* and developed distribution in GoldSim element *RainRate_LogNorma_Dist* is shown in Figure 28.

Table 103. Average Daily Rain Rate

| Parameter Name | GENIIv2 Parameter Symbol | Average Rain Rate (mm/day) (Deterministic Value) | Average Rain Rate (mm/day) |
|---|---|---|---|
| Average Daily Rain Rate | *RAIN* | 0.49 | Lognormal Distribution: GM =0.10, GSD = 6.62 Min = 0 and Max = 100 |

Source: Section 3.1.2 and *Distribution_Comparison.xls*

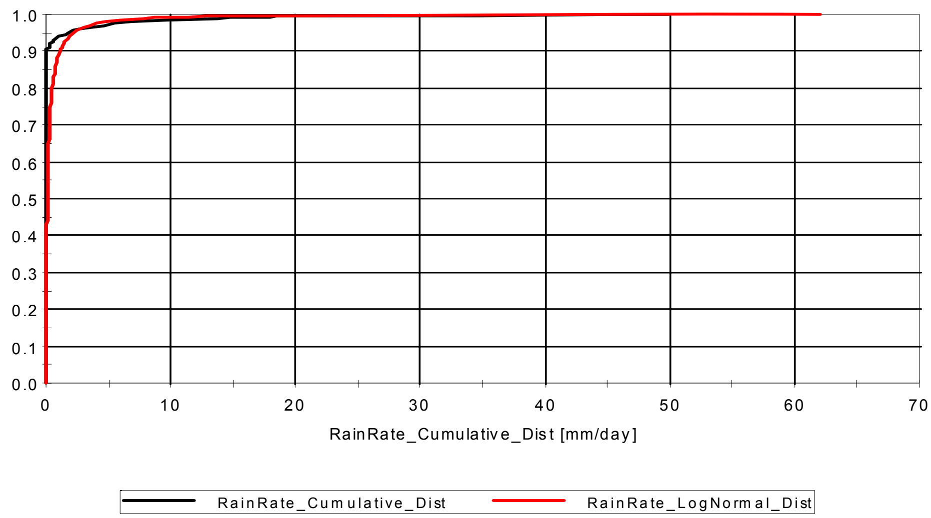


Figure 28. Comparison of Distributions for Average Daily Rain Rate

### 7.6.3 Wind Speed

The straight-line Gaussian plume model is defined under the assumption of a non-zero wind speed, because of infinite concentration and no direction defined (Napier et al. 2006 [DIRS 177331], Section 5.1.6). The GENIIv2 provides a method to solve the problem by introducing a minimum wind speed for calm winds. Per Section 3.1.3, based on the wind speed measurements during the five years period, the mean wind speed is 3.64 m/s and its SD is 2.02 m/s with the minimum wind speed of 0.45 m/s, and the maximum wind speed of 17.8 m/s. With minimum wind speed of 0.45 m/s, the calm wind situation may not occur at the Yucca Mountain.

Two parameters in the GENIIv2 are related to the minimum wind speed, *ARMINRISESPD* for *minimum wind speed during plume rise*, and *ARMINWIND* for *maximum wind speed for calm*. The two parameters can use the minimum wind speed of 0.4 m/s, as shown in Table 104.

Table 104. Wind Speed

| Parameter Name | GENIIv2 Parameter Symbol | Wind Speed (m/s) (Deterministic Value) | Wind Speed (m/s) (Distribution and Value) |
|---|---|---|---|
| minimum wind speed during plume rise | *ARMINRISESPD* | 0.4 | None |
| maximum wind speed for calm | *ARMINWIND* | 0.4 | None |

Source: Section 3.1.3

### 7.6.4 Ambient Air Temperature

Another parameter measured in the Yucca Mountain is ambient air temperature. Per Section 3.1.4, the mean temperature is 17.04°C and SD of 10.13°C with the minimum of –7.5°C and the maximum of 42.31°C. The GENIIv2 parameter is the *ambient air temperature* (*six*), as shown in Table 105.

Table 105. Ambient Air Temperature

| Parameter Name | GENIIv2 Parameter Symbol | Ambient air temperature (°C) (Deterministic Value) | Ambient air temperature (°C) (Distribution and Value) |
|---|---|---|---|
| Ambient air temperature | *six* | 17.04 | Normal Distribution:<br>Mean = 17.04, SD = 10.13<br>Min = -7.5 and Max = 42.31 |

Source: Section 3.1.4

### 7.6.5 Transfer Resistance

Dry deposition velocity for soil particle resuspension is discussed in Section 7.1.5. This parameter is used to calculate particle deposition velocity from the atmospheric dispersion. In general, the deposition velocities observed for any particular material have a wide range of values. Nevertheless, the deposition velocity is frequently assumed to be constant. More realistically, the dry deposition velocity may be modeled using an analogy to electrical resistance, which is one of the options provided in the GENIIv2 (Napier et al. 2006 [DIRS 177331], Section 5.3.5.1). The input data of transfer resistance is in Section 4.1.6.5.

Following the resistance analogy, dry deposition velocities are equal to the reciprocal of the sum of the three component resistances: an aerodynamic resistance, a surface resistance, and a transfer resistance. The aerodynamic resistance is a function of wind speed, atmospheric stability, and surface roughness. The surface resistance is a function of wind speed and surface roughness. Transfer resistances are usually associated with the characteristics of the depositing material and surface type (Ramsdell et al. 1996 [DIRS 177811], p.570). The transfer resistance is used as a mathematical device to establish an upper limit on the deposition velocity. The GENIIv2 user can enter transfer resistances, but as a default, 10 and 100 s/m are assumed for gas (iodine) and particles, respectively (Napier et al. 2006 [DIRS 177331], Section 5.3.5.1). By using these values, the mathematical model for the dry deposition velocities are consistent with experimentally determined deposition velocities as discussed in NUREG/CR-6853 (Molenkamp et al. 2004 [DIRS 177808], p.13). Therefore, the transfer resistances, 10 and 100 s/m for gas (iodine) and particles recommended from these references are considered as the best available data.

It is noted that a single value of 100 s/m for transfer resistance is used to calculate general public atmospheric dispersion factors as discussed in Attachment I, as a conservative approach. However, if the disersion factors are calculated using GENIIv2, the two separate values can be used to reduce the conservatism if needed. The commanded values are shown in Table 106.

Table 106. Transfer Resistance

| Parameter Name | GENIIv2 Parameter Symbol | Transfer Resistance (s/m) (Deterministic Value) | Transfer Resistance (s/m) (Distribution and Value) |
|---|---|---|---|
| Transfer Resistance for Particles | *ARTRANSRESIST* | 100 | None |
| Transfer Resistance for Iodine | *ARTRANSRESIST* | 10 | None |

Source: Section 4.1.6.5

### 7.6.6 Meteorological Data File

A meteorological data file for the Yucca Mountain site is generated and discussed in Attachment I. The file, *ymp01-05.met* contains date, time, stability class, wind direction, wind speed, temperature, mixing height, precipitation code, precipitation rate, and weighting factor in the GENIIv2 format (Napier 2006 [DIRS 177330] Appendix B).

The meteorological data file, *ymp01-05.met*, is selected in the GENIIv2 plume module. The cloud shine library file is also needed, and the GENIIv2 default file, *cshnlib.dat* is used.

## 7.7 DOSIMETRIC RELATED PARAMETERS

The references for dose coefficients for external, inhalation and ingestion are provided in Section 4.1.7. There is no specific calculation needed for these dosimetric parameters, as these values are recommended by regulatory guidance. However, the appropriate dosimetric methodologies (e.g. FGR-11/12 or FGR-12/13), lung absorption class (see Table 57), and receptor age, must be selected as discussed in Section 4.1.7.

If FGR-11/12 method is selected in GENIIv2, dose conversion factors for inhalation and ingestion and external dose coefficients are those located in the GENIIv2 database file *GENII.MDB*. If FGR-12/13 method is selected in GENIIv2, effective dose coefficients for inhalation and ingestion are those in the GENIIv2 text files *FGR13INH.HDB* and *FGR13ING.GDB*, respectively. The external dose coefficients for air submersion, exposure to surface contaminated soil and exposure to infinite contaminated soil are those in the GENIIv2 text files *F12TIII1.EXT*, *F12TIII3.EXT*, *F12TIII7.EXT*, respectively.

The inhalation lung absorption classes (*SOLUBIL*, *lung solubility class* in the database file *GENII.MDB*, or CLLCLAS, *lung transfer inhalation class,* in GENIIv2 screen menu) for non-gaseous elements are shown in Table 57. Six noble gases, He, Ne, Ar, Kr, Xe, and Rn, and two common gas elements, O and N are categorized as *gas* lung class. The organically bound tritium (OBT) is treated as *slow* lung absorption class. A complete summary of selected lung solubility classes, including gases, is shown in Table 107.

Table 107. The Lung Solubility Class Used in the GENIIv2

| Element | Atomic No. | Lung Solubility Class | Element | Atomic No. | Lung Solubility Class | Element | Atomic No. | Lung Solubility Class |
|---|---|---|---|---|---|---|---|---|
| Hydrogen | 1 | vapor | Rubidium | 37 | fast | Ytterbium | 70 | slow |
| Beryllium | 4 | slow | Strontium | 38 | medium | Lutetium | 71 | slow |
| Carbon | 6 | gas | Yttrium | 39 | slow | Hafnium | 72 | medium |
| Nitrogen | 7 | gas | Zirconium | 40 | medium | Tantalum | 73 | slow |
| Oxygen | 8 | gas | Niobium | 41 | medium | Tungsten | 74 | fast |
| Fluorine | 9 | slow | Molybdenum | 42 | medium | Rhenium | 75 | medium |
| Neon | 10 | gas | Technetium | 43 | medium | Osmium | 76 | slow |
| Sodium | 11 | fast | Ruthenium | 44 | medium | Iridium | 77 | slow |
| Magnesium | 12 | medium | Rhodium | 45 | slow | Platinum | 78 | fast |
| Aluminum | 13 | medium | Palladium | 46 | slow | Gold | 79 | slow |
| Silicon | 14 | medium | Silver | 47 | medium | Mercury | 80 | medium |
| Phosphorus | 15 | fast | Cadmium | 48 | slow | Thallium | 81 | fast |
| Sulfur | 16 | fast | Indium | 49 | medium | Lead | 82 | medium |
| Chlorine | 17 | medium | Tin | 50 | medium | Bismuth | 83 | medium |
| Argon | 18 | gas | Antimony | 51 | medium | Polonium | 84 | medium |
| Potassium | 19 | fast | Tellurium | 52 | medium | Astatine | 85 | medium |
| Calcium | 20 | medium | Iodine | 53 | fast | Radon | 86 | gas |
| Scandium | 21 | slow | Xenon | 54 | gas | Francium | 87 | fast |
| Titanium | 22 | medium | Cesium | 55 | fast | Radium | 88 | medium |
| Vanadium | 23 | medium | Barium | 56 | medium | Actinium | 89 | slow |
| Chromium | 24 | slow | Lanthanum | 57 | medium | Thorium | 90 | slow |
| Manganese | 25 | medium | Cerium | 58 | medium | Protactinium | 91 | slow |
| Iron | 26 | medium | Praseodymium | 59 | slow | Uranium | 92 | slow |
| Cobalt | 27 | slow | Neodymium | 60 | slow | Neptunium | 93 | medium |
| Nickel | 28 | medium | Promethium | 61 | slow | Plutonium | 94 | slow |
| Copper | 29 | slow | Samarium | 62 | medium | Americium | 95 | medium |
| Zinc | 30 | slow | Europium | 63 | medium | Curium | 96 | medium |
| Gallium | 31 | medium | Gadolinium | 64 | medium | Berkelium | 97 | medium |
| Germanium | 32 | medium | Terbium | 65 | medium | Californium | 98 | medium |
| Arsenic | 33 | medium | Dysprosium | 66 | medium | Einsteinium | 99 | medium |
| Selenium | 34 | fast | Holmium | 67 | medium | Fermium | 100 | medium |
| Bromine | 35 | medium | Erbium | 68 | medium | Mendelevium | 101 | medium |
| Krypton | 36 | gas | Thulium | 69 | medium | OBT | - | slow |

Source: Section 4.1.7.5

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# 8. GENIIv2 INPUT PARAMETERS

Input to GENIIv2 is organized by module. Each module has several menu screens that provide for selection of parameter options and entry of specific values. This section provides a summary of YMP site-specific values for GENIIv2 organized by module and menu screen and also identifies YMP default files that can be used to automatically enter those values.

## 8.1 GENIIv2 AIR FLUX AND PLUME MODULE INPUT PARAMETERS

The GENIIv2 air flux and plume modules include parameters that define the radionuclide release to the environment and air dispersion of that release. The radionuclide release is defined in a "user defined" Air Flux module that determines the radionuclide particle type and characteristics, release rate, and exhaust characteristics. One of two atmospheric dispersion modules: Acute Plume and Chronic Plume, is then selected to input parameters that determine the dispersion characteristics. No default files are available to automate the data entry for the Air Flux and Plume modules.

### 8.1.1 AFF Air Flux Module

Most of Air Flux input parameters are scenario dependent. The table below provides the input parameters for each sub-menu screen.

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| | **Type of Release Sub-Menu:** | | | |
| media | Point | TRUE | T/F | Table 112 |
| media | Area | FALSE | T/F | Table 112 |
| one | Exit area of source | Scenario dependent | $m^2$ | Table 112 |
| two | Exit height of source | Scenario dependent | m | Table 112 |
| three | Height of adjacent structure | Scenario dependent | m | Table 112 |
| four | Exit velocity of source | Scenario dependent | m/s | Table 112 |
| five | Exit temperature of source | Scenario dependent | deg C | Table 112 |
| six | Ambient air temperature | 17.04 | deg C | Table 105 |
| | | | | |
| | **Flux Type Sub-Menu:** | | | |
| fluxtypes | Gas1 | TRUE | T/F | Table 112 |
| reactivefrac | Non reactive fraction | Scenario dependent | fraction | Table 112 |
| reactivedensity | Density | Scenario dependent | $g/cm^3$ | Table 112 |
| fluxtypes | Particle n (n= 1, 2, 3) | TRUE | T/F | Table 112 |
| radius | radius | Scenario dependent | um | Table 112 |
| density | density | Scenario dependent | $g/cm^3$ | Table 112 |
| | | | | |
| | **Constituent Sub-Menus:** | | | |
| CASID | Constituent (Radionuclide name) | Scenario dependent | - | Table 112 |
| ctime | Time | Scenario dependent | yr | Table 112 |
| cval | Constituent flux for Gas1 | Scenario dependent | pCi/yr | Table 112 |
| cval | Constituent flux for Particle n (n=1, 2, 3) | Scenario dependent | pCi/yr | Table 112 |

### 8.1.2 Acute and Chronic Air Transport Modules

There are four air transport modules used for YMP dose analyses: 1) acute plume, 2) chronic plume, 3) X/Q acute and 4) X/Q chronic. The first two modules calculate atmospheric dispersion X/Q's and deposition rates from hourly meteorological data based on input data in this section. The second two modules allow the user to enter pre-calculated X/Q values and deposition rates.

#### 8.1.2.1 Source Information Menu

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| ARSRCDORISEFLAG | Do Plume Rise | FALSE | T/F | Table 113 |
| ARSRCDODISPFLAG | Use Enhanced Dispersion | FALSE | T/F | Table 113 |

#### 8.1.2.2 Model Information Menu

##### 8.1.2.2.1 Radial Grid Definition Sub-Menu

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| ARNUMRECRING | 16 Sectors in Radial Grid | TRUE | T/F | Table 113 |
| ARNUMRECRING | 36 Sectors in Radial Grid | FALSE | T/F | Table 113 |
| ARRADVAL | Radial Distances | Scenario dependent | m | Table 113 |

##### 8.1.2.2.2 Model Parameters Sub-Menu

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| ARSIGPARM | Pasquill-Gifford (ISC3) | FALSE | T/F | Table 113 |
| ARSIGPARM | Pasquill-Gifford (NRC) | TRUE | T/F | Table 113 |
| ARSIGPARM | Brigg's Urban Condition | FALSE | T/F | Table 113 |
| ARSIGPARM | Brigg's Open Country | FALSE | T/F | Table 113 |
| ARSIGPARM | Turbulence Statistics | FALSE | T/F | Table 113 |
| ARCALMDISTFLAG | User's supplied calm wind distribution | FALSE | T/F | Table 113 |

#### 8.1.2.3 Default Parameters Sub-Menu

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| *ARMINRISESPD* | Minimum wind speed during plume rise | 0.4 | m/s | Table 104 |
| | Sigma to shift to semi-infinite cloud shine | 400 | m | See Note |
| *ARTRANSRESIST* | Transfer resistance for iodine | 10 | s/m | Table 106 |
| *ARTRANSRESIST* | Transfer resistance for particles | 100 | s/m | Table 106 |
| *ARMINWIND* | Maximum wind speed for "calm" | 0.4 | m/s | Table 104 |

Note: A semi-infinite plume is selected in the pathway menu, so the 400 m value is not used.

#### 8.1.2.4 Meteorological Files Sub-Menu

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| ARMETFILE | Path and Name of Meteorological data file | *Ymp01-05.met* | - | Section 7.6.6 |
| ARCLDSHNLIB | Path and Name of Cloud Shine Library | *cshinlib.dat* | - | Section 7.6.6 |

Note: Include path name to each file name based on its location for the GENIIv2 run.

## 8.2 GENIIv2 CHRONIC EXPOSURE MODULE INPUT PARAMETERS

The GENIIv2 Chronic Exposure module calculates concentrations in media resulting from a radionuclide release. The Chronic Exposure module uses as input radionuclide concentrations in air as generated by the Air Transport module. The output is the radionuclide concentration in various exposure media (air, crops, animal products, soil, etc.). The exposure pathways depend on the receptors and scenarios, which is discussed in Table 1.

Input parameters in the Chronic Exposure module can be manually entered from menu screens (see Section 8.2.1), or transferred directly from a default file (see Section 8.2.2).

### 8.2.1 Chronic Exposure Module Menu Screens

Parameters are organized by Chronic Exposure module menu screen. Only those parameters required for the pathways shown in Table 1 are provided with YMP input data. Parameters not used in the YMP site-specific calculations with GENIIv2 are either not discussed or designated with a "-".

#### 8.2.1.1 Controls Menu (C1)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| ANFOOD | Animal product ingestion | TRUE | T/F | Assumption 3.2.3 |
| TFOOD | Terrestrial food crop ingestion | TRUE | T/F | Assumption 3.2.3 |
| AQFOOD | Aquatic food ingestion | FALSE | T/F | Assumption 3.2.3 |
| RECRE | Recreational surface water | FALSE | T/F | Assumption 3.2.3 |
| DEBUG | Debug testing | - | T/F | User option |
| | | | | |
| NTKEND | Duration of exposure period | 1 | yr | Section 7.5.1 |
| RELEND | End of release period | 50 | yr | Section 7.5.1 |
| BEFORE | Time from start to exposure | 49 | yr | Section 7.5.1 |
| ABSHUM | Absolute humidity | 0.00408 | $kg/m^3$ | Table 102 |
| RF1 | Fraction of plants roots in surface soil | 1.0 | fraction | Assumption 3.2.6 |
| RAIN | Average daily rain rate, when raining | 0.49 | mm/day | Table 103 |
| BEFAIR | Air deposition time prior to exposure | 49 | yr | Section 7.5.1 |

#### 8.2.1.2 Water Menus (C2 to C6)

These menus are not used, because water is not contaminated in the YMP air dispersion scenario.

### 8.2.1.3 Soil Menus

#### 8.2.1.3.1 Soil-Leaching Sub-Menu (C7)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| LEACHOPTION | Type of leach rate constant | 1 | Menu Option | "calculated from user input" |
| THICK | Surface soil thickness for leaching | 25 | cm | Table 80 |
| MOISTC | Surface soil moisture content | 0.20 | - | Table 78 |
| BULKD | Surface soil bulk density | 1.5 | $g/cm^3$ | Table 75 |
| VLEACH | Total infiltration rate | 7.9 | cm/yr | Table 81 |
| | | | | |
| | Parent soil absorption coefficient (Kd) | | | |
| CASID | Radionuclide name | Table 77 | - | Section 7.2.2 |
| SOILKD | Soil adsorption coefficient (Kd) | Table 77 | L/kg | Section 7.2.2 |

#### 8.2.1.3.2 Soil-Resuspension Sub-Menu (C8)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| IRES | Type of model to run | 1 | menu | "mass loading model" |
| XMLF | Mass loading factor for resuspension model | 6.0E-04 | $g/m^3$ | Table 87 |
| AVASL | Depth of top soil available for resuspension | 0.2 | cm | Table 88 |
| RESFAC | Resuspension factor | - | 1/m | Not Used |

#### 8.2.1.3.3 Soil-Surface Soil Sub-Menu (C9)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| SLDN | Surface soil area density | 375 | $kg/m^2$ | Table 79 |
| SURCM | Surface soil layer thickness used for density | 25 | cm | Table 80 |
| SSLDN | Surface soil density | 1500 | $kg/m^3$ | Table 75 |

### 8.2.1.4 Agriculture Menus

#### 8.2.1.4.1 Agriculture-General Sub-Menu (C10)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| HARVEST | Radionuclide removal due to harvesting | FALSE | T/F | Assumption 3.2.11 |
| DRYSET | User defined dry deposition interception fraction to plants | FALSE | T/F | Use Model Equation |
| DEPFR1 | Dry deposition interception fraction to plants | - | fraction | Not Used |
| WETSET | User defined wet deposition interception fraction to plants | FALSE | T/F | Use Model Equation |
| DEPFR2 | Wet deposition interception fraction to plants | - | fraction | Not Used |
| LEAFRS | Resuspension factor from soil to plant surfaces | 3.2E-10 | 1/m | Table 86 |
| DVPRES | Deposition velocity from soil to plant surfaces | 8E-03 | m/s | Table 72 |
| WTIM | Weathering rate constant from plants | 14 | day | Table 71 |

### 8.2.1.4.2 Agriculture-Animal Feed-Yield Sub-Menu (C11)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| YELDA(6) | Yield of: | | | |
| | meat animal feed (grain) | 0.59 | kg(wet)/$m^2$ | Table 84 |
| | poultry animal feed (grain) | 0.59 | kg(wet)/$m^2$ | Table 84 |
| | milk animal feed (grain) | 0.59 | kg(wet)/$m^2$ | Table 84 |
| | egg animal feed (grain) | 0.59 | kg(wet)/$m^2$ | Table 84 |
| | meat animal forage (pasture grass) | 2.14 | kg(wet)/$m^2$ | Table 84 |
| | milk animal forage (pasture grass) | 2.14 | kg(wet)/$m^2$ | Table 84 |

### 8.2.1.4.3 Agriculture-Animal Feed-Dry/Wet Ratio Sub-Menu (C12)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| DRYFA2(6) | Dry/wet weight ratio for: | | | |
| | meat animal feed (grain) | 0.903 | fraction | Table 83 |
| | poultry animal feed (grain) | 0.903 | fraction | Table 83 |
| | milk animal feed (grain) | 0.903 | fraction | Table 83 |
| | egg animal feed (grain) | 0.903 | fraction | Table 83 |
| | meat animal forage (pasture grass) | 0.220 | fraction | Table 83 |
| | milk animal forage (pasture grass) | 0.220 | fraction | Table 83 |

### 8.2.1.4.4 Agriculture-Animal Feed-Translocation Factor Sub-Menu (C13)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| TRANSA(6) | Translocation factor of: | | | |
| | meat animal feed (grain) | 0.1 | fraction | Table 70 |
| | poultry animal feed (grain) | 0.1 | fraction | Table 70 |
| | milk animal feed (grain) | 0.1 | fraction | Table 70 |
| | egg animal feed (grain) | 0.1 | fraction | Table 70 |
| | meat animal forage (pasture grass) | 1.0 | fraction | Table 70 |
| | milk animal forage (pasture grass) | 1.0 | fraction | Table 70 |

### 8.2.1.4.5 Agriculture-Animal Feed-Soil Intake Sub-Menu (C14)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| SLCONA(4) | Soil intake rate for: | | | |
| | meat animal | 0.70 | kg/day | Table 74 |
| | poultry animal | 0.02 | kg/day | Table 74 |
| | milk animal | 0.95 | kg/day | Table 74 |
| | egg animal | 0.02 | kg/day | Table 74 |

### 8.2.1.4.6 Agriculture-Animal Feed-Standing Biomass Sub-Menu (C15)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| BIOMA2(6) | Standing biomass (wet) for: | | | |
| | meat animal feed (grain) | 1.25 | kg(wet)/m$^2$ | Table 82 |
| | poultry animal feed (grain) | 1.25 | kg(wet)/m$^2$ | Table 82 |
| | milk animal feed (grain) | 1.25 | kg(wet)/m$^2$ | Table 82 |
| | egg animal feed (grain) | 1.25 | kg(wet)/m$^2$ | Table 82 |
| | meat animal forage (pasture grass) | 2.14 | kg(wet)/m$^2$ | Table 82 |
| | milk animal forage (pasture grass) | 2.14 | kg(wet)/m$^2$ | Table 82 |

### 8.2.1.4.7 Agriculture-Animal Feed-Consumption Sub-Menu (C16)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| CONSUM(6) | Consumption rate of: | | | |
| | meat animal feed (grain) | 0.0 | kg(wet)/day | Assumption 3.2.7 |
| | poultry animal feed (grain) | 0.26 | kg(wet)/day | Table 73 |
| | milk animal feed (grain) | 0.0 | kg(wet)/day | Assumption 3.2.7 |
| | egg animal feed (grain) | 0.26 | kg(wet)/day | Table 73 |
| | meat animal forage (pasture grass) | 48.5 | kg(wet)/day | Table 73 |
| | milk animal forage (pasture grass) | 61.5 | kg(wet)/day | Table 73 |

### 8.2.1.4.8 Agriculture-Animal Feed-Storage Time Sub-Menu (C17)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| STORTM(6) | Storage time for: | | | |
| | meat animal feed (grain) | 0 | day | Assumption 3.2.8 |
| | poultry animal feed (grain) | 0 | day | Assumption 3.2.8 |
| | milk animal feed (grain) | 0 | day | Assumption 3.2.8 |
| | egg animal feed (grain) | 0 | day | Assumption 3.2.8 |
| | meat animal forage (pasture grass) | 0 | day | Assumption 3.2.8 |
| | milk animal forage (pasture grass) | 0 | day | Assumption 3.2.8 |

### 8.2.1.4.9 Agriculture-Animal Feed-Diet Fraction Sub-Menu (C18)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| DIETFR(6) | Fraction of diet that is contaminated: | | | |
| | meat animal feed (grain) | 0.0 | fraction | Assumption 3.2.7 |
| | poultry animal feed (grain) | 1.0 | fraction | Assumption 3.2.9 |
| | milk animal feed (grain) | 0.0 | fraction | Assumption 3.2.7 |
| | egg animal feed (grain) | 1.0 | fraction | Assumption 3.2.9 |
| | meat animal forage (pasture grass) | 1.0 | fraction | Assumption 3.2.9 |
| | milk animal forage (pasture grass) | 1.0 | fraction | Assumption 3.2.9 |

### 8.2.1.4.10 Agriculture-Animal Feed-Growing Period Sub-Menu (C19)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| GRWPA(6) | Growing period for: | | | |
| | meat animal feed (grain) | 200 | day | Table 85 |
| | poultry animal feed (grain) | 200 | day | Table 85 |
| | milk animal feed (grain) | 200 | day | Table 85 |
| | egg animal feed (grain) | 200 | day | Table 85 |
| | meat animal forage (pasture grass) | 75 | day | Table 85 |
| | milk animal forage (pasture grass) | 75 | day | Table 85 |

### 8.2.1.4.11 Agriculture-Food Crop-Standing Biomass Sub-Menu (C20)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| BIOMAS(4) | Standing biomass (wet) for: | | | |
| | leafy vegetables | 3.30 | kg(wet)/m$^2$ | Table 82 |
| | root vegetables | 4.17 | kg(wet)/m$^2$ | Table 82 |
| | fruits | 5.17 | kg(wet)/m$^2$ | Table 82 |
| | grains | 1.25 | kg(wet)/m$^2$ | Table 82 |

### 8.2.1.4.12 Agriculture-Food Crop-Growing Period Sub-Menu (C21)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| GRWP(4) | Growing period for: | | | |
| | leafy vegetables | 75 | day | Table 85 |
| | root vegetables | 80 | day | Table 85 |
| | fruits | 160 | day | Table 85 |
| | grains | 200 | day | Table 85 |

### 8.2.1.4.13 Agriculture-Food Crop-Yield Sub-Menu (C22)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| YELD(4) | Yield of: | | | |
| | leafy vegetables | 3.30 | kg(wet)/m$^2$ | Table 84 |
| | root vegetables | 4.13 | kg(wet)/m$^2$ | Table 84 |
| | fruits | 2.75 | kg(wet)/m$^2$ | Table 84 |
| | grains | 0.59 | kg(wet)/m$^2$ | Table 84 |

### 8.2.1.4.14 Agriculture-Food Crop-Dry/Wet Ratio Sub-Menu (C23)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| DRYFAC(4) | Dry/wet weight ratio of: | | | |
| | leafy vegetables | 0.070 | kg(wet)/m$^2$ | Table 83 |
| | root vegetables | 0.103 | kg(wet)/m$^2$ | Table 83 |
| | fruits | 0.120 | kg(wet)/m$^2$ | Table 83 |
| | grains | 0.903 | kg(wet)/m$^2$ | Table 83 |

### 8.2.1.4.15 Agriculture-Food Crop-Translocation Factor Sub-Menu (C24)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| TRANS(4) | Translocation factor of: | | | |
| | leafy vegetables | 1.0 | kg(wet)/m$^2$ | Table 70 |
| | root vegetables | 0.1 | kg(wet)/m$^2$ | Table 70 |
| | fruits | 0.1 | kg(wet)/m$^2$ | Table 70 |
| | grains | 0.1 | kg(wet)/m$^2$ | Table 70 |

### 8.2.1.4.16 Agriculture-Intake Delay Sub-Menu (C25)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| HLDUP(4) | Time from harvest to ingestion of: | | | |
| | leafy vegetables | 0 | day | Assumption 3.2.10 |
| | root vegetables | 0 | day | Assumption 3.2.10 |
| | fruits | 0 | day | Assumption 3.2.10 |
| | grains | 0 | day | Assumption 3.2.10 |
| | | | | |
| HLDUPA(4) | Time from slaughter to ingestion of: | | | |
| | meat | 0 | day | Assumption 3.2.10 |
| | poultry | 0 | day | Assumption 3.2.10 |
| | milk | 0 | day | Assumption 3.2.10 |
| | eggs | 0 | day | Assumption 3.2.10 |

### 8.2.1.5 Pathways Sub-Menu (C26)

Based on Section 3.2.3, three scenarios are considered: Onsite, Offsite General Environment, and Offsite other than General Environment. The pathways listed below are for Offsite General Environment. The other two cases (Onsite, and Offsite in other than General Environment) are the same except they do not include ingestion pathway (Table 1). For those two cases all ingestion pathways as denoted by a (*) in the table below should be set to "FALSE" in the Pathway menu screen, including ingestion of meat, poultry, milk, eggs (ANF(4)), leafy vegetables, root vegetables, fruits, grains (TDF(4)) and soil (SLING).

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| | Ingestion of: | | | |
| ANF(4) | meat | TRUE (*) | T/F | Assumption 3.2.3 |
| | poultry | TRUE (*) | T/F | Assumption 3.2.3 |
| | milk | TRUE (*) | T/F | Assumption 3.2.3 |
| | eggs | TRUE (*) | T/F | Assumption 3.2.3 |
| | | | | |
| TFD(4) | leafy vegetables | TRUE (*) | T/F | Assumption 3.2.3 |
| | root vegetables | TRUE (*) | T/F | Assumption 3.2.3 |
| | fruits | TRUE (*) | T/F | Assumption 3.2.3 |
| | grains | TRUE (*) | T/F | Assumption 3.2.3 |
| | | | | |
| AQF(4) | fish | FALSE | T/F | Assumption 3.2.3 |
| | mollusca | FALSE | T/F | Assumption 3.2.3 |
| | crustacean | FALSE | T/F | Assumption 3.2.3 |
| | aquatic plants | FALSE | T/F | Assumption 3.2.3 |
| | | | | |
| DRINK | Drinking water | FALSE | T/F | Assumption 3.2.3 |
| SHING | Inadvertent shower water | FALSE | T/F | Assumption 3.2.3 |
| SWING | Inadvertent swimming water | FALSE | T/F | Assumption 3.2.3 |
| SLING | Inadvertent soil | TRUE (*) | T/F | Assumption 3.2.3 |
| | | | | |
| | Inhalation of: | | | |
| INHAL | Outdoor air | TRUE | T/F | Assumption 3.2.3 |
| SHINDR | Indoor air (shower) | FALSE | T/F | Assumption 3.2.3 |
| SLINH | Suspended or resuspended soil | TRUE | T/F | Assumption 3.2.3 |
| | | | | |
| | External: | | | |
| SWDRML | Swimming | FALSE | T/F | Assumption 3.2.3 |
| SRDRML | Boating | FALSE | T/F | Assumption 3.2.3 |
| SHDRML | Shoreline | FALSE | T/F | Assumption 3.2.3 |
| GROUND | Soil | TRUE | T/F | Assumption 3.2.3 |
| AIREXT | External air | TRUE | T/F | Assumption 3.2.3 |
| FINITE | Finite plume model | FALSE | T/F | See (**) |

Notes: (*) For the receptor in the location of the Onsite and Offsite in other than General Environment, the values are FALSE, see Section 3.2.3.
(**) Based on Napier 2006 ([DIRS 177330], Sections 4.6.11 and 4.7.8), when the finite plume model is used, the external dose values are read directly from the atmospheric transport file (ATO) and no calculations are performed for this pathway in the GENII chronic or acute exposure module. Otherwise, a semi-infinite plume is assumed and the dose is to be based on the air concentration.

### 8.2.2 Chronic Exposure Module Default Files

For the convenience, GENIIv2 provides a capability to read user defined default values for the Chronic Exposure module in a default file, instead of manually entering all the parameter values listed above. The default file that is read by the Chronic Exposure module must be named *GNDFLcud.DEF*. It contains 198 input parameter values. The only parameters not contained in the file *GNDFLcud.DEF* are the partition coefficients (adsorption coefficients) for each radionuclide, or chemical element, *SOILKD*. These values are contained in the *YMPGENII.mdb* database file, which is discussed in Section 8.6.

There are three default files available and one must be copied as *GNDFLcud.DEF* into the FRAMES subdirectory prior to using the default file option in GENIIv2. The three files are: *GNDFLcud.GE*, *GNDFLcud.onsite*, and *GNDFLcud.nonGE* and they contain YMP site-specific inputs for Offsite General Environment, Onsite, and Offsite in other than General Environment, respectively. Generation of the three files is discussed in Attachment E.

## 8.3 GENIIv2 ACUTE EXPOSURE MODULE INPUT PARAMETERS

The GENIIv2 Acute Exposure module calculates concentrations in media resulting from a radionuclide release. The module considers two time periods, one during the release and one following the release. The Acute Exposure module uses as input radionuclide concentrations in air as generated by the Air Transport module. The output is the radionuclide concentration in various exposure media (air, crops, animal products, soil, etc.). The exposure pathways depend on the receptors and scenarios, which is discussed in Table 1.

Input parameters in the Acute Exposure module can be manually entered from menu screens (see Section 8.3.1), or transferred directly from a default file (see Section 8.3.2).

### 8.3.1 Acute Exposure Module Menu Screens

Parameters are organized by Acute Exposure module menu screen. Only those parameters required for the pathways shown in Table 1 are provided with YMP input data. Parameters not used in the YMP site-specific calculations with GENIIv2 are either not discussed or designated with a “-”.

#### 8.3.1.1 Controls Menu (A1)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| ANFOOD | Animal product ingestion | TRUE | T/F | Assumption 3.2.3 |
| TFOOD | Terrestrial food crop ingestion | TRUE | T/F | Assumption 3.2.3 |
| AQFOOD | Aquatic food ingestion | FALSE | T/F | Assumption 3.2.3 |
| RECRE | Recreational surface water | FALSE | T/F | Assumption 3.2.3 |
| DEBUG | Debug testing | - | T/F | User option |
| | | | | |
| NTKEND | Duration of exposure period | 1 | yr | Assumption 3.2.5 |
| RELEND | End of release period | 0.000114 | yr | Assumption 3.2.5 |
| ACUTIM | Duration of acute exposure | 0.000114 | yr | Assumption 3.2.5 |
| ABSHUM | Absolute humidity | 0.00408 | kg/m$^3$ | Table 102 |
| RF1 | Fraction of plants roots in surface soil | 1.0 | fraction | Assumption 3.2.6 |
| RAIN | Average daily rain rate, when raining | 0.49 | mm/day | Table 103 |

#### 8.3.1.2 Other Menus

All other menus (A2 through A26) and input parameter values for Acute Exposure module are the same as the menus (C2 through C26) and parameter values used for Chronic Exposure module as discussed in Section 8.2.1.3 to Section 8.2.1.5. The only exception is the parameter of the acute fresh forage intake fraction that is not used for chronic exposure module.

#### 8.3.1.2.1 Agriculture-Animal Feed- Acute Forage Sub-Menu (A27)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| FRACFR | Acute fresh forage intake fraction: | | | |
| | meat animal forage (pasture grass) | 0.83 | fraction | Section 7.3.8 |
| | milk animal forage (pasture grass) | 0.83 | fraction | Section 7.3.8 |

### 8.3.2 Acute Exposure Module Default File

For the convenience, GENIIv2 provides a capability to read user defined default values for the Acute Exposure module in a default file, instead of manually entering all the parameter values listed above. The default file that is read by the Acute Exposure module must be named *GNDFLaud.DEF*. The only parameters not contained in the file *GNDFLaud.DEF* are the partition coefficients (adsorption coefficients) for each radionuclide, or chemical element, *SOILKD*. These values are contained in the *YMPGENII.mdb* database file, which is discussed in Section 8.6.

There are three default files available and one must be copied as *GNDFLaud.DEF* into the FRAMES subdirectory prior to using the default file option in GENIIv2. The three files are: *GNDFLaud.GE*, *GNDFLaud.onsite*, and *GNDFLaud.nonGE* and they contain YMP site-specific inputs for Offsite General Environment, Onsite, and Offsite in other than General Environment, respectively. Generation of the three files is discussed in Attachment E.

## 8.4 GENIIv2 RECEPTOR INTAKE MODULE INPUT PARAMETERS

The GENIIv.2 Receptor Intake module allows the user to specify age groups and parameters necessary to estimate the intake or exposure to radionuclides. Parameters are input on the Receptor Intake module menu screens. Parameters not used in the YMP site-specific calculations with GENIIv2 are either not discussed or designated with a "-".

Input parameters in the Receptor Intake module can be manually entered from menu screens (see Section 8.4.1), or transferred directly from a default file (see Section 8.4.2).

Some input parameters in Receptor Intake module menu screens below contain two values: one for an offsite individual, and one for an onsite individual. Other input parameters apply to pathways applicable only to an offsite individual as discussed in Table 1. Also some input parameters have values tabulated for both mean and 95$^{th}$ percentile.

### 8.4.1 Receptor Intake Module Menu Screens

#### 8.4.1.1 Age Group Selection and External Exposure to Air Menu (R1)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| NAGES | Number of age groups | 1 | n/a | |
| LOWAGE | Age group lower bound | 18 | yrs | Defines Adult |
| UPAGE | Age group upper bound | 70 | yrs | Defines Adult |
| | Mean Values | | | |
| UEXAIR | Daily plume immersion exposure time | 22 (* 8.5) | hr/day | Table 89 |
| TEXAIR | Yearly plume immersion exposure time | 365 (* 250) | day/yr | Table 89 |
| | | | | |
| | 95$^{th}$ Percentile Values for Offsite | | | |
| UEXAIR | Daily plume immersion exposure time | 22.7 | hr/day | Table 101 |
| TEXAIR | Yearly plume immersion exposure time | 365 | day/yr | Table 101 |

Notes: values with * are for onsite individual

#### 8.4.1.2 External Ground Exposure Menu (R2)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| SHIN | Indoor shielding factor | 0.4 | fraction | Table 92 |
| SHOUT | Outdoor shielding factor | 1.0 | fraction | Table 92 |
| | Mean Values | | | |
| UEXGRD | Daily external ground exposure time | 24 (* 8.5) | hr/day | Table 89 |
| TEXGRD | Yearly external ground exposure time | 365 (* 250) | day/yr | Table 89 |
| FTIN | Fraction of time spent indoors | 0.61 (* 0.0) | fraction | Table 91 |
| FTOUT | Fraction of time spent outdoors | 0.31 (* 1.0) | fraction | Table 90 |
| | | | | |
| | 95$^{th}$ Percentile Values for Offsite | | | |
| UEXGRD | Daily external ground exposure time | 24 | hr/day | Table 101 |
| TEXGRD | Yearly external ground exposure time | 365 | day/yr | Table 101 |
| FTIN | Fraction of time spent indoors | 0.65 | fraction | Table 101 |
| FTOUT | Fraction of time spent outdoors | 0.33 | fraction | Table 101 |

Notes: values with * are for onsite individual

### 8.4.1.3 Food Crop Ingestion Menu (R3)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| UCRP(4) | Mean Consumption Rates* | | | |
| | leafy vegetables | 0.123 | kg/day | Table 97 |
| | root vegetables | 0.141 | kg/day | Table 97 |
| | fruits | 0.185 | kg/day | Table 97 |
| | grains | 0.336 | kg/day | Table 97 |
| | | | | |
| | 95th Percentile Consumption Rates for Offsite* | | | |
| | leafy vegetables | 0.159 | kg/day | Table 100 |
| | root vegetables | 0.158 | kg/day | Table 100 |
| | fruits | 0.198 | kg/day | Table 100 |
| | grains | 0.355 | kg/day | Table 100 |
| | | | | |
| TCRP(4) | Mean Consumption Periods | | | |
| | leafy vegetables | 17.9 | day | Table 96 |
| | root vegetables | 22.5 | day | Table 96 |
| | fruits | 54 | day | Table 96 |
| | grains | 0.16 | day | Table 96 |
| | | | | |
| | 95th Percentile Consumption Periods for Offsite | | | |
| | leafy vegetables | 99 | day | Table 100 |
| | root vegetables | 100 | day | Table 100 |
| | fruits | 180 | day | Table 100 |
| | grains | 3 | day | Table 100 |

Notes: * Consumption rates are 0.0 for onsite individual and offsite in other than the General Environment.

### 8.4.1.4 Animal Product Ingestion Menu (R4)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| UAMN(4) | Mean Consumption Rates* | | | |
| | meat | 0.098 | kg/day | Table 97 |
| | poultry | 0.110 | kg/day | Table 97 |
| | milk | 0.348 | kg/day | Table 97 |
| | eggs | 0.109 | kg/day | Table 97 |
| | | | | |
| | 95$^{th}$ Percentile Consumption Rates for Offsite* | | | |
| | meat | 0.112 | kg/day | Table 100 |
| | poultry | 0.126 | kg/day | Table 100 |
| | milk | 0.376 | kg/day | Table 100 |
| | eggs | 0.125 | kg/day | Table 100 |
| | | | | |
| TANM(4) | Mean Consumption Periods | | | |
| | meat | 15.1 | day | Table 96 |
| | poultry | 1.4 | day | Table 96 |
| | milk | 4.2 | day | Table 96 |
| | eggs | 33.3 | day | Table 96 |
| | | | | |
| | 95$^{th}$ Percentile Consumption Periods for Offsite | | | |
| | meat | 99 | day | Table 100 |
| | poultry | 14 | day | Table 100 |
| | milk | 52 | day | Table 100 |
| | eggs | 150 | day | Table 100 |

Notes: * Consumption rates are 0.0 for onsite and offsite in other than General Environment.

### 8.4.1.5 Inadvertent Soil Ingestion Menu (R5)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| | Mean Ingestion Values | | | |
| TSOIL | Soil contact days | 365 | day/yr | Table 99 |
| USOIL | Inadvertent soil ingestion rate | 104 (* 0) | mg/day | Table 98 |
| | | | | |
| | 95$^{th}$ Percentile Soil Ingestion Values for Offsite | | | |
| TSOIL | Soil contact days | 365 | day/yr | Table 101 |
| USOIL | Inadvertent soil ingestion rate | 193 | mg/day | Table 101 |

Notes: values with * are for onsite individual and offsite in other than the General Environment.

#### 8.4.1.6 Air Inhalation Menu (R6)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| | Mean Inhalation Values | | | |
| UINH | Air inhalation rate | 21.7 (** 30.2) | $m^3$/day | Table 93 & Table 101 |
| TINH | Air inhalation period | 365 (* 250) | day/yr | Table 94 |
| FRINH | Fraction of a day outdoor inhalation occurs | 0.92 (* 0.35) | fraction of day | Table 95 |
| | | | | |
| | 95th Percentile Inhalation Values for Offsite | | | |
| UINH | Air inhalation rate | 21.9 (** 30.2) | $m^3$/day | Table 101 |
| TINH | Air inhalation period | 365 | day/yr | Table 101 |
| FRINH | Fraction of a day outdoor inhalation occurs | 0.95 | fraction of day | Table 101 |

Notes: values with * are for onsite individual, and value with ** is for an acute exposure.

#### 8.4.1.7 Resuspended Soil Inhalation Menu (R7)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| | Mean Soil Inhalation Values | | | |
| UINHR | Resuspended soil inhalation rate | 21.7 | $m^3$/day | Table 93 |
| TINHR | Resuspended soil inhalation period | 365 (* 250) | day/yr | Table 94 |
| FRINHR | Fraction of a day resuspension inhalation occurs | 0.31 (* 0.35) | fraction of day | Table 95 |
| | | | | |
| | 95th Percentile Soil Inhalation Values for Offsite | | | |
| UINHR | Resuspended soil inhalation rate | 21.9 | $m^3$/day | Table 101 |
| TINHR | Resuspended soil inhalation period | 365 | day/yr | Table 101 |
| FRINHR | Fraction of a day resuspension inhalation occurs | 0.33 | fraction of day | Table 101 |

Notes: values with * are for onsite individual

### 8.4.2 Receptor Intake Module Default File

For the convenience, GENIIv2 provides a capability to read user defined default values for the Receptor Intake module in a default file, instead of manually entering all the parameter values listed above. The default file that is read by the Receptor Intake module must be named *GNDFLiud.DEF*. It contains 83 input parameters. The only parameter not contained in the file *GNDFLiud.GE* is the receptor age range, *LOWAGE* and *UPAGE* on menu R1, and fraction of a day outdoor inhalation occurs *FRINH* on menu R6. These values must be entered manually.

There are three default files available and one must be copied as *GNDFLiud.DEF* into the FRAMES subdirectory prior to using the default file option in GENIIv2. The three files are: *GNDFLiud.GE*, *GNDFLiud.onsite*, and *GNDFLiud.nonGE* and contain YMP site-specific inputs for Offsite General Environment, Onsite, and Offsite in other than General Environment, respectively. Generation of the three files is discussed in Attachment E.

The YMP site-specific file for Offsite General Environment, *GNDFLiud.GE*, includes parameter values discussed in the previous sections and uses the 95th percentile values for those parameters with multiple values. The YMP site-specific file for Onsite, *GNDFLiud.onsite*, includes parameter values that are listed in the parentheses in the previous sections. The YMP site-specific file for Offsite in other than General Environment, *GNDFLiud.nonGE,* includes parameter values that are similar to those for Offsite General Environment using the 95th percentile values, except that all ingestion related parameter values are set to 0.0 because the ingestion pathways are not applicable.

The three Receptor Intake default files described above are for a chronic exposure scenario using 95th percentile values. For an acute release with an offsite receptor, the inhalation rate must be changed to 30.2 $m^3$/day from 21.9 $m^3$/day to be consistent with the assumption (Section 3.2.5) of 1 hour accident release. The acute inhalation rate must be manually entered from a menu screen, after the default file is loaded into GENIIv2.

## 8.5 GENIIv2 HEALTH IMPACTS MODULE INPUT PARAMETERS

The GENIIv.2 Health Impacts module allows the user to select the type of dose and/or risk calculation to be performed. Parameters are input on the Health Impacts module menu screens. Parameters not used in the YMP site-specific calculations with GENIIv2 are either not discussed or designated with a "-".

### 8.5.1 Method Selection Menu (H1)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| FGR13 | ICRP 60 Dose Conversion Factor Selection | Select | Option Selection | Constraint 4.2.3 and Section 4.1.7.4 |

Calculated doses for YMP for compliance purposes are to be based on the radiation dosimetry of ICRP Publication 60 (ICRP 1991 [DIRS 101836]). Dose conversion factors based on ICRP 60 are provided in Federal Guidance Report 12 (Eckerman and Ryman 1993 [DIRS 107684]), and 13 (EPA 2002 [DIRS 175544]) and are appropriate for YMP dose calculations.

### 8.5.2 Method Parameters Menu (H2)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| HEINC | Calculate lifetime cancer incidence | FALSE | T/F | not needed |
| HEFAT | Calculate cancer fatalities | FALSE | T/F | not needed |
| HECEDE | Calculate radiation effective dose equivalent commitment (CEDE) | TRUE | T/F | Constraint 4.2.3 and Section 4.1.7.4 |
| SOILT | Thickness of contaminated soil/sediment layer | 0.25 | m | Table 80 |
| SSLDN | Density of contaminated soil/sediment layer | 1500 | $kg/m^3$ | Table 75 |

### 8.5.3 Constituent Parameters Menu (H3)

| Parameter | Description | YMP Value | Units | Reference |
|---|---|---|---|---|
| FS-CName | Constituent | Select | - | Table 2 |
| SOLUBIL | Lung transfer inhalation class | Select | - | Table 107 |

The lung transfer inhalation class can be entered manually from the screen menu. It can also be automatically loaded from database file *GENII.mdb*, which contains the parameter: *CLLCLAS*, *lung solubility class*.

## 8.6 GENIIv2 RADIONUCLIDE AND ELEMENT RELATED DATABASE

GENIIv2 contains a radionuclide specific database *GENII.mdb*. When a model is built in GENIIv2, a constituent module loads information from the database for each radionuclide. Default values are provided for many parameters that are required for a GENIIv2 run. YMP site-specific values for eleven parameters under four categories (or tables in *GENII.mdb*) are developed in this document. The parameters are soil-water partition coefficient under partitioning category (*Partitioning* table); transfer coefficients for meat, poultry, milk, and eggs under the animal transfer factor category (*Animal* table); soil-to-plant transfer factors for leafy vegetables, root vegetables, fruit, grain, and forage under the plant transfer factor category (*Plant* table); and lung transfer inhalation class under dosimetric category (*Dosimetry* table). These parameters are chemical element dependent, and data is tabulated for their corresponding radionuclides.

The deterministic values for transfer factors, and transfer coefficients are tabulated in Table 61 to Table 65, and Table 66 to Table 69, respectively. The partition coefficients are tabulated in Table 77. The lung solubility classes are tabulated in Table 107. Modification of the GENIIv2 database is necessary in order to include these site-specific data. Attachment F describes the generation of a YMP site-specific radionuclide dependent database file *YMPGENII.mdb* from the GENIIv2 default database *GENII.mdb* using data developed in this document.

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# 9. CONCLUSIONS

Site-specific inputs for use with GENIIv2 are developed using the previously qualified data and other reliable sources. Based on the required dose calculation with its associated pathways (Section 3.2.3), input parameters are first screened from the GENIIv2 "description (DES)" files (Section 5.3). Those relevant input parameters requiring site-specific values are then evaluated based on available information to develop either a fixed value or distribution (Section 7). Some parameters are based on the assumptions (Section 3) as a conservative approach. Others are based on the input data from the Biosphere Model in Section 4.1 or calculated from Biosphere Model references in Section 7. Parameter values developed in this document are based on mean, median, best estimate or "expected" values from the technical references. 95$^{th}$ percentile values are also developed for receptor related parameters. Input parameters are organized in the GENIIv2 input menu screens (Section 8) for convenience in entering data. These site-specific values are also saved in several GENIIv2 default files that can be read directly by GENIIv2 to avoid entering the parameters individually (Section 8).

As required by regulation (10 CFR 63.111(a)) for the preclosure safety analysis (PCSA), the receptor in the general environment is "any real member of the public located beyond the boundary of the site." There are two ways to represent the calculated dose to any real member of the public located beyond the boundary of the site: 1) deterministic and 2) stochastic. Site-specific GENIIv2 input parameter values to support either method are developed in this calculation.

## 9.1 DETERMINISTIC METHOD

A deterministic dose calculation method uses receptor characteristics that would bound those of any real member of the public. In this case, individual parameter values are selected at the 95$^{th}$ percentile level for the receptor related parameters including food consumption rates, food consumption periods, external and inhalation exposure times, instead of using the mean values. The use of the 95$^{th}$ percentile input values for each receptor related parameter provides a conservatively calculated dose, because it represents a maximized combination of receptor characteristics.

For a deterministic dose calculation method, the "YMP" values" are mean values listed in the Section 8.1, Section 8.2, Section 8.3, and Section 8.5, and the "95$^{th}$ Percentile" values for receptor parameters listed in Section 8.4.

## 9.2 STOCHASTIC METHOD

A stochastic dose calculations method uses mean values and distributions for parameters, including receptor related parameters and used a sensitivity and uncertainty analysis to determine a dose distribution. Then, the dose to any real member of the public is the maximum value (e.g. 95$^{th}$ percentile) from the calculated dose distribution.

For a stochastic dose calculation method, the "YMP" values" are the distribution values shown in the entire Section 7. The mean values needed to run a stochastic calculation are listed in Section 8.1, Section 8.2, Section 8.3, Section 8.4, and Section 8.5.

## 9.3 DEFAULT INPUT FILES

The site-specific parameter values for the Yucca Mountain project developed in this calculation are used to create several GENIIv2 default files. These default files can be read directly by the GENIIv2 software to avoid manually entering each individual parameter value. The default files contain values for use with either a deterministic or stochastic method dose calculation. However, the "Receptor Intake" default files contain the "95$^{th}$ Percentile" values in Section 8.4.1 for receptor parameters. Therefore, those parameter values would need to be manually replaced with "YMP" values when performing a stochastic method calculation.

Three site-specific parameter files are used by GENIIv2: 1)*GNDFLcud.def* - for chronic exposure 2) *GNDFLaud.def* - for acute exposure, and 3) *GNDFLiud.def* - for receptor intake. Because three receptors are considered for the Yucca Mountain project (Section 3.2.3), default files are generated for the three different receptors and are identified by their extensions: (*.onsite*) for onsite, (*.GE*) for offsite general environment, and (*.nonGE*) for offsite other than the general environment. The files are identified in Table 108 and discussed in Attachment E.

Table 108. YMP Receptor Dependent Site-Specific Default Files

| | GENIIv2 | YMP Receptor Dependent Site-Specific Files | | |
|---|---|---|---|---|
| **Parameters** | **Default File Name** | **Onsite** | **Offsite GE** | **Offsite Non-GE** |
| **Chronic Exposure** | *GNDFLcud.def* | *GNDFLcud.onsite* | *GNDFLcud.GE* | *GNDFLcud.nonGE* |
| **Acute Exposure** | *GNDFLaud.def* | *GNDFLaud.onsite* | *GNDFLaud.GE* | *GNDFLaud.nonGE* |
| **Receptor Intake** | *GNDFLiud.def* | *GNDFLiud.onsite* | *GNDFLiud.GE* | *GNDFLiud.nonGE* |

The two offsite Receptor Intake default files described above are for an acute exposure scenario using 95$^{th}$ percentile values. The only difference for a chronic release is that the inhalation rate must be manually changed from 30.2 $m^3$/day to 21.9 $m^3$/day. The onsite receptor intake default file is for an acute exposure scenario using mean values. One additional receptor intake default file is created for use with stochastic runs, *GNDFLiud.pop,* that uses mean values rather than 95$^{th}$ percentile values. It is also setup for an acute exposure scenario, and the inhalation rate would also need to be changed for a chronic scenario.

Files in the column corresponding to the receptor location of interest for the dose calculation must be copied into the FRAMES directory that contains the executable version of GENIIv2 and renamed to the name in the "Default File Name" column. For example, for an Offsite-GE calculation, the file *GNDFLiud.GE* would be copied to the FRAMES directory and renamed as *GNDFLiud.def.*

## 9.4 SITE-SPECIFIC DATABASE IN DOSE COEFFICIENT FILES

A site-specific nuclide dependent database file *YMPGENII.mdb* is generated to include nuclide-specific plant transfer factor, animal transfer coefficients, soil water partition coefficients (Kd), and lung transfer inhalation class as discussed in Attachment F. Also an updated inhalation dose coefficient file – *FGR13INH.ymp* is also created to increase tritium water vapor phase dose coefficient by a factor of 1.5 to all organs to account for skin absorption, as discussed in Attachment G.

These files must be copied into the FRAMES directory that contains the executable version of GENIIv2 and renamed as follows.

1) *YMPGENII.mdb* renamed to *GENII.mdb*

2) *FGR13INH.ymp* renamed to *FGR13INH.HDB*

## 9.5 PARAMETER SUMMARY FILE

All parameters discussed in Section 7 are summarized in the Excel file, *GENII_Parameter_Summary.xls*. This file contains all parameters listed in Table 59. This file contains twelve worksheets. This main worksheet, *SUM3*, includes all parameters, and shows parameter distribution values if only a single input was developed. The worksheet has hyperlinks under GENII Symbol (Column C) if multiple input values were developed under one parameter name. The hyperlink connects to eleven worksheets, *TF, TC, Kd, Lung, Biomass, DryWet, Feed, Trans, Yield, Fixed,* and *Intake*, which contain the relevant parameter distribution values. If a parameter has a lognormal distribution, log(GM) and log(GSD) are calculated, as GENIIv2 takes only log values, instead of GM and GSD.

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# ATTACHMENT A. RADIONUCLIDE LISTING

The table in this attachment lists radionuclides in the radionuclide master data library *RMDLIB.DAT* from the GENIIv2 software package (GENII V.2.02. 2006. STN: 11211-2.02-00 [DIRS 177605]).

Table 109. List of Nuclides in GENIIv2 File *RMBLIB.DAT*

| **Nuclides Alphabetical and by Mass Number** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ac223 | As71 | Bi204 | Ce135 | Cr49 | Eu146 | Gd152 | Ho164 | Ir186A | La143 | Nb97 |
| Ac224 | As72 | Bi205 | Ce137 | Cr51 | Eu147 | Gd153 | Ho164m | Ir186B | Lu169 | Nb97m |
| Ac225 | As73 | Bi206 | Ce137m | Cs125 | Eu148 | Gd159 | Ho166 | Ir187 | Lu170 | Nb98 |
| Ac226 | As74 | Bi207 | Ce139 | Cs126 | Eu149 | Ge66 | Ho166m | Ir188 | Lu171 | Nd136 |
| Ac227 | As76 | Bi210 | Ce141 | Cs127 | Eu150A | Ge67 | Ho167 | Ir189 | Lu172 | Nd138 |
| Ac228 | As77 | Bi210m | Ce143 | Cs128 | Eu150B | Ge68 | I120 | Ir190 | Lu173 | Nd139 |
| Ag102 | As78 | Bi211 | Ce144 | Cs129 | Eu152 | Ge69 | I120m | Ir190m | Lu174 | Nd139m |
| Ag103 | At207 | Bi212 | Cf244 | Cs130 | Eu152m | Ge71 | I121 | Ir190N | Lu174m | Nd141 |
| Ag104 | At211 | Bi213 | Cf246 | Cs131 | Eu154 | Ge75 | I122 | Ir191m | Lu176 | Nd141m |
| Ag104m | At215 | Bi214 | Cf248 | Cs132 | Eu155 | Ge77 | I123 | Ir192 | Lu176m | Nd147 |
| Ag105 | At216 | Bk245 | Cf249 | Cs134 | Eu156 | Ge78 | I124 | Ir192m | Lu177 | Nd149 |
| Ag106 | At217 | Bk246 | Cf250 | Cs134m | Eu157 | H3 | I125 | Ir194 | Lu177m | Nd151 |
| Ag106m | At218 | Bk247 | Cf251 | Cs135 | Eu158 | Hf170 | I126 | Ir194m | Lu178 | Ne19 |
| Ag108 | Au193 | Bk249 | Cf252 | Cs135m | F18 | Hf172 | I128 | Ir195 | Lu178m | Ni56 |
| Ag108m | Au194 | Bk250 | Cf253 | Cs136 | Fe52 | Hf173 | I129 | Ir195m | Lu179 | Ni57 |
| Ag109m | Au195 | Br74 | Cf254 | Cs137 | Fe55 | Hf175 | I130 | K38 | Md257 | Ni59 |
| Ag110 | Au195 | Br74m | Cl36 | Cs138 | Fe59 | Hf177m | I131 | K40 | Md258 | Ni63 |
| Ag110m | Au198 | Br75 | Cl38 | Cu57 | Fe60 | Hf178m | I132 | K42 | Mg28 | Ni65 |
| Ag111 | Au198 | Br76 | Cl39 | Cu60 | Fm252 | Hf179m | I132m | K43 | Mn51 | Ni66 |
| Ag112 | Au199 | Br77 | Cm238 | Cu61 | Fm253 | Hf180m | I133 | K44 | Mn52 | Np232 |
| Ag115 | Au200 | Br80 | Cm240 | Cu62 | Fm254 | Hf181 | I134 | K45 | Mn52m | Np233 |
| Al26 | Au200 | Br80m | Cm241 | Cu64 | Fm255 | Hf182 | I135 | Kr74 | Mn53 | Np234 |
| Al28 | Au201 | Br82 | Cm242 | Cu66 | Fm257 | Hf182m | In109 | Kr76 | Mn54 | Np235 |
| Am237 | Ba126 | Br83 | Cm243 | Cu67 | Fr219 | Hf183 | In110A | Kr77 | Mn56 | Np236A |
| Am238 | Ba128 | Br84 | Cm244 | Dy155 | Fr220 | Hf184 | In110B | Kr79 | Mo101 | Np236B |
| Am239 | Ba131 | C11 | Cm245 | Dy157 | Fr221 | Hg193 | In111 | Kr81 | Mo90 | Np237 |
| Am240 | Ba131 | C14 | Cm246 | Dy159 | Fr222 | Hg193m | In111m | Kr81m | Mo93 | Np238 |
| Am241 | Ba133 | Ca41 | Cm247 | Dy165 | Fr223 | Hg194 | In112 | Kr83m | Mo93m | Np239 |
| Am242 | Ba133 | Ca45 | Cm248 | Dy166 | Ga65 | Hg195 | In113m | Kr85 | Mo99 | Np240 |
| Am242m | Ba135 | Ca47 | Cm249 | Er161 | Ga66 | Hg195m | In114 | Kr85m | N13 | Np240m |
| Am243 | Ba137 | Ca49 | Cm250 | Er165 | Ga67 | Hg197 | In114m | Kr87 | Na22 | O14 |
| Am244 | Ba139 | Cd104 | Co55 | Er167m | Ga68 | Hg197m | In115 | Kr88 | Na24 | O15 |
| Am244m | Ba140 | Cd107 | Co56 | Er169 | Ga70 | Hg199m | In115m | La131 | Nb88 | O19 |
| Am245 | Ba141 | Cd109 | Co57 | Er171 | Ga72 | Hg203 | In116m | La132 | Nb89a | Os180 |
| Am246 | Ba142 | Cd113 | Co58 | Er172 | Ga73 | Hg206 | In117 | La134 | Nb89b | Os181 |
| Am246m | Be10 | Cd113m | Co58m | Es250 | Gd145 | Ho155 | In117m | La135 | Nb90 | Os182 |
| Ar37 | Be7 | Cd115 | Co60 | Es251 | Gd146 | Ho157 | In119 | La137 | Nb93m | Os185 |
| Ar39 | Bi200 | Cd115m | Co60m | Es253 | Gd147 | Ho159 | In119m | La138 | Nb94 | Os189m |
| Ar41 | Bi201 | Cd117 | Co61 | Es254 | Gd148 | Ho161 | Ir182 | La140 | Nb95 | Os190m |
| As69 | Bi202 | Cd117m | Co62m | Es254m | Gd149 | Ho162 | Ir184 | La141 | Nb95m | Os191 |
| As70 | Bi203 | Ce134 | Cr48 | Eu145 | Gd151 | Ho162m | Ir185 | La142 | Nb96 | Os191m |

Table 109. List of Nuclides in GENIIv2 File *RMBLIB.DAT* (Continued)

| **Nuclides Alphabetically and by Mass Number** | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Os193 | Pm148m | Pu236 | Re187 | Sb126m | Sn121 | Tb154 | Th227 | U238 | Yb167 |
| Os194 | Pm149 | Pu237 | Re188 | Sb127 | Sn121m | Tb155 | Th228 | U239 | Yb169 |
| P30 | Pm150 | Pu238 | Re188m | Sb128A | Sn123 | Tb156 | Th229 | U240 | Yb175 |
| P32 | Pm151 | Pu239 | Re189 | Sb128B | Sn123m | Tb156m | Th230 | V47 | Yb177 |
| P33 | Po203 | Pu240 | Rh100 | Sb129 | Sn125 | Tb156N | Th231 | V48 | Yb178 |
| Pa227 | Po205 | Pu241 | Rh101 | Sb130 | Sn126 | Tb157 | Th232 | V49 | Zn62 |
| Pa228 | Po207 | Pu242 | Rh101m | Sb131 | Sn127 | Tb158 | Th234 | W176 | Zn63 |
| Pa230 | Po209 | Pu243 | Rh102 | Sc43 | Sn128 | Tb160 | Ti44 | W177 | Zn65 |
| Pa231 | Po210 | Pu244 | Rh102m | Sc44 | Sr80 | Tb161 | Ti45 | W178 | Zn69 |
| Pa232 | Po211 | Pu245 | Rh103m | Sc44m | Sr81 | Tc101 | Tl194 | W179 | Zn69m |
| Pa233 | Po212 | Pu246 | Rh105 | Sc46 | Sr82 | Tc104 | Tl194m | W181 | Zn71m |
| Pa234 | Po213 | Ra222 | Rh106 | Sc47 | Sr83 | Tc93 | Tl195 | W185 | Zn72 |
| Pa234m | Po214 | Ra223 | Rh106m | Sc48 | Sr85 | Tc93m | Tl197 | W187 | Zr86 |
| Pb195m | Po215 | Ra224 | Rh107 | Sc49 | Sr85m | Tc94 | Tl198 | W188 | Zr88 |
| Pb198 | Po216 | Ra225 | Rh99 | Se70 | Sr87m | Tc94m | Tl198m | Xe120 | Zr89 |
| Pb199 | Po218 | Ra226 | Rh99m | Se72 | Sr89 | Tc95 | Tl199 | Xe121 | Zr93 |
| Pb200 | Pr136 | Ra227 | Rn218 | Se73 | Sr90 | Tc95m | Tl200 | Xe122 | Zr95 |
| Pb201 | Pr137 | Ra228 | Rn219 | Se73m | Sr91 | Tc96 | Tl201 | Xe123 | |
| Pb202 | Pr138 | Rb77 | Rn220 | Se75 | Sr92 | Tc96m | Tl202 | Xe125 | |
| Pb202m | Pr138m | Rb79 | Rn222 | Se77m | Ta172 | Tc97 | Tl204 | Xe127 | |
| Pb203 | Pr139 | Rb80 | Ru103 | Se79 | Ta173 | Tc97m | Tl206 | Xe129m | |
| Pb204m | Pr142 | Rb81 | Ru105 | Se81 | Ta174 | Tc98 | Tl207 | Xe131m | |
| Pb205 | Pr142m | Rb81m | Ru106 | Se81m | Ta175 | Tc99 | Tl208 | Xe133 | |
| Pb209 | Pr143 | Rb82 | Ru94 | Se83 | Ta176 | Tc99m | Tl209 | Xe133m | |
| Pb210 | Pr144 | Rb82m | Ru97 | Si31 | Ta177 | Te116 | Tl210 | Xe135 | |
| Pb211 | Pr144m | Rb83 | S35 | Si32 | Ta178A | Te121 | Tm162 | Xe135m | |
| Pb212 | Pr145 | Rb84 | Sb115 | Sm141 | Ta178B | Te121m | Tm166 | Xe138 | |
| Pb214 | Pr147 | Rb86 | Sb116 | Sm141m | Ta179 | Te123 | Tm167 | Y86 | |
| Pd100 | Pt186 | Rb87 | Sb116m | Sm142 | Ta180 | Te123m | Tm170 | Y86m | |
| Pd101 | Pt188 | Rb88 | Sb117 | Sm145 | Ta180m | Te125m | Tm171 | Y87 | |
| Pd103 | Pt189 | Rb89 | Sb118 | Sm146 | Ta182 | Te127 | Tm172 | Y88 | |
| Pd107 | Pt191 | Re177 | Sb118m | Sm147 | Ta182m | Te127m | Tm173 | Y90 | |
| Pd109 | Pt193 | Re178 | Sb119 | Sm151 | Ta183 | Te129 | Tm175 | Y90m | |
| Pm141 | Pt193m | Re180 | Sb120A | Sm153 | Ta184 | Te129m | U230 | Y91 | |
| Pm142 | Pt195m | Re181 | Sb120B | Sm155 | Ta185 | Te131 | U231 | Y91m | |
| Pm143 | Pt197 | Re182A | Sb122 | Sm156 | Ta186 | Te131m | U232 | Y92 | |
| Pm144 | Pt197m | Re182B | Sb124 | Sn110 | Tb147 | Te132 | U233 | Y93 | |
| Pm145 | Pt199 | Re184 | Sb124m | Sn111 | Tb149 | Te133 | U234 | Y94 | |
| Pm146 | Pt200 | Re184m | Sb124N | Sn113 | Tb150 | Te133m | U235 | Y95 | |
| Pm147 | Pu234 | Re186 | Sb125 | Sn117m | Tb151 | Te134 | U236 | Yb162 | |
| Pm148 | Pu235 | Re186m | Sb126 | Sn119m | Tb153 | Th226 | U237 | Yb166 | |

Source: *RMDLIB.DAT* file in GENII V.2.02 (2006. STN: 11211-2.02-00 [DIRS 177605]). It is also shown in Attachment H and included in the attached CD.

# ATTACHMENT B. IMPLICIT DAUGHTER LISTING

The radionuclide master data library (*RMDLIB.DAT*) contains all radiological decay data for GENIIv2. This file is included in the GENII V.2.02 (2006. STN: 11211-2.02-00 [DIRS 177605]). Decay of very short-lived radionuclides with the decay chains of longer-lived radionuclides is treated implicitly per PNNL-14584 (Napier et al 2006 [DIRS 177331], Section 3.2). External and internal dose conversion factors account for the implicit daughters within the dose factors assigned for the explicit parent radionuclides (Napier et al 2006 [DIRS 177331], Sections 3.4.2 and 3.4.3).

Double counting dose contributions from implicit daughters should be avoided by not including the implicit daughter as an input if its parent radionuclide is already included in the list of input radionuclides. A list of implicit daughters in *RMDLIB.DAT* and all of their potential parent radionuclide decay chains is given in Table 110.

Table 110. Implicit Daughters and Parent Decay Chains

| No. Parents | Implicit Daughter | Parent Nuclide(s) with Implicit Daughter in its Decay Chain | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Ac223 | Pa227 | | | | | | | | | |
| 1 | Ac224 | Th228 | | | | | | | | | |
| 1 | Ac228 | Ra228 | | | | | | | | | |
| 2 | Ag104 | Ag104m | Cd104 | | | | | | | | |
| 1 | Ag108 | Ag108m | | | | | | | | | |
| 1 | Ag110 | Ag110m | | | | | | | | | |
| 1 | Al28 | Mg28 | | | | | | | | | |
| 1 | Am238 | Cm238 | | | | | | | | | |
| 2 | Am245 | Cf249 | Pu245 | | | | | | | | |
| 1 | Am246m | Pu246 | | | | | | | | | |
| 1 | As70 | Se70 | | | | | | | | | |
| 1 | As78 | Ge78 | | | | | | | | | |
| 3 | At215 | Ac223 | Fr219 | Pa227 | | | | | | | |
| 2 | At216 | Pb212 | Fr220 | | | | | | | | |
| 2 | At217 | Ac225 | Fr221 | | | | | | | | |
| 2 | At218 | Rn222 | Po218 | | | | | | | | |
| 2 | Au200 | Au200m | Pt200 | | | | | | | | |
| 1 | Ba137m | Cs137 | | | | | | | | | |
| 7 | Bi211 | Ac223 | Ra223 | At215 | Fr219 | Pb211 | Po215 | Rn219 | | | |
| 3 | Bi212 | Pb212 | At216 | Fr220 | | | | | | | |
| 3 | Bi213 | Ac225 | At217 | Fr221 | | | | | | | |
| 4 | Bi214 | Rn222 | At218 | Pb214 | Po218 | | | | | | |
| 3 | Bk250 | Pu246 | Es254 | Es254m | | | | | | | |
| 1 | Br74 | Kr74 | | | | | | | | | |
| 1 | Br80 | Br80m | | | | | | | | | |
| 1 | Br83 | Se83 | | | | | | | | | |
| 1 | Cm249 | Es253 | | | | | | | | | |
| 1 | Co60m | Fe60 | | | | | | | | | |
| 1 | Cs126 | Ba126 | | | | | | | | | |
| 1 | Cs128 | Ba128 | | | | | | | | | |
| 1 | Cs138 | Xe138 | | | | | | | | | |

Table 110. Implicit Daughters and Parent Decay Chains (Cont.d)

| No. Parents | Implicit Daughter | Parent Nuclide(s) with Implicit Daughter in its Decay Chain | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Cu62 | Zn62 | | | | | | | | | |
| 1 | Cu66 | Ni66 | | | | | | | | | |
| 1 | Dy157 | Ho157 | | | | | | | | | |
| 1 | Fm254 | Es254m | | | | | | | | | |
| 2 | Fr219 | Ac223 | Pa227 | | | | | | | | |
| 1 | Fr220 | Pb212 | | | | | | | | | |
| 1 | Fr221 | Ac225 | | | | | | | | | |
| 1 | Fr222 | Ac226 | | | | | | | | | |
| 1 | Fr223 | Th227 | | | | | | | | | |
| 1 | Ga68 | Ge68 | | | | | | | | | |
| 1 | Hg193 | Hg193m | | | | | | | | | |
| 1 | Ho161 | Er161 | | | | | | | | | |
| 1 | Ho162 | Ho162m | | | | | | | | | |
| 1 | Ho164 | Ho164m | | | | | | | | | |
| 1 | I120 | Xe120 | | | | | | | | | |
| 1 | I121 | Xe121 | | | | | | | | | |
| 1 | I122 | Xe122 | | | | | | | | | |
| 2 | I132 | I132m | Te132 | | | | | | | | |
| 1 | I134 | Te134 | | | | | | | | | |
| 1 | In110A | Sn110 | | | | | | | | | |
| 1 | In113m | Sn113 | | | | | | | | | |
| 1 | In114 | In114m | | | | | | | | | |
| 1 | In115m | Cd115 | | | | | | | | | |
| 3 | In117 | Cd117 | Cd117m | In117m | | | | | | | |
| 2 | In117m | Cd117 | Cd117m | | | | | | | | |
| 1 | In119 | In119m | | | | | | | | | |
| 1 | Ir190m | Ir190N | | | | | | | | | |
| 1 | Ir195 | Ir195m | | | | | | | | | |
| 1 | Kr77 | Rb77 | | | | | | | | | |
| 3 | Kr83m | Br83 | Rb83 | Se83 | | | | | | | |
| 1 | La134 | Ce134 | | | | | | | | | |
| 1 | La141 | Ba141 | | | | | | | | | |
| 1 | La142 | Ba142 | | | | | | | | | |
| 1 | Lu178 | Yb178 | | | | | | | | | |
| 1 | Mn52m | Fe52 | | | | | | | | | |
| 1 | Nb97 | Nb97m | | | | | | | | | |
| 1 | Nd139 | Nd139m | | | | | | | | | |
| 4 | Nd141 | Nd141m | Pm141 | Sm141 | Sm141m | | | | | | |
| 3 | Nd141m | Pm141 | Sm141 | Sm141m | | | | | | | |
| 1 | Np240m | U240 | | | | | | | | | |
| 2 | Os189m | Ir189 | Re189 | | | | | | | | |
| 2 | Pa234 | Pa234m | Th234 | | | | | | | | |
| 1 | Pa234m | Th234 | | | | | | | | | |
| 1 | Pb202m | Bi202 | | | | | | | | | |
| 1 | Pb204m | Bi204 | | | | | | | | | |
| 6 | Pb209 | Ac225 | At217 | Bi213 | Fr221 | Po213 | Tl209 | | | | |
| 3 | Pb211 | Ra223 | Po215 | Rn219 | | | | | | | |
| 2 | Pb214 | Rn222 | Po218 | | | | | | | | |
| 2 | Pm141 | Sm141 | Sm141m | | | | | | | | |

Table 110. Implicit Daughters and Parent Decay Chains (Cont'd)

| No. Parents | Implicit Daughter | Parent Nuclide(s) with Implicit Daughter in its Decay Chain | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Pm142 | Sm142 | | | | | | | | | |
| 1 | Po207 | At207 | | | | | | | | | |
| 9 | Po211 | Ac223 | Ra223 | At211 | At215 | Bi211 | Fr219 | Pb211 | Po215 | Rn219 | |
| 4 | Po212 | Pb212 | At216 | Bi212 | Fr220 | | | | | | |
| 4 | Po213 | Ac225 | At217 | Bi213 | Fr221 | | | | | | |
| 10 | Po214 | Rn222 | At218 | Bi214 | Fr222 | Pb214 | Po218 | Ra222 | Rn218 | Th226 | U230 |
| 2 | Po215 | Ra223 | Rn219 | | | | | | | | |
| 2 | Po216 | Ra224 | Rn220 | | | | | | | | |
| 1 | Po218 | Rn222 | | | | | | | | | |
| 1 | Pr136 | Nd136 | | | | | | | | | |
| 1 | Pr138 | Nd138 | | | | | | | | | |
| 2 | Pr139 | Nd139 | Nd139m | | | | | | | | |
| 2 | Pr144 | Ce144 | Pr144m | | | | | | | | |
| 1 | Pr144m | Ce144 | | | | | | | | | |
| 1 | Pu234 | Pu238 | | | | | | | | | |
| 1 | Pu243 | Cm247 | | | | | | | | | |
| 4 | Ra222 | Ac226 | Fr222 | Th226 | U230 | | | | | | |
| 1 | Rb80 | Sr80 | | | | | | | | | |
| 2 | Rb81 | Rb81m | Sr81 | | | | | | | | |
| 1 | Rb82 | Sr82 | | | | | | | | | |
| 1 | Rb88 | Kr88 | | | | | | | | | |
| 1 | Re180 | Os180 | | | | | | | | | |
| 2 | Rh103m | Pd103 | Ru103 | | | | | | | | |
| 1 | Rh106 | Ru106 | | | | | | | | | |
| 5 | Rn218 | Ac226 | Fr222 | Ra222 | Th226 | U230 | | | | | |
| 1 | Rn219 | Ra223 | | | | | | | | | |
| 1 | Rn220 | Ra224 | | | | | | | | | |
| 1 | Sb116 | Te116 | | | | | | | | | |
| 1 | Sb124m | Sb124N | | | | | | | | | |
| 1 | Sb126m | Sn126 | | | | | | | | | |
| 1 | Sb128A | Sn128 | | | | | | | | | |
| 2 | Sc44 | Sc44m | Ti44 | | | | | | | | |
| 1 | Sc49 | Ca49 | | | | | | | | | |
| 1 | Se73 | Se73m | | | | | | | | | |
| 1 | Se81 | Se81m | | | | | | | | | |
| 1 | Sm141 | Sm141m | | | | | | | | | |
| 1 | Sr87m | Y87 | | | | | | | | | |
| 1 | Ta176 | W176 | | | | | | | | | |
| 1 | Ta178A | W178 | | | | | | | | | |
| 1 | Ta184 | Hf184 | | | | | | | | | |
| 1 | Tc101 | Mo101 | | | | | | | | | |
| 1 | Tc93 | Tc93m | | | | | | | | | |
| 1 | Tc94m | Ru94 | | | | | | | | | |
| 1 | Tc99m | Mo99 | | | | | | | | | |
| 1 | Te129 | Te129m | | | | | | | | | |
| 2 | Te131 | Sb131 | Te131m | | | | | | | | |
| 1 | Te133 | Te133m | | | | | | | | | |
| 2 | Th226 | Ac226 | U230 | | | | | | | | |
| 1 | Tl195 | Pb195m | | | | | | | | | |

Table 110. Implicit Daughters and Parent Decay Chains (Cont'd)

| No. Parents | Implicit Daughter | Parent Nuclide(s) with Implicit Daughter in its Decay Chain | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | Tl198 | Pb198 | Tl198m | | | | | | | | |
| 1 | Tl199 | Pb199 | | | | | | | | | |
| 2 | Tl206 | Bi210m | Hg206 | | | | | | | | |
| 8 | Tl207 | Ac223 | Ra223 | At215 | Bi211 | Fr219 | Pb211 | Po215 | Rn219 | | |
| 4 | Tl208 | Pb212 | At216 | Bi212 | Fr220 | | | | | | |
| 4 | Tl209 | Ac225 | At217 | Bi213 | Fr221 | | | | | | |
| 1 | Tm162 | Yb162 | | | | | | | | | |
| 1 | Tm166 | Yb166 | | | | | | | | | |
| 1 | W177 | Re177 | | | | | | | | | |
| 1 | Xe135m | I135 | | | | | | | | | |
| 1 | Y91m | Sr91 | | | | | | | | | |
| 1 | Y92 | Sr92 | | | | | | | | | |
| 1 | Zn69 | Zn69m | | | | | | | | | |

Source: *RMDLIB.DAT* file in GENII V.2.02 (2006. STN: 11211-2.02-00 [DIRS 177605]). It is also shown in Attachment H and included in the attached CD.

## ATTACHMENT C. CATEGORIZATION OF GENII DESCRIPTION FILES

This attachment categorizes GENIIv2 input parameters used in preclosure safety analysis dose calculations. All parameters for GENIIv2 are listed in the GENIIv2 description files (DES) distributed with the code software. Input parameter descriptions in the DES files include the parameter type, units, minimum and maximum values. The type identifies the parameter as not stochastic or continuous. Continuous parameters can be used in GENIIv2 to perform sensitivity analyses.

The eight DES files listed in Table 111 contain all of the parameters applicable to preclosure safety analysis dose calculations. Parameters in other GENIIv2 DES files are not used in the dose calculations.

Table 111. GENIIv2 Files Containing Site-Specific Inputs Parameters

| GENIIv2 File | Parameter Category | Number of Parameters | Categorization in |
|---|---|---|---|
| FuiAFF.des | Air emission parameters | 18 | Table 112 |
| ACPlume.des | Acute plume release parameters | 29 | Table 113 |
| CHPlume.des | Chronic plume release parameters | 24 | Table 113 |
| Gen_Act.des | Acute exposure parameters | 101 | Table 114 |
| Gen_Exp.des | Chronic exposure parameters | 93 | Table 114 |
| Gen_Rcp.des | Receptor parameters | 51 | Table 115 |
| Gen_hei.des | Health impact parameters | 16 | Table 116 |
| Genii.des | Database parameters | 133 | Table 117 |

Source: The files listed above are included in GENII V.2.02 (2006. STN: 11211-2.02-00 [DIRS 177605]). They are also shown in Attachment H and included in the attached CD.

In order to identify the parameters that require site-specific values or distributions and parameters required to select a release and dose scenario model applicable to the preclosure safety analyses, the parameters in these eight DES files are classified into five categories: 1) *Distribution* - parameters with input values requiring a distribution, 2) *Fixed value* - parameters with fixed input values or values from the GENIIv2 database, *GENII.mdb*, 3) *User model* - parameters used to select a release and dose model, 4) *Data from design/scenario* - parameters with values dependent on specific design features and/or release scenarios, and 5) *Not used* - parameters not used in the dose calculation due to either pathways not applicable or other alternative model used.

The discussion of each parameter in the eight description files is listed in Table 112 to Table 117. The files, *ACPlume.des* and *CHPlume.des* contain very similar parameters, and therefore only one representative table is used. Also, the files *Gen_Act.des* and *Gen_Exp.des* are the essentially same, and therefore only one table is used. The parameters highlighted with green are those developed, either distribution or fixed value, in this document as summarized in Table 59.

Table 112. Categorization of Exposure Parameters in *FuiAFF.des*

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CVTFormat | Not Stochastic | | | | CVT format | Not used (defaults to General Number) |
| progeny | Not Stochastic | | | | Use progeny | Not used (defaults to False) |
| media | Not Stochastic | | | | Type of release | User model |
| dataset | Not Stochastic | | | | Dataset and file extension | Not used (set to aff:Air for airborne) |
| one | Continuous | $m^2$ | | | Exit area of source | Data from design (used for Plume Rise) |
| two | Continuous | m | | | Exit height of source | Data from design (used for Plume Rise) |
| three | Continuous | m | | | Height of adjacent structure | Data from design (used for Plume Rise) |
| four | Continuous | m/s | | | Exit velocity | Data from design (used for Plume Rise) |
| five | Continuous | $^oC$ | | | Exit temperature of source | Data from design (used for Plume Rise) |
| six | Continuous | $^oC$ | | | Ambient air temperature | Distribution |
| fluxtypes | Not Stochastic | | | | Use suspended particle/gas | Data from scenario (from source term) |
| reactivefrac | Continuous | fraction | | | Reactive gas fraction | Not used (model not used) |
| reactivedensit y | Continuous | $g/cm^3$ | | | Reactive gas density | Not used (model not used) |
| radius | Continuous | $\mu m$ | | | Radius | Data from scenario (from source term) |
| density | Continuous | $g/cm^3$ | | | Density | Data from scenario (from source term) |
| CASID | Not Stochastic | | | | Chemical Abstract System Identification | Data from scenario (from source term) |
| ctime | Not Stochastic | yr | | | Time | Data from scenario (from source term) |
| cval | Continuous | | | | Constituent flux | Data from scenario (from source term) |

Table 113. Categorization of Exposure Parameters in *ACPlume.des* and *CHPlume.des*

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| JHOUR * | Continuous | Jhr | 0 | 8760 | Julian start hour | User model (for Acute release) |
| ARMINRISESPD | Not Stochastic | m/s | 0 | 99.99 | Minimum wind speed during plume rise | Fixed value |
| ARMINSIGYSHIFT | Not Stochastic | m | 0 | 1E6 | Sigma to shift to semi-infinite cloud shine | Not used (semi-infinite model used) |
| ARTRANSRESIST | Not Stochastic | s/m | 0 | 1E6 | Transfer resistance | Fixed value |
| ARSIGPARM | Not Stochastic | | | | Sigma Parameterization Usage | User model (NRC method suggested) |
| ARMINWIND | Not Stochastic | m/s | 0 | 2 | Maximum wind speed for 'calm' | Fixed value |
| ARRADVAL | Not Stochastic | m | 1.0E-20 | 1E6 | Radial Distance | Data from scenario |
| ARNUMRECRING | Not Stochastic | | | | Sectors in radial grid | Data from scenario |
| ARSRCNUMB | Not Stochastic | | | | Source Number | Data from scenario |
| ARSRCNAME | Not Stochastic | | | | Source Name | Data from scenario |
| ARSRCDORISEFLAG | Not Stochastic | | | | Do Plume Rise | User model |
| ARSRCDODISPFLAG | Not Stochastic | | | | Use Enhanced Dispersion | User model |
| ARISCFLAG | Not Stochastic | | | | Dispersion | User model |
| ARISCWAKEFLAG | Not Stochastic | | | | Building Wakes | User model |
| ARLOWBOUNDFLAG | Not Stochastic | | | | Use Lower Bound | User model |
| ARBIDFLAG | Not Stochastic | | | | Buoyancy Induced Dispersion | User model |
| ARBLDHGT | Not Stochastic | | 1.0E-20 | | Building Height | Data from design (used for building wake) |
| ARBLDWDTH | Not Stochastic | | 1.0E-20 | | Building Width | Data from design (used for building wake) |
| ARHGHWNDCORFLAG | Not Stochastic | | | | High Wind Correction | User model (used for PNNL enhanced dispersion) |
| ARLOWWNDCORFLAG | Not Stochastic | | | | Low Wind Correction | User model (used for PNNL enhanced dispersion) |
| ARBLDAREA | Not Stochastic | $m^2$ | 1.0E-20 | | Building Area | Data from design (used for PNNL enhanced dispersion) |
| ARMETFILE | Not Stochastic | | | | Path and Name of Meteorological Data File | Fixed value |

Table 113. Categorization of Exposure Parameters in *ACPlume.des* and *CHPlume.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| ARCLDSHNLIB | Not Stochastic | | | | Path and Name of Cloud Shine Library | Fixed value) |
| ARCALMDIST FLAG | Not Stochastic | | | | Use user's supplied calm wind distribution | Not used (scenario not considered) |
| ARCALMDIST | Not Stochastic | fraction | 0 | 1 | Calm Wind Distribution | Not used (scenario not considered) |
| ARSTARTMONTH * | Not Stochastic | mn | 1 | 12 | Release Start Month | User model (for Acute release) |
| ARSTARTDAY * | Not Stochastic | day | 1 | 31 | Release Start Day | User model (for Acute release) |
| ARSTARTYEAR * | Not Stochastic | yr | | | Release Start Year | User model (for Acute release) |
| ARSTARTHOUR * | Not Stochastic | hr | 1 | 24 | Release Start Hour | User model (for Acute release) |

Notes: Parameters with * are only included in file *ACPlume.des*, not in *CHPlume.des*

Table 114. Categorization of Exposure Parameters in *Gen_Exp.des* and *Gen_Act.des*

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| ABSHUM | Continuous | $kg/m^3$ | 0 | 0.1 | Absolute humidity, used only for tritium model | Distribution |
| ACUTIM * | Not Stochastic | yr | 0 | 1 | The exposure time period | Fixed Value |
| AIREXT | Not Stochastic | N/A | | | External air | User model (pathway selection) |
| AIRPROB * | Not Stochastic | N/A | | | Use probability for air | Not used |
| ANDKR | Continuous | $l/m^3$ | 0 | 10 | Indoor volatilization factor for radionuclides | Not used (pathway not applicable) |
| ANDKRN | Continuous | $l/m^3$ | 0 | 10 | Indoor volatilization factor for radon | Not used (pathway not applicable) |
| ANF | Not Stochastic | N/A | | | Ingestion pathway | User model (pathway selection) |
| ANFLabel | Not Stochastic | N/A | | | Terrestrial animal product constant | User model (selection index) |
| ANFOOD | Not Stochastic | N/A | | | Animal product ingestion | User model (pathway selection) |
| AQF | Not Stochastic | N/A | | | Ingestion pathway | User model (pathway selection) |
| AQFLabel | Not Stochastic | N/A | | | Aquatic animal product constant | User model (selection index) |
| AQFOOD | Not Stochastic | N/A | | | Aquatic food ingestion | User model (pathway selection) |
| AVALSL | Continuous | cm | 0.01 | 200 | Depth of top soil available for resuspension | Distribution |
| BEFAIR | Not Stochastic | yr | 0 | 0 | Air deposition time prior to exposure | Fixed value (for chronic exposure) |
| BEFIRR | Not Stochastic | yr | 0 | 0 | Irrigation water deposition time prior to exposure | Not used (pathway not applicable) |
| BEFORE | Not Stochastic | yr | 0 | 1E6 | Time from start to exposure | Fixed value (for chronic exposure) |
| BIOMA2 | Continuous | $kg/m^2$ | 0.1 | 10 | Standing animal feed biomass (wet) | Distribution |
| BIOMAS | Continuous | $kg/m^2$ | 0.1 | 10 | Standing biomass (wet) | Distribution |
| BULKD | Continuous | $g/cm^3$ | 0.5 | 3 | Surface soil bulk density | Distribution |
| CASID | Not Stochastic | N/A | | | Chemical Abstract System Identification | Data from scenario (from source term) |
| CONSUM | Continuous | kg/d | 0.001 | 300 | Consumption rate | Distribution |
| DEBUG | Not Stochastic | N/A | | | Debug testing | Not used |
| DEPFR1 | Continuous | fraction | 0 | 1 | Dry deposition retention fraction to plants | Not used (method not selected) |
| DEPFR2 | Continuous | fraction | 0 | 1 | Wet deposition retention fraction to plant surfaces | Not used (method not selected) |
| DEPPROB * | Not Stochastic | N/A | | | Use probability for deposition | Not used |
| DIETFR | Continuous | fraction | 0 | 1 | Fraction of diet | Fixed value |

Table 114. Categorization of Exposure Parameters in *Gen_Exp.des* and *Gen_Act.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| DPVRES | Continuous | m/s | 0 | 0.1 | Deposition velocity from soil to plant surfaces | Distribution |
| DRINK | Not Stochastic | N/A | | | Drinking water | User model (pathway selection) |
| DRYFA2 | Continuous | fraction | 0.05 | 0.95 | Animal feed dry/wet ratio | Distribution |
| DRYFAC | Continuous | fraction | 0.05 | 0.95 | Dry/wet ratio | Distribution |
| DRYSET | Not Stochastic | N/A | | | User defined dry deposition interception fraction to plants | User model |
| DWATER | Continuous | L/d | 0.001 | 200 | Intake rate of water | Not used (pathway not applicable) |
| DWFACA | Continuous | fraction | 0 | 1 | Animal water contaminated fraction | Not used (pathway not applicable) |
| DWSRC | Not Stochastic | N/A | | | Source of domestic water | Not used (pathway not applicable) |
| DWTRET | Not Stochastic | N/A | | | Treatment plant purification of domestic water | Not used (pathway not applicable) |
| EXTPROB * | Not Stochastic | N/A | | | Use probability for external | Not used |
| FdFrLabel | Not Stochastic | N/A | | | Feed animal constant | User model (selection index) |
| FINITE | Not Stochastic | N/A | | | Finite plume model | User model (pathway selection) |
| FRACFR * [a] | Continuous | fraction | 0 | 1 | Fraction of animal diet that is fresh forage in autumn | Distribution |
| GROUND | Not Stochastic | N/A | | | Soil external | User model (pathway selection) |
| GRWP | Continuous | day | 0 | 365 | Growing period | Fixed value |
| GRWPA | Continuous | day | 0 | 365 | Animal feed growing period | Fixed value |
| HARVST | Not Stochastic | N/A | | | Radionuclide removal due to harvesting | User model |
| HLDUP | Continuous | day | 0 | 365 | Time from harvest to ingestion | Fixed value |
| HLDUP2 | Continuous | day | 0 | 365 | Time from harvest to ingestion | Fixed value |
| HLDUPA | Continuous | day | 0 | 365 | Time from harvest to animal ingestion | Fixed value |
| HOLDDW | Continuous | day | 0 | 365 | Delay time in water distribution system | Not used (pathway not applicable) |
| INHAL | Not Stochastic | N/A | | | Air | User model (pathway selection) |
| IRES | Not Stochastic | N/A | | | Type of resuspension model | User model |
| IRRSA | Not Stochastic | N/A | | | Source of animal feed irrigation | Not used (pathway not applicable) |

Table 114. Categorization of Exposure Parameters in *Gen_Exp.des* and *Gen_Act.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| IRRSR | Not Stochastic | N/A | | | Source of residential irrigation | Not used (pathway not applicable) |
| IRRST | Not Stochastic | N/A | | | Source of irrigation | Not used (pathway not applicable) |
| IRTIMA | Continuous | mon/yr | 0 | 12 | Animal feed irrigation time | Not used (pathway not applicable) |
| IRTIMR | Continuous | mon/yr | 0 | 12 | Irrigation time for residential land | Not used (pathway not applicable) |
| IRTIMT | Continuous | mon/yr | 0 | 12 | Irrigation time | Not used (pathway not applicable) |
| ISALT | Not Stochastic | N/A | | | Aquatic foods from salt water (vesus fresh water) | Not used (pathway not applicable) |
| LEACHOPTION | Not Stochastic | N/A | | | Type of leach rate constant | User model |
| LEACHR | Continuous | 1/yr | 0 | 100 | Leach rate constant | Not used (Kd model used) |
| LEAFRS | Continuous | 1/m | 0 | 0.001 | Resuspension factor from soil to plant surfaces | Distribution |
| LOIC | Not Stochastic | yr | 0 | 0 | Loss of institutional control time prior to exposure | Not used (pathway not applicable) |
| MOISTC | Continuous | fraction | 0 | 1 | Surface soil moisture content | Distribution |
| NDS | Not Stochastic | N/A | | | Progeny count | User model (index) |
| NTKEND | Not Stochastic | yr | 0 | 1E6 | Duration of exposure period | Fixed value |
| NUMCON | Not Stochastic | N/A | | | Number of constituents | Data from scenario (from source term) |
| PROBAIR * | Not Stochastic | Percent | C | 1 | Percent of air | Not used |
| PROBDEP * | Not Stochastic | Percent | 0 | 1 | Percent of deposition | Not used |
| PROBEXT * | Not Stochastic | Percent | 0 | 1 | Percent of external | Not used |
| RAIN | Continuous | mm/d | 0.01 | 10 | Average daily rain rate | Distribution |
| REC | Not Stochastic | N/A | | | External pathway | User model (pathway selection) |
| RECRE | Not Stochastic | N/A | | | Recreational surface water | User model (pathway selection) |
| RELEND | Not Stochastic | yr | 0 | 1E6 | End of release period | Fixed value |
| RESFAC | Continuous | 1/m | 0 | 0.001 | Resuspension factor | Not used (mass loading method used) |
| RESIRR | Not Stochastic | N/A | | | Residential irrigation | Not used (pathway not applicable) |

Table 114. Categorization of Exposure Parameters in *Gen_Exp.des* and *Gen_Act.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| RF1 | Continuous | fraction | 0 | 1 | Fraction of plants roots in surface soil | Fixed value |
| RIRR | Continuous | in/yr | 0 | 200 | Irrigation rate | Not used (pathway not applicable) |
| RIRRA | Continuous | in/yr | 0 | 200 | Animal feed irrigation rate | Not used (pathway not applicable) |
| RIRRR | Continuous | in/yr | 0 | 200 | Irrigation rate for residential land | Not used (pathway not applicable) |
| SEDDN | Continuous | $kg/m^2$ | 0 | 5000 | Shoreline sediment density | Not used (pathway not applicable) |
| SHINDR | Not Stochastic | N/A | | | Indoor or showering | User model (pathway selection) |
| SHING | Not Stochastic | N/A | | | Inadvertent shower water | User model (pathway selection) |
| SLCONA | Continuous | kg/d | 0 | 5 | Animal daily soil consumption rate | Distribution |
| SLDN | Continuous | kg/m^2 | 1E-5 | 3000 | Surface soil areal density | Distribution |
| SLING | Not Stochastic | N/A | | | Inadvertent soil | User model (pathway selection) |
| SLINH | Not Stochastic | N/A | | | Suspended or resuspended soil | User model (pathway selection) |
| SOILKD | Continuous | ml/g | 0 | 1E6 | Soil adsorption coefficient | Distribution |
| SSLDN | Continuous | $kg/m^3$ | 1E-5 | 3000 | Surface soil density | Distribution |
| STORTM | Continuous | day | 0 | 356 | Storage time | Fixed value |
| SURCM | Continuous | cm | 1E-5 | 500 | Surface soil layer thickness used for density | Distribution |
| SWING | Not Stochastic | N/A | | | Inadvertent swimming water | User model (pathway selection) |
| TFD | Not Stochastic | N/A | | | Ingestion pathway | User model (pathway selection) |
| TFDLabel | Not Stochastic | N/A | | | Plant product constant | User model (selection index) |
| TFOOD | Not Stochastic | N/A | | | Terrestrial food crop ingestion | User model (pathway selection) |
| THICK | Continuous | cm | 0 | 10000 | Surface soil thickness | Distribution |
| TRANS | Continuous | fraction | 0 | 1 | Translocation factor | Distribution |
| TRANSA | Continuous | fraction | 0 | 1 | Translocation factor for animal feed | Distribution |
| VLEACH | Continuous | cm/yr | 0 | 500 | Total infiltration rate | Distribution |
| WETSET | Not Stochastic | N/A | | | User defined wet deposition interception fraction to plants | User model |
| WTIM | Continuous | d | 0.1 | 100 | Weathering rate constant from plants | Distribution |

Table 114. Categorization of Exposure Parameters in *Gen_Exp.des* and *Gen_Act.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| XMLF | Continuous | $g/m^3$ | 0 | 5 | Mass loading factor for resuspension model | Distribution |
| YELD | Continuous | $kg/m^2$ | 0.001 | 10 | Yield | Distribution |
| YELDA | Continuous | $kg/m^2$ | 0.1 | 10 | Yield for animal feed | Distribution |

Notes: Parameters with * are only included in file *Gen_Act.des*, not in *Cen_Exp.des*

[a] The parameter FRACFR in this table replaces the parameter FRACUT in the files, because FRACUT is no long used.

Table 115. Categorization of Receptor Parameters in *Gen_Rcp.des*

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| ANFLabel | Not Stochastic | N/A | | | Terrestrial animal product constant | User model (selection index) |
| AQFLabel | Not Stochastic | N/A | | | Aquatic animal product constant | User model (selection index) |
| EQFRAC | Continuous | fraction | 0 | 1 | Radon progeny indoor equilibrium fraction | Not used (pathway not applicable) |
| EVBOAT | Continuous | evt/day | 0 | 10 | Frequency of boating event | Not used (pathway not applicable) |
| EVSHOR | Continuous | evt/day | 0 | 10 | Frequency of shoreline use | Not used (pathway not applicable) |
| EVSHWR | Continuous | evt/day | 0 | 10 | Frequency of showering event | Not used (pathway not applicable) |
| EVSWIM | Continuous | evt/day | 0 | 10 | Frequency of swimming event | Not used (pathway not applicable) |
| FRINDR | Continuous | fraction | 0 | 1 | Fraction of a day indoor inhalation occurs | Not used (pathway not applicable) |
| FRINH | Continuous | fraction | 0 | 1 | Fraction of a day (indoor – mistake) inhalation occurs | Distribution |
| FRINHR | Continuous | fraction | 0 | 1 | Fraction of a day inhalation occurs (for resuspension) | Distribution |
| FTIN | Continuous | fraction | 0 | 1 | Fraction of time spent indoors | Distribution |
| FTOUT | Continuous | fraction | 0 | 1 | Fraction of time spent outdoors | Distribution |
| LOWAGE | Not Stochastic | yr | 0 | 100 | Lower age limit | User model |
| NAGES | Not Stochastic | N/A | | | Number of age groups | User model |
| RNMODL | Not Stochastic | N/A | | | Use Radon Model | Not used (pathway not applicable) |
| SFBOAT | Continuous | none | 0 | 1 | Shielding factor | Not used (pathway not applicable) |
| SHIN | Continuous | none | 0 | 1 | Indoor shielding factor | Fixed value |
| SHOUT | Continuous | none | 0 | 1 | Outdoor shielding factor | Fixed value |
| SWFAC | Continuous | none | 0 | 1 | Shoreline width factor | Not used (pathway not applicable) |
| TANM | Continuous | day/yr | 0 | 365 | Animal product consumption period | Distribution |
| TAQU | Continuous | day/yr | 0 | 365 | Fish consumption period | Not used (pathway not applicable) |
| TBOAT | Continuous | day | 0 | 365 | Boating days | Not used (pathway not applicable) |
| TCRP | Continuous | day/yr | 0 | 365 | Crop consumption period | Distribution |
| TDW | Continuous | day/yr | 0 | 365 | Drinking water ingestion period | Not used (pathway not applicable) |
| TEBOAT | Continuous | hr | 0 | 24 | Duration of boating event | Not used (pathway not applicable) |

Table 115. Categorization of Receptor Parameters in *Gen_Rcp.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| TESHOR | Continuous | hr | 0 | 24 | Duration of shoreline use events | Not used (pathway not applicable) |
| TESHWR | Continuous | hr | 0 | 24 | Duration of showering event | Not used (pathway not applicable) |
| TESWIM | Continuous | hr | 0 | 24 | Duration of swimming event | Not used (pathway not applicable) |
| TEXAIR | Continuous | day | 0 | 365 | Yearly plume immersion exposure time | Fixed value |
| TEXGRD | Continuous | day | 0 | 365 | Yearly external ground exposure time | Fixed value |
| TFDLabel | Not Stochastic | N/A | | | Plant product constant | User model (selection index) |
| TINDRH | Continuous | day/yr | 0 | 365 | Indoor air inhalation period | Not used (pathway not applicable) |
| TINH | Continuous | day/yr | 0 | 365 | Air inhalation period | Fixed value |
| TINHR | Continuous | day/yr | 0 | 365 | Resuspended soil inhalation period | Fixed value |
| TSHOR | Continuous | day | 0 | 365 | Shoreline days | Not used (pathway not applicable) |
| TSHWR | Continuous | day | 0 | 365 | Showering days | Not used (pathway not applicable) |
| TSOIL | Continuous | day | 0 | 365 | Soil contact days | Fixed value |
| TSWIM | Continuous | day | 0 | 365 | Swimming days | Not used (pathway not applicable) |
| UANM | Continuous | kg/day | 0 | 10 | Animal product consumption rate | Distribution |
| UAQU | Continuous | kg/day | 0 | 10 | Aquatic food consumption rate | Not used (pathway not applicable) |
| UCRP | Continuous | kg/day | 0 | 10 | Crop consumption rate | Distribution |
| UDW | Continuous | L/day | 0 | 10 | Drinking water ingestion rate | Not used (pathway not applicable) |
| UEXAIR | Continuous | hr | 0 | 24 | Daily plume immersion exposure time | Fixed value |
| UEXGRD | Continuous | hr | 0 | 24 | Daily external ground exposure time | Fixed value |
| UINDRH | Continuous | $m^3$/day | 0 | 50 | Indoor air inhalation rate | Not used (pathway not applicable) |
| UINH | Continuous | $m^3$/day | 0 | 50 | Air inhalation rate | Distribution |
| UINHR | Continuous | $m^3$/day | 0 | 50 | Resuspended soil inhalation rate | Distribution |
| UPAGE | Not Stochastic | yr | 0 | 100 | Upper age limit | User model |
| USHIN | Continuous | L/hr | 0 | 10 | Ingestion rate of water while showering | Not used (pathway not applicable) |
| USOIL | Continuous | mg/day | 0 | 15000 | Inadvertent soil ingestion rate | Distribution |
| USWIM | Continuous | L/hr | 0 | 10 | Ingestion rate of water while swimming | Not used (pathway not applicable) |

Table 116. Categorization of Health Impact Parameters in *Gen_Hei.des*

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| AMAD | Not Stochastic | um | | | Chemical Abstract System Identification | Not used (from database) |
| CASID | Not Stochastic | N/A | | | Chemical Abstract System Identification | Data from scenario (from source term) |
| F1 | Not Stochastic | fraction | | | Chemical Abstract System Identification | Not used (from database) |
| FGR13 | Not Stochastic | | | | Chemical Abstract System Identification | User model |
| HECEDE | Not Stochastic | | | | Calculate radiation effective dose equivalent commitment | User model |
| HECONFAT | Continuous | risk/Sv | 0.0001 | 1 | Cancer fatality conversion factor | Not used (only doses calculated) |
| HECONINC | Continuous | risk/Sv | 0.0001 | 1 | Cancer incidence conversion factor | Not used (only doses calculated) |
| HEFAT | Not Stochastic | | | | Calculate cancer fatalities | User model |
| HEINC | Not Stochastic | | | | Calculate lifetime cancer incidence | User model |
| IHEAST | Not Stochastic | | 0 | | Chemical Abstract System Identification | User model |
| METHOD | Not Stochastic | | 0 | | Chemical Abstract System Identification | User model |
| NDS | Not Stochastic | N/A | | | Progeny count | Data from scenario (from source term) |
| NUMCON | Not Stochastic | N/A | | | Number of constituents | Data from scenario (from source term) |
| SOILT | Continuous | m | 0.001 | 5 | Thickness of contaminated soil/sediment layer | Distribution |
| SOLUBIL | Not Stochastic | | 1 | 5 | Lung transfer inhalation class | Fixed value |
| SSLDN* | Continuous | $kg/m^3$ | 500 | 3000 | Density of contaminated soil/sediment layer | Distribution |

Note: * the description file uses SLDN for density of contaminated soil/sediment layer. The symbol SLDN has been used for surface soil areal density in *Gen_Exp.des* and *Gen_Act.des*. To eliminate the confusion, the symbol is changed to SSLDN, because this parameter is the same as surface soil density (SSLDN) in the document.

Table 117. Evaluation of Database Parameters in *Genii.des*

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CLABSKN | Continuous | fraction | 0 | 1 | The dermal absorption fraction from soil | Not used (default from database) |
| CLANDF | Continuous | $m^3$/L | 0 | 10 | Inhalation Volatilization Factor for Indoors | Not used (default from database) |
| CLAPF | Continuous | kg/kg | 0 | 1E+10 | Bioconcentration in Wet Animal Forage from Air | Not used (default from database) |
| CLAPLV | Continuous | kg/kg | 0 | 1E+10 | Bioconcentration in Wet Leafy Vegetables from Air | Not used (default from database) |
| CLBFF | Continuous | L/kg | 0 | 200000 | Bioaccumulation in Wet Fish from Freshwater | Not used (default from database) |
| CLBFI | Continuous | L/kg | 0 | 200000 | Bioaccumulation in Wet Crustacea from Freshwater | Not used (default from database) |
| CLBFM | Continuous | L/kg | 0 | 100000 | Bioaccumulation in Wet Mollusk from Freshwater | Not used (default from database) |
| CLBFP | Continuous | L/kg | 0 | 100000 | Bioaccumulation in Wet Plants from Freshwater | Not used (default from database) |
| CLBHALF | Continuous | day | 0 | | Half Time in Biota | Not used (default from database) |
| CLBIOA | Continuous | day | 1.0E-30 | | The biodegradation half-life in Air | Not used (default from database) |
| CLBIOS | Continuous | day | 1.0E-30 | | The biodegradation half-life in Soil | Not used (default from database) |
| CLBIOW | Continuous | day | 1.0E-30 | | The biodegradation half-life in Water | Not used (default from database) |
| CLBMF | Continuous | L/kg | 0 | 100000 | Bioaccumulation in Wet Fish from Saltwater | Not used (default from database) |
| CLBMI | Continuous | L/kg | 0 | 100000 | Bioaccumulation in Wet Crustacea from Saltwater | Not used (default from database) |
| CLBMM | Continuous | L/kg | 0 | 100000 | Bioaccumulation in Wet Mollusk from Saltwater | Not used (default from database) |
| CLBMP | Continuous | L/kg | 0 | 100000 | Bioaccumulation in Wet Plants from Saltwater | Not used (default from database) |
| CLBP | Continuous | degC | -250 | 5000 | The boiling point temperature | Not used (default from database) |
| CLBSAF | Continuous | kg/kg | 0 | 1000000 | Bioaccumulation in Wet Biota from Sediment | Not used (default from database) |
| CLBVAF | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Animal Forage from Soil | Distribution |
| CLBVAG | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Animal Grain from Soil | Distribution |
| CLBVAH | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Animal Hay from Soil | Not used (default from database) |
| CLBVCL | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Cereal from Soil | Distribution |
| CLBVFR | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Fruit from Soil | Distribution |
| CLBVLV | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Leafy Vegetables from Soil | Distribution |

Table 117. Evaluation of Database Parameters in *Genii.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CLBVOV | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Other Vegetables from Soil | Not used (default from database) |
| CLBVRV | Continuous | kg/kg | 0 | 5000 | Bioconcentration in Wet Root Vegetables from Soil | Distribution |
| CLCHEM | Not Stochastic | | 1 | 48 | RAAS constituent Type | Not used (default from database) |
| CLCLASS | Discrete | | 1 | 6 | The atmospheric deposition class | Not used (default from database) |
| CLCNUM | Discrete | | 0 | 1000 | Carbon Number | Not used (default from database) |
| CLCPFG | Continuous | $(mg/kg/d)^{-1}$ | 0 | 2000 | Ingestion Cancer Potency Factor, Water | Not used (default from database) |
| CLCPFGF | Continuous | $(mg/kg/d)^{-1}$ | 0 | 2000 | Ingestion Cancer Potency Factor, Food | Not used (default from database) |
| CLCPFGS | Continuous | $(mg/kg/d)^{-1}$ | 0 | 2000 | Ingestion Cancer Potency Factor, Soil | Not used (default from database) |
| CLCPFH | Continuous | $(mg/kg/d)^{-1}$ | 0 | 2000 | Inhalation Cancer Potency Factor | Not used (default from database) |
| CLDCAIR | Continuous | $cm^2/sec$ | 0 | 1 | The diffusion coefficient in air | Not used (default from database) |
| CLDCAT | Continuous | degC | -50 | 100 | The reference temperature for air diffusion | Not used (default from database) |
| CLDCGRT | Continuous | $cm^2/sec$ | 0 | 1 | The diffusion coefficient in grout | Not used (pathway not applicable) |
| CLDCGT | Continuous | degC | -50 | 100 | The reference temperature for grout diffusion | Not used (pathway not applicable) |
| CLDCWAT | Continuous | $cm^2/sec$ | 0 | 1 | The diffusion coefficient in water | Not used (pathway not applicable) |
| CLDCWT | Continuous | degC | -50 | 100 | The reference temperature for water diffusion | Not used (pathway not applicable) |
| CLDEX | Continuous | rem/hr per $pCi/m^3$ | 0 | 1 | External Dose Factor, Air Immersion | Fixed value (from database) |
| CLDFAD | Continuous | rem/pCi | 0 | 1 | Inhalation Dose Factor, class Day | Fixed value (from database) |
| CLDFAW | Continuous | rem/pCi | 0 | 1 | Inhalation Dose Factor, class Week | Fixed value (from database) |
| CLDFAY | Continuous | rem/pCi | 0 | 1 | Inhalation Dose Factor, class Year | Fixed value (from database) |
| CLDIAM | Continuous | um | 1E-6 | 10 | Inhalation Dose Factor Particle Diameter | Fixed value (from database) |
| CLDIMR | Continuous | rem/hr per pCi/L | 0 | 1 | External Dose Factor, Water Immersion | Not used (default from database) |
| CLDSH | Continuous | rem/hr per $pCi/m^2$ | 0 | 1 | External Dose Factor, Ground Surface | Fixed value (from database) |

Table 117. Evaluation of Database Parameters in *Genii.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CLDSH1 | Continuous | rem/hr per pCi/$m^3$ | 0 | 1 | External Dose Factor, Ground Contaminated to 1cm | Fixed value (from database) |
| CLDSH15 | Continuous | rem/hr per pCi/$m^3$ | 0 | 1 | External Dose Factor, Ground Contaminated to 15cm | Fixed value (from database) |
| CLDSH5 | Continuous | rem/hr per pCi/$m^3$ | 0 | 1 | External Dose Factor, Ground Contaminated to 5cm | Fixed value (from database) |
| CLENTF | Continuous | J/kg K | 0 | 1E+07 | The entropy of fusion | Not used (default from database) |
| CLENTFT | Continuous | degC | -50 | 100 | The entropy of fusion temperature | Not used (default from database) |
| CLETYPE | Not Stochastic | | 1 | 5 | MEPAS exposure type | Not used (default from database) |
| CLFEG | Continuous | day/kg | 0 | 1E5 | Feed to Egg Transfer Factor | Distribution |
| CLFLASH | Continuous | degC | -100 | 2000 | The flash point temperature | Not used (default from database) |
| CLFMK | Continuous | day/L | 0 | 1E5 | Feed to Milk Transfer Factor | Distribution |
| CLFMT | Continuous | day/kg | 0 | 100000 | Feed to Meat Transfer Factor | Distribution |
| CLFONEI | Continuous | fraction | 0 | 1 | The GI absorption fraction, Insoluble | Not used (default from database) |
| CLFONES | Continuous | fraction | 0 | 1 | The GI absorption fraction, Soluble | Not used (default from database) |
| CLFPK | Continuous | day/kg | 0 | 1E5 | Feed to Pork Transfer Factor | Not used (pathway not applicable) |
| CLFPL | Continuous | day/kg | 0 | 1E5 | Feed to Poultry Transfer Factor | Distribution |
| CLFR | Continuous | | 0 | 10 | The fugacity ratio | Not used (default from database) |
| CLGHALF | Continuous | day | 1.0E-30 | | The decay half-life in Groundwater | Not used (default from database) |
| CLGPHALF | Continuous | day | 1.0E-30 | | The physical loss half time in Groundwater | Not used (default from database) |
| CLHEATC | Continuous | J/kg | 0 | 1E8 | The heat of combustion | Not used (default from database) |
| CLHEATF | Continuous | J/kg | 0 | 1E8 | The heat of fusion | Not used (default from database) |
| CLHEATV | Continuous | J/kg | 0 | 1E8 | The heat of vaporization | Not used (default from database) |
| CLHLC | Continuous | atm $m^3$/mole | 0 | 100 | Henry's law constant | Not used (default from database) |
| CLHLCT | Continuous | degC | -50 | 100 | Henry's law constant temperature | Not used (default from database) |
| CLHRRRC | Continuous | $cm^3$/mole sec | 0 | 10 | Hydroxyl radical reaction rate constant | Not used (default from database) |

Table 117. Evaluation of Database Parameters in *Genii.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CLHYDA | Continuous | day | 1.0E-30 | | The hydrolysis half-life in Air | Not used (default from database) |
| CLHYDW | Continuous | day | 1.0E-30 | | The hydrolysis half-life in Water | Not used (default from database) |
| CLKD | Continuous | mL/g | 0 | 1E7 | The dry soil-water partition coefficient | Distribution |
| CLKOC | Continuous | mL/g | 0 | 1E10 | The dry organic-carbon partition coefficient | Not used (default from database) |
| CLKOW | Continuous | mL/mL | 0 | 1E10 | The octanol water partition coefficient | Not used (default from database) |
| CLKPERM | Continuous | cm/hr | 0 | 10 | The aqueous skin permeability constant | Not used (default from database) |
| CLKTYPE | Not Stochastic | | 0 | 1 | MEPAS constituent Type | Not used (default from database) |
| CLLCLAS | Not Stochastic | | | | The lung solubility class | Fixed value (from database) |
| CLMCV | Continuous | $A^3$ | 1 | 5000 | The molecular volume | Not used (default from database) |
| CLMFORM | Not Stochastic | | | | The molecular formula | Not used (default from database) |
| CLMP | Continuous | degC | -250 | 5000 | The melting point temperature | Not used (default from database) |
| CLMV | Continuous | $cm^3$/mol | 1 | 5000 | The molar volume | Not used (default from database) |
| CLMVT | Continuous | degC | -50 | 100 | The molar volume temperature | Not used (default from database) |
| CLOXAIR | Continuous | day | 1.0E-30 | | The oxidation half-life in Air | Not used (default from database) |
| CLPCDEN | Continuous | g/mL | 0 | 20 | The pure contaminant density | Not used (default from database) |
| CLPHTA | Continuous | day | 1.0E-30 | | The photolysis half-life in Air | Not used (default from database) |
| CLPHTW | Continuous | day | 1.0E-30 | | The photolysis half-life in Water | Not used (default from database) |
| CLPKA | Continuous | pH | 1 | 13 | The acid dissociation constant | Not used (default from database) |
| CLRAAS | Not Stochastic | | 1 | 14 | RAAS Constituent Type | Not used (default from database) |
| CLRDFGI | Continuous | rem/pCi | 0 | 1 | Ingestion Dose Factor, insoluble | Not used (default from database) |
| CLRDFGS | Continuous | rem/pCi | 0 | 1 | Ingestion Dose Factor, soluble | Not used (default from database) |
| CLRDFS | Continuous | rem/pCi | 0 | 1 | Dermal Absorption Dose Factor | Not used (default from database) |
| CLRFCH | Continuous | mg/m^3 | 0 | 5000 | Inhalation Reference Concentration | Not used (default from database) |
| CLRFDG | Continuous | mg/kg/day | 0 | 2000 | Ingestion Reference Dose, Water | Not used (default from database) |
| CLRFDGF | Continuous | mg/kg/day | 0 | 2000 | Ingestion Reference Dose, Food | Not used (default from database) |

Table 117. Evaluation of Database Parameters in *Genii.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CLRFDGS | Continuous | mg/kg/day | 0 | 2000 | Ingestion Reference Dose, Soil | Not used (default from database) |
| CLRFDH | Continuous | mg/kg/day | 0 | 2000 | Inhalation Reference Dose | Not used (default from database) |
| CLSFEX | Continuous | risk/yr per pCi/m$^2$ | 0 | 1 | External Slope Factor | Not used (default from database) |
| CLSFG | Continuous | risk/pCi | 0 | 1 | Ingestion Slope Factor, Water | Not used (default from database) |
| CLSFGF | Continuous | risk/pCi | 0 | 1 | Ingestion Slope Factor, Food | Not used (default from database) |
| CLSFGS | Continuous | risk/pCi | 0 | 1 | Ingestion Slope Factor, Soil | Not used (default from database) |
| CLSFH | Continuous | risk/pCi | 0 | 1 | Inhalation Slope Factor | Not used (default from database) |
| CLSHALF | Continuous | day | 1.0E-30 | | The decay half-life in Soil | Not used (default from database) |
| CLSHCF | Continuous | day | 0 | | Half Time in Soil, no leaching | Not used (default from database) |
| CLSOL | Continuous | mg/L | 0 | 1E6 | The water solubility | Not used (default from database) |
| CLSOLT | Continuous | degC | -50 | 100 | The water solubility temperature | Not used (default from database) |
| CLSPHALF | Continuous | day | 1.0E-30 | | The physical loss half time in Soil | Not used (default from database) |
| CLSURT | Continuous | dyne/cm | 0 | 10000 | The surface tension | Not used (default from database) |
| CLSURTT | Continuous | degC | -50 | 100 | The surface tension temperature | Not used (default from database) |
| CLTHALF | Continuous | day | 1.0E-30 | | The decay half-life in Air | Not used (default from database) |
| CLTPHALF | Continuous | day | 1.0E-30 | | The physical loss half time in Air | Not used (default from database) |
| CLTSA | Continuous | A$^2$ | 1 | 5000 | The molecular surface area | Not used (default from database) |
| CLURISKG | Continuous | risk/(ug/L) | 0 | 1000 | Ingestion Unit Risk Factor | Not used (default from database) |
| CLURISKH | Continuous | risk/(ug/m$^3$) | 0 | 1000 | Inhalation Unit Risk Factor | Not used (default from database) |
| CLVAP | Continuous | mm Hg | 0 | 50000 | The vapor pressure | Not used (default from database) |
| CLVD | Continuous | m/sec | 0 | 1 | The atmospheric deposition velocity | Distribution |
| CLVISC | Continuous | centipoise | 0 | 10000 | The dynamic viscosity | Not used (default from database) |
| CLVISCT | Continuous | degC | -50 | 100 | The dynamic viscosity temperature | Not used (default from database) |
| CLVP | Continuous | degC | -50 | 100 | The vapor pressure temperature | Not used (default from database) |

Table 117. Evaluation of Database Parameters in *Genii.des* (Cont'd)

| GENIIv2 Parameter | Parameter Type | Units | Min | Max | Parameter Description | Category |
|---|---|---|---|---|---|---|
| CLVPFA | Continuous | fraction | 0 | 1 | The vapor phase fraction in air versus particulates | Not used (default from database) |
| CLWHALF | Continuous | day | 1.0E-30 | | The decay half-life in Surface Water | Not used (default from database) |
| CLWM | Continuous | g/mole | 1 | 50000 | The molecular weight | Not used (default from database) |
| CLWOEHC | Not Stochastic | | | | The weight of evidence for human carcinogenicity | Not used (default from database) |
| CLWPF | Continuous | fraction | 0 | 1 | The water purification factor | Not used (default from database) |
| CLWPHALF | Continuous | day | 1.0E-30 | | The physical loss half time in Surface Water | Not used (default from database) |
| FSCASID | Not Stochastic | | | | The Chemical Abstracts Service Identification number | Data from scenario (from source term) |
| FSCNAME | Not Stochastic | | | | Constituent Name | Data from scenario (from source term) |
| FSFRACTION | Continuous | fraction | 0 | 1 | First dregration product fraction | Data from scenario (default from database) |
| FUIDataBase | Not Stochastic | | | | Microsoft Access database being used | Data from scenario (default from database) |
| NDS | Not Stochastic | | | | Number of straight chain decay products | Data from scenario (default from database) |
| NumCon | Not Stochastic | | | | Number of Constituents | Data from scenario (default from database) |
| SSCASID | Not Stochastic | | | | Second degration product CASID | Data from scenario (default from database) |
| SSCNAME | Not Stochastic | | | | Second degration product name | Data from scenario (default from database) |
| SSFRACTION | Continuous | fraction | 0 | 1 | Second degration product fraction | Data from scenario (default from database) |

# ATTACHMENT D. PARAMETER DEVELOPMENT CALCULATION FILES

During the parameter development in this document, four Excel files and one GoldSim file are generated to assist the parameter calculations, including *Calculation_TF_TC_Kd.xls*, *Consumption_Rate_Period.xls*, *Distribution_Comparison.gsm*, *Distribution_Comparison.xls*, and *GENII_Parameter_Summary.xls*. The descriptions of these files are provided in the relevant sections in this document. This attachment summarizes the general functions of these files to understand the purpose of the files as well as the calculations.

## D.1. Calculation of Transfer Factors and Coefficients

Calculations of transfer factors, transfer coefficients and partition coefficients are discussed in Section 7.1.1, Section 7.1.2, and Section 7.2.2, respectively. These calculations are completed in the Excel file of *Calculation_TF_TC_Kd.xls*. There are ten worksheets included in the file. Five worksheets, *Leafy*, *Other*, *Fruit*, *Grain*, and *Forage*, contain the calculation of crop transfer factors for the additional elements that are not covered in the Biosphere Model. Four worksheets: *Meat*, *Poultry*, *Milk*, and *Eggs* contain the calculation of transfer coefficients of animal products. As discussed in Section 7.1.1, these worksheets contain information that is originally used for developing the transfer factors in the Biosphere Model (BSC 2004 [DIRS 169672], Appendix A).

In each of these worksheets, Column C to Column T were added for the additional elements copied from Table 9 to Table 20 for crop transfer factors, or from Table 26 to Table 40 for transfer coefficients of animal products, while Column V to Column AK contains the elements used for the Biosphere Model. Calculation of geometric mean, geometric standard deviations, and truncation limits for the transfer factors were copied from a column where an element is used in the Biosphere Model. As explained in BSC 2004 ([DIRS 169672], Section 6.2.1.1.5), when the GSD of the published values was less than 2, it was assumed to be 2, and if it was greater than 10, it was assumed to be 10. A lognormal distribution defined by a geometric mean and a geometric standard deviation with a lower bound and an upper bound is used for transfer factors for all crop types as well as all elements.

The calculation and selection of partition coefficients are performed in the last worksheet, *Kd*, under the Excel file of *Calculation_TF_TC_Kd.xls*. Column A to Column H were copied for the additional elements from Table 45. By using Equation 3 and Equation 4, selection of *Kd* values is done in the Column J to Column N based on the method described in Section 7.2.2. In addition, those elements in the Biosphere Model are also included in the worksheet in cells of M26:R43. The geometric mean, geometric standard deviation, and a lower and upper limit are calculated and highlighted in Column O to Column R. The results are then copied into Column U to Column Z, and sorted in order of element symbol.

## D.2. Parameter Distribution Conversion

Thirty input distributions are developed in this document through conversion of the original distributions or calculation using the original distributions into the distribution types that GENIIv2 can accept. A GoldSim file, *Distribution_Comparison.gsm* is used to generate 1000 realizations from its original distribution, which is usually named as **_Cumulative_Dist*. Some parameters used in the GENIIv2 require some calculations from the original input distributions. These calculated parameters are also generated using 1000 realization values and the parameters are usually named as **_Calculated*. The results of 1000 realization values from these original distributions or calculated from original distributions are then imported into the Excel file, *Distribution_Comparison.xls*. This Excel file contains six worksheets: *ET_Param*, *SR_Param*, *AG_Param*, *Inh_Param*, *Rpt_Param*, and *Rain_Rate*.

When 1000 realization values are copied into a worksheet, it contains realization number in the first column and corresponding parameter values in the second column. The third column is the calculation of natural logarithm from the second column. The parameter distribution values are located in Row 1003 to Row 1009. The calculated values include AM, SD, GM, and GSD. The minimum and maximum values are either calculated from this distribution or obtained from the original distribution. The medium value if needed is obtained from the original distribution. The closest distribution is selected using a simple criterion to check the calculated GSD. If calculated GSD is great than 1.2, a lognormal distribution or loguniform distribution is first attempted. Otherwise, normal or uniform is used. Then potential distributions are tested by creating a new distribution in the GoldSim file, which is named as **_LogNormal_Dist*, **_LogUniform_Dist*, **_Normal_Dist*, and **_Uniform_Dist*, and compared with the original or calculated distributions. Comparisons of these two distributions are shown in the entire Section 7.

## D.3. Calculation of Consumption Rates and Periods

Food consumption rates and food consumption periods are developed based on the CADI and EDPY discussed in Section 4.1.5.1. The input data shown in Table 54 are copied into Column A to Column E for the CADI, and Column O to Column Q for the EDPY in the Excel file of *Consumption_Rate_Period.xls*. The calculations in Column F to Column N and Column R to Column AB are discussed in Sections 7.5.6 and 7.5.7.

## D.4. Other Files Generated

An Excel file *GENII_Parameter_Summary.xls* does not calculate parameter values. It is used for parameter summary, which is described in Section 9.

# ATTACHMENT E. YMP SITE-SPECIFIC DEFAULT FILES

The YMP site-specific input data complied in this calculation have been incorporated into several files that can be used as default files with GENIIv2. As discussed in the *GENII Version 2 Software Design Document* (Napier et al 2006 [DIRS 177331], Appendix F), GENIIv2 provides three user supplied default files: *GNDFLcud.DEF*, *GNDFLaud.DEF*, and *GNDFLiud.DEF*, for chronic exposure parameters, acute exposure parameters, and receptor intake parameters, respectively. This saves the user the need to individually input each value onto a menu screen. These default files are included in the software package of GENII V.2.02 (2006. STN: 11211-2.02-00 [DIRS 177605]). They are also shown in Attachment H and included in the attached CD.

Because the exposure and intake parameter values are different for different receptor locations: onsite, offsite general environment (GE), and offsite non-GE, three files have been created for each of the GENIIv2 default files, as shown in Table 118. To use them with GENIIv2, copy them into the FRAMES subdirectory and rename their extension to "def" to be the same as the GENIIv2 default file name.

Table 118. YMP Site-Specific Default Files

| | GENIIv2 | YMP Location Dependent Site-Specific | | |
|---|---|---|---|---|
| **Parameters** | **Default File Name** | **Onsite** | **Offsite GE** | **Offsite Non-GE** |
| **Chronic Exposure** | *GNDFLcud.def* | *GNDFLcud.onsite* | *GNDFLcud.GE* | *GNDFLcud.nonGE* |
| **Acute Exposure** | *GNDFLaud.def* | *GNDFLaud.onsite* | *GNDFLaud.GE* | *GNDFLaud.nonGE* |
| **Receptor Intake** | *GNDFLiud.def* | *GNDFLiud.onsite* | *GNDFLiud.GE* | *GNDFLiud.nonGE* |

The contents of each of the YMP location dependent site specific files are shown in Table 119 for chronic exposure module, Table 120 for acute exposure module, and Table 121 for receptor intake module. One additional receptor intake file is created for use with stochastic runs, *GNDFLiud.pop,* that uses mean values rather than 95$^{th}$ percentile values, as shown in Table 122. In those tables the symbol "-" denotes parameters not used in the YMP analyses. In those cases, the value in the table and file is the same as the generic default file distributed with GENIIv2. The "Menu" column is a cross-reference to the input menu screen in Section 8 that is the source of the YMP site-specific value.

Along with these nine files for YMP site specific default values, an Excel file *GENII v2 Site-Specific Parameters.xls* is used to help develop these default files. The *GENII v2 Site-Specific Paramaters.xls* file contains four worksheets. The *Des Files* worksheet lists in Column B all of the parameters used for chronic exposure, acute exposure, and receptor intake, and tabulates their default values. The default values are provided for onsite (Column O), offsite in the GE (Column P), offsite in the non-GE (Column Q), and offsite population mean values (Column R). Default values for the appropriate parameters are selected using the Excel INDEX and MATCH functions in Columns M, O, and Q of each of three worksheets: *Acute Default GNDFLaud*, *Chronic Default GNDFLcud*, and *Intake Default GNDFLiud*. Columns N, P, and R of each of those worksheets are then used to format the default values into the proper GENIIv2 default file format. To create the default files, each of the Columns N, P, and R are copied individually, beginning in Row 2, into a text editor and saved as a text file with the corresponding GENIIv2 default file name from Table 118.

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values

| | | | YMP Onsite | File: GNDFLcud.onsite | YMP Offsite GE | File: GNDFLcud.GE | YMP Offsite Non-GE | File: GNDFLcud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Chronic Onsite Mean Values",198** | **Value** | **"YMP Chronic Offsite GE Mean Values",198** | **Value** | **"YMP Chronic Offsite Non-GE Mean Values",198** |
| IRES | N/A | C8 | 1 | "IRES",0,0,0,0,0,0,0,"N/A","N/A",1 | 1 | "IRES",0,0,0,0,0,0,0,"N/A","N/A",1 | 1 | "IRES",0,0,0,0,0,0,0,"N/A","N/A",1 |
| IRRSA | N/A | C4 | - | "IRRSA",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",1,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | C4 | - | "IRRSA",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",2,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | C4 | - | "IRRSA",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",3,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | C4 | - | "IRRSA",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",4,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | C4 | - | "IRRSA",5,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",5,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",5,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | C4 | - | "IRRSA",6,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",6,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",6,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | C4 | - | "IRRST",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",1,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | C4 | - | "IRRST",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",2,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | C4 | - | "IRRST",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",3,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | C4 | - | "IRRST",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",4,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSR | N/A | C2 | - | "IRRSR",0,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSR",0,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSR",0,0,0,0,0,0,0,"N/A","N/A",0 |
| LEACH-OPTION | N/A | C7 | 0 | "LEACHOPTION",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "LEACHOPTION",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "LEACHOPTION",0,0,0,0,0,0,0,"N/A","N/A",0 |
| DWSRC | N/A | C2 | 0 | "DWSRC",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "DWSRC",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "DWSRC",0,0,0,0,0,0,0,"N/A","N/A",0 |
| INHAL | N/A | C26 | TRUE | "INHAL",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "INHAL",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "INHAL",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| ANFOOD | N/A | C1 | FALSE | "ANFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANFOOD",0,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFOOD | N/A | C1 | FALSE | "TFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFOOD",0,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQFOOD | N/A | C1 | FALSE | "AQFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| RECRE | N/A | C1 | FALSE | "RECRE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RECRE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RECRE",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| DEBUG | N/A | C1 | FALSE | "DEBUG",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DEBUG",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DEBUG",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| DWTRET | N/A | C2 | FALSE | "DWTRET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DWTRET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DWTRET",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| RESIRR | N/A | C2 | FALSE | "RESIRR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RESIRR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RESIRR",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| FINITE | N/A | C26 | FALSE | "FINITE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "FINITE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "FINITE",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AIREXT | N/A | C26 | TRUE | "AIREXT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "AIREXT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "AIREXT",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| ANF | N/A | C26 | FALSE | "ANF",1,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",1,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ANF | N/A | C26 | FALSE | "ANF",2,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",2,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ANF | N/A | C26 | FALSE | "ANF",3,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",3,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ANF | N/A | C26 | FALSE | "ANF",4,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",4,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",4,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | C26 | FALSE | "TFD",1,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",1,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | C26 | FALSE | "TFD",2,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",2,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | C26 | FALSE | "TFD",3,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",3,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | C26 | FALSE | "TFD",4,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",4,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",4,0,0,0,0,0,0,"N/A","N/A",FALSE |

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLcud.onsite | YMP Offsite GE | File: GNDFLcud.GE | YMP Offsite Non-GE | File: GNDFLcud.nonGE |
|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Menu | Value | "YMP Chronic Onsite Mean Values",198 | Value | "YMP Chronic Offsite GE Mean Values",198 | Value | "YMP Chronic Offsite Non-GE Mean Values",198 |
| AQF | N/A | C26 | FALSE | "AQF",1,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",1,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | C26 | FALSE | "AQF",2,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",2,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | C26 | FALSE | "AQF",3,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",3,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | C26 | FALSE | "AQF",4,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",4,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",4,0,0,0,0,0,0,"N/A","N/A",FALSE |
| DRINK | N/A | C26 | FALSE | "DRINK",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRINK",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRINK",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SHING | N/A | C26 | FALSE | "SHING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHING",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SWING | N/A | C26 | FALSE | "SWING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SWING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SWING",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SLING | N/A | C26 | TRUE | "SLING",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLING",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLING",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| SHINDR | N/A | C26 | FALSE | "SHINDR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHINDR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHINDR",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SLINH | N/A | C26 | TRUE | "SLINH",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLINH",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLINH",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| REC | N/A | - | - | "REC",1,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",1,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| REC | N/A | - | - | "REC",2,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",2,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| REC | N/A | - | - | "REC",3,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",3,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| GROUND | N/A | C26 | TRUE | "GROUND",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "GROUND",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "GROUND",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| SWDRML | N/A | - | - | "SWDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SWDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SWDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SRDRML | N/A | - | - | "SRDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SRDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SRDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SHDRML | N/A | - | - | "SHDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SHDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SHDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SLDRML | N/A | - | - | "SLDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SLDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SLDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ISALT | N/A | C2 | - | "ISALT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "ISALT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "ISALT",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| DRYSET | N/A | C10 | FALSE | "DRYSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRYSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRYSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| WETSET | N/A | C10 | FALSE | "WETSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "WETSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "WETSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| HARVST | N/A | C10 | FALSE | "HARVST",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "HARVST",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "HARVST",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| LOIC | yr | 0 | - | "LOIC",0,0,0,0,0,0,0,"mn","yr",0 | - | "LOIC",0,0,0,0,0,0,0,"mn","yr",0 | - | "LOIC",0,0,0,0,0,0,0,"mn","yr",0 |
| BEFIRR | yr | C2 | - | "BEFIRR",0,0,0,0,0,0,0,"yr","yr",0 | - | "BEFIRR",0,0,0,0,0,0,0,"yr","yr",0 | - | "BEFIRR",0,0,0,0,0,0,0,"yr","yr",0 |
| BEFAIR | yr | C1 | 49 | "BEFAIR",0,0,0,0,0,0,0,"yr","yr",49 | 49 | "BEFAIR",0,0,0,0,0,0,0,"yr","yr",49 | 49 | "BEFAIR",0,0,0,0,0,0,0,"yr","yr",49 |
| NTKEND | yr | C1 | 1 | "NTKEND",0,0,0,0,0,0,0,"yr","yr",1 | 1 | "NTKEND",0,0,0,0,0,0,0,"yr","yr",1 | 1 | "NTKEND",0,0,0,0,0,0,0,"yr","yr",1 |
| RELEND | yr | C1 | 50 | "RELEND",0,0,0,0,0,0,0,"yr","yr",50 | 50 | "RELEND",0,0,0,0,0,0,0,"yr","yr",50 | 50 | "RELEND",0,0,0,0,0,0,0,"yr","yr",50 |
| BEFORE | yr | C1 | 49 | "BEFORE",0,0,0,0,0,0,0,"yr","yr",49 | 49 | "BEFORE",0,0,0,0,0,0,0,"yr","yr",49 | 49 | "BEFORE",0,0,0,0,0,0,0,"yr","yr",49 |
| ABSHUM | kg/m^3 | C1 | 0.00408 | "ABSHUM",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",0.00408 | 0.00408 | "ABSHUM",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",0.00408 | 0.00408 | "ABSHUM",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",0.00408 |
| RF1 | fraction | C1 | 1 | "RF1",0,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "RF1",0,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "RF1",0,0,0,0,0,0,0,"fraction","fraction",1 |
| XMLF | g/m^3 | C8 | 0.0006 | "XMLF",0,0,0,0,0,0,0,"g/m^3","g/m^3",0.0006 | 0.0006 | "XMLF",0,0,0,0,0,0,0,"g/m^3","g/m^3",0.0006 | 0.0006 | "XMLF",0,0,0,0,0,0,0,"g/m^3","g/m^3",0.0006 |
| AVALSL | cm | C8 | 0.2 | "AVALSL",0,0,0,0,0,0,0,"cm","cm",0.2 | 0.2 | "AVALSL",0,0,0,0,0,0,0,"cm","cm",0.2 | 0.2 | "AVALSL",0,0,0,0,0,0,0,"cm","cm",0.2 |

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values (Cont'd)

| Parameter | Units | Menu | YMP Onsite Value | File: GNDFLcud.onsite "YMP Chronic Onsite Mean Values",198 | YMP Offsite GE Value | File: GNDFLcud.GE "YMP Chronic Offsite GE Mean Values",198 | YMP Offsite Non-GE Value | File: GNDFLcud.nonGE "YMP Chronic Offsite Non-GE Mean Values",198 |
|---|---|---|---|---|---|---|---|---|
| YELDA | kg/m^2 | C11 | 0.59 | "YELDA",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | C11 | 0.59 | "YELDA",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | C11 | 0.59 | "YELDA",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | C11 | 0.59 | "YELDA",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | C11 | 2.14 | "YELDA",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| YELDA | kg/m^2 | C11 | 2.14 | "YELDA",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| HLDUPA | day | C25 | 0 | "HLDUPA",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",1,0,0,0,0,0,0,"day","day",0 |
| HLDUPA | day | C25 | 0 | "HLDUPA",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",2,0,0,0,0,0,0,"day","day",0 |
| HLDUPA | day | C25 | 0 | "HLDUPA",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",3,0,0,0,0,0,0,"day","day",0 |
| HLDUPA | day | C25 | 0 | "HLDUPA",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",4,0,0,0,0,0,0,"day","day",0 |
| GRWPA | day | C19 | 200 | "GRWPA",1,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",1,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",1,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | C19 | 200 | "GRWPA",2,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",2,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",2,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | C19 | 200 | "GRWPA",3,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",3,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",3,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | C19 | 200 | "GRWPA",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",4,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | C19 | 75 | "GRWPA",5,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",5,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",5,0,0,0,0,0,0,"day","day",75 |
| GRWPA | day | C19 | 75 | "GRWPA",6,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",6,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",6,0,0,0,0,0,0,"day","day",75 |
| STORTM | day | C17 | 0 | "STORTM",1,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",1,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",1,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | C17 | 0 | "STORTM",2,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",2,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",2,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | C17 | 0 | "STORTM",3,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",3,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",3,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | C17 | 0 | "STORTM",4,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",4,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",4,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | C17 | 0 | "STORTM",5,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",5,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",5,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | C17 | 0 | "STORTM",6,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",6,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",6,0,0,0,0,0,0,"day","day",0 |
| DIETFR | fraction | C18 | 0 | "DIETFR",1,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",1,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",1,0,0,0,0,0,0,"fraction","fraction",0 |
| DIETFR | fraction | C18 | 1 | "DIETFR",2,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",2,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",2,0,0,0,0,0,0,"fraction","fraction",1 |
| DIETFR | fraction | C18 | 0 | "DIETFR",3,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",3,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",3,0,0,0,0,0,0,"fraction","fraction",0 |
| DIETFR | fraction | C18 | 1 | "DIETFR",4,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",4,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",4,0,0,0,0,0,0,"fraction","fraction",1 |
| DIETFR | fraction | C18 | 1 | "DIETFR",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",5,0,0,0,0,0,0,"fraction","fraction",1 |
| DIETFR | fraction | C18 | 1 | "DIETFR",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",6,0,0,0,0,0,0,"fraction","fraction",1 |
| YELD | kg/m^2 | C22 | 3.3 | "YELD",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "YELD",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "YELD",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 |
| YELD | kg/m^2 | C22 | 4.13 | "YELD",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.13 | 4.13 | "YELD",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.13 | 4.13 | "YELD",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.13 |
| YELD | kg/m^2 | C22 | 2.75 | "YELD",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.75 | 2.75 | "YELD",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.75 | 2.75 | "YELD",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.75 |
| YELD | kg/m^2 | C22 | 0.59 | "YELD",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELD",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELD",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLcud.onsite | YMP Offsite GE | File: GNDFLcud.GE | YMP Offsite Non-GE | File: GNDFLcud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Chronic Onsite Mean Values",198** | **Value** | **"YMP Chronic Offsite GE Mean Values",198** | **Value** | **"YMP Chronic Offsite Non-GE Mean Values",198** |
| HLDUP | day | C25 | 0 | "HLDUP",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",1,0,0,0,0,0,0,"day","day",0 |
| HLDUP | day | C25 | 0 | "HLDUP",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",2,0,0,0,0,0,0,"day","day",0 |
| HLDUP | day | C25 | 0 | "HLDUP",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",3,0,0,0,0,0,0,"day","day",0 |
| HLDUP | day | C25 | 0 | "HLDUP",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",4,0,0,0,0,0,0,"day","day",0 |
| GRWP | day | C21 | 75 | "GRWP",1,0,0,0,0,0,0,"day","day",75 | 75 | "GRWP",1,0,0,0,0,0,0,"day","day",75 | 75 | "GRWP",1,0,0,0,0,0,0,"day","day",75 |
| GRWP | day | C21 | 80 | "GRWP",2,0,0,0,0,0,0,"day","day",80 | 80 | "GRWP",2,0,0,0,0,0,0,"day","day",80 | 80 | "GRWP",2,0,0,0,0,0,0,"day","day",80 |
| GRWP | day | C21 | 160 | "GRWP",3,0,0,0,0,0,0,"day","day",160 | 160 | "GRWP",3,0,0,0,0,0,0,"day","day",160 | 160 | "GRWP",3,0,0,0,0,0,0,"day","day",160 |
| GRWP | day | C21 | 200 | "GRWP",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWP",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWP",4,0,0,0,0,0,0,"day","day",200 |
| RIRRA | in/yr | C5 | - | "RIRRA",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRA",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRA",1,0,0,0,0,0,0,"in/yr","in/yr",35 |
| RIRRA | in/yr | C5 | - | "RIRRA",2,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",2,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",2,0,0,0,0,0,0,"in/yr","in/yr",0 |
| RIRRA | in/yr | C5 | - | "RIRRA",3,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",3,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",3,0,0,0,0,0,0,"in/yr","in/yr",47 |
| RIRRA | in/yr | C5 | - | "RIRRA",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",4,0,0,0,0,0,0,"in/yr","in/yr",0 |
| RIRRA | in/yr | C5 | - | "RIRRA",5,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",5,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",5,0,0,0,0,0,0,"in/yr","in/yr",47 |
| RIRRA | in/yr | C5 | - | "RIRRA",6,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",6,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",6,0,0,0,0,0,0,"in/yr","in/yr",47 |
| IRTIMA | mon/yr | C6 | - | "IRTIMA",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMA | mon/yr | C6 | - | "IRTIMA",2,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",2,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",2,0,0,0,0,0,0,"mon/yr","mon/yr",0 |
| IRTIMA | mon/yr | C6 | - | "IRTIMA",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMA | mon/yr | C6 | - | "IRTIMA",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 |
| IRTIMA | mon/yr | C6 | - | "IRTIMA",5,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",5,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",5,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMA | mon/yr | C6 | - | "IRTIMA",6,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",6,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",6,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| RIRR | in/yr | C5 | - | "RIRR",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",1,0,0,0,0,0,0,"in/yr","in/yr",35 |
| RIRR | in/yr | C5 | - | "RIRR",2,0,0,0,0,0,0,"in/yr","in/yr",40 | - | "RIRR",2,0,0,0,0,0,0,"in/yr","in/yr",40 | - | "RIRR",2,0,0,0,0,0,0,"in/yr","in/yr",40 |
| RIRR | in/yr | C5 | - | "RIRR",3,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",3,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",3,0,0,0,0,0,0,"in/yr","in/yr",35 |
| RIRR | in/yr | C5 | - | "RIRR",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRR",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRR",4,0,0,0,0,0,0,"in/yr","in/yr",0 |
| IRTIMT | mon/yr | C6 | - | "IRTIMT",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMT | mon/yr | C6 | - | "IRTIMT",2,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",2,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",2,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMT | mon/yr | C6 | - | "IRTIMT",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMT | mon/yr | C6 | - | "IRTIMT",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMT",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMT",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 |
| HLDUP2 | day | C25 | - | "HLDUP2",1,0,0,0,0,0,0,"day","day",1 | - | "HLDUP2",1,0,0,0,0,0,0,"day","day",1 | - | "HLDUP2",1,0,0,0,0,0,0,"day","day",1 |
| HLDUP2 | day | C25 | - | "HLDUP2",2,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",2,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",2,0,0,0,0,0,0,"day","day",0 |
| HLDUP2 | day | C25 | - | "HLDUP2",3,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",3,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",3,0,0,0,0,0,0,"day","day",0 |
| HLDUP2 | day | C25 | - | "HLDUP2",4,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",4,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",4,0,0,0,0,0,0,"day","day",0 |

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLcud.onsite | YMP Offsite GE | File: GNDFLcud.GE | YMP Offsite Non-GE | File: GNDFLcud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Chronic Onsite Mean Values",198** | **Value** | **"YMP Chronic Offsite GE Mean Values",198** | **Value** | **"YMP Chronic Offsite Non-GE Mean Values",198** |
| DWFACA | fraction | C3 | - | "DWFACA",1,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",1,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",1,0,0,0,0,0,0,"fraction","fraction",1 |
| DWFACA | fraction | C3 | - | "DWFACA",2,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",2,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",2,0,0,0,0,0,0,"fraction","fraction",1 |
| DWFACA | fraction | C3 | - | "DWFACA",3,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",3,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",3,0,0,0,0,0,0,"fraction","fraction",1 |
| DWFACA | fraction | C3 | - | "DWFACA",4,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",4,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",4,0,0,0,0,0,0,"fraction","fraction",1 |
| SSLDN | kg/m^3 | C9 | 1500 | "SSLDN",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",1500 | 1500 | "SSLDN",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",1500 | 1500 | "SSLDN",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",1500 |
| RIRRR | in/yr | C2 | - | "RIRRR",0,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRR",0,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRR",0,0,0,0,0,0,0,"in/yr","in/yr",35 |
| IRTIMR | mon/yr | C2 | - | "IRTIMR",0,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMR",0,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMR",0,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| HOLDDW | day | C2 | - | "HOLDDW",0,0,0,0,0,0,0,"day","day",1 | - | "HOLDDW",0,0,0,0,0,0,0,"day","day",1 | - | "HOLDDW",0,0,0,0,0,0,0,"day","day",1 |
| RESFAC | 1/m | C8 | - | "RESFAC",0,0,0,0,0,0,0,"1/m","1/m",0.000000001 | - | "RESFAC",0,0,0,0,0,0,0,"1/m","1/m",0.000000001 | - | "RESFAC",0,0,0,0,0,0,0,"1/m","1/m",0.000000001 |
| WTIM | d | C10 | 14 | "WTIM",0,0,0,0,0,0,0,"d","d",14 | 14 | "WTIM",0,0,0,0,0,0,0,"d","d",14 | 14 | "WTIM",0,0,0,0,0,0,0,"d","d",14 |
| DEPFR1 | fraction | C10 | - | "DEPFR1",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR1",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR1",0,0,0,0,0,0,0,"fraction","fraction",0.25 |
| RAIN | mm/d | C1 | 0.49 | "RAIN",0,0,0,0,0,0,0,"mm/d","mm/d",0.49 | 0.49 | "RAIN",0,0,0,0,0,0,0,"mm/d","mm/d",0.49 | 0.49 | "RAIN",0,0,0,0,0,0,0,"mm/d","mm/d",0.49 |
| ANDKR | l/m^3 | C2 | - | "ANDKR",0,0,0,0,0,0,0,"l/m^3","l/m^3",0 | - | "ANDKR",0,0,0,0,0,0,0,"l/m^3","l/m^3",0 | - | "ANDKR",0,0,0,0,0,0,0,"l/m^3","l/m^3",0 |
| ANDKRN | l/m^3 | C2 | - | "ANDKRN",0,0,0,0,0,0,0,"l/m^3","l/m^3",0.1 | - | "ANDKRN",0,0,0,0,0,0,0,"l/m^3","l/m^3",0.1 | - | "ANDKRN",0,0,0,0,0,0,0,"l/m^3","l/m^3",0.1 |
| SEDDN | kg/m^2 | C2 | - | "SEDDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",15 | - | "SEDDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",15 | - | "SEDDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",15 |
| THICK | cm | C7 | 25 | "THICK",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "THICK",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "THICK",0,0,0,0,0,0,0,"cm","cm",25 |
| MOISTC | fraction | C7 | 0.2 | "MOISTC",0,0,0,0,0,0,0,"fraction","fraction",0.2 | 0.2 | "MOISTC",0,0,0,0,0,0,0,"fraction","fraction",0.2 | 0.2 | "MOISTC",0,0,0,0,0,0,0,"fraction","fraction",0.2 |
| BULKD | g/cm^3 | C7 | 1.5 | "BULKD",0,0,0,0,0,0,0,"g/cm^3","g/cm^3",1.5 | 1.5 | "BULKD",0,0,0,0,0,0,0,"g/cm^3","g/cm^3",1.5 | 1.5 | "BULKD",0,0,0,0,0,0,0,"g/cm^3","g/cm^3",1.5 |
| VLEACH | cm/yr | C7 | 7.9 | "VLEACH",0,0,0,0,0,0,0,"cm/yr","cm/yr",7.9 | 7.9 | "VLEACH",0,0,0,0,0,0,0,"cm/yr","cm/yr",7.9 | 7.9 | "VLEACH",0,0,0,0,0,0,0,"cm/yr","cm/yr",7.9 |
| DEPFR2 | fraction | C10 | - | "DEPFR2",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR2",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR2",0,0,0,0,0,0,0,"fraction","fraction",0.25 |
| LEAFRS | 1/m | C10 | 3.2E-10 | "LEAFRS",0,0,0,0,0,0,0,"1/m","1/m",0.00000000032 | 3.2E-10 | "LEAFRS",0,0,0,0,0,0,0,"1/m","1/m",0.00000000032 | 3.2E-10 | "LEAFRS",0,0,0,0,0,0,0,"1/m","1/m",0.00000000032 |
| DPVRES | m/s | C10 | 0.008 | "DPVRES",0,0,0,0,0,0,0,"m/s","m/s",0.008 | 0.008 | "DPVRES",0,0,0,0,0,0,0,"m/s","m/s",0.008 | 0.008 | "DPVRES",0,0,0,0,0,0,0,"m/s","m/s",0.008 |
| SLDN | kg/m^2 | C9 | 375 | "SLDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",375 | 375 | "SLDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",375 | 375 | "SLDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",375 |
| SURCM | cm | C9 | 25 | "SURCM",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "SURCM",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "SURCM",0,0,0,0,0,0,0,"cm","cm",25 |
| DWATER | L/d | C3 | - | "DWATER",1,0,0,0,0,0,0,"L/d","L/d",50 | - | "DWATER",1,0,0,0,0,0,0,"L/d","L/d",50 | - | "DWATER",1,0,0,0,0,0,0,"L/d","L/d",50 |
| DWATER | L/d | C3 | - | "DWATER",2,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",2,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",2,0,0,0,0,0,0,"L/d","L/d",0.3 |
| DWATER | L/d | C3 | - | "DWATER",3,0,0,0,0,0,0,"L/d","L/d",60 | - | "DWATER",3,0,0,0,0,0,0,"L/d","L/d",60 | - | "DWATER",3,0,0,0,0,0,0,"L/d","L/d",60 |
| DWATER | L/d | C3 | - | "DWATER",4,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",4,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",4,0,0,0,0,0,0,"L/d","L/d",0.3 |
| BIOMA2 | kg/m^2 | C15 | 1.25 | "BIOMA2",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| BIOMA2 | kg/m^2 | C15 | 1.25 | "BIOMA2",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| BIOMA2 | kg/m^2 | C15 | 1.25 | "BIOMA2",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| BIOMA2 | kg/m^2 | C15 | 1.25 | "BIOMA2",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLcud.onsite | YMP Offsite GE | File: GNDFLcud.GE | YMP Offsite Non-GE | File: GNDFLcud.nonGE |
|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Menu | Value | "YMP Chronic Onsite Mean Values",198 | Value | "YMP Chronic Offsite GE Mean Values",198 | Value | "YMP Chronic Offsite Non-GE Mean Values",198 |
| BIOMA2 | kg/m^2 | C15 | 2.14 | "BIOMA2",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| BIOMA2 | kg/m^2 | C15 | 2.14 | "BIOMA2",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| CONSUM | kg/d | C16 | 0 | "CONSUM",1,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",1,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",1,0,0,0,0,0,0,"kg/d","kg/d",0 |
| CONSUM | kg/d | C16 | 0.26 | "CONSUM",2,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",2,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",2,0,0,0,0,0,0,"kg/d","kg/d",0.26 |
| CONSUM | kg/d | C16 | 0 | "CONSUM",3,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",3,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",3,0,0,0,0,0,0,"kg/d","kg/d",0 |
| CONSUM | kg/d | C16 | 0.26 | "CONSUM",4,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",4,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",4,0,0,0,0,0,0,"kg/d","kg/d",0.26 |
| CONSUM | kg/d | C16 | 48.5 | "CONSUM",5,0,0,0,0,0,0,"kg/d","kg/d",48.5 | 48.5 | "CONSUM",5,0,0,0,0,0,0,"kg/d","kg/d",48.5 | 48.5 | "CONSUM",5,0,0,0,0,0,0,"kg/d","kg/d",48.5 |
| CONSUM | kg/d | C16 | 61.5 | "CONSUM",6,0,0,0,0,0,0,"kg/d","kg/d",61.5 | 61.5 | "CONSUM",6,0,0,0,0,0,0,"kg/d","kg/d",61.5 | 61.5 | "CONSUM",6,0,0,0,0,0,0,"kg/d","kg/d",61.5 |
| BIOMAS | kg/m^2 | C20 | 3.3 | "BIOMAS",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "BIOMAS",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "BIOMAS",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 |
| BIOMAS | kg/m^2 | C20 | 4.17 | "BIOMAS",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.17 | 4.17 | "BIOMAS",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.17 | 4.17 | "BIOMAS",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.17 |
| BIOMAS | kg/m^2 | C20 | 5.17 | "BIOMAS",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",5.17 | 5.17 | "BIOMAS",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",5.17 | 5.17 | "BIOMAS",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",5.17 |
| BIOMAS | kg/m^2 | C20 | 1.25 | "BIOMAS",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMAS",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMAS",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| TRANSA | fraction | C13 | 0.1 | "TRANSA",1,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",1,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",1,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | C13 | 0.1 | "TRANSA",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",2,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | C13 | 0.1 | "TRANSA",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",3,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | C13 | 0.1 | "TRANSA",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",4,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | C13 | 1 | "TRANSA",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",5,0,0,0,0,0,0,"fraction","fraction",1 |
| TRANSA | fraction | C13 | 1 | "TRANSA",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",6,0,0,0,0,0,0,"fraction","fraction",1 |
| TRANS | fraction | C24 | 1 | "TRANS",1,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANS",1,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANS",1,0,0,0,0,0,0,"fraction","fraction",1 |
| TRANS | fraction | C24 | 0.1 | "TRANS",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",2,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANS | fraction | C24 | 0.1 | "TRANS",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",3,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANS | fraction | C24 | 0.1 | "TRANS",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",4,0,0,0,0,0,0,"fraction","fraction",0.1 |
| DRYFA2 | fraction | C12 | 0.903 | "DRYFA2",1,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",1,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",1,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | C12 | 0.903 | "DRYFA2",2,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",2,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",2,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | C12 | 0.903 | "DRYFA2",3,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",3,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",3,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | C12 | 0.903 | "DRYFA2",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",4,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | C12 | 0.22 | "DRYFA2",5,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",5,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",5,0,0,0,0,0,0,"fraction","fraction",0.22 |
| DRYFA2 | fraction | C12 | 0.22 | "DRYFA2",6,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",6,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",6,0,0,0,0,0,0,"fraction","fraction",0.22 |
| DRYFAC | fraction | C23 | 0.07 | "DRYFAC",1,0,0,0,0,0,0,"fraction","fraction",0.07 | 0.07 | "DRYFAC",1,0,0,0,0,0,0,"fraction","fraction",0.07 | 0.07 | "DRYFAC",1,0,0,0,0,0,0,"fraction","fraction",0.07 |
| DRYFAC | fraction | C23 | 0.103 | "DRYFAC",2,0,0,0,0,0,0,"fraction","fraction",0.103 | 0.103 | "DRYFAC",2,0,0,0,0,0,0,"fraction","fraction",0.103 | 0.103 | "DRYFAC",2,0,0,0,0,0,0,"fraction","fraction",0.103 |
| DRYFAC | fraction | C23 | 0.12 | "DRYFAC",3,0,0,0,0,0,0,"fraction","fraction",0.12 | 0.12 | "DRYFAC",3,0,0,0,0,0,0,"fraction","fraction",0.12 | 0.12 | "DRYFAC",3,0,0,0,0,0,0,"fraction","fraction",0.12 |
| DRYFAC | fraction | C23 | 0.903 | "DRYFAC",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFAC",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFAC",4,0,0,0,0,0,0,"fraction","fraction",0.903 |

Table 119. YMP Chronic Exposure Parameter Files (*GNDFLiud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLcud.onsite | YMP Offsite GE | File: GNDFLcud.GE | YMP Offsite Non-GE | File: GNDFLcud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Chronic Onsite Mean Values",198** | **Value** | **"YMP Chronic Offsite GE Mean Values",198** | **Value** | **"YMP Chronic Offsite Non-GE Mean Values",198** |
| SLCONA | kg/d | C14 | 0.7 | "SLCONA",1,0,0,0,0,0,0,"kg/d","kg/d",0.7 | 0.7 | "SLCONA",1,0,0,0,0,0,0,"kg/d","kg/d",0.7 | 0.7 | "SLCONA",1,0,0,0,0,0,0,"kg/d","kg/d",0.7 |
| SLCONA | kg/d | C14 | 0.02 | "SLCONA",2,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",2,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",2,0,0,0,0,0,0,"kg/d","kg/d",0.02 |
| SLCONA | kg/d | C14 | 0.95 | "SLCONA",3,0,0,0,0,0,0,"kg/d","kg/d",0.95 | 0.95 | "SLCONA",3,0,0,0,0,0,0,"kg/d","kg/d",0.95 | 0.95 | "SLCONA",3,0,0,0,0,0,0,"kg/d","kg/d",0.95 |
| SLCONA | kg/d | C14 | 0.02 | "SLCONA",4,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",4,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",4,0,0,0,0,0,0,"kg/d","kg/d",0.02 |
| SLCONA | kg/d | C14 | - | "SLCONA",5,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",5,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",5,0,0,0,0,0,0,"kg/d","kg/d",0 |
| SLCONA | kg/d | C14 | - | "SLCONA",6,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",6,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",6,0,0,0,0,0,0,"kg/d","kg/d",0 |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Menu | Value | "YMP Acute Onsite Mean Values",203 | Value | "YMP Acute Offsite GE Mean Values",203 | Value | "YMP Acute Offsite Non-GE Mean Values",203 |
| IRES | N/A | A8 | 1 | "IRES",0,0,0,0,0,0,0,"N/A","N/A",1 | 1 | "IRES",0,0,0,0,0,0,0,"N/A","N/A",1 | 1 | "IRES",0,0,0,0,0,0,0,"N/A","N/A",1 |
| IRRSA | N/A | A4 | - | "IRRSA",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",1,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | A4 | - | "IRRSA",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",2,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | A4 | - | "IRRSA",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",3,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | A4 | - | "IRRSA",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",4,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | A4 | - | "IRRSA",5,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",5,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",5,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSA | N/A | A4 | - | "IRRSA",6,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",6,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRSA",6,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | A4 | - | "IRRST",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",1,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",1,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | A4 | - | "IRRST",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",2,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",2,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | A4 | - | "IRRST",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",3,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",3,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRST | N/A | A4 | - | "IRRST",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",4,0,0,0,0,0,0,"N/A","N/A",0 | - | "IRRST",4,0,0,0,0,0,0,"N/A","N/A",0 |
| IRRSR | N/A | A2 | 0 | "IRRSR",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "IRRSR",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "IRRSR",0,0,0,0,0,0,0,"N/A","N/A",0 |
| LEACHOPTION | N/A | A7 | 0 | "LEACHOPTION",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "LEACHOPTION",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "LEACHOPTION",0,0,0,0,0,0,0,"N/A","N/A",0 |
| DWSRC | N/A | A2 | 0 | "DWSRC",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "DWSRC",0,0,0,0,0,0,0,"N/A","N/A",0 | 0 | "DWSRC",0,0,0,0,0,0,0,"N/A","N/A",0 |
| INHAL | N/A | A26 | TRUE | "INHAL",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "INHAL",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "INHAL",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| ANFOOD | N/A | A1 | FALSE | "ANFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANFOOD",0,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFOOD | N/A | A1 | FALSE | "TFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFOOD",0,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQFOOD | N/A | A1 | FALSE | "AQFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQFOOD",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| RECRE | N/A | A1 | FALSE | "RECRE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RECRE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RECRE",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| DEBUG | N/A | A1 | FALSE | "DEBUG",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DEBUG",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DEBUG",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| DWTRET | N/A | A2 | FALSE | "DWTRET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DWTRET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DWTRET",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| RESIRR | N/A | A2 | FALSE | "RESIRR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RESIRR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "RESIRR",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| FINITE | N/A | A26 | FALSE | "FINITE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "FINITE",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "FINITE",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AIREXT | N/A | A26 | TRUE | "AIREXT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "AIREXT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "AIREXT",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| ANF | N/A | A26 | FALSE | "ANF",1,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",1,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ANF | N/A | A26 | FALSE | "ANF",2,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",2,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ANF | N/A | A26 | FALSE | "ANF",3,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",3,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ANF | N/A | A26 | FALSE | "ANF",4,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "ANF",4,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "ANF",4,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | A26 | FALSE | "TFD",1,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",1,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | A26 | FALSE | "TFD",2,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",2,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| TFD | N/A | A26 | FALSE | "TFD",3,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",3,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",3,0,0,0,0,0,0,"N/A","N/A",FALSE |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Menu | Value | "YMP Acute Onsite Mean Values",203 | Value | "YMP Acute Offsite GE Mean Values",203 | Value | "YMP Acute Offsite Non-GE Mean Values",203 |
| TFD | N/A | A26 | FALSE | "TFD",4,0,0,0,0,0,0,"N/A","N/A",FALSE | TRUE | "TFD",4,0,0,0,0,0,0,"N/A","N/A",TRUE | FALSE | "TFD",4,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | A26 | FALSE | "AQF",1,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",1,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | A26 | FALSE | "AQF",2,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",2,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | A26 | FALSE | "AQF",3,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",3,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AQF | N/A | A26 | FALSE | "AQF",4,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",4,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "AQF",4,0,0,0,0,0,0,"N/A","N/A",FALSE |
| DRINK | N/A | A26 | FALSE | "DRINK",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRINK",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRINK",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SHING | N/A | A26 | FALSE | "SHING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHING",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SWING | N/A | A26 | FALSE | "SWING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SWING",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SWING",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SLING | N/A | A26 | TRUE | "SLING",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLING",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLING",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| SHINDR | N/A | A26 | FALSE | "SHINDR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHINDR",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "SHINDR",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SLINH | N/A | A26 | TRUE | "SLINH",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLINH",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "SLINH",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| REC | N/A | - | - | "REC",1,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",1,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",1,0,0,0,0,0,0,"N/A","N/A",FALSE |
| REC | N/A | - | - | "REC",2,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",2,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",2,0,0,0,0,0,0,"N/A","N/A",FALSE |
| REC | N/A | - | - | "REC",3,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",3,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "REC",3,0,0,0,0,0,0,"N/A","N/A",FALSE |
| GROUND | N/A | A26 | TRUE | "GROUND",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "GROUND",0,0,0,0,0,0,0,"N/A","N/A",TRUE | TRUE | "GROUND",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| SWDRML | N/A | - | - | "SWDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SWDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SWDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SRDRML | N/A | - | - | "SRDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SRDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SRDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SHDRML | N/A | - | - | "SHDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SHDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SHDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| SLDRML | N/A | - | - | "SLDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SLDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE | - | "SLDRML",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| ISALT | N/A | A2 | - | "ISALT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "ISALT",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "ISALT",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| DRYSET | N/A | A10 | FALSE | "DRYSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRYSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "DRYSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| WETSET | N/A | A10 | FALSE | "WETSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "WETSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "WETSET",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| HARVST | N/A | A10 | FALSE | "HARVST",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "HARVST",0,0,0,0,0,0,0,"N/A","N/A",FALSE | FALSE | "HARVST",0,0,0,0,0,0,0,"N/A","N/A",FALSE |
| AIRPROB | N/A | - | - | "AIRPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "AIRPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "AIRPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| DEPPROB | N/A | - | - | "DEPPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "DEPPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "DEPPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| EXTPROB | N/A | - | - | "EXTPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "EXTPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE | - | "EXTPROB",0,0,0,0,0,0,0,"N/A","N/A",TRUE |
| NTKEND | yr | A1 | 1 | "NTKEND",0,0,0,0,0,0,0,"yr","yr",1 | 1 | "NTKEND",0,0,0,0,0,0,0,"yr","yr",1 | 1 | "NTKEND",0,0,0,0,0,0,0,"yr","yr",1 |
| RELEND | yr | A1 | 0.000114 | "RELEND",0,0,0,0,0,0,0,"yr","yr",0.000114 | 0.000114 | "RELEND",0,0,0,0,0,0,0,"yr","yr",0.000114 | 0.000114 | "RELEND",0,0,0,0,0,0,0,"yr","yr",0.000114 |
| ACUTIM | yr | A1 | 0.000114 | "ACUTIM",0,0,0,0,0,0,0,"yr","yr",0.000114 | 0.000114 | "ACUTIM",0,0,0,0,0,0,0,"yr","yr",0.000114 | 0.000114 | "ACUTIM",0,0,0,0,0,0,0,"yr","yr",0.000114 |
| ABSHUM | kg/m^3 | A1 | 0.00408 | "ABSHUM",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",0.00408 | 0.00408 | "ABSHUM",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",0.00408 | 0.00408 | "ABSHUM",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",0.00408 |
| RF1 | fraction | A1 | 1 | "RF1",0,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "RF1",0,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "RF1",0,0,0,0,0,0,0,"fraction","fraction",1 |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Acute Onsite Mean Values",203** | **Value** | **"YMP Acute Offsite GE Mean Values",203** | **Value** | **"YMP Acute Offsite Non-GE Mean Values",203** |
| XMLF | g/m^3 | A8 | 0.0006 | "XMLF",0,0,0,0,0,0,0,"g/m^3","g/m^3",0.0006 | 0.0006 | "XMLF",0,0,0,0,0,0,0,"g/m^3","g/m^3",0.0006 | 0.0006 | "XMLF",0,0,0,0,0,0,0,"g/m^3","g/m^3",0.0006 |
| AVALSL | cm | A8 | 0.2 | "AVALSL",0,0,0,0,0,0,0,"cm","cm",0.2 | 0.2 | "AVALSL",0,0,0,0,0,0,0,"cm","cm",0.2 | 0.2 | "AVALSL",0,0,0,0,0,0,0,"cm","cm",0.2 |
| YELDA | kg/m^2 | A11 | 0.59 | "YELDA",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | A11 | 0.59 | "YELDA",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | A11 | 0.59 | "YELDA",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | A11 | 0.59 | "YELDA",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELDA",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| YELDA | kg/m^2 | A11 | 2.14 | "YELDA",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| YELDA | kg/m^2 | A11 | 2.14 | "YELDA",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "YELDA",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| HLDUPA | day | A25 | 0 | "HLDUPA",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",1,0,0,0,0,0,0,"day","day",0 |
| HLDUPA | day | A25 | 0 | "HLDUPA",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",2,0,0,0,0,0,0,"day","day",0 |
| HLDUPA | day | A25 | 0 | "HLDUPA",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",3,0,0,0,0,0,0,"day","day",0 |
| HLDUPA | day | A25 | 0 | "HLDUPA",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUPA",4,0,0,0,0,0,0,"day","day",0 |
| GRWPA | day | A19 | 200 | "GRWPA",1,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",1,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",1,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | A19 | 200 | "GRWPA",2,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",2,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",2,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | A19 | 200 | "GRWPA",3,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",3,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",3,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | A19 | 200 | "GRWPA",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWPA",4,0,0,0,0,0,0,"day","day",200 |
| GRWPA | day | A19 | 75 | "GRWPA",5,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",5,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",5,0,0,0,0,0,0,"day","day",75 |
| GRWPA | day | A19 | 75 | "GRWPA",6,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",6,0,0,0,0,0,0,"day","day",75 | 75 | "GRWPA",6,0,0,0,0,0,0,"day","day",75 |
| STORTM | day | A17 | 0 | "STORTM",1,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",1,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",1,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | A17 | 0 | "STORTM",2,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",2,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",2,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | A17 | 0 | "STORTM",3,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",3,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",3,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | A17 | 0 | "STORTM",4,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",4,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",4,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | A17 | 0 | "STORTM",5,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",5,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",5,0,0,0,0,0,0,"day","day",0 |
| STORTM | day | A17 | 0 | "STORTM",6,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",6,0,0,0,0,0,0,"day","day",0 | 0 | "STORTM",6,0,0,0,0,0,0,"day","day",0 |
| DIETFR | fraction | A18 | 0 | "DIETFR",1,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",1,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",1,0,0,0,0,0,0,"fraction","fraction",0 |
| DIETFR | fraction | A18 | 1 | "DIETFR",2,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",2,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",2,0,0,0,0,0,0,"fraction","fraction",1 |
| DIETFR | fraction | A18 | 0 | "DIETFR",3,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",3,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "DIETFR",3,0,0,0,0,0,0,"fraction","fraction",0 |
| DIETFR | fraction | A18 | 1 | "DIETFR",4,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",4,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",4,0,0,0,0,0,0,"fraction","fraction",1 |
| DIETFR | fraction | A18 | 1 | "DIETFR",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",5,0,0,0,0,0,0,"fraction","fraction",1 |
| DIETFR | fraction | A18 | 1 | "DIETFR",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "DIETFR",6,0,0,0,0,0,0,"fraction","fraction",1 |
| YELD | kg/m^2 | A22 | 3.3 | "YELD",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "YELD",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "YELD",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 |
| YELD | kg/m^2 | A22 | 4.13 | "YELD",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.13 | 4.13 | "YELD",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.13 | 4.13 | "YELD",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.13 |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Menu | Value | "YMP Acute Onsite Mean Values",203 | Value | "YMP Acute Offsite GE Mean Values",203 | Value | "YMP Acute Offsite Non-GE Mean Values",203 |
| YELD | kg/m^2 | A22 | 2.75 | "YELD",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.75 | 2.75 | "YELD",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.75 | 2.75 | "YELD",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.75 |
| YELD | kg/m^2 | A22 | 0.59 | "YELD",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELD",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 | 0.59 | "YELD",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",0.59 |
| HLDUP | day | A25 | 0 | "HLDUP",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",1,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",1,0,0,0,0,0,0,"day","day",0 |
| HLDUP | day | A25 | 0 | "HLDUP",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",2,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",2,0,0,0,0,0,0,"day","day",0 |
| HLDUP | day | A25 | 0 | "HLDUP",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",3,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",3,0,0,0,0,0,0,"day","day",0 |
| HLDUP | day | A25 | 0 | "HLDUP",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",4,0,0,0,0,0,0,"day","day",0 | 0 | "HLDUP",4,0,0,0,0,0,0,"day","day",0 |
| GRWP | day | A21 | 75 | "GRWP",1,0,0,0,0,0,0,"day","day",75 | 75 | "GRWP",1,0,0,0,0,0,0,"day","day",75 | 75 | "GRWP",1,0,0,0,0,0,0,"day","day",75 |
| GRWP | day | A21 | 80 | "GRWP",2,0,0,0,0,0,0,"day","day",80 | 80 | "GRWP",2,0,0,0,0,0,0,"day","day",80 | 80 | "GRWP",2,0,0,0,0,0,0,"day","day",80 |
| GRWP | day | A21 | 160 | "GRWP",3,0,0,0,0,0,0,"day","day",160 | 160 | "GRWP",3,0,0,0,0,0,0,"day","day",160 | 160 | "GRWP",3,0,0,0,0,0,0,"day","day",160 |
| GRWP | day | A21 | 200 | "GRWP",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWP",4,0,0,0,0,0,0,"day","day",200 | 200 | "GRWP",4,0,0,0,0,0,0,"day","day",200 |
| RIRRA | in/yr | A5 | - | "RIRRA",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRA",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRA",1,0,0,0,0,0,0,"in/yr","in/yr",35 |
| RIRRA | in/yr | A5 | - | "RIRRA",2,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",2,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",2,0,0,0,0,0,0,"in/yr","in/yr",0 |
| RIRRA | in/yr | A5 | - | "RIRRA",3,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",3,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",3,0,0,0,0,0,0,"in/yr","in/yr",47 |
| RIRRA | in/yr | A5 | - | "RIRRA",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRRA",4,0,0,0,0,0,0,"in/yr","in/yr",0 |
| RIRRA | in/yr | A5 | - | "RIRRA",5,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",5,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",5,0,0,0,0,0,0,"in/yr","in/yr",47 |
| RIRRA | in/yr | A5 | - | "RIRRA",6,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",6,0,0,0,0,0,0,"in/yr","in/yr",47 | - | "RIRRA",6,0,0,0,0,0,0,"in/yr","in/yr",47 |
| IRTIMA | mon/yr | A6 | - | "IRTIMA",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMA | mon/yr | A6 | - | "IRTIMA",2,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",2,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",2,0,0,0,0,0,0,"mon/yr","mon/yr",0 |
| IRTIMA | mon/yr | A6 | - | "IRTIMA",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMA | mon/yr | A6 | - | "IRTIMA",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMA",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 |
| IRTIMA | mon/yr | A6 | - | "IRTIMA",5,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",5,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",5,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMA | mon/yr | A6 | - | "IRTIMA",6,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",6,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMA",6,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| RIRR | in/yr | A5 | - | "RIRR",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",1,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",1,0,0,0,0,0,0,"in/yr","in/yr",35 |
| RIRR | in/yr | A5 | - | "RIRR",2,0,0,0,0,0,0,"in/yr","in/yr",40 | - | "RIRR",2,0,0,0,0,0,0,"in/yr","in/yr",40 | - | "RIRR",2,0,0,0,0,0,0,"in/yr","in/yr",40 |
| RIRR | in/yr | A5 | - | "RIRR",3,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",3,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRR",3,0,0,0,0,0,0,"in/yr","in/yr",35 |
| RIRR | in/yr | A5 | - | "RIRR",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRR",4,0,0,0,0,0,0,"in/yr","in/yr",0 | - | "RIRR",4,0,0,0,0,0,0,"in/yr","in/yr",0 |
| IRTIMT | mon/yr | A6 | - | "IRTIMT",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",1,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMT | mon/yr | A6 | - | "IRTIMT",2,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",2,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",2,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMT | mon/yr | A6 | - | "IRTIMT",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMT",3,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| IRTIMT | mon/yr | A6 | - | "IRTIMT",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMT",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 | - | "IRTIMT",4,0,0,0,0,0,0,"mon/yr","mon/yr",0 |
| HLDUP2 | day | A25 | - | "HLDUP2",1,0,0,0,0,0,0,"day","day",1 | - | "HLDUP2",1,0,0,0,0,0,0,"day","day",1 | - | "HLDUP2",1,0,0,0,0,0,0,"day","day",1 |
| HLDUP2 | day | A25 | - | "HLDUP2",2,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",2,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",2,0,0,0,0,0,0,"day","day",0 |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Acute Onsite Mean Values",203** | **Value** | **"YMP Acute Offsite GE Mean Values",203** | **Value** | **"YMP Acute Offsite Non-GE Mean Values",203** |
| HLDUP2 | day | A25 | - | "HLDUP2",3,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",3,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",3,0,0,0,0,0,0,"day","day",0 |
| HLDUP2 | day | A25 | - | "HLDUP2",4,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",4,0,0,0,0,0,0,"day","day",0 | - | "HLDUP2",4,0,0,0,0,0,0,"day","day",0 |
| DWFACA | fraction | A3 | - | "DWFACA",1,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",1,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",1,0,0,0,0,0,0,"fraction","fraction",1 |
| DWFACA | fraction | A3 | - | "DWFACA",2,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",2,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",2,0,0,0,0,0,0,"fraction","fraction",1 |
| DWFACA | fraction | A3 | - | "DWFACA",3,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",3,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",3,0,0,0,0,0,0,"fraction","fraction",1 |
| DWFACA | fraction | A3 | - | "DWFACA",4,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",4,0,0,0,0,0,0,"fraction","fraction",1 | - | "DWFACA",4,0,0,0,0,0,0,"fraction","fraction",1 |
| SSLDN | kg/m^3 | A9 | 1500 | "SSLDN",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",1500 | 1500 | "SSLDN",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",1500 | 1500 | "SSLDN",0,0,0,0,0,0,0,"kg/m^3","kg/m^3",1500 |
| RIRRR | in/yr | A2 | - | "RIRRR",0,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRR",0,0,0,0,0,0,0,"in/yr","in/yr",35 | - | "RIRRR",0,0,0,0,0,0,0,"in/yr","in/yr",35 |
| IRTIMR | mon/yr | A2 | - | "IRTIMR",0,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMR",0,0,0,0,0,0,0,"mon/yr","mon/yr",6 | - | "IRTIMR",0,0,0,0,0,0,0,"mon/yr","mon/yr",6 |
| HOLDDW | day | A2 | - | "HOLDDW",0,0,0,0,0,0,0,"day","day",1 | - | "HOLDDW",0,0,0,0,0,0,0,"day","day",1 | - | "HOLDDW",0,0,0,0,0,0,0,"day","day",1 |
| RESFAC | 1/m | A8 | - | "RESFAC",0,0,0,0,0,0,0,"1/m","1/m",0.000000001 | - | "RESFAC",0,0,0,0,0,0,0,"1/m","1/m",0.000000001 | - | "RESFAC",0,0,0,0,0,0,0,"1/m","1/m",0.000000001 |
| WTIM | d | A10 | 14 | "WTIM",0,0,0,0,0,0,0,"d","d",14 | 14 | "WTIM",0,0,0,0,0,0,0,"d","d",14 | 14 | "WTIM",0,0,0,0,0,0,0,"d","d",14 |
| DEPFR1 | fraction | A10 | - | "DEPFR1",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR1",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR1",0,0,0,0,0,0,0,"fraction","fraction",0.25 |
| RAIN | mm/d | A1 | 0.49 | "RAIN",0,0,0,0,0,0,0,"mm/d","mm/d",0.49 | 0.49 | "RAIN",0,0,0,0,0,0,0,"mm/d","mm/d",0.49 | 0.49 | "RAIN",0,0,0,0,0,0,0,"mm/d","mm/d",0.49 |
| ANDKR | l/m^3 | A2 | - | "ANDKR",0,0,0,0,0,0,0,"l/m^3","l/m^3",0 | - | "ANDKR",0,0,0,0,0,0,0,"l/m^3","l/m^3",0 | - | "ANDKR",0,0,0,0,0,0,0,"l/m^3","l/m^3",0 |
| ANDKRN | l/m^3 | A2 | - | "ANDKRN",0,0,0,0,0,0,0,"l/m^3","l/m^3",0.1 | - | "ANDKRN",0,0,0,0,0,0,0,"l/m^3","l/m^3",0.1 | - | "ANDKRN",0,0,0,0,0,0,0,"l/m^3","l/m^3",0.1 |
| SEDDN | kg/m^2 | A2 | - | "SEDDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",15 | - | "SEDDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",15 | - | "SEDDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",15 |
| THICK | cm | A7 | 25 | "THICK",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "THICK",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "THICK",0,0,0,0,0,0,0,"cm","cm",25 |
| MOISTC | fraction | A7 | 0.2 | "MOISTC",0,0,0,0,0,0,0,"fraction","fraction",0.2 | 0.2 | "MOISTC",0,0,0,0,0,0,0,"fraction","fraction",0.2 | 0.2 | "MOISTC",0,0,0,0,0,0,0,"fraction","fraction",0.2 |
| BULKD | g/cm^3 | A7 | 1.5 | "BULKD",0,0,0,0,0,0,0,"g/cm^3","g/cm^3",1.5 | 1.5 | "BULKD",0,0,0,0,0,0,0,"g/cm^3","g/cm^3",1.5 | 1.5 | "BULKD",0,0,0,0,0,0,0,"g/cm^3","g/cm^3",1.5 |
| VLEACH | cm/yr | A7 | 7.9 | "VLEACH",0,0,0,0,0,0,0,"cm/yr","cm/yr",7.9 | 7.9 | "VLEACH",0,0,0,0,0,0,0,"cm/yr","cm/yr",7.9 | 7.9 | "VLEACH",0,0,0,0,0,0,0,"cm/yr","cm/yr",7.9 |
| DEPFR2 | fraction | A10 | - | "DEPFR2",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR2",0,0,0,0,0,0,0,"fraction","fraction",0.25 | - | "DEPFR2",0,0,0,0,0,0,0,"fraction","fraction",0.25 |
| LEAFRS | 1/m | A10 | 3.2E-10 | "LEAFRS",0,0,0,0,0,0,0,"1/m","1/m",0.00000000032 | 3.2E-10 | "LEAFRS",0,0,0,0,0,0,0,"1/m","1/m",0.00000000032 | 3.2E-10 | "LEAFRS",0,0,0,0,0,0,0,"1/m","1/m",0.00000000032 |
| DPVRES | m/s | A10 | 0.008 | "DPVRES",0,0,0,0,0,0,0,"m/s","m/s",0.008 | 0.008 | "DPVRES",0,0,0,0,0,0,0,"m/s","m/s",0.008 | 0.008 | "DPVRES",0,0,0,0,0,0,0,"m/s","m/s",0.008 |
| SLDN | kg/m^2 | A9 | 375 | "SLDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",375 | 375 | "SLDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",375 | 375 | "SLDN",0,0,0,0,0,0,0,"kg/m^2","kg/m^2",375 |
| SURCM | cm | A9 | 25 | "SURCM",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "SURCM",0,0,0,0,0,0,0,"cm","cm",25 | 25 | "SURCM",0,0,0,0,0,0,0,"cm","cm",25 |
| DWATER | L/d | A3 | - | "DWATER",1,0,0,0,0,0,0,"L/d","L/d",50 | - | "DWATER",1,0,0,0,0,0,0,"L/d","L/d",50 | - | "DWATER",1,0,0,0,0,0,0,"L/d","L/d",50 |
| DWATER | L/d | A3 | - | "DWATER",2,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",2,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",2,0,0,0,0,0,0,"L/d","L/d",0.3 |
| DWATER | L/d | A3 | - | "DWATER",3,0,0,0,0,0,0,"L/d","L/d",60 | - | "DWATER",3,0,0,0,0,0,0,"L/d","L/d",60 | - | "DWATER",3,0,0,0,0,0,0,"L/d","L/d",60 |
| DWATER | L/d | A3 | - | "DWATER",4,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",4,0,0,0,0,0,0,"L/d","L/d",0.3 | - | "DWATER",4,0,0,0,0,0,0,"L/d","L/d",0.3 |
| BIOMA2 | kg/m^2 | A15 | 1.25 | "BIOMA2",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Acute Onsite Mean Values",203** | **Value** | **"YMP Acute Offsite GE Mean Values",203** | **Value** | **"YMP Acute Offsite Non-GE Mean Values",203** |
| BIOMA2 | kg/m^2 | A15 | 1.25 | "BIOMA2",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| BIOMA2 | kg/m^2 | A15 | 1.25 | "BIOMA2",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| BIOMA2 | kg/m^2 | A15 | 1.25 | "BIOMA2",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMA2",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| BIOMA2 | kg/m^2 | A15 | 2.14 | "BIOMA2",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",5,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| BIOMA2 | kg/m^2 | A15 | 2.14 | "BIOMA2",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 | 2.14 | "BIOMA2",6,0,0,0,0,0,0,"kg/m^2","kg/m^2",2.14 |
| CONSUM | kg/d | A16 | 0 | "CONSUM",1,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",1,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",1,0,0,0,0,0,0,"kg/d","kg/d",0 |
| CONSUM | kg/d | A16 | 0.26 | "CONSUM",2,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",2,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",2,0,0,0,0,0,0,"kg/d","kg/d",0.26 |
| CONSUM | kg/d | A16 | 0 | "CONSUM",3,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",3,0,0,0,0,0,0,"kg/d","kg/d",0 | 0 | "CONSUM",3,0,0,0,0,0,0,"kg/d","kg/d",0 |
| CONSUM | kg/d | A16 | 0.26 | "CONSUM",4,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",4,0,0,0,0,0,0,"kg/d","kg/d",0.26 | 0.26 | "CONSUM",4,0,0,0,0,0,0,"kg/d","kg/d",0.26 |
| CONSUM | kg/d | A16 | 48.5 | "CONSUM",5,0,0,0,0,0,0,"kg/d","kg/d",48.5 | 48.5 | "CONSUM",5,0,0,0,0,0,0,"kg/d","kg/d",48.5 | 48.5 | "CONSUM",5,0,0,0,0,0,0,"kg/d","kg/d",48.5 |
| CONSUM | kg/d | A16 | 61.5 | "CONSUM",6,0,0,0,0,0,0,"kg/d","kg/d",61.5 | 61.5 | "CONSUM",6,0,0,0,0,0,0,"kg/d","kg/d",61.5 | 61.5 | "CONSUM",6,0,0,0,0,0,0,"kg/d","kg/d",61.5 |
| BIOMAS | kg/m^2 | A20 | 3.3 | "BIOMAS",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "BIOMAS",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 | 3.3 | "BIOMAS",1,0,0,0,0,0,0,"kg/m^2","kg/m^2",3.3 |
| BIOMAS | kg/m^2 | A20 | 4.17 | "BIOMAS",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.17 | 4.17 | "BIOMAS",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.17 | 4.17 | "BIOMAS",2,0,0,0,0,0,0,"kg/m^2","kg/m^2",4.17 |
| BIOMAS | kg/m^2 | A20 | 5.17 | "BIOMAS",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",5.17 | 5.17 | "BIOMAS",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",5.17 | 5.17 | "BIOMAS",3,0,0,0,0,0,0,"kg/m^2","kg/m^2",5.17 |
| BIOMAS | kg/m^2 | A20 | 1.25 | "BIOMAS",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMAS",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 | 1.25 | "BIOMAS",4,0,0,0,0,0,0,"kg/m^2","kg/m^2",1.25 |
| TRANSA | fraction | A13 | 0.1 | "TRANSA",1,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",1,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",1,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | A13 | 0.1 | "TRANSA",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",2,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | A13 | 0.1 | "TRANSA",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",3,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | A13 | 0.1 | "TRANSA",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANSA",4,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANSA | fraction | A13 | 1 | "TRANSA",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",5,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",5,0,0,0,0,0,0,"fraction","fraction",1 |
| TRANSA | fraction | A13 | 1 | "TRANSA",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",6,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANSA",6,0,0,0,0,0,0,"fraction","fraction",1 |
| TRANS | fraction | A24 | 1 | "TRANS",1,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANS",1,0,0,0,0,0,0,"fraction","fraction",1 | 1 | "TRANS",1,0,0,0,0,0,0,"fraction","fraction",1 |
| TRANS | fraction | A24 | 0.1 | "TRANS",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",2,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",2,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANS | fraction | A24 | 0.1 | "TRANS",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",3,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",3,0,0,0,0,0,0,"fraction","fraction",0.1 |
| TRANS | fraction | A24 | 0.1 | "TRANS",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",4,0,0,0,0,0,0,"fraction","fraction",0.1 | 0.1 | "TRANS",4,0,0,0,0,0,0,"fraction","fraction",0.1 |
| DRYFA2 | fraction | A12 | 0.903 | "DRYFA2",1,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",1,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",1,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | A12 | 0.903 | "DRYFA2",2,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",2,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",2,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | A12 | 0.903 | "DRYFA2",3,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",3,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",3,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | A12 | 0.903 | "DRYFA2",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFA2",4,0,0,0,0,0,0,"fraction","fraction",0.903 |
| DRYFA2 | fraction | A12 | 0.22 | "DRYFA2",5,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",5,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",5,0,0,0,0,0,0,"fraction","fraction",0.22 |
| DRYFA2 | fraction | A12 | 0.22 | "DRYFA2",6,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",6,0,0,0,0,0,0,"fraction","fraction",0.22 | 0.22 | "DRYFA2",6,0,0,0,0,0,0,"fraction","fraction",0.22 |
| DRYFAC | fraction | A23 | 0.07 | "DRYFAC",1,0,0,0,0,0,0,"fraction","fraction",0.07 | 0.07 | "DRYFAC",1,0,0,0,0,0,0,"fraction","fraction",0.07 | 0.07 | "DRYFAC",1,0,0,0,0,0,0,"fraction","fraction",0.07 |

Table 120. YMP Acute Exposure Parameter Files (*GNDFLaud.**) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLaud.onsite | YMP Offsite GE | File: GNDFLaud.GE | YMP Offsite Non-GE | File: GNDFLaud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Acute Onsite Mean Values",203** | **Value** | **"YMP Acute Offsite GE Mean Values",203** | **Value** | **"YMP Acute Offsite Non-GE Mean Values",203** |
| DRYFAC | fraction | A23 | 0.103 | "DRYFAC",2,0,0,0,0,0,0,"fraction","fraction",0.103 | 0.103 | "DRYFAC",2,0,0,0,0,0,0,"fraction","fraction",0.103 | 0.103 | "DRYFAC",2,0,0,0,0,0,0,"fraction","fraction",0.103 |
| DRYFAC | fraction | A23 | 0.12 | "DRYFAC",3,0,0,0,0,0,0,"fraction","fraction",0.12 | 0.12 | "DRYFAC",3,0,0,0,0,0,0,"fraction","fraction",0.12 | 0.12 | "DRYFAC",3,0,0,0,0,0,0,"fraction","fraction",0.12 |
| DRYFAC | fraction | A23 | 0.903 | "DRYFAC",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFAC",4,0,0,0,0,0,0,"fraction","fraction",0.903 | 0.903 | "DRYFAC",4,0,0,0,0,0,0,"fraction","fraction",0.903 |
| FRACFR | fraction | A27 | 0.83 | "FRACFR",1,0,0,0,0,0,0,"fraction","fraction",0.83 | 0.83 | "FRACFR",1,0,0,0,0,0,0,"fraction","fraction",0.83 | 0.83 | "FRACFR",1,0,0,0,0,0,0,"fraction","fraction",0.83 |
| FRACFR | fraction | A27 | 0.83 | "FRACFR",3,0,0,0,0,0,0,"fraction","fraction",0.83 | 0.83 | "FRACFR",3,0,0,0,0,0,0,"fraction","fraction",0.83 | 0.83 | "FRACFR",3,0,0,0,0,0,0,"fraction","fraction",0.83 |
| PROBAIR | percent | - | - | "PROBAIR",2,0,0,0,0,0,0,"percent","percent",95 | - | "PROBAIR",2,0,0,0,0,0,0,"percent","percent",95 | - | "PROBAIR",2,0,0,0,0,0,0,"percent","percent",95 |
| PROBDEP | percent | - | - | "PROBDEP",3,0,0,0,0,0,0,"percent","percent",95 | - | "PROBDEP",3,0,0,0,0,0,0,"percent","percent",95 | - | "PROBDEP",3,0,0,0,0,0,0,"percent","percent",95 |
| PROBEXT | percent | - | - | "PROBEXT",4,0,0,0,0,0,0,"percent","percent",95 | - | "PROBEXT",4,0,0,0,0,0,0,"percent","percent",95 | - | "PROBEXT",4,0,0,0,0,0,0,"percent","percent",95 |
| SLCONA | kg/d | A14 | 0.7 | "SLCONA",1,0,0,0,0,0,0,"kg/d","kg/d",0.7 | 0.7 | "SLCONA",1,0,0,0,0,0,0,"kg/d","kg/d",0.7 | 0.7 | "SLCONA",1,0,0,0,0,0,0,"kg/d","kg/d",0.7 |
| SLCONA | kg/d | A14 | 0.02 | "SLCONA",2,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",2,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",2,0,0,0,0,0,0,"kg/d","kg/d",0.02 |
| SLCONA | kg/d | A14 | 0.95 | "SLCONA",3,0,0,0,0,0,0,"kg/d","kg/d",0.95 | 0.95 | "SLCONA",3,0,0,0,0,0,0,"kg/d","kg/d",0.95 | 0.95 | "SLCONA",3,0,0,0,0,0,0,"kg/d","kg/d",0.95 |
| SLCONA | kg/d | A14 | 0.02 | "SLCONA",4,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",4,0,0,0,0,0,0,"kg/d","kg/d",0.02 | 0.02 | "SLCONA",4,0,0,0,0,0,0,"kg/d","kg/d",0.02 |
| SLCONA | kg/d | A14 | - | "SLCONA",5,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",5,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",5,0,0,0,0,0,0,"kg/d","kg/d",0 |
| SLCONA | kg/d | A14 | - | "SLCONA",6,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",6,0,0,0,0,0,0,"kg/d","kg/d",0 | - | "SLCONA",6,0,0,0,0,0,0,"kg/d","kg/d",0 |

Note: - means not applicable for YMP site-specific, use GENIIv2 defaults.

Table 121. YMP Receptor Intake Parameter Files (*GNDFLiud*.*) and Parameter Values

| Parameter | Units | Menu | YMP Onsite Value | File: GNDFLiud.onsite "YMP Receptor Onsite Mean Values",84 | YMP Offsite GE Value | File: GNDFLiud.GE "YMP Receptor Offsite GE 95th Values",84 | YMP Offsite Non-GE Value | File: GNDFLiud.nonGE "YMP Receptor Offsite Non-GE 95th Values",84 |
|---|---|---|---|---|---|---|---|---|
| NAGES | N/A | R1 | 1 | "NAGES",0,0,0,0,0,0,0,"N/A","N/A",1 | 1 | "NAGES",0,0,0,0,0,0,0,"N/A","N/A",1 | 1 | "NAGES",0,0,0,0,0,0,0,"N/A","N/A",1 |
| EDAGE | yr | - | - | "EDAGE",1,0,0,0,0,0,0,"yr","yr",70 | - | "EDAGE",1,0,0,0,0,0,0,"yr","yr",70 | - | "EDAGE",1,0,0,0,0,0,0,"yr","yr",70 |
| POPAGE | none | - | - | "POPAGE",1,0,0,0,0,0,0,"none","none",1 | - | "POPAGE",1,0,0,0,0,0,0,"none","none",1 | - | "POPAGE",1,0,0,0,0,0,0,"none","none",1 |
| UEXAIR | hr | R1 | 8.5 | "UEXAIR",1,0,0,0,0,0,0,"hr","hr",8.5 | 22.7 | "UEXAIR",1,0,0,0,0,0,0,"hr","hr",22.7 | 22.7 | "UEXAIR",1,0,0,0,0,0,0,"hr","hr",22.7 |
| TEXAIR | day | R1 | 250 | "TEXAIR",1,0,0,0,0,0,0,"day","day",250 | 365 | "TEXAIR",1,0,0,0,0,0,0,"day","day",365 | 365 | "TEXAIR",1,0,0,0,0,0,0,"day","day",365 |
| SHIN | none | R2 | 0.4 | "SHIN",0,0,0,0,0,0,0,"none","none",0.4 | 0.4 | "SHIN",0,0,0,0,0,0,0,"none","none",0.4 | 0.4 | "SHIN",0,0,0,0,0,0,0,"none","none",0.4 |
| SHOUT | none | R2 | 1 | "SHOUT",0,0,0,0,0,0,0,"none","none",1 | 1 | "SHOUT",0,0,0,0,0,0,0,"none","none",1 | 1 | "SHOUT",0,0,0,0,0,0,0,"none","none",1 |
| UEXGRD | hr | R2 | 8.5 | "UEXGRD",1,0,0,0,0,0,0,"hr","hr",8.5 | 24 | "UEXGRD",1,0,0,0,0,0,0,"hr","hr",24 | 24 | "UEXGRD",1,0,0,0,0,0,0,"hr","hr",24 |
| TEXGRD | day | R2 | 250 | "TEXGRD",1,0,0,0,0,0,0,"day","day",250 | 365 | "TEXGRD",1,0,0,0,0,0,0,"day","day",365 | 365 | "TEXGRD",1,0,0,0,0,0,0,"day","day",365 |
| FTIN | fraction | R2 | 0 | "FTIN",1,0,0,0,0,0,0,"fraction","fraction",0 | 0.65 | "FTIN",1,0,0,0,0,0,0,"fraction","fraction",0.65 | 0.65 | "FTIN",1,0,0,0,0,0,0,"fraction","fraction",0.65 |
| FTOUT | fraction | R2 | 1 | "FTOUT",1,0,0,0,0,0,0,"fraction","fraction",1 | 0.33 | "FTOUT",1,0,0,0,0,0,0,"fraction","fraction",0.33 | 0.33 | "FTOUT",1,0,0,0,0,0,0,"fraction","fraction",0.33 |
| EVSWIM | evt/day | - | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESWIM | hr | - | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 |
| TSWIM | day | - | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 |
| SFBOAT | none | - | - | "SFBOAT",0,0,0,0,0,0,0,"none","none",1 | - | "SFBOAT",0,0,0,0,0,0,0,"none","none",1 | - | "SFBOAT",0,0,0,0,0,0,0,"none","none",1 |
| EVBOAT | evt/day | - | - | "EVBOAT",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVBOAT",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVBOAT",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TEBOAT | hr | - | - | "TEBOAT",1,0,0,0,0,0,0,"hr","hr",2 | - | "TEBOAT",1,0,0,0,0,0,0,"hr","hr",2 | - | "TEBOAT",1,0,0,0,0,0,0,"hr","hr",2 |
| TBOAT | day | - | - | "TBOAT",1,0,0,0,0,0,0,"day","day",50 | - | "TBOAT",1,0,0,0,0,0,0,"day","day",50 | - | "TBOAT",1,0,0,0,0,0,0,"day","day",50 |
| EVSHOR | evt/day | - | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHOR | hr | - | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 |
| TSHOR | day | - | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 |
| SWFAC | none | - | - | "SWFAC",0,0,0,0,0,0,0,"none","none",0.2 | - | "SWFAC",0,0,0,0,0,0,0,"none","none",0.2 | - | "SWFAC",0,0,0,0,0,0,0,"none","none",0.2 |
| UCRP | kg/day | R3 | 0 | "UCRP",1,1,0,0,0,0,0,"kg/day","kg/day",0 | 0.159 | "UCRP",1,1,0,0,0,0,0,"kg/day","kg/day",0.159 | 0 | "UCRP",1,1,0,0,0,0,0,"kg/day","kg/day",0 |
| TCRP | day/yr | R3 | 0 | "TCRP",1,1,0,0,0,0,0,"day/yr","day/yr",0 | 99 | "TCRP",1,1,0,0,0,0,0,"day/yr","day/yr",99 | 0 | "TCRP",1,1,0,0,0,0,0,"day/yr","day/yr",0 |
| UCRP | kg/day | R3 | 0 | "UCRP",1,2,0,0,0,0,0,"kg/day","kg/day",0 | 0.158 | "UCRP",1,2,0,0,0,0,0,"kg/day","kg/day",0.158 | 0 | "UCRP",1,2,0,0,0,0,0,"kg/day","kg/day",0 |
| TCRP | day/yr | R3 | 0 | "TCRP",1,2,0,0,0,0,0,"day/yr","day/yr",0 | 100 | "TCRP",1,2,0,0,0,0,0,"day/yr","day/yr",100 | 0 | "TCRP",1,2,0,0,0,0,0,"day/yr","day/yr",0 |
| UCRP | kg/day | R3 | 0 | "UCRP",1,3,0,0,0,0,0,"kg/day","kg/day",0 | 0.198 | "UCRP",1,3,0,0,0,0,0,"kg/day","kg/day",0.198 | 0 | "UCRP",1,3,0,0,0,0,0,"kg/day","kg/day",0 |
| TCRP | day/yr | R3 | 0 | "TCRP",1,3,0,0,0,0,0,"day/yr","day/yr",0 | 180 | "TCRP",1,3,0,0,0,0,0,"day/yr","day/yr",180 | 0 | "TCRP",1,3,0,0,0,0,0,"day/yr","day/yr",0 |
| UCRP | kg/day | R3 | 0 | "UCRP",1,4,0,0,0,0,0,"kg/day","kg/day",0 | 0.355 | "UCRP",1,4,0,0,0,0,0,"kg/day","kg/day",0.355 | 0 | "UCRP",1,4,0,0,0,0,0,"kg/day","kg/day",0 |
| TCRP | day/yr | R3 | 0 | "TCRP",1,4,0,0,0,0,0,"day/yr","day/yr",0 | 3 | "TCRP",1,4,0,0,0,0,0,"day/yr","day/yr",3 | 0 | "TCRP",1,4,0,0,0,0,0,"day/yr","day/yr",0 |

Table 121. YMP Receptor Intake Parameter Files (*GNDFLiud*.*) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLiud.onsite | YMP Offsite GE | File: GNDFLiud.GE | YMP Offsite Non-GE | File: GNDFLiud.nonGE |
|---|---|---|---|---|---|---|---|---|
| Parameter | Units | Menu | Value | "YMP Receptor Onsite Mean Values",84 | Value | "YMP Receptor Offsite GE 95th Values",84 | Value | "YMP Receptor Offsite Non-GE 95th Values",84 |
| UANM | kg/day | R4 | 0 | "UANM",1,1,0,0,0,0,0,"kg/day","kg/day",0 | 0.112 | "UANM",1,1,0,0,0,0,0,"kg/day","kg/day",0.112 | 0 | "UANM",1,1,0,0,0,0,0,"kg/day","kg/day",0 |
| TANM | day/yr | R4 | 0 | "TANM",1,1,0,0,0,0,0,"day/yr","day/yr",0 | 99 | "TANM",1,1,0,0,0,0,0,"day/yr","day/yr",99 | 0 | "TANM",1,1,0,0,0,0,0,"day/yr","day/yr",0 |
| UANM | kg/day | R4 | 0 | "UANM",1,2,0,0,0,0,0,"kg/day","kg/day",0 | 0.126 | "UANM",1,2,0,0,0,0,0,"kg/day","kg/day",0.126 | 0 | "UANM",1,2,0,0,0,0,0,"kg/day","kg/day",0 |
| TANM | day/yr | R4 | 0 | "TANM",1,2,0,0,0,0,0,"day/yr","day/yr",0 | 14 | "TANM",1,2,0,0,0,0,0,"day/yr","day/yr",14 | 0 | "TANM",1,2,0,0,0,0,0,"day/yr","day/yr",0 |
| UANM | kg/day | R4 | 0 | "UANM",1,3,0,0,0,0,0,"kg/day","kg/day",0 | 0.376 | "UANM",1,3,0,0,0,0,0,"kg/day","kg/day",0.376 | 0 | "UANM",1,3,0,0,0,0,0,"kg/day","kg/day",0 |
| TANM | day/yr | R4 | 0 | "TANM",1,3,0,0,0,0,0,"day/yr","day/yr",0 | 52 | "TANM",1,3,0,0,0,0,0,"day/yr","day/yr",52 | 0 | "TANM",1,3,0,0,0,0,0,"day/yr","day/yr",0 |
| UANM | kg/day | R4 | 0 | "UANM",1,4,0,0,0,0,0,"kg/day","kg/day",0 | 0.125 | "UANM",1,4,0,0,0,0,0,"kg/day","kg/day",0.125 | 0 | "UANM",1,4,0,0,0,0,0,"kg/day","kg/day",0 |
| TANM | day/yr | R4 | 0 | "TANM",1,4,0,0,0,0,0,"day/yr","day/yr",0 | 150 | "TANM",1,4,0,0,0,0,0,"day/yr","day/yr",150 | 0 | "TANM",1,4,0,0,0,0,0,"day/yr","day/yr",0 |
| UAQU | kg/day | - | - | "UAQU",1,1,0,0,0,0,0,"kg/day","kg/day",0.11 | - | "UAQU",1,1,0,0,0,0,0,"kg/day","kg/day",0.11 | - | "UAQU",1,1,0,0,0,0,0,"kg/day","kg/day",0.11 |
| TAQU | day/yr | - | - | "TAQU",1,1,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,1,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,1,0,0,0,0,0,"day/yr","day/yr",365 |
| UAQU | kg/day | - | - | "UAQU",1,2,0,0,0,0,0,"kg/day","kg/day",0.019 | - | "UAQU",1,2,0,0,0,0,0,"kg/day","kg/day",0.019 | - | "UAQU",1,2,0,0,0,0,0,"kg/day","kg/day",0.019 |
| TAQU | day/yr | - | - | "TAQU",1,2,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,2,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,2,0,0,0,0,0,"day/yr","day/yr",365 |
| UAQU | kg/day | - | - | "UAQU",1,3,0,0,0,0,0,"kg/day","kg/day",0.019 | - | "UAQU",1,3,0,0,0,0,0,"kg/day","kg/day",0.019 | - | "UAQU",1,3,0,0,0,0,0,"kg/day","kg/day",0.019 |
| TAQU | day/yr | - | - | "TAQU",1,3,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,3,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,3,0,0,0,0,0,"day/yr","day/yr",365 |
| UAQU | kg/day | - | - | "UAQU",1,4,0,0,0,0,0,"kg/day","kg/day",0.019 | - | "UAQU",1,4,0,0,0,0,0,"kg/day","kg/day",0.019 | - | "UAQU",1,4,0,0,0,0,0,"kg/day","kg/day",0.019 |
| TAQU | day/yr | - | - | "TAQU",1,4,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,4,0,0,0,0,0,"day/yr","day/yr",365 | - | "TAQU",1,4,0,0,0,0,0,"day/yr","day/yr",365 |
| UDW | L/day | - | - | "UDW",1,0,0,0,0,0,0,"L/day","L/day",2 | - | "UDW",1,0,0,0,0,0,0,"L/day","L/day",2 | - | "UDW",1,0,0,0,0,0,0,"L/day","L/day",2 |
| TDW | day/yr | - | - | "TDW",1,0,0,0,0,0,0,"day/yr","day/yr",365 | - | "TDW",1,0,0,0,0,0,0,"day/yr","day/yr",365 | - | "TDW",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| EVSWIM | evt/day | - | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESWIM | hr | - | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 |
| TSWIM | day | - | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 |
| USWIM | L/hr | - | - | "USWIM",1,0,0,0,0,0,0,"L/hr","L/hr",0.02 | - | "USWIM",1,0,0,0,0,0,0,"L/hr","L/hr",0.02 | - | "USWIM",1,0,0,0,0,0,0,"L/hr","L/hr",0.02 |
| EVSHWR | evt/day | - | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHWR | hr | - | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 |
| TSHWR | day | - | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 |
| USHIN | L/hr | - | - | "USHIN",1,0,0,0,0,0,0,"L/hr","L/hr",0.06 | - | "USHIN",1,0,0,0,0,0,0,"L/hr","L/hr",0.06 | - | "USHIN",1,0,0,0,0,0,0,"L/hr","L/hr",0.06 |
| TSOIL | day | R5 | 365 | "TSOIL",1,0,0,0,0,0,0,"day","day",365 | 365 | "TSOIL",1,0,0,0,0,0,0,"day","day",365 | 365 | "TSOIL",1,0,0,0,0,0,0,"day","day",365 |
| USOIL | mg/day | R5 | 0 | "USOIL",1,0,0,0,0,0,0,"mg/day","mg/day",0 | 193 | "USOIL",1,0,0,0,0,0,0,"mg/day","mg/day",193 | 0 | "USOIL",1,0,0,0,0,0,0,"mg/day","mg/day",0 |
| UINH | m^3/day | R6 | 30.2 | "UINH",1,0,0,0,0,0,0,"m^3/day","m^3/day",30.2 | 30.2 | "UINH",1,0,0,0,0,0,0,"m^3/day","m^3/day",30.2 | 30.2 | "UINH",1,0,0,0,0,0,0,"m^3/day","m^3/day",30.2 |
| TINH | day/yr | R6 | 250 | "TINH",1,0,0,0,0,0,0,"day/yr","day/yr",250 | 365 | "TINH",1,0,0,0,0,0,0,"day/yr","day/yr",365 | 365 | "TINH",1,0,0,0,0,0,0,"day/yr","day/yr",365 |

Table 121. YMP Receptor Intake Parameter Files (*GNDFLiud*.*) and Parameter Values (Cont'd)

| | | | YMP Onsite | File: GNDFLiud.onsite | YMP Offsite GE | File: GNDFLiud.GE | YMP Offsite Non-GE | File: GNDFLiud.nonGE |
|---|---|---|---|---|---|---|---|---|
| **Parameter** | **Units** | **Menu** | **Value** | **"YMP Receptor Onsite Mean Values",84** | **Value** | **"YMP Receptor Offsite GE 95th Values",84** | **Value** | **"YMP Receptor Offsite Non-GE 95th Values",84** |
| FRINH | fraction | R6 | 0.35 | "FRINH",1,0,0,0,0,0,0,"fraction","fraction",0.35 | 0.95 | "FRINH",1,0,0,0,0,0,0,"fraction","fraction",0.95 | 0.95 | "FRINH",1,0,0,0,0,0,0,"fraction","fraction",0.95 |
| UINHR | m^3/day | R7 | 21.7 | "UINHR",1,0,0,0,0,0,0,"m^3/day","m^3/day",21.7 | 21.9 | "UINHR",1,0,0,0,0,0,0,"m^3/day","m^3/day",21.9 | 21.9 | "UINHR",1,0,0,0,0,0,0,"m^3/day","m^3/day",21.9 |
| TINHR | day/yr | R7 | 250 | "TINHR",1,0,0,0,0,0,0,"day/yr","day/yr",250 | 365 | "TINHR",1,0,0,0,0,0,0,"day/yr","day/yr",365 | 365 | "TINHR",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| FRINHR | fraction | R7 | 0.35 | "FRINHR",1,0,0,0,0,0,0,"fraction","fraction",0.35 | 0.33 | "FRINHR",1,0,0,0,0,0,0,"fraction","fraction",0.33 | 0.31 | "FRINHR",1,0,0,0,0,0,0,"fraction","fraction",0.33 |
| UINDRH | m^3/day | - | - | "UINDRH",1,0,0,0,0,0,0,"m^3/day","m^3/day",23 | - | "UINDRH",1,0,0,0,0,0,0,"m^3/day","m^3/day",23 | - | "UINDRH",1,0,0,0,0,0,0,"m^3/day","m^3/day",23 |
| TINDRH | day/yr | - | - | "TINDRH",1,0,0,0,0,0,0,"day/yr","day/yr",365 | - | "TINDRH",1,0,0,0,0,0,0,"day/yr","day/yr",365 | - | "TINDRH",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| FRINDR | fraction | R8 | 0 | "FRINDR",1,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "FRINDR",1,0,0,0,0,0,0,"fraction","fraction",0 | 0 | "FRINDR",1,0,0,0,0,0,0,"fraction","fraction",0 |
| EVSHWR | evt/day | - | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHWR | hr | - | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 |
| TSHWR | day | - | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 |
| ASKINSH | cm^2 | - | - | "ASKINSH",1,0,0,0,0,0,0,"cm^2","cm^2",20000 | - | "ASKINSH",1,0,0,0,0,0,0,"cm^2","cm^2",20000 | - | "ASKINSH",1,0,0,0,0,0,0,"cm^2","cm^2",20000 |
| EVSWIM | evt/day | - | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESWIM | hr | - | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 |
| TSWIM | day | - | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 |
| ASKINSW | cm^2 | - | - | "ASKINSW",1,0,0,0,0,0,0,"cm^2","cm^2",20000 | - | "ASKINSW",1,0,0,0,0,0,0,"cm^2","cm^2",20000 | - | "ASKINSW",1,0,0,0,0,0,0,"cm^2","cm^2",20000 |
| EVSOIL | evt/day | - | - | "EVSOIL",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSOIL",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSOIL",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TSOILD | day | - | - | "TSOILD",1,0,0,0,0,0,0,"day","day",182.5 | - | "TSOILD",1,0,0,0,0,0,0,"day","day",182.5 | - | "TSOILD",1,0,0,0,0,0,0,"day","day",182.5 |
| ADHSOL | mg/cm^2 | - | - | "ADHSOL",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 | - | "ADHSOL",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 | - | "ADHSOL",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 |
| ASKINSL | cm^2 | - | - | "ASKINSL",1,0,0,0,0,0,0,"cm^2","cm^2",5000 | - | "ASKINSL",1,0,0,0,0,0,0,"cm^2","cm^2",5000 | - | "ASKINSL",1,0,0,0,0,0,0,"cm^2","cm^2",5000 |
| EVSHOR | evt/day | - | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHOR | hr | - | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 |
| TSHOR | day | - | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 |
| ADHSED | mg/cm^2 | - | - | "ADHSED",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 | - | "ADHSED",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 | - | "ADHSED",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 |
| ASKINSD | cm^2 | - | - | "ASKINSD",1,0,0,0,0,0,0,"cm^2","cm^2",5000 | - | "ASKINSD",1,0,0,0,0,0,0,"cm^2","cm^2",5000 | - | "ASKINSD",1,0,0,0,0,0,0,"cm^2","cm^2",5000 |

Note: - means not applicable for YMP site-specific, use GENIIv2 defaults.

Table 122. Receptor Intake File for Stochastic Run (*GNDFLiud.pop)* and Parameter Values

| Parameter | Units | Menu | YMP Offsite pop Value | File: GNDFLiud.pop "YMP Receptor Offsite Mean Values",84 |
|---|---|---|---|---|
| NAGES | N/A | R1 | 1 | "NAGES",0,0,0,0,0,0,0,"N/A","N/A",1 |
| EDAGE | yr | - | - | "EDAGE",1,0,0,0,0,0,0,"yr","yr",70 |
| POPAGE | none | - | - | "POPAGE",1,0,0,0,0,0,0,"none","none",1 |
| UEXAIR | hr | R1 | 22 | "UEXAIR",1,0,0,0,0,0,0,"hr","hr",22 |
| TEXAIR | day | R1 | 365 | "TEXAIR",1,0,0,0,0,0,0,"day","day",365 |
| SHIN | none | R2 | 0.4 | "SHIN",0,0,0,0,0,0,0,"none","none",0.4 |
| SHOUT | none | R2 | 1 | "SHOUT",0,0,0,0,0,0,0,"none","none",1 |
| UEXGRD | hr | R2 | 24 | "UEXGRD",1,0,0,0,0,0,0,"hr","hr",24 |
| TEXGRD | day | R2 | 365 | "TEXGRD",1,0,0,0,0,0,0,"day","day",365 |
| FTIN | fraction | R2 | 0.61 | "FTIN",1,0,0,0,0,0,0,"fraction","fraction",0.61 |
| FTOUT | fraction | R2 | 0.31 | "FTOUT",1,0,0,0,0,0,0,"fraction","fraction",0.31 |
| EVSWIM | evt/day | - | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESWIM | hr | - | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 |
| TSWIM | day | - | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 |
| SFBOAT | none | - | - | "SFBOAT",0,0,0,0,0,0,0,"none","none",1 |
| EVBOAT | evt/day | - | - | "EVBOAT",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TEBOAT | hr | - | - | "TEBOAT",1,0,0,0,0,0,0,"hr","hr",2 |
| TBOAT | day | - | - | "TBOAT",1,0,0,0,0,0,0,"day","day",50 |
| EVSHOR | evt/day | - | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHOR | hr | - | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 |
| TSHOR | day | - | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 |
| SWFAC | none | - | - | "SWFAC",0,0,0,0,0,0,0,"none","none",0.2 |
| UCRP | kg/day | R3 | 0.123 | "UCRP",1,1,0,0,0,0,0,"kg/day","kg/day",0.123 |
| TCRP | day/yr | R3 | 17.9 | "TCRP",1,1,0,0,0,0,0,"day/yr","day/yr",17.9 |
| UCRP | kg/day | R3 | 0.141 | "UCRP",1,2,0,0,0,0,0,"kg/day","kg/day",0.141 |
| TCRP | day/yr | R3 | 22.5 | "TCRP",1,2,0,0,0,0,0,"day/yr","day/yr",22.5 |
| UCRP | kg/day | R3 | 0.185 | "UCRP",1,3,0,0,0,0,0,"kg/day","kg/day",0.185 |
| TCRP | day/yr | R3 | 54 | "TCRP",1,3,0,0,0,0,0,"day/yr","day/yr",54 |
| UCRP | kg/day | R3 | 0.336 | "UCRP",1,4,0,0,0,0,0,"kg/day","kg/day",0.336 |
| TCRP | day/yr | R3 | 0.16 | "TCRP",1,4,0,0,0,0,0,"day/yr","day/yr",0.16 |
| UANM | kg/day | R4 | 0.098 | "UANM",1,1,0,0,0,0,0,"kg/day","kg/day",0.098 |
| TANM | day/yr | R4 | 15.1 | "TANM",1,1,0,0,0,0,0,"day/yr","day/yr",15.1 |

Table 122. Receptor Intake File for Stochastic Run (*GNDFLiud.pop)* and Parameter Values (Cont'd)

| Parameter | Units | Menu | YMP Offsite pop Value | File: GNDFLiud.pop "YMP Receptor Offsite Mean Values",84 |
|---|---|---|---|---|
| UANM | kg/day | R4 | 0.11 | "UANM",1,2,0,0,0,0,0,"kg/day","kg/day",0.11 |
| TANM | day/yr | R4 | 1.4 | "TANM",1,2,0,0,0,0,0,"day/yr","day/yr",1.4 |
| UANM | kg/day | R4 | 0.348 | "UANM",1,3,0,0,0,0,0,"kg/day","kg/day",0.348 |
| TANM | day/yr | R4 | 4.2 | "TANM",1,3,0,0,0,0,0,"day/yr","day/yr",4.2 |
| UANM | kg/day | R4 | 0.109 | "UANM",1,4,0,0,0,0,0,"kg/day","kg/day",0.109 |
| TANM | day/yr | R4 | 33.3 | "TANM",1,4,0,0,0,0,0,"day/yr","day/yr",33.3 |
| UAQU | kg/day | - | - | "UAQU",1,1,0,0,0,0,0,"kg/day","kg/day",0.11 |
| TAQU | day/yr | - | - | "TAQU",1,1,0,0,0,0,0,"day/yr","day/yr",365 |
| UAQU | kg/day | - | - | "UAQU",1,2,0,0,0,0,0,"kg/day","kg/day",0.019 |
| TAQU | day/yr | - | - | "TAQU",1,2,0,0,0,0,0,"day/yr","day/yr",365 |
| UAQU | kg/day | - | - | "UAQU",1,3,0,0,0,0,0,"kg/day","kg/day",0.019 |
| TAQU | day/yr | - | - | "TAQU",1,3,0,0,0,0,0,"day/yr","day/yr",365 |
| UAQU | kg/day | - | - | "UAQU",1,4,0,0,0,0,0,"kg/day","kg/day",0.019 |
| TAQU | day/yr | - | - | "TAQU",1,4,0,0,0,0,0,"day/yr","day/yr",365 |
| UDW | L/day | - | - | "UDW",1,0,0,0,0,0,0,"L/day","L/day",2 |
| TDW | day/yr | - | - | "TDW",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| EVSWIM | evt/day | - | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESWIM | hr | - | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 |
| TSWIM | day | - | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 |
| USWIM | L/hr | - | - | "USWIM",1,0,0,0,0,0,0,"L/hr","L/hr",0.02 |
| EVSHWR | evt/day | - | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHWR | hr | - | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 |
| TSHWR | day | - | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 |
| USHIN | L/hr | - | - | "USHIN",1,0,0,0,0,0,0,"L/hr","L/hr",0.06 |
| TSOIL | day | R5 | 365 | "TSOIL",1,0,0,0,0,0,0,"day","day",365 |
| USOIL | mg/day | R5 | 104 | "USOIL",1,0,0,0,0,0,0,"mg/day","mg/day",104 |
| UINH | m^3/day | R6 | 30.2 | "UINH",1,0,0,0,0,0,0,"m^3/day","m^3/day",30.2 |
| TINH | day/yr | R6 | 365 | "TINH",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| FRINH | fraction | R6 | 0.92 | "FRINH",1,0,0,0,0,0,0,"fraction","fraction",0.92 |
| UINHR | m^3/day | R7 | 21.7 | "UINHR",1,0,0,0,0,0,0,"m^3/day","m^3/day",21.7 |
| TINHR | day/yr | R7 | 365 | "TINHR",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| FRINHR | fraction | R7 | 0.31 | "FRINHR",1,0,0,0,0,0,0,"fraction","fraction",0.31 |

Table 122. Receptor Intake File for Stochastic Run (*GNDFLiud.pop)* and Parameter Values (Cont'd)

| Parameter | Units | Menu | YMP Offsite pop Value | File: GNDFLiud.pop "YMP Receptor Offsite Mean Values",84 |
|---|---|---|---|---|
| UINDRH | m^3/day | - | - | "UINDRH",1,0,0,0,0,0,0,"m^3/day","m^3/day",23 |
| TINDRH | day/yr | - | - | "TINDRH",1,0,0,0,0,0,0,"day/yr","day/yr",365 |
| FRINDR | fraction | R8 | 0 | "FRINDR",1,0,0,0,0,0,0,"fraction","fraction",0 |
| EVSHWR | evt/day | - | - | "EVSHWR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHWR | hr | - | - | "TESHWR",1,0,0,0,0,0,0,"hr","hr",0.167 |
| TSHWR | day | - | - | "TSHWR",1,0,0,0,0,0,0,"day","day",365 |
| ASKINSH | cm^2 | - | - | "ASKINSH",1,0,0,0,0,0,0,"cm^2","cm^2",20000 |
| EVSWIM | evt/day | - | - | "EVSWIM",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESWIM | hr | - | - | "TESWIM",1,0,0,0,0,0,0,"hr","hr",2 |
| TSWIM | day | - | - | "TSWIM",1,0,0,0,0,0,0,"day","day",50 |
| ASKINSW | cm^2 | - | - | "ASKINSW",1,0,0,0,0,0,0,"cm^2","cm^2",20000 |
| EVSOIL | evt/day | - | - | "EVSOIL",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TSOILD | day | - | - | "TSOILD",1,0,0,0,0,0,0,"day","day",182.5 |
| ADHSOL | mg/cm^2 | - | - | "ADHSOL",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 |
| ASKINSL | cm^2 | - | - | "ASKINSL",1,0,0,0,0,0,0,"cm^2","cm^2",5000 |
| EVSHOR | evt/day | - | - | "EVSHOR",1,0,0,0,0,0,0,"evt/day","evt/day",1 |
| TESHOR | hr | - | - | "TESHOR",1,0,0,0,0,0,0,"hr","hr",5 |
| TSHOR | day | - | - | "TSHOR",1,0,0,0,0,0,0,"day","day",100 |
| ADHSED | mg/cm^2 | - | - | "ADHSED",1,0,0,0,0,0,0,"mg/cm^2","mg/cm^2",0.5 |
| ASKINSD | cm^2 | - | - | "ASKINSD",1,0,0,0,0,0,0,"cm^2","cm^2",5000 |

Note: - means not applicable for YMP site-specific, use GENIIv2 defaults.

## ATTACHMENT F. YMP SITE-SPECIFIC NUCLIDE DEPENDENT DATABASE FILE

As discussed in the GENII Version 2 User's Guide (Napier et al 2006 [DIRS 177330], Section 4.1), nuclide dependent data are provided to GENIIv2 from a database file named *GENII.mdb*. YMP site-specific data has been incorporated into a database file *YMPGENII.mdb* that is modified version of *GENII.mdb*. The new file *YMPGENII.mdb* contains the YMP site-specific transfer coefficients for animal products from Section 7.1.2, soil-to-plant transfer factors from Section 7.1.1, soil water partition coefficients from Section 7.2.2, and lung transfer inhalation class, or lung solubility class from Section 4.1.7.5 for all of the YMP radionuclides listed in Table 2. To use this file with GENIIv2, copy it into the FRAMES subdirectory and rename it to *"GENII.mdb*".

Individual parameters in the nuclide dependent database are identified by a field name. Only those fields whose values were developed are updated in the database file *YMPGENII.mdb*, as shown in Table 123.

Table 123. Nuclide Dependent Parameters Replaced in *YMPGENII.mdb*

| Field Name | Parameter Name | Units | Source |
|---|---|---|---|
| CLFMT | Feed to Animal Meat Transfer Factor | d/kg | Table 66 |
| CLFMK | Feed to Animal Milk Transfer Factor | d/kg | Table 68 |
| CLFPL | Feed to Poultry Transfer Factor | d/kg | Table 67 |
| CLFEG | Feed to Egg Transfer Factor | d/kg | Table 69 |
| | | | |
| CLBVLV | Soil to Plant Concentration Ratio for Leafy Vegetables | kg soil/kg dry | Table 61 |
| CLBVRV | Soil to Plant Concentration Ratio for Root Vegetables | kg soil/kg dry | Table 62 |
| CLBVFR | Soil to Plant Concentration Ratio for Fruit | kg soil/kg dry | Table 63 |
| CLBVCL | Soil to Plant Concentration Ratio for Cereal | kg soil/kg dry | Table 64 |
| CLBVAF | Soil to Plant Concentration Ratio for Animal Forage | kg soil/kg dry | Table 65 |
| CLBVAH | Soil to Plant Concentration Ratio for Animal Hay | kg soil/kg dry | same as Forage |
| CLBVAG | Soil to Plant Concentration Ratio for Animal Grain | kg soil/kg dry | same as Cereal |
| CLBVOV | Soil to Plant Concentration Ratio for Other Vegetables | kg soil/kg dry | same as Root |
| | | | |
| CLKD | The dry soil-water partition coefficient | mL/g or L/kg | Table 77 |
| | | | |
| CLLCLAS | Lung solubility class | - | Table 107 |

The contents of the YMP site specific radionuclide dependent transfer coefficients and transfer factors in *YMPGENII.mdb* are shown in Table 124, which contains radionuclide that correspond to 33 elements. The contents of the YMP site specific radionuclide dependent soil water partition coefficients and lung solubility class in *YMPGENII.mdb* are shown in Table 125, which contains radionuclides that correspond to 43 elements (38 elements for partition coefficients and 5 noble gas elements).

To help update *YMPGENII.mdb*, two Excel files, *Nuclide Plant and Animal Data.xls* and *Nuclide Kd and Lung Class Data.xls* are used to manipulate the parameter values. The *Nuclide Plant and Animal Data.xls* file includes four worksheets that contain the site-specific animal transfer factors from Table 66 to Table 69 and five worksheets that contain site-specific soil to plant concentration factors from Table 61 to Table 65. The Excel VLOOKUP function is used in the worksheet *GENII All Extracted Data* to select the animal transfer factors and soil to plant concentration factors for each nuclide in the GENII database file, *GENII.mdb* based on its element. The acronyms used in *GENII.mdb* for the parameters are listed in the worksheet *DB Parameters*, and they are listed as the column headings in the worksheet *GENII All Extracted Data*. For those elements that do not have site-specific factors in Table 61 to Table 69, a value of "#N/A" is shown in the worksheet *GENII All Extracted Data* and the current factor value in the GENII database file, *GENII.mdb*, continues to be used. The worksheet *ImportBoth* is the same as the worksheet *GENII All Extracted Data* except that all of the rows with elements having "#N/A" have been deleted. The worksheet *ImportBoth* is then used to update the animal transfer factors and soil to plant concentration factors into the site-specific database *YMPGENII.mdb* using the ACCESS code *Import Spreadsheet Wizard*.

The *Nuclide Kd and Lung Class Data.xls* file includes one worksheet that contains the site-specific dry soil-water partition coefficients from Table 77 and one worksheet that contains site-specific lung solubility classes from Table 107. The Excel VLOOKUP function is used in the worksheet *GENII All Extracted Data* to select the partition coefficients and lung solubility classes for each nuclide in the GENII database file, *GENII.mdb* based on its element. The acronyms used in *GENII.mdb* for the parameters are listed as the column headings in the worksheet *GENII All Extracted Data*. For those elements that do not have site-specific factors in Table 77 or Table 107, a value of "#N/A" is shown in the worksheet *GENII All Extracted Data* and the current factor value in the GENII database file, *GENII.mdb*, continues to be used. The worksheet *ImportKd* and *ImportLungAll* are the same as the worksheet *GENII All Extracted Data* except that all of the rows with elements having "#N/A" have been deleted. The worksheets *ImportKd* and *ImportLungAll* are then used to update the dry soil-water partition coefficients and lung solubility classes into the site-specific database *YMPGENII.mdb* using the ACCESS code *Import Spreadsheet Wizard*.

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb*

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AC223 | 7.9E-05 | 7.6E-06 | 4.0E-03 | 2.9E-03 | 4.3E-03 | 1.1E-03 | 5.4E-04 | 1.7E-02 | 1.7E-02 | 5.4E-04 | 1.1E-03 | 8.5E-04 |
| AC224 | 7.9E-05 | 7.6E-06 | 4.0E-03 | 2.9E-03 | 4.3E-03 | 1.1E-03 | 5.4E-04 | 1.7E-02 | 1.7E-02 | 5.4E-04 | 1.1E-03 | 8.5E-04 |
| AC225 | 7.9E-05 | 7.6E-06 | 4.0E-03 | 2.9E-03 | 4.3E-03 | 1.1E-03 | 5.4E-04 | 1.7E-02 | 1.7E-02 | 5.4E-04 | 1.1E-03 | 8.5E-04 |
| AC226 | 7.9E-05 | 7.6E-06 | 4.0E-03 | 2.9E-03 | 4.3E-03 | 1.1E-03 | 5.4E-04 | 1.7E-02 | 1.7E-02 | 5.4E-04 | 1.1E-03 | 8.5E-04 |
| AC227 | 7.9E-05 | 7.6E-06 | 4.0E-03 | 2.9E-03 | 4.3E-03 | 1.1E-03 | 5.4E-04 | 1.7E-02 | 1.7E-02 | 5.4E-04 | 1.1E-03 | 8.5E-04 |
| AC228 | 7.9E-05 | 7.6E-06 | 4.0E-03 | 2.9E-03 | 4.3E-03 | 1.1E-03 | 5.4E-04 | 1.7E-02 | 1.7E-02 | 5.4E-04 | 1.1E-03 | 8.5E-04 |
| AM237 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM238 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM239 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM240 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM241 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM242 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM242m | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM243 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM244 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM244m | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM245 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM246 | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| AM246m | 3.4E-05 | 1.6E-06 | 1.8E-03 | 4.9E-03 | 1.2E-03 | 4.0E-04 | 7.5E-05 | 2.1E-03 | 2.1E-03 | 7.5E-05 | 4.0E-04 | 5.4E-04 |
| CA41 | 1.5E-03 | 6.9E-03 | 4.1E-02 | 5.0E-01 | 3.0E+00 | 5.4E-01 | 5.4E-01 | 3.6E+00 | 3.6E+00 | 5.4E-01 | 5.4E-01 | 5.4E-01 |
| CA45 | 1.5E-03 | 6.9E-03 | 4.1E-02 | 5.0E-01 | 3.0E+00 | 5.4E-01 | 5.4E-01 | 3.6E+00 | 3.6E+00 | 5.4E-01 | 5.4E-01 | 5.4E-01 |
| CA47 | 1.5E-03 | 6.9E-03 | 4.1E-02 | 5.0E-01 | 3.0E+00 | 5.4E-01 | 5.4E-01 | 3.6E+00 | 3.6E+00 | 5.4E-01 | 5.4E-01 | 5.4E-01 |
| CA49 | 1.5E-03 | 6.9E-03 | 4.1E-02 | 5.0E-01 | 3.0E+00 | 5.4E-01 | 5.4E-01 | 3.6E+00 | 3.6E+00 | 5.4E-01 | 5.4E-01 | 5.4E-01 |
| CD104 | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD107 | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD109 | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD113 | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD113m | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD115 | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD115m | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CD117 | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CD117m | 7.8E-04 | 9.4E-04 | 3.7E-01 | 6.1E-02 | 7.6E-01 | 2.9E-01 | 2.1E-01 | 1.2E+00 | 1.2E+00 | 2.1E-01 | 2.9E-01 | 2.9E-01 |
| CE134 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE135 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE137 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE137m | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE139 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE141 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE143 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CE144 | 2.7E-04 | 3.7E-05 | 3.9E-03 | 1.6E-03 | 2.6E-02 | 1.6E-02 | 5.4E-03 | 4.9E-02 | 4.9E-02 | 5.4E-03 | 1.6E-02 | 5.1E-03 |
| CF244 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF246 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF248 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF249 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF250 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF251 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF252 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF253 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CF254 | 8.5E-04 | 9.1E-07 | 4.0E-03 | 2.0E-03 | 6.3E-03 | 6.3E-03 | 6.3E-03 | 2.2E-02 | 2.2E-02 | 6.3E-03 | 6.3E-03 | 6.3E-03 |
| CL36 | 4.6E-02 | 1.8E-02 | 3.0E-02 | 4.4E-02 | 6.4E+01 | 6.4E+01 | 2.4E+01 | 7.5E+01 | 7.5E+01 | 2.4E+01 | 6.4E+01 | 6.4E+01 |
| CL38 | 4.6E-02 | 1.8E-02 | 3.0E-02 | 4.4E-02 | 6.4E+01 | 6.4E+01 | 2.4E+01 | 7.5E+01 | 7.5E+01 | 2.4E+01 | 6.4E+01 | 6.4E+01 |
| CL39 | 4.6E-02 | 1.8E-02 | 3.0E-02 | 4.4E-02 | 6.4E+01 | 6.4E+01 | 2.4E+01 | 7.5E+01 | 7.5E+01 | 2.4E+01 | 6.4E+01 | 6.4E+01 |
| CM238 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM240 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM241 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM242 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM243 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM244 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM245 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM246 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM247 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM248 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CM249 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CM250 | 4.1E-05 | 3.8E-06 | 4.0E-03 | 2.0E-03 | 8.6E-04 | 3.2E-04 | 4.3E-05 | 2.8E-03 | 2.8E-03 | 4.3E-05 | 3.2E-04 | 2.2E-04 |
| CO55 | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO56 | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO57 | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO58 | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO58m | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO60 | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO60m | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO61 | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CO62m | 1.5E-02 | 1.4E-03 | 1.5E-01 | 1.0E-01 | 8.2E-02 | 3.8E-02 | 7.2E-03 | 1.8E-01 | 1.8E-01 | 7.2E-03 | 3.8E-02 | 1.3E-02 |
| CS125 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS126 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS127 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS128 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS129 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS130 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS131 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS132 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS134 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS134m | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS135 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS135m | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS136 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS137 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| CS138 | 2.4E-02 | 7.7E-03 | 2.6E+00 | 3.5E-01 | 8.5E-02 | 5.0E-02 | 2.0E-02 | 1.3E-01 | 1.3E-01 | 2.0E-02 | 5.0E-02 | 5.6E-02 |
| EU145 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU146 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU147 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU148 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU149 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EU150a | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU150b | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU152 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU152m | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU154 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU155 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU156 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU157 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| EU158 | 2.5E-03 | 2.0E-05 | 4.0E-03 | 7.0E-03 | 1.0E-02 | 5.0E-03 | 3.4E-03 | 3.2E-02 | 3.2E-02 | 3.4E-03 | 5.0E-03 | 5.0E-03 |
| FE52 | 2.5E-02 | 2.1E-04 | 3.2E-01 | 7.4E-01 | 6.0E-03 | 2.4E-03 | 1.8E-03 | 1.5E-02 | 1.5E-02 | 1.8E-03 | 2.4E-03 | 2.4E-03 |
| FE55 | 2.5E-02 | 2.1E-04 | 3.2E-01 | 7.4E-01 | 6.0E-03 | 2.4E-03 | 1.8E-03 | 1.5E-02 | 1.5E-02 | 1.8E-03 | 2.4E-03 | 2.4E-03 |
| FE59 | 2.5E-02 | 2.1E-04 | 3.2E-01 | 7.4E-01 | 6.0E-03 | 2.4E-03 | 1.8E-03 | 1.5E-02 | 1.5E-02 | 1.8E-03 | 2.4E-03 | 2.4E-03 |
| FE60 | 2.5E-02 | 2.1E-04 | 3.2E-01 | 7.4E-01 | 6.0E-03 | 2.4E-03 | 1.8E-03 | 1.5E-02 | 1.5E-02 | 1.8E-03 | 2.4E-03 | 2.4E-03 |
| I120 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I120m | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I121 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I122 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I123 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I124 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I125 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I126 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I128 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I129 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I130 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I131 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I132 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I132m | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I133 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I134 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| I135 | 1.0E-02 | 9.1E-03 | 5.5E-02 | 2.6E+00 | 2.6E-02 | 3.2E-02 | 2.5E-02 | 4.0E-02 | 4.0E-02 | 2.5E-02 | 3.2E-02 | 5.7E-02 |
| NB88 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NB89a | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB89b | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB90 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB93m | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB94 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB95 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB95m | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB96 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB97 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB97m | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NB98 | 1.4E-04 | 1.4E-04 | 9.5E-04 | 2.1E-03 | 3.0E-02 | 1.1E-02 | 7.0E-03 | 5.5E-02 | 5.5E-02 | 7.0E-03 | 1.1E-02 | 9.7E-03 |
| NI56 | 5.3E-03 | 5.5E-03 | 3.8E-03 | 1.1E-01 | 1.8E-01 | 7.4E-02 | 4.0E-02 | 2.2E-01 | 2.2E-01 | 4.0E-02 | 7.4E-02 | 5.8E-02 |
| NI57 | 5.3E-03 | 5.5E-03 | 3.8E-03 | 1.1E-01 | 1.8E-01 | 7.4E-02 | 4.0E-02 | 2.2E-01 | 2.2E-01 | 4.0E-02 | 7.4E-02 | 5.8E-02 |
| NI59 | 5.3E-03 | 5.5E-03 | 3.8E-03 | 1.1E-01 | 1.8E-01 | 7.4E-02 | 4.0E-02 | 2.2E-01 | 2.2E-01 | 4.0E-02 | 7.4E-02 | 5.8E-02 |
| NI63 | 5.3E-03 | 5.5E-03 | 3.8E-03 | 1.1E-01 | 1.8E-01 | 7.4E-02 | 4.0E-02 | 2.2E-01 | 2.2E-01 | 4.0E-02 | 7.4E-02 | 5.8E-02 |
| NI65 | 5.3E-03 | 5.5E-03 | 3.8E-03 | 1.1E-01 | 1.8E-01 | 7.4E-02 | 4.0E-02 | 2.2E-01 | 2.2E-01 | 4.0E-02 | 7.4E-02 | 5.8E-02 |
| NI66 | 5.3E-03 | 5.5E-03 | 3.8E-03 | 1.1E-01 | 1.8E-01 | 7.4E-02 | 4.0E-02 | 2.2E-01 | 2.2E-01 | 4.0E-02 | 7.4E-02 | 5.8E-02 |
| NP232 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP233 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP234 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP235 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP236a | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP236b | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP237 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP238 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP239 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP240 | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| NP240m | 3.4E-04 | 6.3E-06 | 3.6E-03 | 3.4E-03 | 5.9E-02 | 3.1E-02 | 4.4E-03 | 5.8E-02 | 5.8E-02 | 4.4E-03 | 3.1E-02 | 3.4E-02 |
| PA227 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PA228 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PA230 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PA231 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PA232 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PA233 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PA234 | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PA234m | 6.6E-05 | 4.4E-06 | 3.0E-03 | 2.0E-03 | 4.6E-03 | 1.1E-03 | 9.5E-04 | 1.9E-02 | 1.9E-02 | 9.5E-04 | 1.1E-03 | 1.1E-03 |
| PB195m | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB198 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB199 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB200 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB201 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB202 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB202m | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB203 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB205 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB209 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB210 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB211 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB212 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PB214 | 6.3E-04 | 1.7E-04 | 2.5E-02 | 5.6E-02 | 1.5E-02 | 9.0E-03 | 5.5E-03 | 1.8E-02 | 1.8E-02 | 5.5E-03 | 9.0E-03 | 1.2E-02 |
| PD100 | 1.3E-03 | 2.9E-03 | 1.8E-03 | 1.0E-02 | 1.7E-01 | 7.8E-02 | 5.4E-02 | 2.8E-01 | 2.8E-01 | 5.4E-02 | 7.8E-02 | 7.8E-02 |
| PD101 | 1.3E-03 | 2.9E-03 | 1.8E-03 | 1.0E-02 | 1.7E-01 | 7.8E-02 | 5.4E-02 | 2.8E-01 | 2.8E-01 | 5.4E-02 | 7.8E-02 | 7.8E-02 |
| PD103 | 1.3E-03 | 2.9E-03 | 1.8E-03 | 1.0E-02 | 1.7E-01 | 7.8E-02 | 5.4E-02 | 2.8E-01 | 2.8E-01 | 5.4E-02 | 7.8E-02 | 7.8E-02 |
| PD107 | 1.3E-03 | 2.9E-03 | 1.8E-03 | 1.0E-02 | 1.7E-01 | 7.8E-02 | 5.4E-02 | 2.8E-01 | 2.8E-01 | 5.4E-02 | 7.8E-02 | 7.8E-02 |
| PD109 | 1.3E-03 | 2.9E-03 | 1.8E-03 | 1.0E-02 | 1.7E-01 | 7.8E-02 | 5.4E-02 | 2.8E-01 | 2.8E-01 | 5.4E-02 | 7.8E-02 | 7.8E-02 |
| PM141 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM142 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM143 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM144 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM145 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM146 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM147 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PM148 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM148m | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM149 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM150 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PM151 | 2.5E-03 | 1.6E-05 | 9.5E-04 | 1.4E-02 | 1.0E-02 | 5.0E-03 | 2.8E-03 | 3.2E-02 | 3.2E-02 | 2.8E-03 | 5.0E-03 | 5.0E-03 |
| PU234 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU235 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU236 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU237 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU238 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU239 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU240 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU241 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU242 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU243 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU244 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU245 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| PU246 | 1.3E-05 | 2.3E-07 | 1.2E-03 | 1.7E-03 | 2.9E-04 | 1.9E-04 | 1.9E-05 | 1.0E-03 | 1.0E-03 | 1.9E-05 | 1.9E-04 | 1.8E-04 |
| RA222 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RA223 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RA224 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RA225 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RA226 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RA227 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RA228 | 8.1E-04 | 5.8E-04 | 1.7E-02 | 3.9E-04 | 6.8E-02 | 1.2E-02 | 3.1E-03 | 8.2E-02 | 8.2E-02 | 3.1E-03 | 1.2E-02 | 7.3E-03 |
| RH100 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH101 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH101m | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH102 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH102m | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH103m | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| RH105 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH106 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH106m | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH107 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH99 | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RH99m | 1.5E-03 | 3.6E-03 | 3.6E-03 | 1.2E-02 | 6.4E-01 | 3.1E-01 | 2.0E-01 | 6.7E-01 | 6.7E-01 | 2.0E-01 | 3.1E-01 | 3.1E-01 |
| RU103 | 6.0E-03 | 1.8E-06 | 1.5E-02 | 5.1E-03 | 1.8E-01 | 4.3E-02 | 1.4E-02 | 2.1E-01 | 2.1E-01 | 1.4E-02 | 4.3E-02 | 1.8E-02 |
| RU105 | 6.0E-03 | 1.8E-06 | 1.5E-02 | 5.1E-03 | 1.8E-01 | 4.3E-02 | 1.4E-02 | 2.1E-01 | 2.1E-01 | 1.4E-02 | 4.3E-02 | 1.8E-02 |
| RU106 | 6.0E-03 | 1.8E-06 | 1.5E-02 | 5.1E-03 | 1.8E-01 | 4.3E-02 | 1.4E-02 | 2.1E-01 | 2.1E-01 | 1.4E-02 | 4.3E-02 | 1.8E-02 |
| RU94 | 6.0E-03 | 1.8E-06 | 1.5E-02 | 5.1E-03 | 1.8E-01 | 4.3E-02 | 1.4E-02 | 2.1E-01 | 2.1E-01 | 1.4E-02 | 4.3E-02 | 1.8E-02 |
| RU97 | 6.0E-03 | 1.8E-06 | 1.5E-02 | 5.1E-03 | 1.8E-01 | 4.3E-02 | 1.4E-02 | 2.1E-01 | 2.1E-01 | 1.4E-02 | 4.3E-02 | 1.8E-02 |
| SB115 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB116 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB116m | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB117 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB118m | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB119 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB120a | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB120b | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB122 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB124 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB124m | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB124n | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB125 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB126 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB126m | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB127 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB128a | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB128b | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB129 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SB130 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB131 | 9.9E-04 | 1.5E-04 | 1.2E-02 | 7.9E-02 | 9.4E-03 | 4.6E-03 | 1.0E-02 | 1.8E-02 | 1.8E-02 | 1.0E-02 | 4.6E-03 | 7.7E-03 |
| SE70 | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE73 | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE73m | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE75 | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE77m | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE79 | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE81 | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE81m | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SE83 | 8.8E-02 | 5.7E-03 | 5.1E+00 | 7.3E+00 | 4.6E-02 | 4.6E-02 | 2.9E-02 | 1.5E-01 | 1.5E-01 | 2.9E-02 | 4.6E-02 | 4.6E-02 |
| SM141 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM141m | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM142 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM145 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM146 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM147 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM151 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM153 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM155 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SM156 | 3.0E-03 | 1.8E-05 | 1.3E-02 | 1.6E-02 | 1.0E-02 | 5.8E-03 | 4.2E-03 | 2.2E-02 | 2.2E-02 | 4.2E-03 | 5.8E-03 | 5.8E-03 |
| SN110 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN111 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN113 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN117m | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN119m | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN121 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN121m | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN123 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN123m | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN125 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN126 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SN127 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SN128 | 1.9E-02 | 1.1E-03 | 3.5E-02 | 8.7E-02 | 3.8E-02 | 1.5E-02 | 9.2E-03 | 1.6E-01 | 1.6E-01 | 9.2E-03 | 1.5E-02 | 1.5E-02 |
| SR80 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR81 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR82 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR83 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR85 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR85m | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR87m | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR89 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR90 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR91 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| SR92 | 1.4E-03 | 1.7E-03 | 3.1E-02 | 2.7E-01 | 1.7E+00 | 7.9E-01 | 1.7E-01 | 2.1E+00 | 2.1E+00 | 1.7E-01 | 7.9E-01 | 2.9E-01 |
| TC101 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC104 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC93 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC93m | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC94 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC94m | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC95 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC95m | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC96 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC96m | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC97 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC97m | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC98 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC99 | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TC99m | 1.1E-03 | 2.1E-03 | 6.3E-02 | 2.4E+00 | 4.6E+01 | 4.4E+00 | 1.6E+00 | 2.7E+01 | 2.7E+01 | 1.6E+00 | 4.4E+00 | 4.3E+00 |
| TH226 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| TH227 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| TH228 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| TH229 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| TH230 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| TH231 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| TH232 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| TH234 | 1.1E-04 | 4.4E-06 | 5.9E-03 | 3.5E-03 | 4.3E-03 | 4.4E-04 | 1.7E-04 | 1.0E-02 | 1.0E-02 | 1.7E-04 | 4.4E-04 | 2.9E-04 |
| U230 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U231 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U232 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U233 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U234 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U235 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U236 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U237 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U238 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U239 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| U240 | 4.8E-04 | 4.9E-04 | 2.4E-01 | 6.3E-01 | 1.1E-02 | 6.0E-03 | 1.1E-03 | 1.7E-02 | 1.7E-02 | 1.1E-03 | 6.0E-03 | 6.3E-03 |
| Y86 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y86m | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y87 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y88 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y90 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y90m | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y91 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y91m | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y92 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y93 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y94 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| Y95 | 1.3E-03 | 1.8E-05 | 7.3E-03 | 2.5E-03 | 1.4E-02 | 7.4E-03 | 4.6E-03 | 3.6E-02 | 3.6E-02 | 4.6E-03 | 7.4E-03 | 7.4E-03 |
| ZR86 | 1.1E-04 | 7.7E-06 | 5.5E-04 | 1.2E-03 | 3.6E-03 | 1.6E-03 | 1.6E-03 | 1.9E-02 | 1.9E-02 | 1.6E-03 | 1.6E-03 | 1.4E-03 |
| ZR88 | 1.1E-04 | 7.7E-06 | 5.5E-04 | 1.2E-03 | 3.6E-03 | 1.6E-03 | 1.6E-03 | 1.9E-02 | 1.9E-02 | 1.6E-03 | 1.6E-03 | 1.4E-03 |
| ZR89 | 1.1E-04 | 7.7E-06 | 5.5E-04 | 1.2E-03 | 3.6E-03 | 1.6E-03 | 1.6E-03 | 1.9E-02 | 1.9E-02 | 1.6E-03 | 1.6E-03 | 1.4E-03 |

Table 124. Site Specific Transfer Coefficients and Transfer Factors in *YMPGENII.mdb* (Cont'd)

| CASID | Meat day/kg CLFMT | Milk day/L CLFMK | Poultry day/kg CLFPL | Egg day/kg CLFEG | Leafy kg/kg CLBVLV | Root kg/kg CLBVRV | Cereal kg/kg CLBVCL | Forage kg/kg CLBVAF | Hay kg/kg CLBVAH | Grain kg/kg CLBVAG | Other kg/kg CLBVOV | Fruit kg/kg CLBVFR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ZR93 | 1.1E-04 | 7.7E-06 | 5.5E-04 | 1.2E-03 | 3.6E-03 | 1.6E-03 | 1.6E-03 | 1.9E-02 | 1.9E-02 | 1.6E-03 | 1.6E-03 | 1.4E-03 |
| ZR95 | 1.1E-04 | 7.7E-06 | 5.5E-04 | 1.2E-03 | 3.6E-03 | 1.6E-03 | 1.6E-03 | 1.9E-02 | 1.9E-02 | 1.6E-03 | 1.6E-03 | 1.4E-03 |
| ZR97 | 1.1E-04 | 7.7E-06 | 5.5E-04 | 1.2E-03 | 3.6E-03 | 1.6E-03 | 1.6E-03 | 1.9E-02 | 1.9E-02 | 1.6E-03 | 1.6E-03 | 1.4E-03 |

Table 125. Site Specific Partition Coefficients and Lung Solubility Class in *YMPGENII.mdb*

| CASID | CLKD (mL/g) | CLLCLAS | CASID | CLKD (mL/g) | CLLCLAS |
|---|---|---|---|---|---|
| AC223 | 1500.0 | slow | PM141 | 650.0 | slow |
| AC224 | 1500.0 | slow | PM142 | 650.0 | slow |
| AC225 | 1500.0 | slow | PM143 | 650.0 | slow |
| AC226 | 1500.0 | slow | PM144 | 650.0 | slow |
| AC227 | 1500.0 | slow | PM145 | 650.0 | slow |
| AC228 | 1500.0 | slow | PM146 | 650.0 | slow |
| AM237 | 2000.0 | medium | PM147 | 650.0 | slow |
| AM238 | 2000.0 | medium | PM148 | 650.0 | slow |
| AM239 | 2000.0 | medium | PM148m | 650.0 | slow |
| AM240 | 2000.0 | medium | PM149 | 650.0 | slow |
| AM241 | 2000.0 | medium | PM150 | 650.0 | slow |
| AM242 | 2000.0 | medium | PM151 | 650.0 | slow |
| AM242m | 2000.0 | medium | PO203 | 400.0 | medium |
| AM243 | 2000.0 | medium | PO205 | 400.0 | medium |
| AM244 | 2000.0 | medium | PO207 | 400.0 | medium |
| AM244m | 2000.0 | medium | PO210 | 400.0 | medium |
| AM245 | 2000.0 | medium | PO211 | 400.0 | medium |
| AM246 | 2000.0 | medium | PO212 | 400.0 | medium |
| AM246m | 2000.0 | medium | PO213 | 400.0 | medium |
| AR37 | 0.0 | gas | PO214 | 400.0 | medium |
| AR39 | 0.0 | gas | PO215 | 400.0 | medium |
| AR41 | 0.0 | gas | PO216 | 400.0 | medium |
| BI200 | 450.0 | medium | PO218 | 400.0 | medium |
| BI201 | 450.0 | medium | PU234 | 1200.0 | slow |
| BI202 | 450.0 | medium | PU235 | 1200.0 | slow |
| BI203 | 450.0 | medium | PU236 | 1200.0 | slow |
| BI205 | 450.0 | medium | PU237 | 1200.0 | slow |
| BI206 | 450.0 | medium | PU238 | 1200.0 | slow |
| BI207 | 450.0 | medium | PU239 | 1200.0 | slow |
| BI210 | 450.0 | medium | PU240 | 1200.0 | slow |
| BI210m | 450.0 | medium | PU241 | 1200.0 | slow |
| BI211 | 450.0 | medium | PU242 | 1200.0 | slow |
| BI212 | 450.0 | medium | PU243 | 1200.0 | slow |
| BI213 | 450.0 | medium | PU244 | 1200.0 | slow |
| BI214 | 450.0 | medium | PU245 | 1200.0 | slow |
| C11 | 18.0 | gas | PU246 | 1200.0 | slow |
| C14 | 18.0 | gas | RA222 | 36000.0 | medium |
| CA41 | 30.0 | medium | RA223 | 36000.0 | medium |
| CA45 | 30.0 | medium | RA224 | 36000.0 | medium |
| CA47 | 30.0 | medium | RA225 | 36000.0 | medium |
| CA49 | 30.0 | medium | RA226 | 36000.0 | medium |
| CD104 | 74.0 | slow | RA227 | 36000.0 | medium |
| CD107 | 74.0 | slow | RA228 | 36000.0 | medium |
| CD109 | 74.0 | slow | RH100 | 60.0 | slow |
| CD113 | 74.0 | slow | RH101 | 60.0 | slow |
| CD113m | 74.0 | slow | RH101m | 60.0 | slow |
| CD115 | 74.0 | slow | RH102 | 60.0 | slow |
| CD115m | 74.0 | slow | RH102m | 60.0 | slow |

Table 125. Site Specific Partition Coefficients and Lung Solubility Class in *YMPGENII.mdb* (Cont'd)

| CASID | CLKD (mL/g) | CLLCLAS | CASID | CLKD (mL/g) | CLLCLAS |
|---|---|---|---|---|---|
| CD117 | 74.0 | slow | RH103m | 60.0 | slow |
| CD117m | 74.0 | slow | RH105 | 60.0 | slow |
| CE134 | 8100.0 | medium | RH106 | 60.0 | slow |
| CE135 | 8100.0 | medium | RH106m | 60.0 | slow |
| CE137 | 8100.0 | medium | RH107 | 60.0 | slow |
| CE137m | 8100.0 | medium | RH99 | 60.0 | slow |
| CE139 | 8100.0 | medium | RH99m | 60.0 | slow |
| CE141 | 8100.0 | medium | RN218 | 0.0 | gas |
| CE143 | 8100.0 | medium | RN219 | 0.0 | gas |
| CE144 | 8100.0 | medium | RN220 | 0.0 | gas |
| CF244 | 200.0 | medium | RN222 | 0.0 | gas |
| CF246 | 200.0 | medium | RU103 | 990.0 | medium |
| CF248 | 200.0 | medium | RU105 | 990.0 | medium |
| CF249 | 200.0 | medium | RU106 | 990.0 | medium |
| CF250 | 200.0 | medium | RU94 | 990.0 | medium |
| CF251 | 200.0 | medium | RU97 | 990.0 | medium |
| CF252 | 200.0 | medium | SB115 | 150.0 | medium |
| CF253 | 200.0 | medium | SB116 | 150.0 | medium |
| CF254 | 200.0 | medium | SB116m | 150.0 | medium |
| CL36 | 0.140 | medium | SB117 | 150.0 | medium |
| CL38 | 0.140 | medium | SB118m | 150.0 | medium |
| CL39 | 0.140 | medium | SB119 | 150.0 | medium |
| CM238 | 4400.0 | medium | SB120a | 150.0 | medium |
| CM240 | 4400.0 | medium | SB120b | 150.0 | medium |
| CM241 | 4400.0 | medium | SB122 | 150.0 | medium |
| CM242 | 4400.0 | medium | SB124 | 150.0 | medium |
| CM243 | 4400.0 | medium | SB124m | 150.0 | medium |
| CM244 | 4400.0 | medium | SB124n | 150.0 | medium |
| CM245 | 4400.0 | medium | SB125 | 150.0 | medium |
| CM246 | 4400.0 | medium | SB126 | 150.0 | medium |
| CM247 | 4400.0 | medium | SB126m | 150.0 | medium |
| CM248 | 4400.0 | medium | SB127 | 150.0 | medium |
| CM249 | 4400.0 | medium | SB128a | 150.0 | medium |
| CM250 | 4400.0 | medium | SB128b | 150.0 | medium |
| CO55 | 1300.0 | slow | SB129 | 150.0 | medium |
| CO56 | 1300.0 | slow | SB130 | 150.0 | medium |
| CO57 | 1300.0 | slow | SB131 | 150.0 | medium |
| CO58 | 1300.0 | slow | SE70 | 150.0 | fast |
| CO58m | 1300.0 | slow | SE73 | 150.0 | fast |
| CO60 | 1300.0 | slow | SE73m | 150.0 | fast |
| CO60m | 1300.0 | slow | SE75 | 150.0 | fast |
| CO61 | 1300.0 | slow | SE77m | 150.0 | fast |
| CO62m | 1300.0 | slow | SE79 | 150.0 | fast |
| CS125 | 4400.0 | fast | SE81 | 150.0 | fast |
| CS126 | 4400.0 | fast | SE81m | 150.0 | fast |
| CS127 | 4400.0 | fast | SE83 | 150.0 | fast |
| CS128 | 4400.0 | fast | SM141 | 810.0 | medium |
| CS129 | 4400.0 | fast | SM141m | 810.0 | medium |

Table 125. Site Specific Partition Coefficients and Lung Solubility Class in *YMPGENII.mdb* (Cont'd)

| CASID | CLKD (mL/g) | CLLCLAS | CASID | CLKD (mL/g) | CLLCLAS |
|---|---|---|---|---|---|
| CS130 | 4400.0 | fast | SM142 | 810.0 | medium |
| CS131 | 4400.0 | fast | SM145 | 810.0 | medium |
| CS132 | 4400.0 | fast | SM146 | 810.0 | medium |
| CS134 | 4400.0 | fast | SM147 | 810.0 | medium |
| CS134m | 4400.0 | fast | SM151 | 810.0 | medium |
| CS135 | 4400.0 | fast | SM153 | 810.0 | medium |
| CS135m | 4400.0 | fast | SM155 | 810.0 | medium |
| CS136 | 4400.0 | fast | SM156 | 810.0 | medium |
| CS137 | 4400.0 | fast | SN110 | 450.0 | medium |
| CS138 | 4400.0 | fast | SN111 | 450.0 | medium |
| EU145 | 650.0 | medium | SN113 | 450.0 | medium |
| EU146 | 650.0 | medium | SN117m | 450.0 | medium |
| EU147 | 650.0 | medium | SN119m | 450.0 | medium |
| EU148 | 650.0 | medium | SN121 | 450.0 | medium |
| EU149 | 650.0 | medium | SN121m | 450.0 | medium |
| EU150a | 650.0 | medium | SN123 | 450.0 | medium |
| EU150b | 650.0 | medium | SN123m | 450.0 | medium |
| EU152 | 650.0 | medium | SN125 | 450.0 | medium |
| EU152m | 650.0 | medium | SN126 | 450.0 | medium |
| EU154 | 650.0 | medium | SN127 | 450.0 | medium |
| EU155 | 650.0 | medium | SN128 | 450.0 | medium |
| EU156 | 650.0 | medium | SR80 | 20.0 | medium |
| EU157 | 650.0 | medium | SR81 | 20.0 | medium |
| EU158 | 650.0 | medium | SR82 | 20.0 | medium |
| FE52 | 220.0 | medium | SR83 | 20.0 | medium |
| FE55 | 220.0 | medium | SR85 | 20.0 | medium |
| FE59 | 220.0 | medium | SR85m | 20.0 | medium |
| FE60 | 220.0 | medium | SR87m | 20.0 | medium |
| H3 | 0.7 | vapor | SR89 | 20.0 | medium |
| H3EL | 0.7 | vapor | SR90 | 20.0 | medium |
| I120 | 4.50 | fast | SR91 | 20.0 | medium |
| I120m | 4.50 | fast | SR92 | 20.0 | medium |
| I121 | 4.50 | fast | TC101 | 0.140 | medium |
| I122 | 4.50 | fast | TC104 | 0.140 | medium |
| I123 | 4.50 | fast | TC93 | 0.140 | medium |
| I124 | 4.50 | fast | TC93m | 0.140 | medium |
| I125 | 4.50 | fast | TC94 | 0.140 | medium |
| I126 | 4.50 | fast | TC94m | 0.140 | medium |
| I128 | 4.50 | fast | TC95 | 0.140 | medium |
| I129 | 4.50 | fast | TC95m | 0.140 | medium |
| I130 | 4.50 | fast | TC96 | 0.140 | medium |
| I131 | 4.50 | fast | TC96m | 0.140 | medium |
| I132 | 4.50 | fast | TC97 | 0.140 | medium |
| I132m | 4.50 | fast | TC97m | 0.140 | medium |
| I133 | 4.50 | fast | TC98 | 0.140 | medium |
| I134 | 4.50 | fast | TC99 | 0.140 | medium |
| I135 | 4.50 | fast | TC99m | 0.140 | medium |
| KR74 | 0.0 | gas | TE116 | 540.0 | medium |

Table 125. Site Specific Partition Coefficients and Lung Solubility Class in *YMPGENII.mdb* (Cont'd)

| CASID | CLKD (mL/g) | CLLCLAS | CASID | CLKD (mL/g) | CLLCLAS |
|---|---|---|---|---|---|
| KR76 | 0.0 | gas | TE121 | 540.0 | medium |
| KR77 | 0.0 | gas | TE121m | 540.0 | medium |
| KR79 | 0.0 | gas | TE123 | 540.0 | medium |
| KR81 | 0.0 | gas | TE123m | 540.0 | medium |
| KR81m | 0.0 | gas | TE125m | 540.0 | medium |
| KR83m | 0.0 | gas | TE127 | 540.0 | medium |
| KR85 | 0.0 | gas | TE127m | 540.0 | medium |
| KR85m | 0.0 | gas | TE129 | 540.0 | medium |
| KR87 | 0.0 | gas | TE129m | 540.0 | medium |
| KR88 | 0.0 | gas | TE131 | 540.0 | medium |
| NB88 | 540.0 | medium | TE131m | 540.0 | medium |
| NB89a | 540.0 | medium | TE132 | 540.0 | medium |
| NB89b | 540.0 | medium | TE133 | 540.0 | medium |
| NB90 | 540.0 | medium | TE133m | 540.0 | medium |
| NB93m | 540.0 | medium | TE134 | 540.0 | medium |
| NB94 | 540.0 | medium | TH226 | 3000.0 | slow |
| NB95 | 540.0 | medium | TH227 | 3000.0 | slow |
| NB95m | 540.0 | medium | TH228 | 3000.0 | slow |
| NB96 | 540.0 | medium | TH229 | 3000.0 | slow |
| NB97 | 540.0 | medium | TH230 | 3000.0 | slow |
| NB97m | 540.0 | medium | TH231 | 3000.0 | slow |
| NB98 | 540.0 | medium | TH232 | 3000.0 | slow |
| NE19 | 0.0 | gas | TH234 | 3000.0 | slow |
| NI56 | 400.0 | medium | U230 | 33.0 | slow |
| NI57 | 400.0 | medium | U231 | 33.0 | slow |
| NI59 | 400.0 | medium | U232 | 33.0 | slow |
| NI63 | 400.0 | medium | U233 | 33.0 | slow |
| NI65 | 400.0 | medium | U234 | 33.0 | slow |
| NI66 | 400.0 | medium | U235 | 33.0 | slow |
| NP232 | 25.0 | medium | U236 | 33.0 | slow |
| NP233 | 25.0 | medium | U237 | 33.0 | slow |
| NP234 | 25.0 | medium | U238 | 33.0 | slow |
| NP235 | 25.0 | medium | U239 | 33.0 | slow |
| NP236a | 25.0 | medium | U240 | 33.0 | slow |
| NP236b | 25.0 | medium | XE120 | 0.0 | gas |
| NP237 | 25.0 | medium | XE121 | 0.0 | gas |
| NP238 | 25.0 | medium | XE122 | 0.0 | gas |
| NP239 | 25.0 | medium | XE123 | 0.0 | gas |
| NP240 | 25.0 | medium | XE125 | 0.0 | gas |
| NP240m | 25.0 | medium | XE127 | 0.0 | gas |
| OBT | 0.7 | slow | XE129m | 0.0 | gas |
| PA227 | 1800.0 | slow | XE131m | 0.0 | gas |
| PA228 | 1800.0 | slow | XE133 | 0.0 | gas |
| PA230 | 1800.0 | slow | XE133m | 0.0 | gas |
| PA231 | 1800.0 | slow | XE135 | 0.0 | gas |
| PA232 | 1800.0 | slow | XE135m | 0.0 | gas |
| PA233 | 1800.0 | slow | XE138 | 0.0 | gas |
| PA234 | 1800.0 | slow | Y86 | 740.0 | slow |

Table 125. Site Specific Partition Coefficients and Lung Solubility Class in *YMPGENII.mdb* (Cont'd)

| CASID | CLKD (mL/g) | CLLCLAS | CASID | CLKD (mL/g) | CLLCLAS |
|---|---|---|---|---|---|
| PA234m | 1800.0 | slow | Y86m | 740.0 | slow |
| PB195m | 16000.0 | medium | Y87 | 740.0 | slow |
| PB198 | 16000.0 | medium | Y88 | 740.0 | slow |
| PB199 | 16000.0 | medium | Y90 | 740.0 | slow |
| PB200 | 16000.0 | medium | Y90m | 740.0 | slow |
| PB201 | 16000.0 | medium | Y91 | 740.0 | slow |
| PB202 | 16000.0 | medium | Y91m | 740.0 | slow |
| PB202m | 16000.0 | medium | Y92 | 740.0 | slow |
| PB203 | 16000.0 | medium | Y93 | 740.0 | slow |
| PB205 | 16000.0 | medium | Y94 | 740.0 | slow |
| PB209 | 16000.0 | medium | Y95 | 740.0 | slow |
| PB210 | 16000.0 | medium | ZR86 | 2200.0 | medium |
| PB211 | 16000.0 | medium | ZR88 | 2200.0 | medium |
| PB212 | 16000.0 | medium | ZR89 | 2200.0 | medium |
| PB214 | 16000.0 | medium | ZR93 | 2200.0 | medium |
| PD100 | 180.0 | slow | ZR95 | 2200.0 | medium |
| PD101 | 180.0 | slow | ZR97 | 2200.0 | medium |
| PD103 | 180.0 | slow | | | |
| PD107 | 180.0 | slow | | | |
| PD109 | 180.0 | slow | | | |

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## ATTACHMENT G. YMP SITE-SPECIFIC FGR-13 INHALATION DCF FILE

As discussed in the *GENII Version 2 Software Design Document* (Napier et al 2006 [DIRS 177331], Section B.4), GENIIv2 dose conversion factors using the latest ICRP methods are provided in a file named *FGR13INH.hdb.* As discussed in Section 4.1.7.7, the tritium vapor phase adult inhalation dose conversion factor is multiplied be a factor of 1.5 for all organs to account for skin absorption. The new values for each organ are 2.7 x $10^{-11}$ Sv/Bq in the row corresponding to age 7300 (Column 2) and class vapor V (Column 4). Those values have been incorporated into a new dose conversion factor file *FGR13INH.ymp*, (see highlighted part in Table 126). All other values remain the same as in the original file. To use this file with GENIIv2, copy it into the FRAMES subdirectory and rename it to *"FGR13INH.hdb*".

Table 126. Partial Data from *FGR13INH.ymp* where Inhalation Dose Coefficients Updated

| Nuclide | Age | AMAD | Class /f1 | | | | | Adrenals | UB_Wall | Bone_Sur | … |
|---|---|---|---|---|---|---|---|---|---|---|---|
| H-3 | 100 | 1 | F | E | 1.00E+00 | 1 | L | 2.46E-11 | 2.46E-11 | 2.46E-11 | … |
| H-3 | 365 | 1 | F | E | 1.00E+00 | 1 | L | 1.92E-11 | 1.92E-11 | 1.92E-11 | … |
| H-3 | 1825 | 1 | F | E | 1.00E+00 | 1 | L | 1.07E-11 | 1.07E-11 | 1.07E-11 | … |
| H-3 | 3650 | 1 | F | E | 1.00E+00 | 1 | L | 7.99E-12 | 7.99E-12 | 7.99E-12 | … |
| H-3 | 5475 | 1 | F | E | 1.00E+00 | 1 | L | 5.83E-12 | 5.83E-12 | 5.83E-12 | … |
| H-3 | 7300 | 1 | F | E | 1.00E+00 | 1 | L | 6.16E-12 | 6.16E-12 | 6.16E-12 | … |
| H-3 | 100 | 1 | M | E | 2.00E-01 | 1 | L | 8.28E-12 | 8.28E-12 | 8.28E-12 | … |
| H-3 | 365 | 1 | M | E | 1.00E-01 | 1 | L | 5.40E-12 | 5.40E-12 | 5.40E-12 | … |
| H-3 | 1825 | 1 | M | E | 1.00E-01 | 1 | L | 3.34E-12 | 3.34E-12 | 3.34E-12 | … |
| H-3 | 3650 | 1 | M | E | 1.00E-01 | 1 | L | 2.44E-12 | 2.44E-12 | 2.44E-12 | … |
| H-3 | 5475 | 1 | M | E | 1.00E-01 | 1 | L | 2.00E-12 | 2.00E-12 | 2.00E-12 | … |
| H-3 | 7300 | 1 | M | E | 1.00E-01 | 1 | L | 2.15E-12 | 2.15E-12 | 2.15E-12 | … |
| H-3 | 100 | 1 | S | E | 2.00E-02 | 1 | L | 7.10E-13 | 7.10E-13 | 7.10E-13 | … |
| H-3 | 365 | 1 | S | E | 1.00E-02 | 1 | L | 4.56E-13 | 4.56E-13 | 4.56E-13 | … |
| H-3 | 1825 | 1 | S | E | 1.00E-02 | 1 | L | 3.12E-13 | 3.12E-13 | 3.12E-13 | … |
| H-3 | 3650 | 1 | S | E | 1.00E-02 | 1 | L | 2.36E-13 | 2.36E-13 | 2.36E-13 | … |
| H-3 | 5475 | 1 | S | E | 1.00E-02 | 1 | L | 2.13E-13 | 2.13E-13 | 2.13E-13 | … |
| H-3 | 7300 | 1 | S | E | 1.00E-02 | 1 | L | 2.30E-13 | 2.30E-13 | 2.30E-13 | … |
| H-3 | 100 | 0 | V | E | 1.00E+00 | 1 | L | 6.35E-11 | 6.35E-11 | 6.35E-11 | … |
| H-3 | 365 | 0 | V | E | 1.00E+00 | 1 | L | 4.86E-11 | 4.86E-11 | 4.86E-11 | … |
| H-3 | 1825 | 0 | V | E | 1.00E+00 | 1 | L | 3.07E-11 | 3.07E-11 | 3.07E-11 | … |
| H-3 | 3650 | 0 | V | E | 1.00E+00 | 1 | L | 2.28E-11 | 2.28E-11 | 2.28E-11 | … |
| H-3 | 5475 | 0 | V | E | 1.00E+00 | 1 | L | 1.80E-11 | 1.80E-11 | 1.80E-11 | … |
| H-3 | 7300 | 0 | V | E | 1.00E+00 | 1 | L | 2.70E-11 | 2.70E-11 | 2.70E-11 | … |
| H-3 | 100 | 0 | G | E | 1.00E+00 | 1 | L | 6.35E-15 | 6.35E-15 | 6.35E-15 | … |
| H-3 | 365 | 0 | G | E | 1.00E+00 | 1 | L | 4.86E-15 | 4.86E-15 | 4.86E-15 | … |
| H-3 | 1825 | 0 | G | E | 1.00E+00 | 1 | L | 3.07E-15 | 3.07E-15 | 3.07E-15 | … |
| H-3 | 3650 | 0 | G | E | 1.00E+00 | 1 | L | 2.28E-15 | 2.28E-15 | 2.28E-15 | … |
| … | … | … | … | … | … | … | … | … | … | … | … |

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# ATTACHMENT H. ELECTRONIC FILES WITH THIS REPORT

The electronic files associated with this document can be categorized as three types. The first set includes the calculation files under a subdirectory of Calculation_Files that contains four Excel files and one GoldSim file. The second set includes the YMP default files under a subdirectory of YMPDefault_Files that contains 12 YMP default files, three Excel files to be used to develop these default files, and one batch file to use YMP default files. The last set includes some GENIIv2 files that are mentioned in this document under a subdirectory of GENIIv2_Files that contains 19 original GENIIv2 files. These files are included in a data CD.

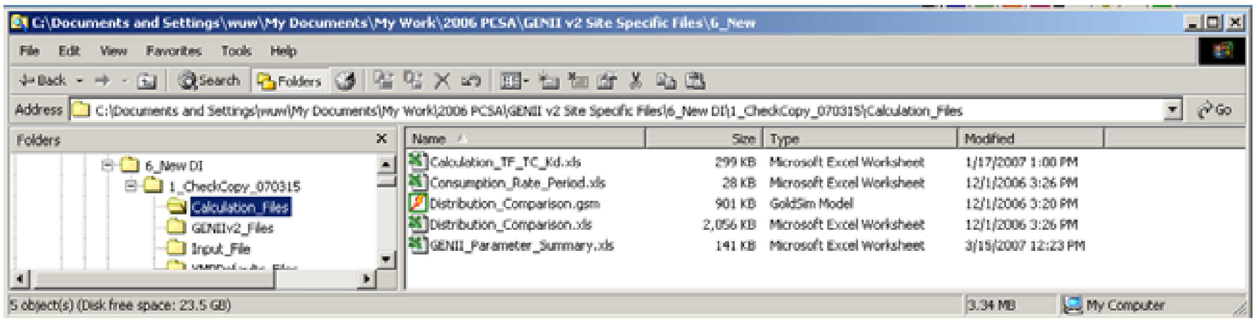


Figure 29. Electronic Files For Calculations and Results

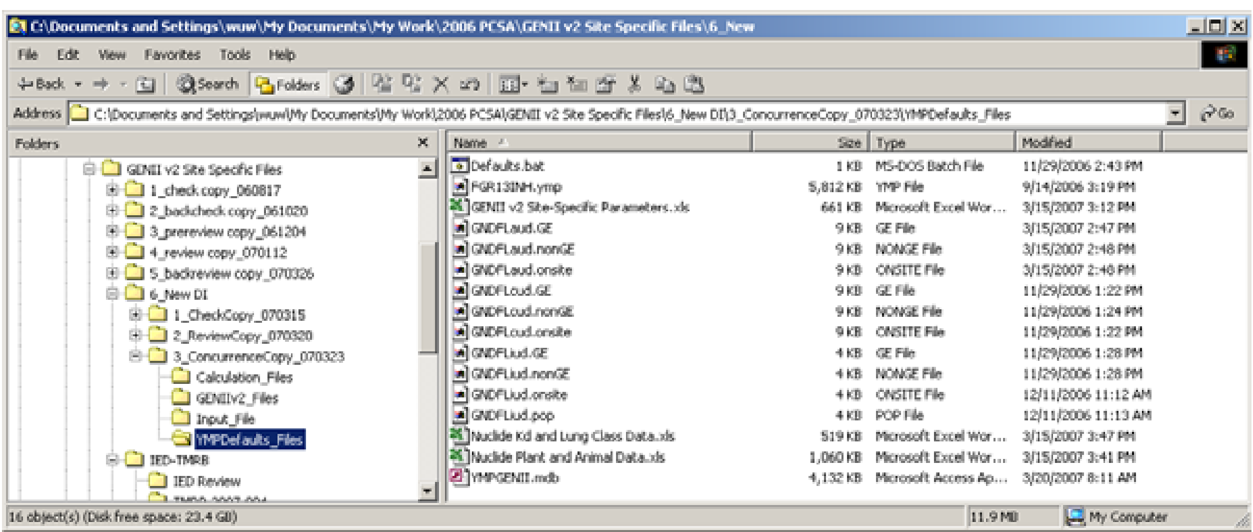


Figure 30. Electronic Files for YMP Site Specific Default Development

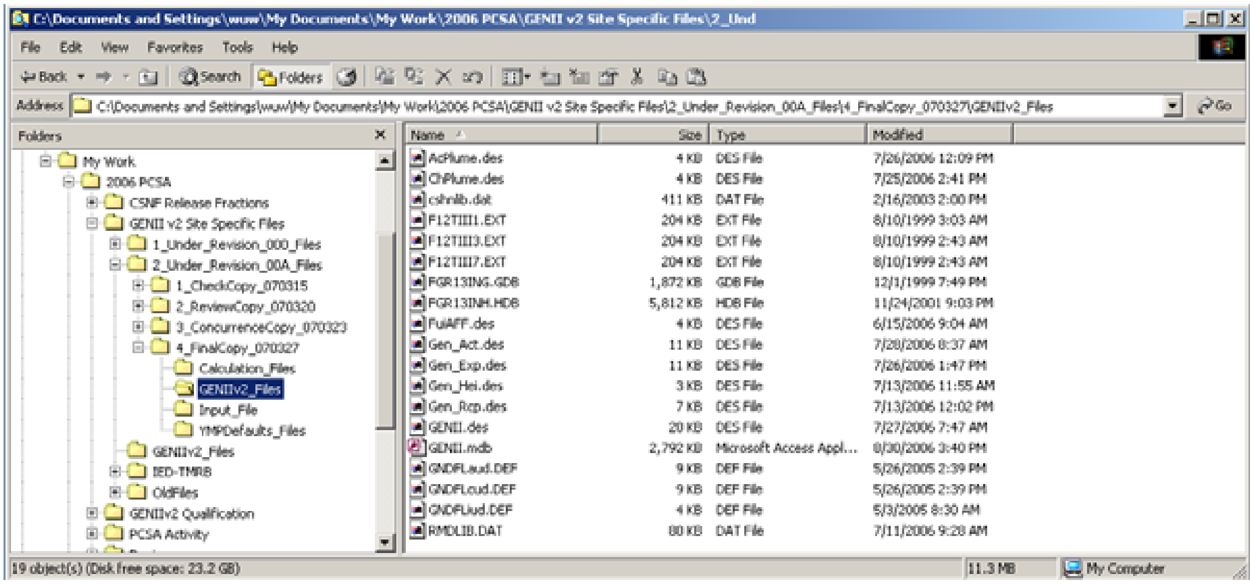


Figure 31. Electronic Files from Original GENIIv2

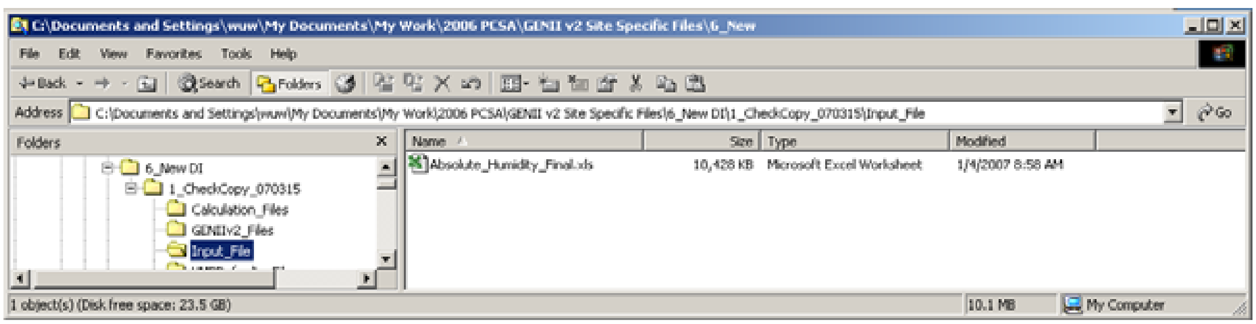


Figure 32. Electronic Files from Attachment I

# ATTACHMENT I. METEOROLOGICAL INPUTS

The Meteorological Inputs are from Jorge Schulz through an email as attached below. It is used as assumptions requiring verification in Section 3.1. The Excel file *Absolute_Humidity.xls* discussed in this attachment is used to develop the cumulative distribution of daily rain rate as discussed in Section 3.1.2, and the file is included in the attached CD as shown in Attachment H. No other files mentioned in this attachment is used in this document.

From: Jorge Schulz on 03/15/2007 06:29 AM
To: Wesley Wu/YM/RWDOE@CRWMS
cc: Dale Dexheimer/YM/RWDOE@CRWMS, Sen-Sung Tsai/YM/RWDOE@CRWMS
Subject: Meteorological Inputs

LSN: Relevant - Privileged
User Filed as: Excl/AdminMgmt-14-4/QA:N/A

Wesley:

**References:**

MO0305SEP01MET.002. Meteorological Monitoring Data for 2001. Submittal date: 05/21/2003. [DIRS 166164]

MO0305SEP02MET.002. Meteorological Monitoring Data for 2002. Submittal date: 05/21/2003. [DIRS 166163]

MO0503SEPMMD03.001. Meteorological Monitoring Data for 2003. Submittal date: 03/03/2005. [DIRS 176097]

MO0607SEPMMD04.001. Meteorological Monitoring Data for 2004. Submittal date: 07/18/2006. [DIRS 178311]

MO0610METMND05.000. Meteorological Monitoring Data for 2005. Submittal date: 09/18/2006. [DIRS 178328]

**Absolute Humidity:**

Absolute humidity is used to calculate tritium concentration in food pathways. The parameter is developed using site-specific meteorological data provided in above references. The calculation is performed in an Excel file: *Absolute_Humidity.xls*. The arithmetic mean of the hourly absolute humidity values is 4.08 g/m$^3$ and standard deviation is 2.09 g/m$^3$. A lognormal distribution is recommended with GM of 3.63 g/m$^3$, GSD of 1.63, lower bound of 0.39 g/m$^3$ and upper bound of 16.4 g/m$^3$.

**Average Daily Rain Rate:**

The average daily rain rate is determined from the Yucca Mountain site meteorological data provided in above references, which includes the precipitation amount, *p*, in mm for each hour. The average daily rain rate is calculated by (1) summing the hourly precipitation for each calendar day, and (2) averaging calculated daily rain rate for the entire period. The calculation is performed in the Excel file *Absolute_Humidity.xls*, which contains two worksheets. *MetData* worksheet contains all raw data and average calculation, and *Parameters* worksheet provides some inputs and summary of average calculation done in *MetData*.

The calculated average daily rain rate is 0.49 mm/day and standard deviation is 2.88 mm/day for those days with precipitation. There are 699 hours of precipitation out of a total of 43,751 hours of valid data (1.6%).

**Wind Speed:**

Based on the wind speed measurements during the five years period, the mean wind speed is 3.64 m/s and its SD is 2.02 m/s with the minimum wind speed of 0.45 m/s, and the maximum wind speed of 17.8 m/s. The calculation is performed in the worksheet *MetData* of Excel file *Met Data 2001-2005.xls*.

**Ambient Temperature**

The ambient temperature is provided in the referenced meteorological data. The mean temperature is calculated in the worksheet *MetData* of Excel file *Met Data 2001-2005.xls* The mean temperature is 17.04C and SD of 10.13C with the minimum of –7.5C and the maximum of 42.31C.

**Transfer Resistance:**

Transfer resistances are usually associated with the characteristics of the depositing material and surface type. The transfer resistance is used as a mathematical device to establish an upper limit on the deposition velocity. The user can enter transfer resistance, but as a default, 10 and 100 s/m are assumed for gas (iodine) and particles, respectively. For the purposes of determining atmospheric dispersion factors, the transfer resistance for particles (100 s/m) is used for both particles and iodines. This is conservative because the higher transfer resistance results in lower deposition velocities and higher depleted X/Q values.

**Met Data File Generation:**

A meteorological data file for the Yucca Mountain site has been generated consistent with the (GENIIv2) input data format. The file, *ymp01-05.met* contains date, time, stability class, wind direction, wind speed, temperature, mixing height, precipitation code, precipitation rate, and weight in the GENIIv2 format, which are converted from the meteorological data files referenced above

Calculation of the required additional parameters and the meteorological data conversion into the GENIIv2 format is performed in the Excel spreadsheet *Met Data 2001-2005.xls*. The Excel spreadsheet *Met Data 2001-2005.xls* has several worksheets, of which, three: *Parameters*, *Monin-Obukhov Data*, and *MetData* are used in the meteorological data conversion.

The Excel spreadsheets are available in folder *O:\\SA-DEPT\YMP XQ Calculation\Spreadsheets*

Regards,

Jorge