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SAFETY ASSESSMENT

RESRAD MODELS

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RESRAD SUPPLEMENTAL – JANUARY 14, 2009

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Safety Assessment for Proposed Class 2 Permit Modification for Disposal of Exempt Concentrations of Special Nuclear Material

US Ecology Idaho (USEI) proposes to modify its Grand View facility's Waste Acceptance Criteria (WAC) consistent with a rulemaking approved by the Idaho Department of Environmental Quality (IDEQ) Board at its October 10, 2007 meeting. This new rule, which will become effective upon either specific approval of the legislature in the spring of 2008 or their adjournment, clarifies that only permitted hazardous waste disposal facilities may accept exempt concentrations of special nuclear material (SNM).

USEI's proposed Class 2 permit modification would extend the same case-by-case review and approval process now in place for exempt source and byproduct material to exempt SNM. This process requires that the waste generator must first prepare a safety assessment that determines that waste may safely be disposed at USEI's Grand View, Idaho disposal facility and does not require disposal at a facility licensed under the federal Atomic Energy Act as amended. For SNM, this safety assessment must be submitted to the U.S. Nuclear Regulatory Commission (NRC), which must issue an exemption to utilize the Grand View facility. USEI must then provide its own safety findings to IDEQ for a concurrence review. This case-by-case process has been employed for over three years for exempt source and byproduct material. In all cases exempted waste has been disposed safely and in compliance with all requirements.

Background on SNM

The US Nuclear Regulatory Commission (NRC) defines SNM as any isotope of plutonium, uranium-235, uranium-233 or uranium enriched in uranium-235 or uranium-233, or any other material enriched in the isotopes uranium-233 or uranium-235. Generally, NRC classifies SNM as low-level radioactive waste if it is in concentrations no greater than 100 nanocuries per gram.¹

SNM waste is generated by the operation and decommissioning of commercial nuclear power plants and nuclear fuel fabrication facilities, from weapons research, development, production and decommissioning activities. They may also appear in small quantities in low-level radioactive wastes generated by academic, medical and industrial research activities.

Radiological Characteristics and Dose

Special nuclear materials are predominantly alpha emitting radionuclides with very few gamma ray emissions, although one of the isotopes of plutonium emits only beta particles. Based on these characteristics, SNM radionuclides do not present an external dose hazard. They primarily pose inhalation hazards similar to the naturally occurring

¹ 10 CFR 60.5(a)(3) Table 1.

uranium and thorium wastes that the Grand View facility currently accepts. SNM materials are normally found as oxides or metals which make them much less of a hazard if ingested than if inhaled. For instance, the ingestion annual limit on intake (ALI) for ²³⁹Pu is 133 times higher than its inhalation ALI.² Of the SNM radionuclides, ²³⁹Pu has the most restrictive annual limit on intake (ALI) and derived air concentration (DAC). Both the ALI and DAC are indicators of the relative hazard associated with various isotopes of the same element and the difference in hazard between different radioactive elements as illustrated in the following table:

Radionuclide ³	Inhalation ALI μCi	Ingestion ALI μCi	Inhalation Dose per Unit Intake mrem/pCi	Ingestion Dose per Unit Intake mrem/pCi
²³⁸ Pu	0.007	0.9	0.39	4.95E-5
²³⁹ Pu	0.006	0.8	0.43	5.18E-5
²⁴⁰ Pu	0.006	0.8	0.43	5.19E-5
²⁴¹ Pu*	0.5	40	0.004958	7.67E-7
²⁴² Pu	0.007	0.8	0.41	4.92E-5
²³⁵ U	1	10	0.123	2.67E-5
²³³ U	1	10	0.135	2.64E-5
²³⁸ U-238	1	10	0.118	2.38E-5
²³² Th	0.001	0.7	1.64	2.70E-3

*Pu-241 emits only beta particles

As seen in the table, ²³²Th is the limiting isotope regarding potential dose to the worker. As demonstrated by USEI's occupational monitoring the annual dose to workers is minimal, and well below USEI's administrative dose limits.

USEI has performed a safety assessment to evaluate the potential inhalation dose to members of the public and its employees as a result of receiving and disposing exempt levels of SNM-contaminated waste. This assessment was based on a combination of very conservative factors:

1. ²³⁹Pu was used as the contaminant, since it represents the highest potential dose for unit activity inhaled
2. USEI workers were modeled, since they have potential to receive higher doses than members of the public,
3. Railcars were used as off-loading these would produce the highest potential inhalation doses and represent the most probable mode of transport.
4. A concentration of 60 pCi/gm of ²³⁹Pu was assumed as the highest concentration the NRC may approve for disposal at USEI. As can be seen in the example a higher concentration could be accepted and doses would still be in accordance with NRC guidelines of a few millirem per year.

² 10 CFR 20, Appendix B

³ ICRP Publication 30: Limits for Intakes of Radionuclides by Workers. International Commission on Radiological Protection, Elsevier, 1986.

5. AP 42, Fifth Edition, Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Source, Section 13.2.4, Aggregate Handling And Storage Piles provided the emission factor used to determine the amount of respirable dust produced by the trans-loading of the waste at the RTF. Aggregate Handling was chosen because the activity generating the dust is very similar to the method used to trans-load waste at the RTF. The method is described as batch dumping in AP-42 and refers to the use of a front-end-loader. At the RTF an excavator is used to perform the trans-loading. In both cases the material is elevated and dropped onto a hard surface.⁴

Based on these multiple conservative assumptions, the assessment (Attachment 1) found that the maximum potential dose to a USEI employee would be $4.3E-7$ mSv ($4.3E-5$ mrem) per railcar. Based on this assessment, it is clear that doses to USEI workers would be less, even under this conservative scenario, than other radiologically contaminated waste the company has handled safely and compliantly for nearly a decade.

Closure / Post Closure

The main drivers of dose for the Resrad model will continue to be those long lived beta emitting isotopes which are assigned small or zero K_d values by the model. The final average concentrations of these isotopes which consist of C-14, Tc-99, Cl-36 and I-129 will be maintained at the level indicated in the current WAC. These select isotopes will continue to be managed as described in the modification dated October 2008. The addition of plutonium and ^{233 and 235}U will have no impact on the post-closure dose predicted by the model. Considering their high K_d (550 L/kg for sand and 5500 L/kg for clay), plutonium isotopes will present no increase in dose for the landfill cell post-closure period. Because they are isotopes of uranium, ^{235 and 233}U have already been demonstrated to pose no additional dose for the post-closure period (Attachment 2).

Concentrations Approved for Disposal

Every authorization for alternate disposal and related exemption (e.g. disposal at other than an Atomic Energy Act-regulated low-level radioactive waste disposal facility) is

⁴ The formula employed to derive the mass of the dust released requires that several parameters be input by the generator of the dust. These parameters are wind velocity in mph, moisture content of the aggregate material, and a factor to account for the activity median aerodynamic diameter of the particles of interest. Since significant internal dose can only result from inhalation of dust, only the mass of the respirable fraction of dust was calculated. The following are the parameters used in the calculation: Moisture content (M)- 25%, wind velocity (U)- 1mph, particle size (k) 0.35 (for particles of ten microns AMAD or less). A volume of air sufficient to encompass the railcar, the excavator operator and the width of the building is postulated in order to estimate a concentration as the model produces a mass of dust ejected into the air. The length of the rail car is approximately 20 meters, the width of the building is approximately 10 meters and the height necessary to encompass the excavator operator is estimated to be 5 meters off the ground. The amount of dust produced is assumed to fill the volume instantly. Since the air is moving the dust is cleared. Another bucket of waste is dropped and the concentration is again present. Because these events happen close in time, concentration is assumed to be constant during the off-loading of each railcar.

considered on its own merits through a case-by-case review. A general consideration for the disposition of SNM is the question of criticality. Exempt concentrations of SNM would be well below the minimum concentrations at which criticality would be a concern. For example, the US Department of Transportation (U.S.DOT) exempts certain concentrations of fissile material from criticality precautions when those concentrations are below certain thresholds for criticality.⁵ One of these criteria that would confer exemption from the observation of criticality precautions for low concentrations of fissile material is that there be at least 2000 grams of non-fissile material for every gram of fissile material and that there are no more than 180 grams of fissile material distributed within 360 kg of contiguous non-fissile material. In soil assumed to contain 60 pCi/g of ²³⁹Pu, there would be one billion grams of non-fissile material for every gram of ²³⁹Pu.

$$\frac{60 \text{ pCi}_{\text{Pu}}}{\text{g}_{\text{dirt}}}, \frac{60 \text{ pCi}_{\text{Pu}}}{\text{g}_{\text{dirt}}} \otimes \frac{1}{62 \text{ E} + 9 \text{ pCi}_{\text{Pu}}/\text{g}_{\text{Pu}}} = \frac{9.67742 \text{ E} - 10 \text{ g}_{\text{Pu}}}{\text{g}_{\text{dirt}}}, \text{ invert to obtain } \frac{\text{g}_{\text{dirt}}}{\text{g}_{\text{Pu}}} = 1.033\text{E} + 9$$

Additionally, in a gondola railcar assumed to hold 90,909 kg of soil contaminated at 60 pCi/g of ²³⁹Pu the total number of grams of ²³⁹Pu would be 0.088 g. Hence, exempt concentrations are expected to be several orders of magnitude below minimum limits for criticality. It should also be noted that Uranium natural, natural Thorium and ²³⁹Plutonium are all regulated by the U.S. DOT as Class 7 material at the same concentrations of 27 pCi/g⁶. In addition the reportable quantity (RQ) for natural Thorium compared to Plutonium is an order magnitude lower for natural Thorium than ²³⁹Plutonium⁷. Both Uranium natural and natural Thorium have been safely and compliantly managed with minimal dose to workers at the USEI facility over the past number of years.

Once in the cell, the concentration of plutonium should remain the same as it is in the waste. Although plutonium can have 5 oxidation states, in environments surrounding repository sites plutonium will most likely assume the IV state. The IV state forms the most insoluble salts of plutonium and is favored by a high pH environment and low concentration.⁸ This is also reflected by its high K_d as described in the discussion of post-closure dose.

With the question of criticality addressed, dose limit will dictate the allowable concentration through a risk-based approach. To obtain an alternate disposal authorization and related exemption, the waste generator must submit a description of waste concentrations and laboratory analytical data. Based on this information, a safety assessment analyzing potential exposure scenarios is developed describing timeframes and distances people may be in proximity to the material and conservatively estimating

⁵ 49 CFR 173.453(c)(1) and (2).

⁶ 49 CFR 173.436, Exempt material activity concentrations and exempt consignment activity limits for radionuclides

⁷ 49 CFR 172.101 Appendix A

⁸ "The Chemical Interactions of Actinides in the Environment", Runde, Wolfgang, Los Alamos Science, No. 26, pp. 393 & 396.

doses based on this. This includes routes of exposure such as ingestion or inhalation. The generator must also describe how the disposal at the Grand View facility is authorized by law and will not endanger life or property or the common defense and security and are otherwise in the public interest.

The NRC reviews this assessment and evaluates it for adequate and appropriate scenarios, reasonable conservativeness and compliance with the dose limits. If the agency believes that the assessment addresses all potential doses that can reasonably be expected to occur, that the scenarios accurately depicts potential doses, conservative assumptions are used as necessary and projected doses are within a few millirem, the agency will grant the authorization and issue an exemption.

The NRC has set an upper limit based on dose that it will release material for alternate disposal of “a few millirem per year” to any member of the public, which is found in NUREG 1757, v.1, rev.1, Consolidated Decommissioning Guidance- Decommissioning Guidance for Materials Licensees, Final Report, pp 15-25..

Conclusion

The proposed modification to USEI’s WAC clarifies the review process for SNM materials consistent with past practice and the October 2007 IDEQ rulemaking. This includes a case-by-case assessment and review with IDEQ making the final decision on whether the waste may be disposed at USEI. Adequate protections exist that only exempt concentrations of SNM may be approved for disposal, and these concentrations are consistent with other radioactive wastes USEI has managed safely and compliantly at the Grand View site for over eight years.

Attachment 1
Maximum, Potential Dose to a USEI Employee

Given:

1. Derived air concentration for ^{239}Pu — $3\text{E}-12 \mu\text{Ci}/\text{ml}$ ($3 \text{ pCi}/\text{m}^3$) (10 CFR 20).
2. Inhalation dose conversion factor for ^{239}Pu — $0.43 \text{ mrem}/\text{pCi}$ (ICRP-30).
3. Breathing rate for standard man performing light work— $1.2 \text{ m}^3/\text{hr}$ (ICRP-26).

Assumptions:

1. Concentration of ^{239}Pu in railcar— $60 \text{ pCi}/\text{g}$.
2. Time to empty railcar—45 minutes.
3. Respirable dust generated— $1.8\text{E}-6 \text{ g}/\text{m}^3$. Calculated using AP 42, Fifth Edition Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point and Area Source, Section 13.2.4, Aggregate Handling And Storage Piles
4. All dust particles are $1 \mu\text{m}$ AMAD.

Calculations:

Activity concentration of Airborne ^{239}Pu :

$$1.8\text{E}-6 \frac{\text{g}}{\text{m}^3} \otimes 60 \text{ pCi}/\text{g} = 1.1\text{E}-4 \text{ pCi}/\text{m}^3$$

Activity inhaled in 45 min:

$$1.2 \frac{\text{m}^3}{\text{hr}} \otimes 1.1\text{E}-4 \frac{\text{pCi}}{\text{m}^3} \otimes 0.75 \text{ hr} = 1\text{E}-4 \text{ pCi}$$

Inhalation Dose from emptying one railcar:

$$1\text{E}-4 \text{ pCi} \otimes 0.43 \frac{\text{mrem}}{\text{pCi}} = 4.3\text{E}-5 \text{ mrem}$$

Annual Inhalation Dose Assuming cars are received at the rate of 25/week for 1 work year.

$$4.3\text{E}-5 \text{ mrem} \otimes 25 \frac{\text{Railcars}}{\text{work week}} \otimes 50 \frac{\text{work weeks}}{\text{work year}} = 0.054 \text{ mrem}$$

Particulate airborne radionuclide concentrations have been monitored at the RTF since 2002. Dose estimates made from the concentrations measured for the period 2002-2006 have averaged 6.1 millirem per year (without taking credit for respiratory protection). Samples are taken once a week, composited over a quarter and sent for analysis. Duration of exposure is estimated based on the ratio of the mass of exempt radioactive materials received to the mass of total materials received. For the period described that ratio is 0.46.

As can be seen the annual contribution to dose from receiving this amount of Pu-239 would be insignificant. It is important to note that we will terminate projects each year as well as add them. Therefore, evaluation of the impact of any added customer to overall annual dose by itself may be misleading.

Attachment 2

Contribution to Post-Closure Dose by SNM Radionuclides Showing no Significant Effect

Type

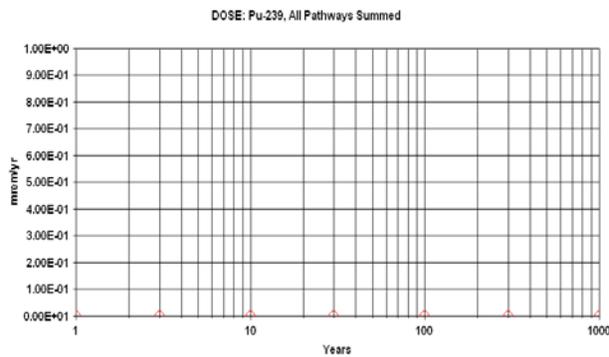
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- Concentration
- Dose/Source Ratio
- Soil Guidelines
- Risk

Radionuclide

- Summed
- Individual
- Individual and Property
- Individual and Trends

Pathways

- Summed
- Components
- Water Indep./Dependent
- Individual
- External



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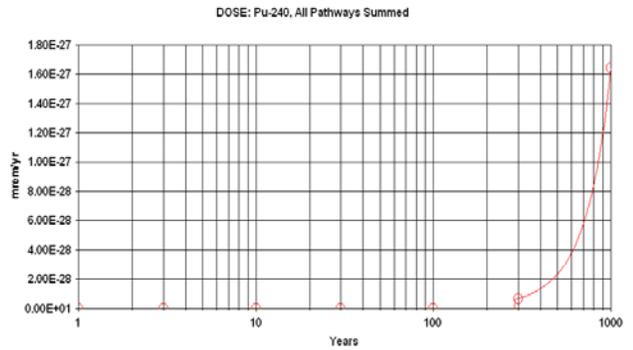
- Dose
- Concentration
- Dose/Source Ratio
- Soil Guidelines
- Risk

Radionuclide

- Summed
- Individual
- Individual and Property
- Individual and Trends

Pathways

- Summed
- Components
- Water Indep./Dependent
- Individual
- External



Type

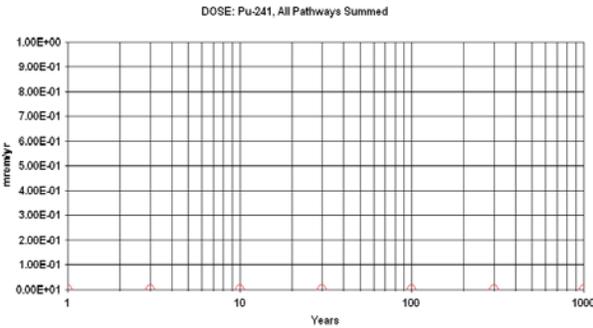
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- Concentration
- Dose/Source Ratio
- Soil Guidelines
- Risk

Radionuclide

- Summed
- Individual
- Individual and Property
- Individual and Trends

Pathways

- Summed
- Components
- Water Indep./Dependent
- Individual
- External



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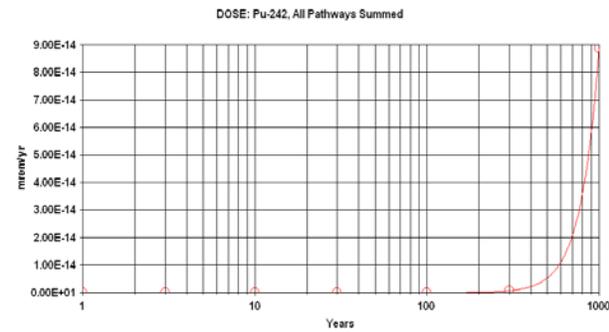
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- Concentration
- Dose/Source Ratio
- Soil Guidelines
- Risk

Radionuclide

- Summed
- Individual
- Individual and Property
- Individual and Trends

Pathways

- Summed
- Components
- Water Indep./Dependent
- Individual
- External



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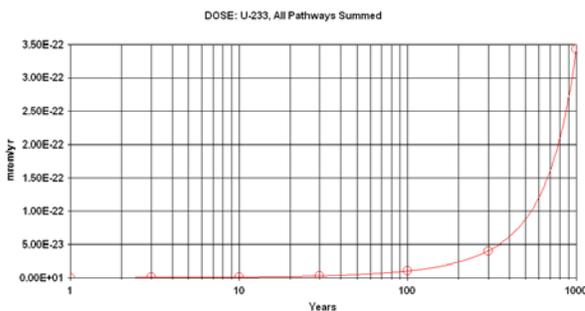
- Dose
- Concentration
- Dose/Source Ratio
- Soil Guidelines
- Risk

Radionuclide

- Summed
- Individual
- Individual and Property
- Individual and Trends

Pathways

- Summed
- Components
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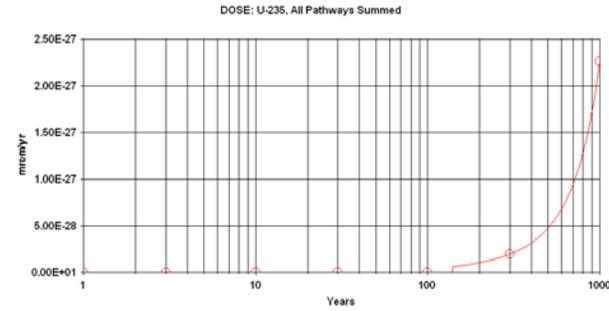
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- Risk

Radionuclide

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- Individual and Property
- Individual and Trends

Pathways

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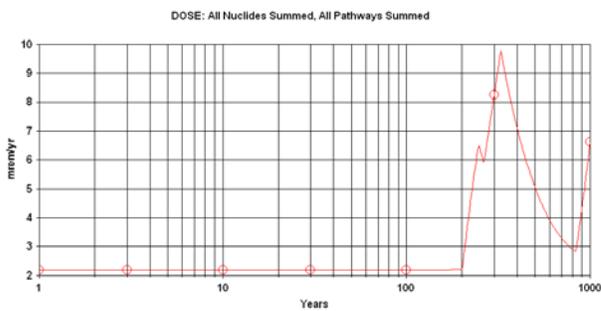
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Radionuclide

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Pathways

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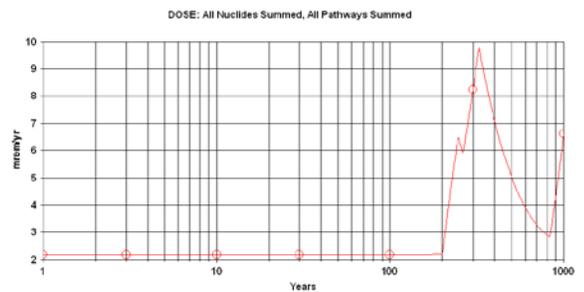
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- Concentration
- Dose/Source Ratio
- Soil Guidelines
- Risk

Radionuclide

- Summed
- Individual
- Individual and Property
- Individual and Trends

Pathways

- Summed
- Components
- Water Indep./Dependent
- Individual
- External



USEEOL_FINAL_03_25_05_RAD 01/06/2008 09:27 GRAPHICS.ASC Includes All Pathways

With SNM Radionuclides at 60 pCi/g

Without SNM Radionuclides

Safety Assessment for Increased Uranium and Radium Concentrations

Proposal:

1. Increase natural uranium limits from current 0.0421% by weight to 0.0499% by weight (i.e. still below .05% by weight threshold)
2. Increase the allowable concentration for ^{226}Ra and/or ^{228}Ra to 500 pCi/g (combined radium) for all bulk waste and to 1,500 pCi/g combined ^{226}Ra and ^{228}Ra for waste in rigid and other reinforced containers.
3. Limit higher-activity ^{226}Ra containerized/packaged waste placement to a minimum 6 meters below any completed cell surface
4. Increase the allowable concentration of ^{210}Pb from 666 to 1500 pCi/g
5. Allow direct disposal of higher-activity ^{226}Ra containers up to 1500 pCi/g with modified visual inspections
6. Allow disposal of 10 CFR 30.11 exempted byproduct material from production particle accelerators under the provisions and limitations of Table C.3

Discussion

Uranium - USEI seeks approval to receive natural uranium up to a maximum of 0.0499%, within the .05% by weight “unimportant quantities” limit set forth in 10 CFR 40.13(a). USEI’s current natural uranium limit is 141 pCi/g, or 0.0421% by weight. This previous limit was set in 2001 to maintain the sum of all uranium progeny to less than 2000 pCi/g consistent with a judgment made at that earlier time not to receive USDOT placarded shipments. Increasing the allowable weight percentage to 0.0499% would result in a new natural uranium isotopic limit of 167 pCi/g and the sum of all isotopes of 2340 pCi/g. This increase is consistent with the new limits established in USEI’s WAC modification of February 2008 and continues to comply with the NRC exemption limit of less than 0.05 weight percent. (See suggested redlines to Table C.1, below)

Radium and ^{210}Pb - USEI requests authorization to increase its acceptance limit for lower-activity, bulk shipments of diffuse radium from the current activity concentration of 222 pCi/g to 500 pCi/g for diffuse ^{226}Ra and ^{228}Ra (combined) under Table C.2 (see attached suggested redlines). We also request authorization to accept higher-activity radium waste in specialized containers for ^{226}Ra and/or ^{228}Ra at a combined limit of 1500 pCi/g. This will allow USEI to better serve municipalities and water treatment companies in Idaho and other states who are taking steps to comply with USEPA regulations under the Safe Drinking Water Act limiting radium in drinking water. Filters from the oil and gas industry are another type of waste that would be disposed under this new limit.

Generally, ^{226}Ra and ^{228}Ra in media used for filtering water (e.g. radium-selective ion exchange resin, engineered zeolite sands, etc) is evenly distributed (40 to 60 percent for either radionuclide). However, to account for site-specific variations and to maintain consistency with current practices, USEI’s proposed limit is expressed in terms of the sum of the two isotope concentrations. As a daughter product of ^{226}Ra , ^{210}Pb will eventually achieve the same activity level as its parent. It is therefore reasonable to

include ^{210}Pb where it occurs separate from its progenitor at a maximum concentration of 1500 pCi/g.

Potential Operational Doses

Diffuse ^{226}Ra , ^{228}Ra , and ^{210}Pb Bulk Waste

While bulk waste shipments will be received by truck and by rail, it is expected the majority of waste will be received by truck. Receipt by rail has higher calculated doses due to additional handling; therefore, rail receipt was used to conservatively calculate the maximally exposed individuals. Table 1 presents the calculated internal and external doses for the receipt of a gondola railcar of bulk waste material with concentrations of ^{226}Ra , ^{228}Ra , of 500 pCi/g and ^{210}Pb at the maximum requested diffuse material concentrations. The resulting calculated doses are well within USEI's annual administrative dose limits of 500 mR/yr.

TABLE 1
Estimated Dose Received per Rail Car at Maximum Radium Concentration (mRem)

	Existing Concentration Limits	Proposed Concentration Limits
Bulk ^{226}Ra + ^{228}Ra at combined 500 pCi/g		
Gondola Survey	0.0440	0.0980
Excav. Op.*	0.0259	0.0583
Truck Survey	0.0336	0.0757
Truck Driver	0.0773	0.1740
Stabilization worker*	0.0259	0.0583
Cell Worker	0.0223	0.0503
^{210}Pb at 1,500 pCi/g		
Gondola Survey	0	0
Excav. Op.*	0.00345	0.00778
Truck Survey	0	0
Truck Driver	0	0
Stabilization worker*	0.000345	0.000778
Cell Worker	0	0

* Includes inhalation dose

USEI used MicroShield™ to calculate occupational doses. The concentration limits shown in Table 1 are increased by a factor of 2.25, from our current limit of 222 pCi/g, which in turn increases the occupational dose to workers by a factor of 2.25. ^{210}Pb emits no gamma radiation of significance and is not considered for external exposure. Some internal exposure is possible when material is transloaded, stabilized or disposed in the cell. Respiratory protection is required for work in the cell. These doses are expected to be very low. A protection factor of 10 is also applied for the use of air purifying respirators in those areas.

Higher-Activity Containerized Radium

The receipt of containerized (including reinforced waste bags) radium-contaminated waste will result in small increases in annual projected doses to USEI workers but will remain within required limits. In almost all cases these materials will be received by truck. USEI has formal procedures governing the receipt and disposal operations for all wastes with a radiological content. ERMP-01 is the receipt procedure that will be used for controlling the receipt of radium-contaminated waste, and contains charts that visually depict exposure level versus radium concentration. This procedure was modified to support this proposed Class 2 modification at both the RTF and Main disposal facility. Microshield projects exposure levels to be 3.4 mR per hour on contact and 0.72 mR per hour at one meter from reinforced bags containing 4 cubic meters (141 cubic feet) of filtration material loaded to the maximum concentration, of 1,500 pCi/g, (see Appendix 1 for Microshield calculations). The above mentioned control charts will be used to verify radium concentrations meet USEI's waste acceptance criteria.

Packaging - To reduce the potential for waste spillage or contamination, all ^{226}Ra received at concentrations above 500 pCi/g must be packaged in a robust IP-1 qualified container such as a steel container (B25 box or steel drum), or a robust transport bag or container that has been reinforced with a strong and impermeable liner (heavy gauge HDPE, PVC or similar) and a sealed closure device or system (e.g., the transport bag's integrated system of flaps and straps) that will significantly reduce the potential for accidental breakage, spillage, or release of materials.

Visual Inspection - ^{226}Ra decays to ^{222}Rn , a radioactive, noble gas. ^{222}Rn ($T_{1/2} = 3.8\text{d}$) subsequently decays to other radioactive elements. Radon can diffuse through plastic and woven fabrics. As it diffuses, some of the Radon will decay to its radioactive progeny, which will attach to any materials available. Over time, these radioactive progeny can potentially result in higher levels of external contamination on bags containing ^{226}Ra . In the recent past, USEI has observed some elevated contamination levels on shipments of water treatment media shipped in bags. These infrequent elevated contamination levels and estimated projected levels of radioactive progeny will not exceed USDOT limits and have not contributed to elevated contamination levels on site.

Consistent with the ALARA principle, USEI proposes a slightly modified visual inspection to verify compliance with the facility's fill and liquids requirements. As part of the permit modification, USEI will require all higher-activity Radium waste packages received to include a sealed, clear, inner liner (10 mil clear HDPE or similar). This inner liner will be sealed by the generator prior to shipment. USEI will open the outer package (reinforced bag or steel container) to observe the clear inner liner system. A visual inspection of the waste can be conducted without opening the inner liner, thereby, reducing a potential for contamination release while fill and liquid visual inspections are performed.

To determine the estimated dose to USEI workers for the proposed limit of 1500 pCi/g for Radium, it is assumed these packages remain sealed and an external dose is the primary dose of concern. Receipt and disposal procedures have been reduced to three primary functions per full truckload (which typically is 5 to 6 packages). These functions are: (1) off loading from the transport vehicle and loading onto a USEI vehicle for transport into the disposal cell; (2) transport and off-loading in the disposal cell; and (3) radiological surveys of the container while on the staging pad and are further discussed below.

- (1) USEI employees will off-load containers by fork lift or other remote means depending on the weight of the containers. Observations indicate approximately 20 minutes are required to remove a container from the transport vehicle and place it in the landfill, on to a site vehicle, or staging pad. Assuming each container is approximately one meter from the fork lift operator, the anticipated dose to the employee while transloading one of these shipments is estimated to be approximately 0.36 mrem.
- (2) Once the packages are loaded onto the transfer vehicle, observations indicate approximately five minutes is required to transport the waste to the cell and approximately ten minutes is required to off load and landfill the packages. The anticipated dose to the employee while transporting the packages is estimated to be approximately 0.36 mrem.
- (3) Operators conducting required radiological and dose rate surveys and swipe tests are closest to the package; therefore, within the highest radiation field. Observations indicate less than thirty minutes is required to perform swipe and dose rates surveys on each truck load (4-5 containers per truck load); therefore, the anticipated dose to an employee performing radiological and dose rate surveys and swipe tests per shipment is estimated to be approximately 0.37mrem.

Thus, calculated dose estimates to USEI workers are very low and well within permitted annual dose limits. USEI will conduct real-time monitoring to confirm the operation dose estimates and assumptions as part of its required personnel dosimetry program.

Estimated Annual Volume

The annual volume of drinking water filter media having radium concentrations up to 1,500 pCi/g is estimated to be between 250-400 tons. USEI's total dose calculation indicates approximately 500 tons of material having radium concentrations 1,500 pCi/g limit. Further, USEI estimates that another 500 tons of bulk material is received having radium concentrations up to 500 pCi/g radium limit from the RTF. The estimated total dose is 40.12 millirem as shown in Table 2.

Table 2

	Estimated Total Dose per Truck Load (millirem)	Number of Truck-Loads	Sub Total (millirem)
Radium- 500 pCi/g, received at RTF	0.5146	25*	12.865
Radium- 1500 pCi/g received at Facility	1.09	25*	27.25
		Total	40.12

*Assumes each truck load contains 20 tons

Three workers at the site may receive 9.1 millirem each if they are involved in the receipt and transfer/disposal of all 500 tons of the material. An estimated 500 Tons of bulk material having up to 500 pCi/g radium limit is received at the RTF and trucked for disposal. Calculations indicate six workers at the RTF may receive 2.14 millirem each if they are involved in the receipt and transfer/disposal of all 500 tons of material. These dosage estimates are conservative because it is assumed that the same workers are involved with all the waste received at the upper concentration limits.

Spill Scenario

Minor spill

The most likely spill occurs when a forklift or some other sharp object comes into contact with the bag and creates a small hole in the side of the package during unloading operations. When this occurs, USEI has HDPE adhesive tape available so the USEI workers may patch the hole and repackage any spillage. The dose to USEI workers performing a minor spill clean up and patch is estimated to take less than 30 minutes and the estimated doses will be negligible.

Major spill

A major spill is extremely unlikely because of the way these materials are handled and packaged. A major spill would occur when a package is accidentally dropping from a van or flat-bed conveyance and the package is damaged and its contents spill. Although the transport containers are specifically designed to prevent bursting, if a package were to burst and dispersed its contents, the spill would be managed in accordance with USEI's Site Contingency Plan and ERMP-01 and several during and area return to use radiation surveys.

Once the clean-up is declared complete, radiation surveys will be conducted of the affected area and all personnel directly involved in the clean-up. All personnel involved and equipment used in the clean-up must meet the contamination limits specified in the Facility's Radiological Health and Safety Manual. If a determination is made that the contamination levels have not been achieved, the clean-up and/or decontamination process will continue until acceptable results are achieved.

Effect on Post-Closure Dose

The State of Idaho has rules regulating the disposal of radioactive material. These rules are enumerated in IDAPA 58.01.10. Within these regulations it is required for facilities, such as USEI, to include in their “Department-Approved” closure program “reasonable assurance that the radon emanation rate from the closed disposal unit will not exceed twenty (20) picocuries per square meter per second averaged across the entire area of the closed disposal unit. USEI will comply with this rule as demonstrated in the following text.

^{226}Ra and ^{228}Ra decay to the gaseous elements of ^{222}Rn and ^{220}Rn , respectively. These elements then decay to other radioactive elements. Since radon is a noble gas and does not react chemically, it diffuses through porous materials and mixes with air before decaying to its particulate progeny. As the half-lives of ^{222}Rn and ^{220}Rn are short, they only diffuse a fixed distance before they decay to non-gaseous elements that attach to a particle or surface due to electrostatic attraction. ^{220}Rn has a very short half-life (56 seconds) and decays to solid radioactive materials in such a short time, that the design thickness of the disposal cell’s berm and cap will assure that the $20\text{pCi}/\text{m}^2/\text{s}$ radon emanation limit will be met. The longer half-life of ^{222}Rn requires a greater delay in its diffusion towards the cell surface than that of ^{220}Rn , thus by increasing the distance the radon must diffuse will in turn inhibit its progeny from being available to deliver a dose to workers or the public.

To demonstrate the requested changes will not impact the post-closure dose, USEI has performed conservative calculations using RESRAD for concentrations of radium (^{226}Ra and/or ^{228}Ra) greater than 222 pCi/g up to 1500 pCi/g. The modeled results indicate using a six meter thick barrier such as a disposal cell cap consisting of layers of waste and backfill containing radium less than 222 pCi/g will insure a dose from the greater than 222pCi/g radium and its progeny will be indistinguishable from background levels at the surface of the completed disposal cell for the 1,000-years modeled (RESRAD dose assessment attached).

Therefore, USEI proposes to dispose of any waste stream containing ^{226}Ra or ^{228}Ra greater than 222 pCi/g at least six meters below the outermost surface of the cell’s cover. As stated above, taking these precautions will prevent the higher concentrations proposed for ^{226}Ra , ^{228}Ra and ^{210}Pb from altering the site’s predicted post-closure dose and assure that the $20\text{pCi}/\text{m}^2/\text{s}$ radon emanation limit is met.

Proposed New Table C.1

TABLE C.1: UNIMPORTANT QUANTITIES OF SOURCE MATERIAL UNIFORMLY DISPERSED* IN SOIL OR OTHER MEDIA**

	STATUS OF EQUILIBRIUM	MAXIMUM CONCENTRATION OF SOURCE MATERIAL	SUM OF CONCENTRATIONS PARENT(S) AND ALL PROGENY PRESENT***
a	Natural uranium in equilibrium with progeny	<500 ppm / 167 pCi/g (²³⁸ U activity)	≤ 3000 pCi/g
	Refined natural uranium (²³⁸ U, ²³⁵ U, ²³⁴ U, ²³⁴ Th, ^{234m} Pa, ²³¹ Th)	<500 ppm / 333 pCi/g (total U)	≤2000 pCi/g
	Depleted Uranium (²³⁴ Th, ^{234m} Pa)	<500 ppm / 167 pCi/g (²³⁸ U activity)	≤2000 pCi/g
b	Natural thorium (²³² Th- + ²²⁸ Th)	<500 ppm / 110 pCi/g	≤2000 pCi/g
	²³⁰ Th in equilibrium with progeny	0.01 ppm / 200 pCi/g	≤2000 pCi/g
	²³⁰ Th (with no progeny)	0.1 ppm / ≤2000 pCi/g	
	Any mixture of Thorium and Uranium	Sum of ratios ≤ 1****	≤3000 pCi/g

Proposed New Table C.2

TABLE C.2: NATURALLY OCCURRING RADIOACTIVE MATERIAL OTHER THAN URANIUM AND THORIUM UNIFORMLY DISPERSED* IN SOIL OR OTHER MEDIA**

	STATUS OF EQUILIBRIUM	MAXIMUM CONCENTRATION OF PARENT NUCLIDES	SUM OF CONCENTRATIONS OF PARENT AND ALL PROGENY PRESENT***
a	²²⁶ Ra and ²²⁸ Ra with progeny in bulk form ¹	500 pCi/g	4,500 pCi/g
b	²²⁶ Ra and ²²⁸ Ra with progeny in reinforced IP-1 containers ¹	1500 pCi/g	13,500 pCi/g
c	²¹⁰ Pb with progeny (Bi-210 & Po-210) uncontained form	1500 pCi/g	4500 pCi/g
	⁴⁰ K	818 pCi/g	N/A
	Any other NORM		≤3000 pCi/g

¹Any material containing ²²⁶Ra greater than 222 pCi/g shall be disposed at least 6 meters from the nearest external point on the completed cell.

Landfill Operations

As described in the previous section, wastes containing ^{226}Ra and ^{228}Ra in excess of 222 PCi/g will be placed at least six meters from the outermost surface of the disposal cell as shown in Figure 4-4.

Disposal cells are filled sequentially using layers called “lifts.” Each lift is comprised of waste or backfill that is emplaced and compacted.. The lifts are laid somewhat evenly and as level. At any one time, there may be several operating levels, each comprised of several lifts, within a disposal cell. These operating lifts are created for a variety of reasons including to provide temporary access paths, waste stockpiles, or to meet waste placement and segregation requirements similar to those contemplated for ^{226}Ra and ^{228}Ra . To keep ^{226}Ra and ^{228}Ra at least six meter from the disposal cell’s surface and to accommodate multiple operating levels, an effective procedure will be used in conjunction with USEI’s waste tracking system.

USEI tracks waste placement in each disposal cells using an alpha-numeric system that identifies individual grids where waste is placed as documented in ERMP-04, “Landfill Operations.” USEI will amend ERMP-04, “Landfill Operations,” to include additional controls to achieve a six-meter separation. These control methods include setting two new concrete survey benchmarks at the four corners of the disposal cell totaling eight new benchmarks. Each benchmark will be maintained for the life of the disposal cell. These benchmarks will be offset 50 feet from each disposal cell’s corner. Each benchmark will have a center post that will be visible from an adjacent benchmark. Operators sighting along the center posts will be able to achieve an accurate alignment for the X- and Y-axes and will be able to identify the disposal cell’s centerlines and “tic marks” for each grid. Attached are plan view, and profile drawings that represent USEI trench location markers. These drawings will be included in ERMP-04, Landfill operations.

Once a location within the disposal cell has been identified as an area where wastes containing ^{226}Ra and ^{228}Ra having an excess of 222 PCi/g will be placed, USEI will designate an acceptable ^{226}Ra and ^{228}Ra disposal footprint within the cell’s storage volume. To establish the acceptable ^{226}Ra and ^{228}Ra disposal footprint, the longitudinal and lateral center lines of the disposal cell will be determined and identified on the disposal cell. These center lines will enable USEI operators to measure one-half of the cell’s length and width for an associated depth from the centerlines to identify the edge of the ^{226}Ra and ^{228}Ra having an excess of 222 PCi/g disposal footprint with stakes, pin flags, or other suitable implement. These boundary indicators may be offset from the boundary to avoid construction equipment operators from damaging or accidentally removing the boundary indicators during disposal operations. USEI operators will use these boundary indicators to place the ^{226}Ra and ^{228}Ra materials having an excess of 222 PCi/g.

Once the disposal area, or footprint, for the wastes containing ^{226}Ra and ^{228}Ra in excess of 222 PCi/g has been delineated, disposal operations may commence for that lift. USEI

will monitor disposal operations to ensure these waste materials are not emplaced beyond their delineated acceptable boundaries. Monitoring will consist of visual inspections from the edge of the disposal cell, use of split-view right angle prisms by the equipment operators, or other means approved by USEI management. To maximize disposal cell storage, USEI will delineate a new acceptable ^{226}Ra and ^{228}Ra having an excess of 222 pCi/g footprint approximately every five feet of elevation gain. This process will continue until the wastes containing ^{226}Ra and ^{228}Ra in excess of 222 pCi/g reach an uppermost limit of being within six meters below the outermost surface of the disposal cell's cap. Waste placement within landfill is documented on USEI's work order, which is part of the facility's operating record.

Proposed New Table C.4b

On October 1st of 2007 the NRC published its new and final rule which amended the definition of Byproduct Material. This new rule addresses how particle accelerators are operated and the conditions under which the NRC exercises licensing authority over accelerator produced by-product material. The NRC will allow a disposal facility to dispose of such material in accordance with any Federal or State solid or hazardous waste law, including the Solid Waste Disposal Act, as authorized under the Energy Policy Act of 2005, specifically 10 CFR 20.2008. The State of Idaho requires USEI to seek specific exemptions to receive and dispose of NRC regulated accelerator produced by-product material in accordance with the USEI Waste Acceptance Criteria, Table C.4.b. The newly proposed Table C.4b will allow USEI to receive and dispose of these materials under the provisions of Table C.3 of the waste acceptance criteria.

TABLE C.4B: MATERIALS SPECIFICALLY EXEMPTED BY THE NRC OR NRC AGREEMENT STATE

EXEMPTION	MATERIALS	ISOTOPE, ACTIVITY OR CONCENTRATION*
10 CFR 30.11**	BYPRODUCT MATERIAL EXEMPTED FROM NRC OR AGREEMENT STATE REGULATION BY RULE, ORDER, LICENSE, LICENSE CONDITION OR LETTER OF INTERPRETATION MAY BE ACCEPTED AS DETERMINED BY SPECIFIC NRC OR AGREEMENT STATE EXEMPTION.***	BYPRODUCT MATERIAL AT CONCENTRATIONS CONSISTENT WITH THE EXEMPTION
10 CFR 40.14**	SOURCE MATERIAL EXEMPTED FROM NRC OR AGREEMENT STATE REGULATION BY RULE, ORDER, LICENSE, LICENSE CONDITION OR LETTER OF INTERPRETATION MAY BE ACCEPTED AS DETERMINED BY SPECIFIC NRC OR AGREEMENT STATE EXEMPTION.***	SOURCE MATERIAL AT CONCENTRATIONS CONSISTENT WITH THE EXEMPTION.
10 CFR 70.17	SPECIAL NUCLEAR MATERIAL (SNM) EXEMPTED FROM NRC REGULATION BY RULE, ORDER, LICENSE, LICENSE CONDITION OR LETTER OF INTERPRETATION MAY BE ACCEPTED AS DETERMINED BY SPECIFIC NRC OR AGREEMENT STATE EXEMPTION.***	SNM AT CONCENTRATIONS CONSISTENT WITH THE EXEMPTION.

*Sum of all isotopes up to a maximum concentration of 3,000 pCi/gm. Specifically exempted production particle accelerator material may be received under Table C.3 provisions [10 CFR 20.2008 (b)].

**Also includes equivalent Agreement State regulation where applicable.

*** Similar material not regulated or licensed by the NRC may also be accepted. Sum of all isotopes up to a maximum concentration of 3,000 pCi/gm. IDEQ shall be notified prior to the receipt of Special Nuclear Material not regulated or licensed by the NRC.

Exempt Radiological Materials Procedures

Safety Assessment

The Model

The RESRAD model is a publicly available performance assessment model that allows estimation of potential radiation doses to hypothetical individuals from radioactive materials disposed below ground surface. The reference case used in previous safety assessments by US Ecology Inc. (USEI) models doses from all pathways including direct exposure, inhalation, and ingestion, through a number of pathways that describe the movement of water, vapor and gases in the environment. This simple and conservative case had been used since it was effective at demonstrating compliance in previous USEI submittals. These very conservative models demonstrated that compliance with all permit and regulatory requirements would be achieved. As noted in the RESRAD manual:

*“The models and input parameters described in this manual and incorporated into RESRAD have been chosen so as to be realistic but reasonably conservative, and the calculated doses corresponding to guideline values of the radionuclide concentrations are expected to be reasonably conservative estimates (overestimates) of the actual doses.”*¹

The RESRAD model currently incorporated into the USEI permit relies predominantly on very conservative default parameters and exposure scenarios to demonstrate compliance. This “very conservative case” approach produces hypothetical dose estimates that significantly overstate what might actually occur. A more site specific description of the physical geology, hydrology and human use parameters (home construction, water use, etc) will, for example, provide a more meaningful evaluation of potential for hypothetical doses under the RESRAD resident farmer scenario.

With the safety assessment presented in this document, USEI proposes to use the same RESRAD model employing more realistic, site specific parameters. The same 15 mrem per year radiation exposure standard for the general public set forth in IDAPA 58, Title 01, Chapter 10 and used in the current model is employed. In addition, USEI has retained the services of Mr. Eric Lappala, P.E., to develop the site-specific RESRAD parameters and evaluate the contaminated zone for this safety assessment. Mr. Lappala’s report draws heavily upon existing site hydrogeological investigations performed during the course of permitting and site development. The Lappala report is appended to and

¹ User’s Manual for RESRAD Version 6 ANL/EAD-4 by C. Yu, A.J. Zielen, J.-J. Cheng, D.J. LePoire, E. Gnanapragasam, S. Kamboj, J. Arnish, A. Wallo III,* W.A. Williams,* and H. Peterson* Environmental Assessment Division Argonne National Laboratory, 9700 South Cass Avenue, Argonne, Illinois 60439 July 2001

incorporated as a part of this safety assessment. Mr. Lappala's credentials are attached to his report.

USEI believes that these improvements based on site-specific hydrogeologic information better represent the site's behavior and the selected RESRAD parameter values better represent potential exposure scenarios. The use of site-specific information and more realistic exposure scenarios is encouraged in the RESRAD Version 6 documentation. As noted on page *xi* of the preface regarding this latest version of the RESRAD model:

"These improvements have increased RESRAD's capabilities and flexibility and enabled users to interact with the code more easily. With the improvements, the code has become more realistic in terms of the models and default parameters it uses."

Site-specific RESRAD improvements reflected in this safety assessment are as follows:

1. Refine the contaminated soil, vadose and saturated zone models to better reflect actual site conditions,
2. Refine the radon gas scenario to better reflect house construction practices consistent with construction practices in the local area,
3. Refine the aquatic (surface pond) pathway as a route of exposure to potentially exposed individuals,
4. Add additional radionuclides (e.g. fission and activation products) to provide a basis for inclusion of limits in the permit's Waste Acceptance Criteria for specified byproduct material subject to potential case by case exemptions.
5. Provide a basis for expanding the Environmental Monitoring and Occupational Monitoring Program for select radiological constituents.

USEI proposes that the improved, more site-specific RESRAD model be incorporated into its permit for purposes of evaluating future case-by-case proposals to accept source or byproduct material that has been exempted from regulation for disposal purposes by the U.S. Nuclear Regulatory Commission or its Agreement States. Acceptance of such exempt material is presently provided for in existing Idaho regulations and the permit.

Contaminated Soil, Vadose and Saturated Zone Models

The site-specific hydrogeologic properties and conditions used in the RESRAD analysis were determined using extensive site-specific information available from the many characterization reports previously submitted to the Idaho Department. This is the same information used to support the existing, recently renewed RCRA permit for the USEI facility. Specifically, hydrogeologic conditions in both the vadose and saturated zones from these reports were used to develop the necessary input parameters for RESRAD.

Site-specific conditions in the waste disposal cell needed for the RESRAD analysis were determined using information on potentially anticipated waste streams regarding waste forms, volumes, concentrations of radionuclides, co-disposed waste forms and volumes, waste emplacement and stabilization methods, and waste cover operations.

A reference case RESRAD analysis was performed using the site specific vadose zone, saturated zone, and waste cell conditions. Waste cell conditions were conservatively modeled by only taking credit for the three foot compacted natural clay liner employed at the facility. No credit is taken in the assessment for containment provided by the dual synthetic liner and leachate collection system also required as a condition of USEI's permit.

Sensitivity analyses was performed to determine the parameters for which the estimated dose was the most sensitive. These parameters are the distribution coefficient (K_D for ^{14}C , the quantity of ^{14}C in the anticipated waste stream, the RESRAD "b" parameter used of the contaminated zone (b_{CZ}), and the saturated conductivity of the contaminated zone (K_{satCZ}).

Revised Radon Pathway

RESRAD code's default radon gas scenario is not consistent with home construction practices in the rural communities of Idaho surrounding to the USEI facility. It is conservative to assume that a home would be built on disposal cells. Since deed restrictions would prevent this activity, it is most likely that no construction of any type will occur on top of closed disposal units. USEI proposes to revise the RESRAD model's default radon gas pathway scenario by replacing the assumption that houses with basements are constructed into closed trenches with the assumption that "at grade" construction is used. The city engineer for Mountain Home, ID, has indicated that the majority of homes built in this area (greater than 90% of homes built in the more populated but nearby Mountain Home area) are either slab on grade or pier on beam with a ventilated crawl space². This change in model assumptions is consistent with RESRAD guidance to use site-specific data. Accordingly, USEI's revised performance assessment models a house built on a slab directly above the waste disposal zone on top of the disposal trench. By changing the parameter for depth of a hypothetical home the foundation to 0 (slab on ground surface) from the default value of -1 meter depth, the radon emanation rate better reflects a realistic radon flux for the type of house construction common in the area. The maximum annual hypothetical dose calculated from this improved radon scenario and using the assumed concentrations requested in the Exempt Radiological Manual Procedures (ERMP) is 2.7 mrem in year 1,000.

New Radionuclides Added to the Model

² Personal communication with City Engineer, Mtn. Home, Idaho.

In USEI's permit modification of December 2001, a table of materials and items exempted by the U.S. Nuclear Regulatory Commission (USNRC) was included in the Waste Acceptance Criteria ("WAC"). This table includes generally exempted items and devices that contained small amounts of radionuclides not specifically listed in the USEI WAC. These additional radionuclides have short half-lives, large partitioning coefficients (K_d 's) or both. They would decay to insignificant levels before reaching ground water and were previously determined by the Department to be acceptable for disposal. The RESRAD analysis provided in this documentation confirmed that these radionuclides do not contribute substantively to the hypothetical dose to a resident farmer and conform to all regulatory requirements.

USEI currently provides an annual update to the assessment of disposed radiological materials. The annual reports are cumulative so that with the receipt of a radionuclide its contribution to the inventory is properly accounted for.

USEI anticipates seeking case-by-case concurrence to accept specified NRC and Agreement State exempt byproduct material containing predominantly fission and activation product radionuclides in low concentrations. Two common examples of fission and activation products are ^{137}Cs and ^{60}Co respectively. These exempt byproduct materials may also contain very small concentrations of transuranic radionuclides in physical forms similar to materials currently being received. These waste forms will include soils, concrete and building debris and similar decommissioning wastes. These wastes are expected to contain measured or analytically derived concentrations in the range of tens of pCi per gram or less of fission and activation products, and less than 0.1 pCi per gram of transuranic radionuclides. This is consistent with the doses per unit intake (inhalation and ingestions) for fission and activation product radionuclides versus transuranic radionuclides and is taken into account in the RESRAD analysis. These levels also consider the requirements for protection of workers during operations as discussed in the expanded operational monitoring program below. Worker exposures are expected to be consistent with USNRC guidance for disposal of exempt materials³.

Previous Model Input

The RESRAD model accounts for nuclides that are present in waste streams that USEI has accepted or may accept in the future. As the list of nuclides in the model has grown over the past number of years, concentrations for each nuclide in the code have been conservatively justified based on multiple assumption. Detailed explanations are found in the safety assessments that were submitted with past WAC permit modifications⁴.

³ Nureg 1757, v.1, rev.1, Consolidated Decommissioning Guidance- Decommissioning Guidance for Materials Licensees, Final Report, pp. 15-25, US Nuclear Regulatory Commission, Office of Nuclear Materials Safety and Safeguards, Washington, DC, September 2003.

⁴ September 18, 2001: "Radioactive Material Waste Acceptance Criteria"; April 12, 2005: "Waste Acceptance Criteria For Material Not Regulated by the NRC or its Agreement States for Disposal Purposes"; July 5, 2007: "Select Isotope Limits"; February 19, 2008: "10CFR70.17 Special Nuclear Material and Select Isotope Limits"

Generally speaking, concentrations for the majority of the nuclides in the model, such as Uranium, Thorium, and much of their progeny, were determined by considering the ratio of radiological material to non-radiological material received at USEI, which was roughly 0.5 but for modeling purposes the ratio that was used was 0.67. It was also assumed that the average concentration of the waste coming in would be at 75% of the WAC limits.

Modeled concentrations for fission, activation, SNM, and other select isotopes were generally selected by choosing conservative concentrations that were determined to not put USEI workers at elevated risks or cause the post closure dose limit of 15mRem to be exceeded when modeled in RESRAD.

Expanded Environmental Monitoring Program

To provide added confidence that the facility is safely isolating radioactive constituents from the biosphere, the permit modification is proposed to expand the required environmental monitoring program as follows:

Gamma spectroscopic analysis will be performed for all air, water and soil samples in addition to the current suite that consists of isotopic alpha spectroscopy for uranium and thorium radionuclides, analyses for radium, gross beta and gross alpha activity. Analysis for ^{239}Pu and ^{241}Am will be added to those radionuclides assessed using alpha spectroscopy. They will serve as the indicator radionuclide for other transuranic radionuclides as shown in Table 3-1.

Expanded Occupational Exposure Monitoring Program

USEI is currently required, under worker protection regulations, to monitor its employees for exposure to external sources of radiation using whole body dosimeters. The current method for monitoring for potential external radiation exposure (*thermo luminescent dosimeters*) is the accepted method for monitoring for doses from radioactive materials in both current and proposed wastes. Therefore, no change to the external monitoring program is considered necessary.

Alpha emitting radionuclides including transuranic alpha emitters can contribute to internal exposure if inhaled but are not significant sources of external radiation exposure. The occupational air sampling program will be expanded consistent with environmental air monitoring to include analysis for gamma-emitting radionuclides. Analysis for ^{239}Pu and ^{241}Am will also be included in the suite of analyses employed for occupational air sampling to provide sufficient assurance that transuranic radionuclides are not present in quantities sufficient to cause any internal dose of consequence.

No change is required for the contamination control program as the proposed exempt wastes will be composed of radionuclides that emit the same types of radiation that are currently monitored. The additional radionuclides will be monitored using the same equipment and procedures currently in place with the same detection limits applying.

USEI's current counting equipment meets the standard of practice in routine monitoring procedures for counting swipe samples that potentially contain alpha, beta and gamma-emitting radionuclides.

Model Summary Reports

A copy of the proposed RESRAD and the current RESRAD model summary reports are included with this safety assessment for comparison.

Based upon the upgraded RESRAD model, the maximum post-closure dose has been reduced from 13.5 mrem/yr in year 1000 to 9.8 mrem/yr in year 326.

Revised Waste Acceptance Criteria

A driving principle in the development of the revised WAC has been that the hypothetical dose to the general public and USEI employees not be increased significantly above background. Further, USEI experience has shown that these wastes can be safely received, offloaded, and disposed in accordance with all permit and regulatory requirements. This principle has been reinforced by the NRC's requirements that any materials exempted from regulation for purposes of disposal would not cause a dose of more than "a few mrem" to any individual involved in packaging, transporting and disposing of the materials⁵ Finally, USEI's proposed WAC modification retains the overall limit of 2,000 pCi/gm for the sum of the concentrations of all radionuclides in a given waste stream.

By using a concentration limit of 25 pCi/g for fission and activation product radionuclides, USEI can assure that potential doses to employees and to the general public from the receipt, processing and disposal of those radionuclides will remain within the NRC guidelines of "a few mrem". These concentrations would result in a dose to the workers approximately 3 orders of magnitude below the allowable dose for occupational exposure, assuming the individuals worked in this airborne concentration without respiratory protection for a full 2000-hour work year. Additionally, USEI workers are required to wear respirators while working in areas where waste is loaded or unloaded. These respirators provide an additional reduction in the amount of material workers could inhale by at least a factor of 10. Doses to members of the general public from the transport and disposal of these materials can also be demonstrated to be a factor of ten times less than that allowed by the U.S. Nuclear Regulatory Commission.

³H (tritium), a radioisotope of hydrogen, produces only a small amount of dose per unit activity if inhaled or ingested. As shown in the RESRAD report, a concentration of tritium of 1000 pCi/g throughout the mass of the contaminated zone will produce a maximum hypothetical dose of 3.5×10^{-4} mrem per year. In addition, tritium's relatively

⁵ Nureg 1757, v.1, rev.1, Consolidated Decommissioning Guidance- Decommissioning Guidance for Materials Licensees, Final Report, pp. 15-25, US Nuclear Regulatory Commission, Office of Nuclear Materials Safety and Safeguards, Washington, DC, September 2003.

short half-life of 12.5 years allows for substantial decay to occur before the model conservatively introduces it to the upper saturated zone. Since tritium is a radioisotope of hydrogen, it travels with water as it moves through the vadose zone. Based upon the USEI site's characteristics as modeled, water is transported to the upper saturated zone in approximately 220 years. This allows tritium to undergo 17.6 half-lives by the time it reaches that zone. In this time the concentration of tritium has been reduced to 5×10^{-4} % of its original concentration. As can be seen in the RESRAD analysis, the remaining tritium contributes an insignificant portion to the hypothetical post-closure dose. For this reason the WAC for tritium is proposed at 1000 pCi/g for byproduct material wastes.

Limits already in the WAC for the naturally occurring alpha emitting radionuclides are not proposed to change. The concentration limits for the transuranic radionuclides is proposed to be 0.1 pCi/g. USEI believes that in most instances, any transuranic radionuclides it receives will be as a minor radiological contaminant in other radiologically contaminated waste. The proposed limit for transuranic radionuclides is consistent with this expectation. At the level of 0.1 pCi/g, potential worker doses from the transuranic radionuclides are expected to be approximately one-thousandth of the allowable limit prescribed by the NRC and at least one tenth the allowable limit for dose to members of the general public. In the revised model, transuranic radionuclides contribute no post-closure dose within the model time frame of 1000 years. The maximum dose from transuranic radionuclides occurs about year 5000 and is approximately 3.6×10^{-8} mrem/yr.

Because an unanticipated radionuclide may be considered for disposal at the site, USEI proposes to amend the WAC to allow for the disposal of any particular radionuclide based upon a satisfactory demonstration that its disposal will not substantively increase the post closure dose, or cause a dose to site workers or members of the general public of more than "a few mrem". USEI seeks a permit modification to use the RESRAD analysis described in this safety assessment for that limited purpose. The demonstration shall be conditioned as described below conducted in the following manner:

1. The material must be exempted by the US Nuclear Regulatory Commission or its Agreement State, and if diffuse, shall meet the appropriate concentration limitation for the type of emission, i.e., fission and activation products, transuranic, etc.
2. The material shall be evaluated using realistic scenarios to assess hypothetical doses to site employees and members of the general public to assure they are consistent with the results reported here. Results below one-thousandth the annual occupational dose limit or one tenth the annual dose limit for members of the general public respectively will be viewed to be consistent. Materials otherwise conforming to all permit requirements and meeting this criterion will qualify for disposal.

3. If a published K_d is not obtainable, decay of the radionuclide(s) will be used and the K_d assumed to be zero to determine its concentration at the time the model predicts the material would reach ground water.
4. If at the time the material is predicted to reach ground water, its concentration, based on its half-life, is less than 0.1 pCi/g then it will be considered acceptable for disposal.
5. Any additional radionuclides accepted using this methodology will be included in the exempt waste annual report for the year it was disposed.

Corrections

In order to correct two errors, USEI proposed to change the wording in Table 4 for exemption 10 CFR 40.13(b) by removing the wording “<2000 pCi/g source material and progeny”, which does not appear in the exemption and replacing it with the words “as set forth in exemption”. Also in row one of Table 1, the ppm for natural uranium will be corrected to 422 from 211. This corrects a calculational error. Additionally, Section C.3.2 of the WAP was modified to clarify the annual assessment report requirements as well as adding a requirement to provide an annual summary report of environmental monitoring activities. Finally, the nomenclature to describe radionuclides was modified so that a common format utilizing the industry accepted practice of using superscripts (²³⁸U vs. _U-238).

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Total Dose Components	
Time = 0.000E+00	45
Time = 1.000E+00	49
Time = 3.000E+00	53
Time = 1.000E+01	57
Time = 3.000E+01	61
Time = 1.000E+02	65
Time = 3.000E+02	69
Time = 1.000E+03	73
Time = 5.000E+03	77
Dose/Source Ratios Summed Over All Pathways	81
Single Radionuclide Soil Guidelines	87
Dose Per Nuclide Summed Over All Pathways	91
Soil Concentration Per Nuclide	97

Dose Conversion Factor (and Related) Parameter Summary

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Menu	Parameter	Current Value	Default	Parameter Name
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.720E+00	6.720E+00	DCF2 (1)
B-1	Ag-108m+D	2.830E-04	2.830E-04	DCF2 (2)
B-1	Ag-110m+D	8.030E-05	8.030E-05	DCF2 (3)
B-1	Am-241	4.440E-01	4.440E-01	DCF2 (4)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2 (5)
B-1	Au-195	1.300E-05	1.300E-05	DCF2 (6)
B-1	Ba-133	7.860E-06	7.860E-06	DCF2 (7)
B-1	C-14	2.090E-06	2.090E-06	DCF2 (8)
B-1	Ca-41	1.350E-06	1.350E-06	DCF2 (9)
B-1	Cd-109	1.140E-04	1.140E-04	DCF2 (10)
B-1	Ce-144+D	3.740E-04	3.740E-04	DCF2 (11)
B-1	Cf-252	1.570E-01	1.570E-01	DCF2 (12)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2 (13)
B-1	Cm-244	2.480E-01	2.480E-01	DCF2 (15)
B-1	Cm-245	4.550E-01	4.550E-01	DCF2 (16)
B-1	Cm-246	4.510E-01	4.510E-01	DCF2 (18)
B-1	Cm-247+D	4.140E-01	4.140E-01	DCF2 (19)
B-1	Cm-248	1.650E+00	1.650E+00	DCF2 (20)
B-1	Co-57	9.070E-06	9.070E-06	DCF2 (21)
B-1	Co-60	2.190E-04	2.190E-04	DCF2 (22)
B-1	Cs-134	4.630E-05	4.630E-05	DCF2 (23)
B-1	Cs-135	4.550E-06	4.550E-06	DCF2 (24)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2 (25)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2 (26)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2 (28)
B-1	Eu-155	4.140E-05	4.140E-05	DCF2 (29)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2 (30)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2 (31)
B-1	Gd-153	2.380E-05	2.380E-05	DCF2 (32)
B-1	Ge-68+D	5.190E-05	5.190E-05	DCF2 (33)
B-1	H-3	6.400E-08	6.400E-08	DCF2 (34)
B-1	I-129	1.740E-04	1.740E-04	DCF2 (35)
B-1	K-40	1.240E-05	1.240E-05	DCF2 (36)
B-1	Mn-54	6.700E-06	6.700E-06	DCF2 (37)
B-1	Na-22	7.660E-06	7.660E-06	DCF2 (38)
B-1	Nb-93m	2.920E-05	2.920E-05	DCF2 (39)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2 (40)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2 (41)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2 (42)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2 (43)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2 (44)
B-1	Pb-210+D	2.320E-02	2.320E-02	DCF2 (45)
B-1	Pm-147	3.920E-05	3.920E-05	DCF2 (46)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2 (47)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2 (48)
B-1	Pu-240	4.290E-01	4.290E-01	DCF2 (49)
B-1	Pu-241+D	8.250E-03	8.250E-03	DCF2 (50)
B-1	Pu-242	4.110E-01	4.110E-01	DCF2 (52)
B-1	Pu-244+D	4.030E-01	4.030E-01	DCF2 (53)
B-1	Ra-226+D	8.600E-03	8.600E-03	DCF2 (54)

Dose Conversion Factor (and Related) Parameter Summary (continued)
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Menu	Parameter	Current Value	Default	Parameter Name
B-1	Ra-228+D	5.080E-03	5.080E-03	DCF2(55)
B-1	Ru-106+D	4.770E-04	4.770E-04	DCF2(56)
B-1	Sb-125+D	1.386E-05	1.386E-05	DCF2(57)
B-1	Sm-147	7.470E-02	7.470E-02	DCF2(58)
B-1	Sm-151	3.000E-05	3.000E-05	DCF2(59)
B-1	Sr-90+D	1.310E-03	1.310E-03	DCF2(60)
B-1	Tc-99	8.330E-06	8.330E-06	DCF2(61)
B-1	Th-228+D	3.450E-01	3.450E-01	DCF2(62)
B-1	Th-229+D	2.160E+00	2.160E+00	DCF2(63)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(64)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(65)
B-1	Tl-204	2.410E-06	2.410E-06	DCF2(66)
B-1	U-233	1.350E-01	1.350E-01	DCF2(67)
B-1	U-234	1.320E-01	1.320E-01	DCF2(68)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(69)
B-1	U-236	1.250E-01	1.250E-01	DCF2(70)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(71)
B-1	Zn-65	2.040E-05	2.040E-05	DCF2(72)
Dose conversion factors for ingestion, mrem/pCi:				
D-1	Ac-227+D	1.480E-02	1.480E-02	DCF3(1)
D-1	Ag-108m+D	7.620E-06	7.620E-06	DCF3(2)
D-1	Ag-110m+D	1.080E-05	1.080E-05	DCF3(3)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(4)
D-1	Am-243+D	3.630E-03	3.630E-03	DCF3(5)
D-1	Au-195	1.060E-06	1.060E-06	DCF3(6)
D-1	Ba-133	3.400E-06	3.400E-06	DCF3(7)
D-1	C-14	2.090E-06	2.090E-06	DCF3(8)
D-1	Ca-41	1.270E-06	1.270E-06	DCF3(9)
D-1	Cd-109	1.310E-05	1.310E-05	DCF3(10)
D-1	Ce-144+D	2.110E-05	2.110E-05	DCF3(11)
D-1	Cf-252	1.080E-03	1.080E-03	DCF3(12)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(13)
D-1	Cm-244	2.020E-03	2.020E-03	DCF3(15)
D-1	Cm-245	3.740E-03	3.740E-03	DCF3(16)
D-1	Cm-246	3.700E-03	3.700E-03	DCF3(18)
D-1	Cm-247+D	3.420E-03	3.420E-03	DCF3(19)
D-1	Cm-248	1.360E-02	1.360E-02	DCF3(20)
D-1	Co-57	1.180E-06	1.180E-06	DCF3(21)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(22)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(23)
D-1	Cs-135	7.070E-06	7.070E-06	DCF3(24)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(25)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(26)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(28)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(29)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(30)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(31)
D-1	Gd-153	1.170E-06	1.170E-06	DCF3(32)
D-1	Ge-68+D	1.410E-06	1.410E-06	DCF3(33)
D-1	H-3	6.400E-08	6.400E-08	DCF3(34)

Dose Conversion Factor (and Related) Parameter Summary (continued)
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Menu	Parameter	Current Value	Default	Parameter Name
D-1	I-129	2.760E-04	2.760E-04	DCF3(35)
D-1	K-40	1.860E-05	1.860E-05	DCF3(36)
D-1	Mn-54	2.770E-06	2.770E-06	DCF3(37)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(38)
D-1	Nb-93m	5.210E-07	5.210E-07	DCF3(39)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(40)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(41)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(42)
D-1	Np-237+D	4.440E-03	4.440E-03	DCF3(43)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(44)
D-1	Pb-210+D	7.270E-03	7.270E-03	DCF3(45)
D-1	Pm-147	1.050E-06	1.050E-06	DCF3(46)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(47)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(48)
D-1	Pu-240	3.540E-03	3.540E-03	DCF3(49)
D-1	Pu-241+D	6.850E-05	6.850E-05	DCF3(50)
D-1	Pu-242	3.360E-03	3.360E-03	DCF3(52)
D-1	Pu-244+D	3.320E-03	3.320E-03	DCF3(53)
D-1	Ra-226+D	1.330E-03	1.330E-03	DCF3(54)
D-1	Ra-228+D	1.440E-03	1.440E-03	DCF3(55)
D-1	Ru-106+D	2.740E-05	2.740E-05	DCF3(56)
D-1	Sb-125+D	3.647E-06	3.647E-06	DCF3(57)
D-1	Sm-147	1.850E-04	1.850E-04	DCF3(58)
D-1	Sm-151	3.890E-07	3.890E-07	DCF3(59)
D-1	Sr-90+D	1.530E-04	1.530E-04	DCF3(60)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(61)
D-1	Th-228+D	8.080E-04	8.080E-04	DCF3(62)
D-1	Th-229+D	4.030E-03	4.030E-03	DCF3(63)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(64)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(65)
D-1	Th-232	3.360E-06	3.360E-06	DCF3(66)
D-1	Tl-204	2.890E-04	2.890E-04	DCF3(67)
D-1	U-233	2.830E-04	2.830E-04	DCF3(68)
D-1	U-234	2.670E-04	2.670E-04	DCF3(69)
D-1	U-235+D	2.690E-04	2.690E-04	DCF3(70)
D-1	U-236	2.690E-04	2.690E-04	DCF3(71)
D-1	U-238+D	1.440E-05	1.440E-05	DCF3(72)
D-1	Zn-65			
D-34	Food transfer factors:			
D-34	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-34	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Ag-108m+D, plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(2,1)
D-34	Ag-108m+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(2,2)
D-34	Ag-108m+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(2,3)
D-34				
D-34	Ag-110m+D, plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(3,1)
D-34	Ag-110m+D, beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(3,2)
D-34	Ag-110m+D, milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(3,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)
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Menu	Parameter	Current Value	Default	Parameter Name
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(4,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(4,3)
D-34				
D-34	Am-243D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Am-243D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(5,2)
D-34	Am-243D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(5,3)
D-34				
D-34	Au-195 , plant/soil concentration ratio, dimensionless	1.000E-01	1.000E-01	RTF(6,1)
D-34	Au-195 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Au-195 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-05	1.000E-05	RTF(6,3)
D-34				
D-34	Ba-133 , plant/soil concentration ratio, dimensionless	5.000E-03	5.000E-03	RTF(7,1)
D-34	Ba-133 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-04	2.000E-04	RTF(7,2)
D-34	Ba-133 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-04	5.000E-04	RTF(7,3)
D-34				
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(8,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(8,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(8,3)
D-34				
D-34	Ca-41 , plant/soil concentration ratio, dimensionless	5.000E-01	5.000E-01	RTF(9,1)
D-34	Ca-41 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.600E-03	1.600E-03	RTF(9,2)
D-34	Ca-41 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-03	3.000E-03	RTF(9,3)
D-34				
D-34	Cd-109 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(10,1)
D-34	Cd-109 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	4.000E-04	4.000E-04	RTF(10,2)
D-34	Cd-109 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Ce-144D , plant/soil concentration ratio, dimensionless	2.000E-03	2.000E-03	RTF(11,1)
D-34	Ce-144D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(11,2)
D-34	Ce-144D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-05	3.000E-05	RTF(11,3)
D-34				
D-34	Cf-252 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Cf-252 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	6.000E-05	6.000E-05	RTF(12,2)
D-34	Cf-252 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	7.500E-07	7.500E-07	RTF(12,3)
D-34				
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(13,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(13,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(13,3)
D-34				
D-34	Cm-244 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(15,1)
D-34	Cm-244 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(15,2)
D-34	Cm-244 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(15,3)
D-34				
D-34	Cm-245 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(16,1)
D-34	Cm-245 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(16,2)
D-34	Cm-245 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(16,3)
D-34				
D-34	Cm-246 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(18,1)
D-34	Cm-246 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(18,2)
D-34	Cm-246 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(18,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value	Default	Parameter Name
D-34	Cm-247+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(19,1)
D-34	Cm-247+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(19,2)
D-34	Cm-247+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(19,3)
D-34				
D-34	Cm-248 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(20,1)
D-34	Cm-248 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(20,2)
D-34	Cm-248 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(20,3)
D-34				
D-34	Co-57 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(21,1)
D-34	Co-57 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(21,2)
D-34	Co-57 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(21,3)
D-34				
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(22,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(22,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(22,3)
D-34				
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(23,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(23,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(23,3)
D-34				
D-34	Cs-135 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(24,1)
D-34	Cs-135 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(24,2)
D-34	Cs-135 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(24,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(25,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(25,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(25,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(26,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(26,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(26,3)
D-34				
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(28,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(28,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(28,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(29,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(29,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(29,3)
D-34				
D-34	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(30,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(30,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(30,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(31,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(31,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(31,3)
D-34				
D-34	Gd-153 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(32,1)
D-34	Gd-153 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(32,2)
D-34	Gd-153 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(32,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: HEAST 1995 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Ge-68D , plant/soil concentration ratio, dimensionless	4.000E-01	4.000E-01	RTF(33,1)
D-34	Ge-68D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-01	2.000E-01	RTF(33,2)
D-34	Ge-68D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(33,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(34,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(34,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(34,3)
D-34				
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(35,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(35,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(35,3)
D-34				
D-34	K-40 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(36,1)
D-34	K-40 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(36,2)
D-34	K-40 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	7.000E-03	7.000E-03	RTF(36,3)
D-34				
D-34	Mn-54 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(37,1)
D-34	Mn-54 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-04	5.000E-04	RTF(37,2)
D-34	Mn-54 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(37,3)
D-34				
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(38,1)
D-34	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(38,2)
D-34	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(38,3)
D-34				
D-34	Nb-93m , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(39,1)
D-34	Nb-93m , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(39,2)
D-34	Nb-93m , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(39,3)
D-34				
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(40,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(40,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(40,3)
D-34				
D-34	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(41,1)
D-34	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(41,2)
D-34	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(41,3)
D-34				
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(42,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(42,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(42,3)
D-34				
D-34	Np-237D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(43,1)
D-34	Np-237D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(43,2)
D-34	Np-237D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(43,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(44,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(44,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(44,3)
D-34				
D-34	Pb-210D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(45,1)
D-34	Pb-210D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(45,2)
D-34	Pb-210D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(45,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value	Default	Parameter Name
D-34	Pm-147 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(46,1)
D-34	Pm-147 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(46,2)
D-34	Pm-147 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(46,3)
D-34				
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(47,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(47,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(47,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(48,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(48,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(48,3)
D-34				
D-34	Pu-240 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(49,1)
D-34	Pu-240 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(49,2)
D-34	Pu-240 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(49,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(50,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(50,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(50,3)
D-34				
D-34	Pu-242 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(52,1)
D-34	Pu-242 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(52,2)
D-34	Pu-242 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(52,3)
D-34				
D-34	Pu-244+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(53,1)
D-34	Pu-244+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(53,2)
D-34	Pu-244+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(53,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(54,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(54,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(54,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(55,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(55,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(55,3)
D-34				
D-34	Ru-106+D , plant/soil concentration ratio, dimensionless	3.000E-02	3.000E-02	RTF(56,1)
D-34	Ru-106+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(56,2)
D-34	Ru-106+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.300E-06	3.300E-06	RTF(56,3)
D-34				
D-34	Sb-125+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(57,1)
D-34	Sb-125+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(57,2)
D-34	Sb-125+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-04	1.000E-04	RTF(57,3)
D-34				
D-34	Sm-147 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(58,1)
D-34	Sm-147 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(58,2)
D-34	Sm-147 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(58,3)
D-34				
D-34	Sm-151 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(59,1)
D-34	Sm-151 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(59,2)
D-34	Sm-151 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(59,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: HEAST 1995 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF (60,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF (60,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF (60,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF (61,1)
D-34	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF (61,2)
D-34	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF (61,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF (62,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF (62,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF (62,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF (63,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF (63,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF (63,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF (64,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF (64,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF (64,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF (65,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF (65,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF (65,3)
D-34				
D-34	Tl-204 , plant/soil concentration ratio, dimensionless	2.000E-01	2.000E-01	RTF (66,1)
D-34	Tl-204 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF (66,2)
D-34	Tl-204 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-03	3.000E-03	RTF (66,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF (67,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF (67,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF (67,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF (68,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF (68,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF (68,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF (69,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF (69,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF (69,3)
D-34				
D-34	U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF (70,1)
D-34	U-236 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF (70,2)
D-34	U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF (70,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF (71,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF (71,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF (71,3)
D-34				
D-34	Zn-65 , plant/soil concentration ratio, dimensionless	4.000E-01	4.000E-01	RTF (72,1)
D-34	Zn-65 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-01	1.000E-01	RTF (72,2)
D-34	Zn-65 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF (72,3)

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: HEAST 1995 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D, fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5	Ag-108m+D, fish	5.000E+00	5.000E+00	BIOFAC(2,1)
D-5	Ag-108m+D, crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(2,2)
D-5	Ag-110m+D, fish	5.000E+00	5.000E+00	BIOFAC(3,1)
D-5	Ag-110m+D, crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(3,2)
D-5	Am-241, fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Am-241, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5	Am-243+D, fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Am-243+D, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(5,2)
D-5	Au-195, fish	3.500E+01	3.500E+01	BIOFAC(6,1)
D-5	Au-195, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5	Ba-133, fish	4.000E+00	4.000E+00	BIOFAC(7,1)
D-5	Ba-133, crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(7,2)
D-5	C-14, fish	5.000E+04	5.000E+04	BIOFAC(8,1)
D-5	C-14, crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(8,2)
D-5	Ca-41, fish	1.000E+03	1.000E+03	BIOFAC(9,1)
D-5	Ca-41, crustacea and mollusks	3.300E+02	3.300E+02	BIOFAC(9,2)
D-5	Cd-109, fish	2.000E+02	2.000E+02	BIOFAC(10,1)
D-5	Cd-109, crustacea and mollusks	2.000E+03	2.000E+03	BIOFAC(10,2)
D-5	Ce-144+D, fish	3.000E+01	3.000E+01	BIOFAC(11,1)
D-5	Ce-144+D, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(11,2)
D-5	Cf-252, fish	2.500E+01	2.500E+01	BIOFAC(12,1)
D-5	Cf-252, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)
D-5	Cm-243, fish	3.000E+01	3.000E+01	BIOFAC(13,1)
D-5	Cm-243, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(13,2)
D-5	Cm-244, fish	3.000E+01	3.000E+01	BIOFAC(15,1)
D-5	Cm-244, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(15,2)
D-5	Cm-245, fish	3.000E+01	3.000E+01	BIOFAC(16,1)
D-5	Cm-245, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(16,2)
D-5	Cm-246, fish	3.000E+01	3.000E+01	BIOFAC(18,1)
D-5	Cm-246, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(18,2)
D-5	Cm-247+D, fish	3.000E+01	3.000E+01	BIOFAC(19,1)
D-5	Cm-247+D, crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(19,2)

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: HEAST 1995 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Cm-248 , fish	3.000E+01	3.000E+01	BIOFAC(20,1)
D-5	Cm-248 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(20,2)
D-5				
D-5	Co-57 , fish	3.000E+02	3.000E+02	BIOFAC(21,1)
D-5	Co-57 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(21,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(22,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(22,2)
D-5				
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(23,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(23,2)
D-5				
D-5	Cs-135 , fish	2.000E+03	2.000E+03	BIOFAC(24,1)
D-5	Cs-135 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(24,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(25,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(25,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(26,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(26,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(28,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(28,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(29,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(29,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(30,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(30,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(31,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(31,2)
D-5				
D-5	Gd-153 , fish	2.500E+01	2.500E+01	BIOFAC(32,1)
D-5	Gd-153 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(32,2)
D-5				
D-5	Ge-68+D , fish	4.000E+03	4.000E+03	BIOFAC(33,1)
D-5	Ge-68+D , crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(33,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(34,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(34,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(35,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(35,2)
D-5				
D-5	K-40 , fish	1.000E+03	1.000E+03	BIOFAC(36,1)
D-5	K-40 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(36,2)
D-5				
D-5	Mn-54 , fish	4.000E+02	4.000E+02	BIOFAC(37,1)
D-5	Mn-54 , crustacea and mollusks	9.000E+04	9.000E+04	BIOFAC(37,2)
D-5				

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: HEAST 1995 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC (38,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC (38,2)
D-5				
D-5	Nb-93m , fish	3.000E+02	3.000E+02	BIOFAC (39,1)
D-5	Nb-93m , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (39,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC (40,1)
D-5	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (40,2)
D-5				
D-5	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC (41,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (41,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC (42,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (42,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC (43,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC (43,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC (44,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC (44,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC (45,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (45,2)
D-5				
D-5	Pm-147 , fish	3.000E+01	3.000E+01	BIOFAC (46,1)
D-5	Pm-147 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC (46,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC (47,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (47,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC (48,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (48,2)
D-5				
D-5	Pu-240 , fish	3.000E+01	3.000E+01	BIOFAC (49,1)
D-5	Pu-240 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (49,2)
D-5				
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC (50,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (50,2)
D-5				
D-5	Pu-242 , fish	3.000E+01	3.000E+01	BIOFAC (52,1)
D-5	Pu-242 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (52,2)
D-5				
D-5	Pu-244+D , fish	3.000E+01	3.000E+01	BIOFAC (53,1)
D-5	Pu-244+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC (53,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC (54,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC (54,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC (55,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC (55,2)
D-5				

Dose Conversion Factor (and Related) Parameter Summary (continued)

File: HEAST 1995 Morbidity

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Ru-106+D , fish	1.000E+01	1.000E+01	BIOFAC(56,1)
D-5	Ru-106+D , crustacea and mollusks	3.000E+02	3.000E+02	BIOFAC(56,2)
D-5				
D-5	Sb-125+D , fish	1.000E+02	1.000E+02	BIOFAC(57,1)
D-5	Sb-125+D , crustacea and mollusks	1.000E+01	1.000E+01	BIOFAC(57,2)
D-5				
D-5	Sm-147 , fish	2.500E+01	2.500E+01	BIOFAC(58,1)
D-5	Sm-147 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(58,2)
D-5				
D-5	Sm-151 , fish	2.500E+01	2.500E+01	BIOFAC(59,1)
D-5	Sm-151 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(59,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(60,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(60,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(61,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(61,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(62,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(62,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(63,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(63,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(64,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(64,2)
D-5				
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(65,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(65,2)
D-5				
D-5	Tl-204 , fish	1.000E+04	1.000E+04	BIOFAC(66,1)
D-5	Tl-204 , crustacea and mollusks	1.500E+04	1.500E+04	BIOFAC(66,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(67,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(67,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(68,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(68,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(69,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(69,2)
D-5				
D-5	U-236 , fish	1.000E+01	1.000E+01	BIOFAC(70,1)
D-5	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(70,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(71,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(71,2)
D-5				
D-5	Zn-65 , fish	1.000E+03	1.000E+03	BIOFAC(72,1)
D-5	Zn-65 , crustacea and mollusks	1.000E+04	1.000E+04	BIOFAC(72,2)

Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	8.822E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.360E+01	2.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	5.820E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	2.500E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	5.000E+03	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	3.200E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ag-108m	2.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ag-110m	2.500E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Am-241	1.000E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Am-243	1.000E-01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Au-195	1.000E+02	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Ba-133	2.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): C-14	1.000E+01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Ca-41	2.500E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Cd-109	2.500E+01	0.000E+00	---	S1(10)
R012	Initial principal radionuclide (pCi/g): Ce-144	2.500E+01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): Cf-252	1.000E-01	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): Cm-243	1.000E-01	0.000E+00	---	S1(13)
R012	Initial principal radionuclide (pCi/g): Cm-244	1.000E-01	0.000E+00	---	S1(15)
R012	Initial principal radionuclide (pCi/g): Cm-245	1.000E-01	0.000E+00	---	S1(16)
R012	Initial principal radionuclide (pCi/g): Cm-246	1.000E-01	0.000E+00	---	S1(18)
R012	Initial principal radionuclide (pCi/g): Cm-247	1.000E-01	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): Co-57	1.000E-01	0.000E+00	---	S1(21)
R012	Initial principal radionuclide (pCi/g): Co-60	2.500E+01	0.000E+00	---	S1(22)
R012	Initial principal radionuclide (pCi/g): Cs-134	2.500E+01	0.000E+00	---	S1(23)
R012	Initial principal radionuclide (pCi/g): Cs-135	2.500E+01	0.000E+00	---	S1(24)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.500E+01	0.000E+00	---	S1(25)
R012	Initial principal radionuclide (pCi/g): Eu-152	2.500E+01	0.000E+00	---	S1(26)
R012	Initial principal radionuclide (pCi/g): Eu-154	2.500E+01	0.000E+00	---	S1(28)
R012	Initial principal radionuclide (pCi/g): Eu-155	2.500E+01	0.000E+00	---	S1(29)
R012	Initial principal radionuclide (pCi/g): Fe-55	2.500E+01	0.000E+00	---	S1(30)
R012	Initial principal radionuclide (pCi/g): Gd-152	2.500E+01	0.000E+00	---	S1(31)
R012	Initial principal radionuclide (pCi/g): Gd-153	2.500E+01	0.000E+00	---	S1(32)
R012	Initial principal radionuclide (pCi/g): Ge-68	2.500E+01	0.000E+00	---	S1(33)
R012	Initial principal radionuclide (pCi/g): H-3	1.000E+03	0.000E+00	---	S1(34)
R012	Initial principal radionuclide (pCi/g): I-129	1.000E-02	0.000E+00	---	S1(35)
R012	Initial principal radionuclide (pCi/g): K-40	8.000E+02	0.000E+00	---	S1(36)
R012	Initial principal radionuclide (pCi/g): Mn-54	2.500E+01	0.000E+00	---	S1(37)
R012	Initial principal radionuclide (pCi/g): Na-22	2.500E+01	0.000E+00	---	S1(38)
R012	Initial principal radionuclide (pCi/g): Nb-93m	2.500E+01	0.000E+00	---	S1(39)
R012	Initial principal radionuclide (pCi/g): Nb-94	2.500E+01	0.000E+00	---	S1(40)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User	Used by RESRAD	Parameter Name
		Input	Default (If different from user input)	
R012	Initial principal radionuclide (pCi/g): Ni-59	2.500E+01	0.000E+00	S1(41)
R012	Initial principal radionuclide (pCi/g): Ni-63	2.500E+01	0.000E+00	S1(42)
R012	Initial principal radionuclide (pCi/g): Np-237	1.000E-01	0.000E+00	S1(43)
R012	Initial principal radionuclide (pCi/g): Pa-231	3.200E+00	0.000E+00	S1(44)
R012	Initial principal radionuclide (pCi/g): Pb-210	3.330E+02	0.000E+00	S1(45)
R012	Initial principal radionuclide (pCi/g): Pm-147	2.500E+01	0.000E+00	S1(46)
R012	Initial principal radionuclide (pCi/g): Pu-238	1.000E-01	0.000E+00	S1(47)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.000E-01	0.000E+00	S1(48)
R012	Initial principal radionuclide (pCi/g): Pu-240	1.000E-01	0.000E+00	S1(49)
R012	Initial principal radionuclide (pCi/g): Pu-241	1.000E-01	0.000E+00	S1(50)
R012	Initial principal radionuclide (pCi/g): Pu-242	1.000E-01	0.000E+00	S1(52)
R012	Initial principal radionuclide (pCi/g): Pu-244	1.000E-01	0.000E+00	S1(53)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.120E+02	0.000E+00	S1(54)
R012	Initial principal radionuclide (pCi/g): Ra-228	2.800E+01	0.000E+00	S1(55)
R012	Initial principal radionuclide (pCi/g): Ru-106	2.500E+01	0.000E+00	S1(56)
R012	Initial principal radionuclide (pCi/g): Sb-125	2.500E+01	0.000E+00	S1(57)
R012	Initial principal radionuclide (pCi/g): Sm-147	2.500E+01	0.000E+00	S1(58)
R012	Initial principal radionuclide (pCi/g): Sm-151	2.500E+01	0.000E+00	S1(59)
R012	Initial principal radionuclide (pCi/g): Sr-90	2.500E+01	0.000E+00	S1(60)
R012	Initial principal radionuclide (pCi/g): Tc-99	1.000E+00	0.000E+00	S1(61)
R012	Initial principal radionuclide (pCi/g): Th-228	2.800E+01	0.000E+00	S1(62)
R012	Initial principal radionuclide (pCi/g): Th-229	2.800E+01	0.000E+00	S1(63)
R012	Initial principal radionuclide (pCi/g): Th-230	8.300E+01	0.000E+00	S1(64)
R012	Initial principal radionuclide (pCi/g): Th-232	2.800E+01	0.000E+00	S1(65)
R012	Initial principal radionuclide (pCi/g): Tl-204	2.500E+01	0.000E+00	S1(66)
R012	Initial principal radionuclide (pCi/g): U-233	3.300E+00	0.000E+00	S1(67)
R012	Initial principal radionuclide (pCi/g): U-234	8.300E+01	0.000E+00	S1(68)
R012	Initial principal radionuclide (pCi/g): U-235	3.200E+00	0.000E+00	S1(69)
R012	Initial principal radionuclide (pCi/g): U-236	3.200E+00	0.000E+00	S1(70)
R012	Initial principal radionuclide (pCi/g): U-238	8.300E+01	0.000E+00	S1(71)
R012	Initial principal radionuclide (pCi/g): Zn-65	2.500E+01	0.000E+00	S1(72)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	W1(1)
R012	Concentration in groundwater (pCi/L): Ag-108m	not used	0.000E+00	W1(2)
R012	Concentration in groundwater (pCi/L): Ag-110m	not used	0.000E+00	W1(3)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	W1(4)
R012	Concentration in groundwater (pCi/L): Am-243	not used	0.000E+00	W1(5)
R012	Concentration in groundwater (pCi/L): Au-195	not used	0.000E+00	W1(6)
R012	Concentration in groundwater (pCi/L): Ba-133	not used	0.000E+00	W1(7)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	W1(8)
R012	Concentration in groundwater (pCi/L): Ca-41	not used	0.000E+00	W1(9)
R012	Concentration in groundwater (pCi/L): Cd-109	not used	0.000E+00	W1(10)
R012	Concentration in groundwater (pCi/L): Ce-144	not used	0.000E+00	W1(11)
R012	Concentration in groundwater (pCi/L): Cf-252	not used	0.000E+00	W1(12)
R012	Concentration in groundwater (pCi/L): Cm-243	not used	0.000E+00	W1(13)
R012	Concentration in groundwater (pCi/L): Cm-244	not used	0.000E+00	W1(15)
R012	Concentration in groundwater (pCi/L): Cm-245	not used	0.000E+00	W1(16)
R012	Concentration in groundwater (pCi/L): Cm-246	not used	0.000E+00	W1(18)
R012	Concentration in groundwater (pCi/L): Cm-247	not used	0.000E+00	W1(19)
R012	Concentration in groundwater (pCi/L): Co-57	not used	0.000E+00	W1(21)
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	W1(22)
R012	Concentration in groundwater (pCi/L): Cs-134	not used	0.000E+00	W1(23)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R012	Concentration in groundwater (pCi/L): Cs-135	not used	0.000E+00	---	W1(24)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(25)
R012	Concentration in groundwater (pCi/L): Eu-152	not used	0.000E+00	---	W1(26)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(28)
R012	Concentration in groundwater (pCi/L): Eu-155	not used	0.000E+00	---	W1(29)
R012	Concentration in groundwater (pCi/L): Fe-55	not used	0.000E+00	---	W1(30)
R012	Concentration in groundwater (pCi/L): Gd-152	not used	0.000E+00	---	W1(31)
R012	Concentration in groundwater (pCi/L): Gd-153	not used	0.000E+00	---	W1(32)
R012	Concentration in groundwater (pCi/L): Ge-68	not used	0.000E+00	---	W1(33)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(34)
R012	Concentration in groundwater (pCi/L): I-129	not used	0.000E+00	---	W1(35)
R012	Concentration in groundwater (pCi/L): K-40	not used	0.000E+00	---	W1(36)
R012	Concentration in groundwater (pCi/L): Mn-54	not used	0.000E+00	---	W1(37)
R012	Concentration in groundwater (pCi/L): Na-22	not used	0.000E+00	---	W1(38)
R012	Concentration in groundwater (pCi/L): Nb-93m	not used	0.000E+00	---	W1(39)
R012	Concentration in groundwater (pCi/L): Nb-94	not used	0.000E+00	---	W1(40)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(41)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(42)
R012	Concentration in groundwater (pCi/L): Np-237	not used	0.000E+00	---	W1(43)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(44)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(45)
R012	Concentration in groundwater (pCi/L): Pm-147	not used	0.000E+00	---	W1(46)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(47)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(48)
R012	Concentration in groundwater (pCi/L): Pu-240	not used	0.000E+00	---	W1(49)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(50)
R012	Concentration in groundwater (pCi/L): Pu-242	not used	0.000E+00	---	W1(52)
R012	Concentration in groundwater (pCi/L): Pu-244	not used	0.000E+00	---	W1(53)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(54)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(55)
R012	Concentration in groundwater (pCi/L): Ru-106	not used	0.000E+00	---	W1(56)
R012	Concentration in groundwater (pCi/L): Sb-125	not used	0.000E+00	---	W1(57)
R012	Concentration in groundwater (pCi/L): Sm-147	not used	0.000E+00	---	W1(58)
R012	Concentration in groundwater (pCi/L): Sm-151	not used	0.000E+00	---	W1(59)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(60)
R012	Concentration in groundwater (pCi/L): Tc-99	not used	0.000E+00	---	W1(61)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(62)
R012	Concentration in groundwater (pCi/L): Th-229	not used	0.000E+00	---	W1(63)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(64)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(65)
R012	Concentration in groundwater (pCi/L): Tl-204	not used	0.000E+00	---	W1(66)
R012	Concentration in groundwater (pCi/L): U-233	not used	0.000E+00	---	W1(67)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(68)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(69)
R012	Concentration in groundwater (pCi/L): U-236	not used	0.000E+00	---	W1(70)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(71)
R012	Concentration in groundwater (pCi/L): Zn-65	not used	0.000E+00	---	W1(72)
	Cover depth (m)	3.600E+00	0.000E+00	---	COVER0
	Density of cover material (g/cm ³)	1.780E+00	1.500E+00	---	DENSCV
	Cover depth erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCV

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	7.500E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.840E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	4.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone field capacity	4.000E-01	2.000E-01	---	FCSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.500E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.000E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	5	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.630E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	5.200E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	1.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	4.500E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.100E+01	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.500E-02	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	4.600E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.690E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	3.400E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	3.300E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, field capacity	7.000E-02	2.000E-01	---	FCUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	2.000E+00	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	2.200E+03	1.000E+01	---	HCUZ(2)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 3, thickness (m)	2.130E+01	0.000E+00	---	H(3)
R015	Unsat. zone 3, soil density (g/cm**3)	1.300E+00	1.500E+00	---	DENSUZ(3)
R015	Unsat. zone 3, total porosity	5.200E-01	4.000E-01	---	TPUZ(3)
R015	Unsat. zone 3, effective porosity	4.000E-01	2.000E-01	---	EPUZ(3)
R015	Unsat. zone 3, field capacity	4.900E-01	2.000E-01	---	FCUZ(3)
R015	Unsat. zone 3, soil-specific b parameter	3.000E+00	5.300E+00	---	BUZ(3)
R015	Unsat. zone 3, hydraulic conductivity (m/yr)	9.000E+02	1.000E+01	---	HCUZ(3)
R015	Unsat. zone 4, thickness (m)	1.680E+01	0.000E+00	---	H(4)
R015	Unsat. zone 4, soil density (g/cm**3)	1.310E+00	1.500E+00	---	DENSUZ(4)
R015	Unsat. zone 4, total porosity	4.900E-01	4.000E-01	---	TPUZ(4)
R015	Unsat. zone 4, effective porosity	4.300E-01	2.000E-01	---	EPUZ(4)
R015	Unsat. zone 4, field capacity	4.800E-01	2.000E-01	---	FCUZ(4)
R015	Unsat. zone 4, soil-specific b parameter	5.000E+00	5.300E+00	---	BUZ(4)
R015	Unsat. zone 4, hydraulic conductivity (m/yr)	6.000E+01	1.000E+01	---	HCUZ(4)
R015	Unsat. zone 5, thickness (m)	1.220E+01	0.000E+00	---	H(5)
R015	Unsat. zone 5, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(5)
R015	Unsat. zone 5, total porosity	5.200E-01	4.000E-01	---	TPUZ(5)
R015	Unsat. zone 5, effective porosity	1.500E-01	2.000E-01	---	EPUZ(5)
R015	Unsat. zone 5, field capacity	3.200E-01	2.000E-01	---	FCUZ(5)
R015	Unsat. zone 5, soil-specific b parameter	8.000E+00	5.300E+00	---	BUZ(5)
R015	Unsat. zone 5, hydraulic conductivity (m/yr)	1.000E-01	1.000E+01	---	HCUZ(5)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCU(1,1)
R016	Unsat. zone 2 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,2)
R016	Unsat. zone 3 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,3)
R016	Unsat. zone 4 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,4)
R016	Unsat. zone 5 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,5)
R016	Saturated zone (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.826E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ag-108m				
R016	Contaminated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.800E+02	0.000E+00	---	DCNUCU(2,1)
R016	Unsat. zone 2 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,2)
R016	Unsat. zone 3 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,3)
R016	Unsat. zone 4 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,4)
R016	Unsat. zone 5 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,5)
R016	Saturated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.910E-05	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ag-110m				
R016	Contaminated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCC (3)
R016	Unsaturated zone 1 (cm**3/g)	1.800E+02	0.000E+00	---	DCNUCU (3,1)
R016	Unsaturated zone 2 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,2)
R016	Unsaturated zone 3 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,3)
R016	Unsaturated zone 4 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,4)
R016	Unsaturated zone 5 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,5)
R016	Saturated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCS (3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.910E-05	ALEACH (3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (3)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC (4)
R016	Unsaturated zone 1 (cm**3/g)	8.400E+03	2.000E+01	---	DCNUCU (4,1)
R016	Unsaturated zone 2 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,2)
R016	Unsaturated zone 3 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,3)
R016	Unsaturated zone 4 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,4)
R016	Unsaturated zone 5 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,5)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS (4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.064E-07	ALEACH (4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (4)
R016	Distribution coefficients for Am-243				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC (5)
R016	Unsaturated zone 1 (cm**3/g)	8.400E+03	2.000E+01	---	DCNUCU (5,1)
R016	Unsaturated zone 2 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,2)
R016	Unsaturated zone 3 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,3)
R016	Unsaturated zone 4 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,4)
R016	Unsaturated zone 5 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,5)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS (5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.064E-07	ALEACH (5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (5)
R016	Distribution coefficients for Au-195				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (6)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (6)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ba-133				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC (7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,5)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS (7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.433E-05	ALEACH (7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (7)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCC (8)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,3)
R016	Unsaturated zone 4 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,4)
R016	Unsaturated zone 5 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,5)
R016	Saturated zone (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCS (8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.333E-04	ALEACH (8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (8)
R016	Distribution coefficients for Ca-41				
R016	Contaminated zone (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCC (9)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (9,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,5)
R016	Saturated zone (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCS (9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.333E-04	ALEACH (9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (9)
R016	Distribution coefficients for Cd-109				
R016	Contaminated zone (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCC(10)
R016	Unsaturated zone 1 (cm**3/g)	5.600E+02	0.000E+00	---	DCNUCU(10,1)
R016	Unsaturated zone 2 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU(10,2)
R016	Unsaturated zone 3 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU(10,3)
R016	Unsaturated zone 4 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU(10,4)
R016	Unsaturated zone 5 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU(10,5)
R016	Saturated zone (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCS(10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.542E-04	ALEACH(10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(10)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ce-144				
R016	Contaminated zone (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+04	1.000E+03	---	DCNUCU(11,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,5)
R016	Saturated zone (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.443E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for Cf-252				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for Cm-243				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(13)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(13,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(13,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(13,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(13,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(13,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(13)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(13)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(13)
R016	Distribution coefficients for Cm-244				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(15)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(15,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(15,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(15,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(15,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(15,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(15)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(15)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(15)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cm-245				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (16)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (16,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (16,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (16,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (16,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (16,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (16)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (16)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (16)
R016	Distribution coefficients for Cm-246				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (18)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (18,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (18,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (18,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (18,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (18,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (18)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (18)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (18)
R016	Distribution coefficients for Cm-247				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (19)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (19,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (19,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (19,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (19,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (19,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (19)
R016	Distribution coefficients for Co-57				
R016	Contaminated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCC (21)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+03	---	DCNUCU (21,1)
R016	Unsaturated zone 2 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (21,2)
R016	Unsaturated zone 3 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (21,3)
R016	Unsaturated zone 4 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (21,4)
R016	Unsaturated zone 5 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (21,5)
R016	Saturated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCS (21)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.862E-05	ALEACH (21)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (21)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCC (22)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+03	---	DCNUCU (22,1)
R016	Unsaturated zone 2 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (22,2)
R016	Unsaturated zone 3 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (22,3)
R016	Unsaturated zone 4 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (22,4)
R016	Unsaturated zone 5 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (22,5)
R016	Saturated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCS (22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.862E-05	ALEACH (22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (22)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCC (23)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU (23,1)
R016	Unsaturated zone 2 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (23,2)
R016	Unsaturated zone 3 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (23,3)
R016	Unsaturated zone 4 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (23,4)
R016	Unsaturated zone 5 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (23,5)
R016	Saturated zone (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCS (23)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.147E-06	ALEACH (23)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (23)
R016	Distribution coefficients for Cs-135				
R016	Contaminated zone (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCC (24)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU (24,1)
R016	Unsaturated zone 2 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (24,2)
R016	Unsaturated zone 3 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (24,3)
R016	Unsaturated zone 4 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (24,4)
R016	Unsaturated zone 5 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (24,5)
R016	Saturated zone (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCS (24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.147E-06	ALEACH (24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (24)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCC (25)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU (25,1)
R016	Unsaturated zone 2 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (25,2)
R016	Unsaturated zone 3 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (25,3)
R016	Unsaturated zone 4 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (25,4)
R016	Unsaturated zone 5 (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCU (25,5)
R016	Saturated zone (cm**3/g)	2.800E+02	1.000E+03	---	DCNUCS (25)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.147E-06	ALEACH (25)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (25)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (26)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (26,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (26,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (26,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (26,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (26,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (26)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (26)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (26)
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (28)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (28,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (28,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (28,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (28,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (28,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (28)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (28)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (28)
R016	Distribution coefficients for Eu-155				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (29)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (29,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (29,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (29,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (29,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (29,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (29)
R016	Distribution coefficients for Fe-55				
R016	Contaminated zone (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCC (30)
R016	Unsaturated zone 1 (cm**3/g)	1.650E+02	1.000E+03	---	DCNUCU (30,1)
R016	Unsaturated zone 2 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (30,2)
R016	Unsaturated zone 3 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (30,3)
R016	Unsaturated zone 4 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (30,4)
R016	Unsaturated zone 5 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (30,5)
R016	Saturated zone (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCS (30)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.822E-06	ALEACH (30)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (30)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (31)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (31,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (31,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (31,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (31,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (31,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (31)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (31)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (31)
R016	Distribution coefficients for Gd-153				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (32)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (32,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (32,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (32,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (32,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (32,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (32)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (32)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (32)
R016	Distribution coefficients for Ge-68				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (33)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (33,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (33,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (33,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (33,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (33,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (33)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (34)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (34,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (34,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (34,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (34,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (34,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (34)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for I-129				
R016	Contaminated zone (cm**3/g)	2.000E-01	1.000E-01	---	DCNUCC (35)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (35,1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (35,2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (35,3)
R016	Unsaturated zone 4 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (35,4)
R016	Unsaturated zone 5 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (35,5)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS (35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.691E-03	ALEACH (35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (35)
R016	Distribution coefficients for K-40				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCC (36)
R016	Unsaturated zone 1 (cm**3/g)	7.500E+01	5.500E+00	---	DCNUCU (36,1)
R016	Unsaturated zone 2 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (36,2)
R016	Unsaturated zone 3 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (36,3)
R016	Unsaturated zone 4 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (36,4)
R016	Unsaturated zone 5 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (36,5)
R016	Saturated zone (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCS (36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.135E-04	ALEACH (36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (36)
R016	Distribution coefficients for Mn-54				
R016	Contaminated zone (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCC (37)
R016	Unsaturated zone 1 (cm**3/g)	1.800E+02	2.000E+02	---	DCNUCU (37,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (37,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (37,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (37,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (37,5)
R016	Saturated zone (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCS (37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.433E-05	ALEACH (37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (37)
R016	Distribution coefficients for Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC (38)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (38,1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (38,2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (38,3)
R016	Unsaturated zone 4 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (38,4)
R016	Unsaturated zone 5 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (38,5)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS (38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.694E-04	ALEACH (38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (38)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Nb-93m				
R016	Contaminated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCC(39)
R016	Unsaturated zone 1 (cm**3/g)	9.000E+02	0.000E+00	---	DCNUCU(39,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(39,2)
R016	Unsaturated zone 3 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(39,3)
R016	Unsaturated zone 4 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(39,4)
R016	Unsaturated zone 5 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(39,5)
R016	Saturated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCS(39)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.075E-05	ALEACH(39)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(39)
R016	Distribution coefficients for Nb-94				
R016	Contaminated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCC(40)
R016	Unsaturated zone 1 (cm**3/g)	9.000E+02	0.000E+00	---	DCNUCU(40,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(40,2)
R016	Unsaturated zone 3 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(40,3)
R016	Unsaturated zone 4 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(40,4)
R016	Unsaturated zone 5 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU(40,5)
R016	Saturated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCS(40)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.075E-05	ALEACH(40)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(40)
R016	Distribution coefficients for Ni-59				
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCC(41)
R016	Unsaturated zone 1 (cm**3/g)	6.500E+02	1.000E+03	---	DCNUCU(41,1)
R016	Unsaturated zone 2 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(41,2)
R016	Unsaturated zone 3 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(41,3)
R016	Unsaturated zone 4 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(41,4)
R016	Unsaturated zone 5 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(41,5)
R016	Saturated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS(41)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.304E-06	ALEACH(41)
R016	Solubility constant	4.000E+02	0.000E+00	Sol. Kd =-1.671E-01 not used	SOLUBK(41)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCC(42)
R016	Unsaturated zone 1 (cm**3/g)	6.500E+02	1.000E+03	---	DCNUCU(42,1)
R016	Unsaturated zone 2 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(42,2)
R016	Unsaturated zone 3 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(42,3)
R016	Unsaturated zone 4 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(42,4)
R016	Unsaturated zone 5 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU(42,5)
R016	Saturated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS(42)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.304E-06	ALEACH(42)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(42)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC (43)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (43,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (43,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (43,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (43,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (43,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS (43)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.686E-06	ALEACH (43)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (43)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCC (44)
R016	Unsaturated zone 1 (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCU (44,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (44,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (44,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (44,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (44,5)
R016	Saturated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCS (44)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (44)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (44)
R016	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCC (45)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCU (45,1)
R016	Unsaturated zone 2 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (45,2)
R016	Unsaturated zone 3 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (45,3)
R016	Unsaturated zone 4 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (45,4)
R016	Unsaturated zone 5 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (45,5)
R016	Saturated zone (cm**3/g)	2.701E+05	1.000E+02	---	DCNUCS (45)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.375E-06	ALEACH (45)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (45)
R016	Distribution coefficients for Pm-147				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (46)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (46,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (46,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (46,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (46,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (46,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (46)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (46)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (46)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (47)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (47, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (47, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (47, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (47, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (47, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (47)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (47)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (47)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (48)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (48, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (48, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (48, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (48, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (48, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (48)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (48)
16	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (48)
R016	Distribution coefficients for Pu-240				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (49)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (49, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (49, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (49, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (49, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (49, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (49)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (49)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (49)
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (50)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (50, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (50, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (50, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (50, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (50, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (50)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (50)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (50)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-242				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (52)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (52,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (52,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (52,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (52,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (52,5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (52)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (52)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (52)
R016	Distribution coefficients for Pu-244				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (53)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (53,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (53,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (53,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (53,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (53,5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (53)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (53)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (53)
R016	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC (54)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (54,1)
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (54,2)
R016	Unsaturated zone 3 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (54,3)
R016	Unsaturated zone 4 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (54,4)
R016	Unsaturated zone 5 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (54,5)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS (54)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.454E-05	ALEACH (54)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (54)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC (55)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (55,1)
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (55,2)
R016	Unsaturated zone 3 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (55,3)
R016	Unsaturated zone 4 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (55,4)
R016	Unsaturated zone 5 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (55,5)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS (55)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.454E-05	ALEACH (55)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (55)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ru-106				
R016	Contaminated zone (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCC (56)
R016	Unsaturated zone 1 (cm**3/g)	8.000E+02	0.000E+00	---	DCNUCU (56,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (56,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (56,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (56,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (56,5)
R016	Saturated zone (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCS (56)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.122E-05	ALEACH (56)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (56)
R016	Distribution coefficients for Sb-125				
R016	Contaminated zone (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCC (57)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+02	0.000E+00	---	DCNUCU (57,1)
R016	Unsaturated zone 2 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (57,2)
R016	Unsaturated zone 3 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (57,3)
R016	Unsaturated zone 4 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (57,4)
R016	Unsaturated zone 5 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (57,5)
R016	Saturated zone (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCS (57)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.813E-05	ALEACH (57)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (57)
R016	Distribution coefficients for Sm-147				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (58)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (58)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (58)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (58)
R016	Distribution coefficients for Sm-151				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (59)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (59,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (59,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (59,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (59,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (59,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (59)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (59)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (59)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCC (60)
R016	Unsaturated zone 1 (cm**3/g)	1.100E+02	3.000E+01	---	DCNUCU (60,1)
R016	Unsaturated zone 2 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (60,2)
R016	Unsaturated zone 3 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (60,3)
R016	Unsaturated zone 4 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (60,4)
R016	Unsaturated zone 5 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (60,5)
R016	Saturated zone (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCS (60)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.135E-04	ALEACH (60)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (60)
R016	Distribution coefficients for Tc-99				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (61)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (61,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (61,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (61,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (61,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (61,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (61)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (61)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (61)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (62)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (62,1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (62,2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (62,3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (62,4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (62,5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (62)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (62)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (62)
R016	Distribution coefficients for Th-229				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (63)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (63,1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (63,2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (63,3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (63,4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (63,5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (63)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (63)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (63)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (64)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (64,1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (64,2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (64,3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (64,4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (64,5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (64)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (64)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (64)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (65)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (65,1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (65,2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (65,3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (65,4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (65,5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (65)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (65)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (65)
R016	Distribution coefficients for Tl-204				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (66)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (66,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (66,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (66,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (66,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (66,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (66)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (66)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (66)
R016	Distribution coefficients for U-233				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (67)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (67,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (67,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (67,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (67,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (67,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (67)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (67)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (67)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (68)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (68,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (68,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (68,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (68,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (68,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (68)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (68)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (68)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (69)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (69,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (69,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (69,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (69,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (69,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (69)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (69)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (69)
R016	Distribution coefficients for U-236				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (70)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (70,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (70,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (70,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (70,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (70,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (70)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (70)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (70)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (71)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (71,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (71,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (71,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (71,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (71,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (71)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (71)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (71)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Zn-65				
R016	Contaminated zone (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCC(72)
R016	Unsaturated zone 1 (cm**3/g)	2.400E+03	0.000E+00	---	DCNUCU(72,1)
R016	Unsaturated zone 2 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU(72,2)
R016	Unsaturated zone 3 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU(72,3)
R016	Unsaturated zone 4 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU(72,4)
R016	Unsaturated zone 5 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU(72,5)
R016	Saturated zone (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCS(72)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.604E-06	ALEACH(72)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(72)
R016	Distribution coefficients for daughter Cm-248				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(20)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(20,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(20,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(20,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(20,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(20,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(20)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(20)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(20)
	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE(1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE(2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE(3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE(4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE(5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE(6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE(7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE(8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE(9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE(10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE(11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE(12)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R018	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	1.000E+00	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.100E+01	FMEAT
R018	Contamination fraction of milk	-1	-1	0.100E+01	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LF15
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LF16
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LW15
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LW16
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
C14	DCF correction factor for gaseous forms of C14	1.234E+02	8.894E+01	---	CO2F
	Storage times of contaminated foodstuffs (days):				
	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSEFL
R021	Total porosity of the cover material	4.130E-01	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	2.650E-02	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	7.233E-07	2.000E-06	---	DIFCV
R021	in foundation material	3.000E-07	3.000E-07	---	DIFFL
R021	in contaminated zone soil	3.000E-07	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	1.500E+00	5.000E-01	---	REXG
R021	Height of the building (room) (m)	2.500E+00	2.500E+00	---	HRM
R021	Building interior area factor	1.000E+00	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	---	DMFL
	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	---	EMANA(1)
	Emanating power of Rn-220 gas	1.500E-01	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	512	---	---	NPTS
TITL	Maximum number of integration points for dose	17	---	---	LYMAX

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	active
Find peak pathway doses	active

Contaminated Zone Dimensions

Initial Soil Concentrations, pCi/g

Area: 88221.00 square meters
Thickness: 33.60 meters
Cover Depth: 3.60 meters

Ac-227 3.200E+00
Ag-108m 2.500E+01
Ag-110m 2.500E+01
Am-241 1.000E-01
Am-243 1.000E-01
Au-195 1.000E+02
Ba-133 2.500E+01
C-14 1.000E+01
Ca-41 2.500E+01
Cd-109 2.500E+01
Ce-144 2.500E+01
Cf-252 1.000E-01
Cm-243 1.000E-01
Cm-244 1.000E-01
Cm-245 1.000E-01
Cm-246 1.000E-01
Cm-247 1.000E-01
Co-57 1.000E-01
Co-60 2.500E+01
Cs-134 2.500E+01
Cs-135 2.500E+01
Cs-137 2.500E+01
Eu-152 2.500E+01
Eu-154 2.500E+01
Eu-155 2.500E+01
Fe-55 2.500E+01
Gd-152 2.500E+01
Gd-153 2.500E+01
Ge-68 2.500E+01
H-3 1.000E+03
I-129 1.000E-02
K-40 8.000E+02
Mn-54 2.500E+01
Na-22 2.500E+01
Nb-93m 2.500E+01
Nb-94 2.500E+01
Ni-59 2.500E+01
Ni-63 2.500E+01
Np-237 1.000E-01
Pa-231 3.200E+00
Pb-210 3.330E+02
Pm-147 2.500E+01
Pu-238 1.000E-01
Pu-239 1.000E-01
Pu-240 1.000E-01
Pu-241 1.000E-01
Pu-242 1.000E-01
Pu-244 1.000E-01
Ra-226 1.120E+02
Ra-228 2.800E+01
Ru-106 2.500E+01
Sb-125 2.500E+01
Sm-147 2.500E+01
Sm-151 2.500E+01

Sr-90	2.500E+01
Tc-99	1.000E+00
Th-228	2.800E+01
Th-229	2.800E+01
Th-230	8.300E+01
Th-232	2.800E+01
Tl-204	2.500E+01
U-233	3.300E+00
U-234	8.300E+01
U-235	3.200E+00
U-236	3.200E+00
U-238	8.300E+01
Zn-65	2.500E+01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
TDOSE(t):	2.172E+00	2.172E+00	2.172E+00	2.173E+00	2.174E+00	2.190E+00	8.238E+00	6.612E+00	7.680E+00
M(t):	8.689E-02	8.689E-02	8.690E-02	8.692E-02	8.698E-02	8.720E-02	3.295E-01	2.645E-01	3.072E-01

Maximum TDOSE(t): 9.766E+00 mrem/yr at t = 326.0 ± 0.7 years

242	0.000E+00	0.0000	0.000E+00	0.0000	1.604E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
244	9.676E-27	0.0000	0.000E+00	0.0000										
226	7.757E-21	0.0000	0.000E+00	0.0000	1.977E+00	0.2025	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	8.755E-22	0.0000	0.000E+00	0.0000	2.232E-01	0.0229	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.299E-19	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	1.312E-24	0.0000	0.000E+00	0.0000	3.344E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	5.822E-28	0.0000	0.000E+00	0.0000										
U-238	2.906E-25	0.0000	0.000E+00	0.0000	1.042E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	0.000E+00	0.0000												
Total	5.985E-19	0.0000	0.000E+00	0.0000	2.201E+00	0.2254	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

242	0.000E+00	0.0000	1.604E-18	0.0000										
244	0.000E+00	0.0000	9.676E-27	0.0000										
Ka-226	0.000E+00	0.0000	1.977E+00	0.2025										
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	1.573E+00	0.1611	0.000E+00	0.0000	0.000E+00	0.0000	2.788E-01	0.0285	3.727E-03	0.0004	7.793E-02	0.0080	1.934E+00	0.1980
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	2.232E-01	0.0229										
Th-232	0.000E+00	0.0000	3.299E-19	0.0000										
Tl-204	8.959E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.248E-26	0.0000	3.858E-25	0.0000	1.263E-25	0.0000	1.480E-24	0.0000
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	3.344E-04	0.0000										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000	5.822E-28	0.0000										
U-238	0.000E+00	0.0000	1.042E-07	0.0000										
Zn-65	0.000E+00	0.0000												
Total	4.894E+00	0.5011	0.000E+00	0.0000	0.000E+00	0.0000	5.353E-01	0.0548	5.015E-01	0.0513	1.634E+00	0.1673	9.766E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

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242	0.000E+00	0.0000	0.000E+00	0.0000	2.772E-29	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
44	5.647E-27	0.0000	0.000E+00	0.0000										
26	5.563E-21	0.0000	0.000E+00	0.0000	2.172E+00	0.9998	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	3.307E-20	0.0000	0.000E+00	0.0000										
Ru-106	2.494E-26	0.0000	0.000E+00	0.0000										
Sb-125	2.355E-27	0.0000	0.000E+00	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	1.792E-19	0.0000	0.000E+00	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	8.933E-25	0.0000	0.000E+00	0.0000	3.487E-04	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	1.383E-21	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	0.000E+00	0.0000	1.046E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	1.730E-25	0.0000	0.000E+00	0.0000	7.416E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	1.345E-22	0.0000	0.000E+00	0.0000										
Total	4.280E-19	0.0000	0.000E+00	0.0000	2.172E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

242	0.000E+00	0.0000	2.772E-29	0.0000										
44	0.000E+00	0.0000	5.647E-27	0.0000										
226	0.000E+00	0.0000	2.172E+00	0.9998										
Ra-228	0.000E+00	0.0000	3.307E-20	0.0000										
Ru-106	0.000E+00	0.0000	2.494E-26	0.0000										
Sb-125	0.000E+00	0.0000	2.355E-27	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000	1.792E-19	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	3.487E-04	0.0002										
Th-232	0.000E+00	0.0000	1.383E-21	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000	1.046E-09	0.0000										
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000	7.416E-16	0.0000										
Zn-65	0.000E+00	0.0000	1.345E-22	0.0000										
Total	0.000E+00	0.0000	2.172E+00	1.0000										

*Sum of all water independent and dependent pathways.

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-242	0.000E+00	0.0000	0.000E+00	0.0000	8.594E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
44	5.656E-27	0.0000	0.000E+00	0.0000										
226	5.569E-21	0.0000	0.000E+00	0.0000	2.171E+00	0.9995	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	8.053E-20	0.0000	0.000E+00	0.0000										
Ru-106	1.256E-26	0.0000	0.000E+00	0.0000										
Sb-125	1.837E-27	0.0000	0.000E+00	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	1.249E-19	0.0000	0.000E+00	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	2.683E-24	0.0000	0.000E+00	0.0000	1.046E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	8.490E-21	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	0.000E+00	0.0000	7.324E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	1.733E-25	0.0000	0.000E+00	0.0000	1.112E-14	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	4.771E-23	0.0000	0.000E+00	0.0000										
Total	4.241E-19	0.0000	0.000E+00	0.0000	2.172E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

-242	0.000E+00	0.0000	8.594E-28	0.0000												
244	0.000E+00	0.0000	5.656E-27	0.0000												
226	0.000E+00	0.0000	2.171E+00	0.9995												
Ra-228	0.000E+00	0.0000	8.053E-20	0.0000												
Ru-106	0.000E+00	0.0000	1.256E-26	0.0000												
Sb-125	0.000E+00	0.0000	1.837E-27	0.0000												
Sm-147	0.000E+00	0.0000														
Sm-151	0.000E+00	0.0000														
Sr-90	0.000E+00	0.0000														
Tc-99	0.000E+00	0.0000														
Th-228	0.000E+00	0.0000	1.249E-19	0.0000												
Th-229	0.000E+00	0.0000														
Th-230	0.000E+00	0.0000	1.046E-03	0.0005												
Th-232	0.000E+00	0.0000	8.490E-21	0.0000												
Tl-204	0.000E+00	0.0000														
U-233	0.000E+00	0.0000														
U-234	0.000E+00	0.0000	7.324E-09	0.0000												
U-235	0.000E+00	0.0000														
U-236	0.000E+00	0.0000														
U-238	0.000E+00	0.0000	1.112E-14	0.0000												
Zn-65	0.000E+00	0.0000	4.771E-23	0.0000												
Total	0.000E+00	0.0000	2.172E+00	1.0000												

*Sum of all water independent and dependent pathways.

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-242	0.000E+00	0.0000	0.000E+00	0.0000	2.165E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
244	5.675E-27	0.0000	0.000E+00	0.0000										
226	5.580E-21	0.0000	0.000E+00	0.0000	2.170E+00	0.9989	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	1.200E-19	0.0000	0.000E+00	0.0000										
Ru-106	3.186E-27	0.0000	0.000E+00	0.0000										
Sb-125	1.118E-27	0.0000	0.000E+00	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	6.066E-20	0.0000	0.000E+00	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	6.275E-24	0.0000	0.000E+00	0.0000	2.440E-03	0.0011	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.383E-20	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	9.956E-29	0.0000	0.000E+00	0.0000	3.871E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	1.738E-25	0.0000	0.000E+00	0.0000	1.298E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	6.002E-24	0.0000	0.000E+00	0.0000										
Total	4.179E-19	0.0000	0.000E+00	0.0000	2.172E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Summary : EGL Vadose Zone Analysis

File: USEI_EGL_FINAL_03_25_05.rad

242	0.000E+00	0.0000	2.165E-26	0.0000										
44	0.000E+00	0.0000	5.675E-27	0.0000										
Ka-226	0.000E+00	0.0000	2.170E+00	0.9989										
Ra-228	0.000E+00	0.0000	1.200E-19	0.0000										
Ru-106	0.000E+00	0.0000	3.186E-27	0.0000										
Sb-125	0.000E+00	0.0000	1.118E-27	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000	6.066E-20	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	2.440E-03	0.0011										
Th-232	0.000E+00	0.0000	3.383E-20	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	3.871E-08	0.0000										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000	1.298E-13	0.0000										
Zn-65	0.000E+00	0.0000	6.002E-24	0.0000										
Total	0.000E+00	0.0000	2.172E+00	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File: USEI_EGL_FINAL_03_25_05.rad

H-242	0.000E+00	0.0000	0.000E+00	0.0000	1.693E-24	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
H-244	5.741E-27	0.0000	0.000E+00	0.0000										
Rd-226	5.620E-21	0.0000	0.000E+00	0.0000	2.166E+00	0.9966	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	8.426E-20	0.0000	0.000E+00	0.0000										
Ru-106	2.619E-29	0.0000	0.000E+00	0.0000										
Sb-125	1.963E-28	0.0000	0.000E+00	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	4.847E-21	0.0000	0.000E+00	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	1.899E-23	0.0000	0.000E+00	0.0000	7.318E-03	0.0034	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	1.273E-19	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	8.988E-28	0.0000	0.000E+00	0.0000	3.463E-07	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	3.565E-30	0.0000	0.000E+00	0.0000										
U-238	1.758E-25	0.0000	0.000E+00	0.0000	3.443E-12	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	4.240E-27	0.0000	0.000E+00	0.0000										
Total	4.070E-19	0.0000	0.000E+00	0.0000	2.173E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Summary : EGL Vadose Zone Analysis

File: USEI_EGL_FINAL_03_25_05.rad

242	0.000E+00	0.0000	1.693E-24	0.0000										
244	0.000E+00	0.0000	5.741E-27	0.0000										
226	0.000E+00	0.0000	2.166E+00	0.9966										
Ra-228	0.000E+00	0.0000	8.426E-20	0.0000										
Ru-106	0.000E+00	0.0000	2.619E-29	0.0000										
Sb-125	0.000E+00	0.0000	1.963E-28	0.0000										
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000	4.847E-21	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	7.318E-03	0.0034										
Th-232	0.000E+00	0.0000	1.273E-19	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	3.463E-07	0.0000										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000	3.565E-30	0.0000										
U-238	0.000E+00	0.0000	3.443E-12	0.0000										
Zn-65	0.000E+00	0.0000	4.240E-27	0.0000										
Total	0.000E+00	0.0000	2.173E+00	1.0000										

*Sum of all water independent and dependent pathways.

242	0.000E+00	0.0000	0.000E+00	0.0000	1.202E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
44	5.933E-27	0.0000	0.000E+00	0.0000										
Ra-226	5.736E-21	0.0000	0.000E+00	0.0000	2.153E+00	0.9902	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	8.426E-21	0.0000	0.000E+00	0.0000										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	3.549E-24	0.0000	0.000E+00	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	5.655E-23	0.0000	0.000E+00	0.0000	2.123E-02	0.0098	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	2.139E-19	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	7.779E-27	0.0000	0.000E+00	0.0000	2.920E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	2.475E-29	0.0000	0.000E+00	0.0000										
U-238	1.814E-25	0.0000	0.000E+00	0.0000	8.425E-11	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	0.000E+00	0.0000												
Total	4.082E-19	0.0000	0.000E+00	0.0000	2.174E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Summary : EGL Vadose Zone Analysis

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242	0.000E+00	0.0000	1.202E-22	0.0000										
44	0.000E+00	0.0000	5.933E-27	0.0000										
226	0.000E+00	0.0000	2.153E+00	0.9902										
Ra-228	0.000E+00	0.0000	8.426E-21	0.0000										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000	3.549E-24	0.0000										
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	2.123E-02	0.0098										
Th-232	0.000E+00	0.0000	2.139E-19	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	2.920E-06	0.0000										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000	2.475E-29	0.0000										
U-238	0.000E+00	0.0000	8.425E-11	0.0000										
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	2.174E+00	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis File: USEI_EGL_FINAL_03_25_05.rad

242	0.000E+00	0.0000	0.000E+00	0.0000	1.422E-20	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
44	6.661E-27	0.0000	0.000E+00	0.0000										
Ra-226	6.160E-21	0.0000	0.000E+00	0.0000	2.110E+00	0.9680	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	2.000E-24	0.0000	0.000E+00	0.0000										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	2.033E-22	0.0000	0.000E+00	0.0000	6.965E-02	0.0319	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	2.441E-19	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	9.253E-26	0.0000	0.000E+00	0.0000	3.170E-05	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	1.228E-28	0.0000	0.000E+00	0.0000										
U-238	2.027E-25	0.0000	0.000E+00	0.0000	3.020E-09	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	0.000E+00	0.0000												
Total	4.461E-19	0.0000	0.000E+00	0.0000	2.180E+00	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Summary : EGL Vadose Zone Analysis

File: USEI_EGL_FINAL_03_25_05.rad

242	0.000E+00	0.0000	1.422E-20	0.0000										
44	0.000E+00	0.0000	6.661E-27	0.0000										
Ra-226	0.000E+00	0.0000	2.110E+00	0.9680										
Ra-228	0.000E+00	0.0000	2.000E-24	0.0000										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	6.965E-02	0.0319										
Th-232	0.000E+00	0.0000	2.441E-19	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	3.170E-05	0.0000										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000	1.228E-28	0.0000										
U-238	0.000E+00	0.0000	3.020E-09	0.0000										
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	2.180E+00	1.0000										

*Sum of all water independent and dependent pathways.

42	0.000E+00	0.0000	0.000E+00	0.0000	1.149E-18	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
14	9.269E-27	0.0000	0.000E+00	0.0000										
226	7.554E-21	0.0000	0.000E+00	0.0000	1.992E+00	0.2418	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	7.801E-22	0.0000	0.000E+00	0.0000	2.057E-01	0.0250	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	3.187E-19	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	1.074E-24	0.0000	0.000E+00	0.0000	2.833E-04	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	5.164E-28	0.0000	0.000E+00	0.0000										
U-238	2.788E-25	0.0000	0.000E+00	0.0000	8.119E-08	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	0.000E+00	0.0000												
Total	5.786E-19	0.0000	0.000E+00	0.0000	2.198E+00	0.2669	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

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242	0.000E+00	0.0000	1.149E-18	0.0000										
144	0.000E+00	0.0000	9.269E-27	0.0000										
Ra-226	0.000E+00	0.0000	1.992E+00	0.2418										
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	2.054E+00	0.2493	0.000E+00	0.0000	0.000E+00	0.0000	3.639E-01	0.0442	4.865E-03	0.0006	1.017E-01	0.0123	2.524E+00	0.3064
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	2.057E-01	0.0250										
Th-232	0.000E+00	0.0000	3.187E-19	0.0000										
Tl-204	1.368E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.107E-23	0.0000	5.893E-23	0.0000	1.929E-23	0.0000	2.261E-22	0.0000
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	2.833E-04	0.0000										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000	5.164E-28	0.0000										
U-238	0.000E+00	0.0000	8.119E-08	0.0000										
Zn-65	0.000E+00	0.0000												
Total	4.128E+00	0.5011	0.000E+00	0.0000	0.000E+00	0.0000	5.241E-01	0.0636	3.148E-01	0.0382	1.073E+00	0.1302	8.238E+00	1.0000

*Sum of all water independent and dependent pathways.

242	0.000E+00	0.0000	0.000E+00	0.0000	1.480E-16	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
44	2.947E-26	0.0000	0.000E+00	0.0000										
26	1.542E-20	0.0000	0.000E+00	0.0000	1.638E+00	0.2477	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	6.251E-21	0.0000	0.000E+00	0.0000	6.639E-01	0.1004	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	8.111E-19	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	2.981E-23	0.0000	0.000E+00	0.0000	3.166E-03	0.0005	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	0.000E+00	0.0000												
U-236	4.418E-27	0.0000	0.000E+00	0.0000										
U-238	8.746E-25	0.0000	0.000E+00	0.0000	3.082E-06	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	0.000E+00	0.0000												
Total	1.439E-18	0.0000	0.000E+00	0.0000	2.305E+00	0.3486	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Summary : EGL Vadose Zone Analysis

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242	0.000E+00	0.0000	1.480E-16	0.0000										
244	0.000E+00	0.0000	2.947E-26	0.0000										
226	0.000E+00	0.0000	1.638E+00	0.2477										
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	1.556E-03	0.0002	0.000E+00	0.0000	0.000E+00	0.0000	2.756E-04	0.0000	3.685E-06	0.0000	7.705E-05	0.0000	1.912E-03	0.0003
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000	6.639E-01	0.1004										
Th-232	0.000E+00	0.0000	8.111E-19	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000	3.166E-03	0.0005										
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000	4.418E-27	0.0000										
U-238	0.000E+00	0.0000	3.082E-06	0.0000										
Zn-65	0.000E+00	0.0000												
Total	1.527E+00	0.2310	0.000E+00	0.0000	0.000E+00	0.0000	1.738E+00	0.2629	4.827E-01	0.0730	5.589E-01	0.0845	6.612E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis File: USEI_EGL_FINAL_03_25_05.rad

242	7.184E-31	0.0000	0.000E+00	0.0000	1.215E-13	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
44	2.186E-23	0.0000	0.000E+00	0.0000										
Ra-226	9.109E-19	0.0000	0.000E+00	0.0000	5.182E-01	0.0675	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	1.272E-26	0.0000	0.000E+00	0.0000										
Th-230	5.484E-18	0.0000	0.000E+00	0.0000	3.120E+00	0.4062	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Th-232	1.688E-16	0.0000	0.000E+00	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	7.867E-28	0.0000	0.000E+00	0.0000										
U-234	1.533E-19	0.0000	0.000E+00	0.0000	8.721E-02	0.0114	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-235	3.341E-29	0.0000	0.000E+00	0.0000										
U-236	4.218E-24	0.0000	0.000E+00	0.0000										
U-238	1.295E-21	0.0000	0.000E+00	0.0000	4.622E-04	0.0001	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Zn-65	0.000E+00	0.0000												
Total	2.680E-16	0.0000	0.000E+00	0.0000	3.726E+00	0.4851	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Summary : EGL Vadose Zone Analysis

File: USEI_EGL_FINAL_03_25_05.rad

242	0.000E+00	0.0000	1.215E-13	0.0000										
44	0.000E+00	0.0000	2.186E-23	0.0000										
26	0.000E+00	0.0000	5.182E-01	0.0675										
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	2.288E-21	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.054E-22	0.0000	5.420E-24	0.0000	1.133E-22	0.0000	2.812E-21	0.0000
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000	1.272E-26	0.0000										
Th-230	0.000E+00	0.0000	3.120E+00	0.4062										
Th-232	0.000E+00	0.0000	1.688E-16	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000	7.867E-28	0.0000										
U-234	0.000E+00	0.0000	8.721E-02	0.0114										
U-235	0.000E+00	0.0000	3.341E-29	0.0000										
U-236	0.000E+00	0.0000	4.218E-24	0.0000										
U-238	0.000E+00	0.0000	4.622E-04	0.0001										
Zn-65	0.000E+00	0.0000												
Total	2.734E+00	0.3560	0.000E+00	0.0000	0.000E+00	0.0000	5.857E-01	0.0763	1.843E-01	0.0240	4.507E-01	0.0587	7.680E+00	1.0000

*Sum of all water independent and dependent pathways.

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j, t) (mrem/yr) / (pCi/g)								
			t = 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
Ac-227	Ac-227	1.000E+00	3.016E-33	2.928E-33	2.759E-33	2.240E-33	1.235E-33	1.539E-34	4.005E-37	0.000E+00	0.000E+00
Ag-108m	Ag-108m	1.000E+00	5.429E-27	5.409E-27	5.368E-27	5.229E-27	4.851E-27	3.731E-27	1.762E-27	1.276E-28	3.899E-35
Ag-110m	Ag-110m	1.000E+00	3.692E-24	1.343E-24	1.776E-25	1.493E-28	2.443E-37	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Am-241	Np-237	1.000E+00	5.828E-42	1.751E-41	4.096E-41	1.241E-40	3.705E-40	1.346E-39	5.355E-39	5.162E-38	4.000E-34
Am-241	U-233	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.237E-42
Am-241	Th-229	1.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	2.102E-44	8.296E-43	3.047E-41	3.507E-39	4.724E-34
Am-241	ΣDSR(j)		5.828E-42	1.751E-41	4.096E-41	1.241E-40	3.706E-40	1.347E-39	5.385E-39	5.513E-38	8.723E-34
Am-243	Am-243	1.000E+00	6.027E-42	6.042E-42	6.072E-42	6.180E-42	6.499E-42	7.755E-42	1.284E-41	7.503E-41	1.803E-36
Am-243	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	4.204E-45	1.401E-44	6.726E-44	1.141E-42	6.642E-38
Am-243	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.517E-41
Am-243	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.803E-45	4.176E-43	1.655E-37
Am-243	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.121E-44	2.140E-42	9.784E-37
Am-243	ΣDSR(j)		6.027E-42	6.042E-42	6.072E-42	6.181E-42	6.503E-42	7.769E-42	1.292E-41	7.873E-41	3.014E-36
195	Au-195	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
133	Ba-133	1.000E+00	3.781E-32	3.552E-32	3.134E-32	2.023E-32	5.788E-33	7.255E-35	2.670E-40	0.000E+00	0.000E+00
C-14	C-14	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.062E-01	8.802E-02
Ca-41	Ca-41	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.230E-01
Cd-109	Cd-109	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ce-144	Ce-144	1.000E+00	8.130E-28	3.343E-28	5.650E-29	1.122E-31	2.138E-39	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cf-252	Cf-252	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cf-252	Cm-248	9.691E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cf-252	Pu-244	8.890E-01	1.347E-40	8.791E-40	4.006E-39	2.312E-38	9.196E-38	3.739E-37	1.597E-36	1.705E-35	6.338E-32
Cf-252	Pu-240	8.879E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cf-252	U-236	8.879E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cf-252	Th-232	8.879E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cf-252	Ra-228	8.879E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.353E-43
Cf-252	Th-228	8.879E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.809E-45
Cf-252	Th-228	8.879E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.189E-39
Cf-252	ΣDSR(j)		1.347E-40	8.791E-40	4.006E-39	2.312E-38	9.196E-38	3.739E-37	1.597E-36	1.705E-35	6.338E-32
Cm-243	Cm-243	9.976E-01	8.594E-39	8.408E-39	8.048E-39	6.903E-39	4.453E-39	9.600E-40	1.198E-41	0.000E+00	0.000E+00
Cm-243	Pu-239	9.976E-01	0.000E+00	0.000E+00	0.000E+00	1.401E-45	2.803E-45	5.605E-45	9.809E-45	4.764E-44	6.358E-40
Cm-243	U-235	9.976E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.696E-42
Cm-243	Pa-231	9.976E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	4.764E-44	4.317E-39
Cm-243	Ac-227	9.976E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.204E-45	2.522E-43	2.566E-38
243	ΣDSR(j)		8.594E-39	8.408E-39	8.048E-39	6.903E-39	4.453E-39	9.600E-40	1.199E-41	3.475E-43	3.062E-38

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j, t) (mrem/yr)/(pCi/g)								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
Cm-243	Cm-243	2.400E-03	2.068E-41	2.023E-41	1.936E-41	1.661E-41	1.071E-41	2.309E-42	2.803E-44	0.000E+00	0.000E+00
Cm-243	Am-243	2.400E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.678E-41
Cm-243	Pu-239	2.400E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	6.110E-43
Cm-243	U-235	2.400E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45
Cm-243	Pa-231	2.400E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.499E-42
Cm-243	Ac-227	2.400E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.865E-42
Cm-243	ΣDSR(j)		2.068E-41	2.023E-41	1.936E-41	1.661E-41	1.071E-41	2.309E-42	2.803E-44	0.000E+00	2.775E-41
Cm-244	Cm-244	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-244	Pu-240	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-244	U-236	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-244	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-244	Ra-228	1.000E+00	0.000E+00	0.000E+00	0.000E+00	7.006E-45	3.335E-43	1.288E-41	2.458E-40	9.261E-39	1.047E-34
Cm-244	Th-228	1.000E+00	0.000E+00	4.204E-45	1.794E-43	2.517E-41	1.768E-39	8.289E-38	1.591E-36	5.175E-35	2.330E-31
Cm-244	ΣDSR(j)		0.000E+00	4.204E-45	1.794E-43	2.518E-41	1.768E-39	8.290E-38	1.592E-36	5.176E-35	2.331E-31
Cm-245	Cm-245	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	6.211E-41
Cm-245	Pu-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.389E-44
Cm-245	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-245	Np-237	1.000E+00	0.000E+00	0.000E+00	5.605E-45	1.569E-43	3.224E-42	7.515E-41	1.216E-39	4.894E-38	2.373E-33
Cm-245	U-233	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.055E-42
5	Th-229	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.682E-44	2.913E-42	1.384E-39	1.086E-33
5	ΣDSR(j)		0.000E+00	0.000E+00	5.605E-45	1.569E-43	3.224E-42	7.516E-41	1.219E-39	5.033E-38	3.458E-33
Cm-245	Cm-245	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45
Cm-245	Pu-241	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-245	Np-237	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.204E-45	2.803E-44	1.513E-43	2.392E-42	6.496E-38
Cm-245	U-233	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-245	Th-229	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.135E-43	3.672E-38
Cm-245	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.204E-45	2.803E-44	1.513E-43	2.506E-42	1.017E-37
Cm-246	Cm-246	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-246	Pu-242	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-246	U-238	9.997E-01	9.949E-44	6.964E-43	3.690E-42	3.337E-41	2.903E-40	3.518E-39	4.304E-38	1.431E-36	1.917E-32
Cm-246	U-234	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-246	Th-230	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-246	Ra-226	9.997E-01	8.509E-35	5.361E-33	2.865E-31	6.568E-29	1.351E-26	5.260E-24	1.270E-21	5.419E-19	2.145E-15
Cm-246	Pb-210	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Cm-246	ΣDSR(j)		8.509E-35	5.361E-33	2.865E-31	6.568E-29	1.351E-26	5.260E-24	1.270E-21	5.419E-19	2.145E-15
Cm-247	Cm-247	1.000E+00	4.796E-31	4.806E-31	4.824E-31	4.890E-31	5.084E-31	5.823E-31	8.581E-31	3.334E-30	7.784E-27
Cm-247	Am-243	1.000E+00	0.000E+00	1.401E-45	2.803E-45	5.605E-45	1.822E-44	7.287E-44	3.671E-43	7.390E-42	1.080E-36
Cm-247	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	5.465E-44	1.731E-38
Cm-247	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.602E-41
Cm-247	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.809E-45
Cm-247	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.905E-44	1.199E-37
Cm-247	ΣDSR(j)		4.796E-31	4.806E-31	4.824E-31	4.890E-31	5.084E-31	5.823E-31	8.581E-31	3.334E-30	7.784E-27

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j, t) (mrem/yr)/(pCi/g)									
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03	
Np-237	Np-237	1.000E+00	3.599E-35	3.607E-35	3.623E-35	3.679E-35	3.843E-35	4.477E-35	6.927E-35	3.192E-34	1.973E-30	
Np-237	U-233	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	4.204E-45	7.847E-44	6.894E-39	
Np-237	Th-229	1.000E+00	2.157E-42	1.512E-41	8.022E-41	7.275E-40	6.380E-39	7.945E-38	1.051E-36	4.594E-35	2.922E-30	
Np-237	ΣDSR(j)		3.599E-35	3.607E-35	3.623E-35	3.679E-35	3.844E-35	4.485E-35	7.033E-35	3.651E-34	4.895E-30	
Pa-231	Pa-231	1.000E+00	5.569E-34	5.581E-34	5.603E-34	5.684E-34	5.921E-34	6.830E-34	1.027E-33	4.285E-33	1.502E-29	
Pa-231	Ac-227	1.000E+00	4.828E-35	1.431E-34	3.250E-34	8.889E-34	2.026E-33	3.613E-33	5.686E-33	2.402E-32	9.041E-29	
Pa-231	ΣDSR(j)		6.052E-34	7.011E-34	8.854E-34	1.457E-33	2.618E-33	4.296E-33	6.713E-33	2.830E-32	1.054E-28	
Pb-210	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pm-147	Pm-147	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pm-147	Sm-147	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pm-147	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-238	Pu-238	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-238	Ra-226	1.000E+00	8.921E-18	1.336E-16	1.553E-15	4.063E-14	9.570E-13	3.019E-11	5.925E-10	1.083E-08	3.640E-07	
Pu-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-238	ΣDSR(j)		8.921E-18	1.336E-16	1.553E-15	4.063E-14	9.570E-13	3.019E-11	5.925E-10	1.083E-08	3.640E-07	
Pu-239	Pu-239	1.000E+00	3.817E-42	3.826E-42	3.844E-42	3.907E-42	4.097E-42	4.837E-42	7.772E-42	4.087E-41	5.374E-37	
Pu-239	U-235	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.401E-45	1.822E-44	1.444E-39	
Pu-239	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.605E-45	7.287E-44	9.627E-43	4.421E-41	3.709E-36	
Pu-239	Ac-227	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	8.408E-45	2.228E-43	4.336E-42	2.328E-40	2.205E-35	
Pu-239	ΣDSR(j)		3.817E-42	3.826E-42	3.844E-42	3.907E-42	4.111E-42	5.133E-42	1.307E-41	3.179E-40	2.630E-35	
Pu-240	Pu-240	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-240	U-236	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-240	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-240	Ra-228	1.000E+00	8.408E-45	1.121E-43	1.253E-42	2.788E-41	4.597E-40	7.843E-39	1.059E-37	3.519E-36	3.815E-32	
Pu-240	Th-228	1.000E+00	3.747E-42	1.074E-40	2.294E-39	1.060E-37	2.602E-36	5.116E-35	6.864E-34	1.967E-32	8.488E-29	
Pu-240	ΣDSR(j)		3.755E-42	1.075E-40	2.295E-39	1.061E-37	2.602E-36	5.116E-35	6.865E-34	1.967E-32	8.492E-29	
Pu-241	Pu-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-241	Am-241	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-241	Np-237	1.000E+00	2.803E-45	2.102E-44	1.093E-43	8.912E-43	5.911E-42	3.610E-41	1.685E-40	1.705E-39	1.333E-35	
Pu-241	U-233	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	4.064E-44	
Pu-241	Th-229	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	1.682E-44	8.380E-43	1.106E-40	1.561E-35	
Pu-241	ΣDSR(j)		2.803E-45	2.102E-44	1.093E-43	8.912E-43	5.911E-42	3.612E-41	1.693E-40	1.816E-39	2.893E-35	
Pu-241	Pu-241	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-241	Np-237	2.450E-05	0.000E+00	0.000E+00	1.401E-45	2.803E-45	4.204E-45	7.006E-45	1.121E-44	5.325E-44	3.254E-40	
Pu-241	U-233	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Pu-241	Th-229	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	7.006E-45	4.782E-40	
Pu-241	ΣDSR(j)		0.000E+00	0.000E+00	1.401E-45	2.803E-45	4.204E-45	7.006E-45	1.121E-44	6.026E-44	8.036E-40	

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j,t) (mrem/yr)/(pCi/g)												
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03				
Pu-242	Pu-242	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	U-238	1.000E+00	1.617E-37	4.858E-37	1.137E-36	3.450E-36	1.035E-35	3.817E-35	1.574E-34	1.617E-33	5.048E-30				
Pu-242	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	Ra-226	1.000E+00	2.772E-28	8.594E-27	2.165E-25	1.693E-23	1.202E-21	1.422E-19	1.149E-17	1.480E-15	1.215E-12				
Pu-242	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	ΣDSR(j)		2.772E-28	8.594E-27	2.165E-25	1.693E-23	1.202E-21	1.422E-19	1.149E-17	1.480E-15	1.215E-12				
Pu-244	Pu-244	1.000E+00	5.647E-26	5.656E-26	5.675E-26	5.741E-26	5.933E-26	6.661E-26	9.269E-26	2.947E-25	2.186E-22				
Pu-244	Pu-240	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244	U-236	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244	Th-232	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244	Ra-228	9.987E-01	0.000E+00	0.000E+00	0.000E+00	8.408E-45	4.204E-43	2.593E-41	1.098E-39	1.248E-37	7.145E-33				
Pu-244	Th-228	9.987E-01	0.000E+00	4.204E-45	1.836E-43	2.702E-41	2.200E-39	1.645E-37	7.051E-36	6.955E-34	1.589E-29				
Pu-244	ΣDSR(j)		5.647E-26	5.656E-26	5.675E-26	5.741E-26	5.933E-26	6.661E-26	9.269E-26	2.947E-25	2.186E-22				
Ra-226	Ra-226	1.000E+00	1.939E-02	1.939E-02	1.938E-02	1.934E-02	1.923E-02	1.884E-02	1.779E-02	1.463E-02	4.627E-03				
Ra-226	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226	ΣDSR(j)		1.939E-02	1.939E-02	1.938E-02	1.934E-02	1.923E-02	1.884E-02	1.779E-02	1.463E-02	4.627E-03				
8	Ra-228	1.000E+00	1.015E-24	9.008E-25	7.100E-25	3.087E-25	2.856E-26	6.886E-30	3.172E-40	0.000E+00	0.000E+00				
8	Th-228	1.000E+00	1.180E-21	2.875E-21	4.284E-21	3.009E-21	3.009E-22	7.142E-26	3.141E-36	0.000E+00	0.000E+00				
228	ΣDSR(j)		1.181E-21	2.876E-21	4.285E-21	3.009E-21	3.009E-22	7.143E-26	3.141E-36	0.000E+00	0.000E+00				
Ru-106	Ru-106	1.000E+00	9.976E-28	5.024E-28	1.274E-28	1.047E-30	1.155E-36	0.000E+00							
Sb-125	Sb-125	1.000E+00	9.422E-29	7.349E-29	4.471E-29	7.853E-30	5.455E-32	1.524E-39	0.000E+00						
Sm-147	Sm-147	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sm-151	Sm-151	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	5.327E-36	5.212E-36	4.990E-36	4.284E-36	2.771E-36	6.033E-37	7.739E-39	1.401E-45	0.000E+00				
Tc-99	Tc-99	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.524E+00	1.912E-03	2.812E-21				
Th-228	Th-228	1.000E+00	6.398E-21	4.460E-21	2.167E-21	1.731E-22	1.267E-25	1.345E-36	0.000E+00						
Th-229	Th-229	1.000E+00	3.131E-32	3.137E-32	3.149E-32	3.192E-32	3.317E-32	3.793E-32	5.564E-32	2.128E-31	4.541E-28				
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226	1.000E+00	4.201E-06	1.260E-05	2.940E-05	8.817E-05	2.558E-04	8.391E-04	2.479E-03	7.999E-03	3.759E-02				
Th-230	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.803E-45	
Th-230	ΣDSR(j)		4.201E-06	1.260E-05	2.940E-05	8.817E-05	2.558E-04	8.391E-04	2.479E-03	7.999E-03	3.759E-02				

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Branch Fraction*	DSR(j, t) (mrem/yr)/(pCi/g)											
			t = 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03			
Th-232	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-232	Ra-228	1.000E+00	6.240E-26	1.779E-25	3.720E-25	7.852E-25	1.100E-24	1.259E-24	1.723E-24	5.155E-24	2.706E-21	2.706E-21	2.706E-21	2.706E-21
Th-232	Th-228	1.000E+00	4.933E-23	3.030E-22	1.208E-21	4.547E-21	7.637E-21	8.715E-21	1.138E-20	2.896E-20	6.026E-18	6.026E-18	6.026E-18	6.026E-18
Th-232	ΣDSR(j)		4.940E-23	3.032E-22	1.208E-21	4.548E-21	7.638E-21	8.716E-21	1.138E-20	2.897E-20	6.029E-18	6.029E-18	6.029E-18	6.029E-18
Tl-204	Tl-204	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.045E-24	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	U-233	1.000E+00	1.551E-42	1.555E-42	1.562E-42	1.589E-42	1.668E-42	1.976E-42	3.206E-42	1.746E-41	2.802E-37	2.802E-37	2.802E-37	2.802E-37
U-233	Th-229	1.000E+00	1.479E-36	4.445E-36	1.041E-35	3.166E-35	9.559E-35	3.607E-34	1.589E-33	2.053E-32	2.384E-28	2.384E-28	2.384E-28	2.384E-28
U-233	ΣDSR(j)		1.479E-36	4.445E-36	1.041E-35	3.166E-35	9.559E-35	3.607E-34	1.589E-33	2.053E-32	2.384E-28	2.384E-28	2.384E-28	2.384E-28
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226	1.000E+00	1.261E-11	8.824E-11	4.664E-10	4.173E-09	3.518E-08	3.819E-07	3.413E-06	3.815E-05	1.051E-03	1.051E-03	1.051E-03	1.051E-03
U-234	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		1.261E-11	8.824E-11	4.664E-10	4.173E-09	3.518E-08	3.819E-07	3.413E-06	3.815E-05	1.051E-03	1.051E-03	1.051E-03	1.051E-03
U-235	U-235	1.000E+00	1.663E-39	1.667E-39	1.675E-39	1.704E-39	1.788E-39	2.116E-39	3.425E-39	1.847E-38	2.809E-34	2.809E-34	2.809E-34	2.809E-34
U-235	Pa-231	1.000E+00	5.894E-39	1.771E-38	4.150E-38	1.263E-37	3.819E-37	1.450E-36	6.507E-36	8.960E-35	1.495E-30	1.495E-30	1.495E-30	1.495E-30
U-235	Ac-227	1.000E+00	3.415E-40	2.373E-39	1.234E-38	1.043E-37	7.576E-37	5.602E-36	3.226E-35	4.866E-34	8.946E-30	8.946E-30	8.946E-30	8.946E-30
U-235	ΣDSR(j)		7.898E-39	2.175E-38	5.551E-38	2.323E-37	1.141E-36	7.055E-36	3.877E-35	5.763E-34	1.044E-29	1.044E-29	1.044E-29	1.044E-29
U-236	U-236	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-236	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-236	Ra-228	1.000E+00	1.037E-36	7.025E-36	3.459E-35	2.453E-34	1.247E-33	5.716E-33	2.466E-32	2.463E-31	5.920E-28	5.920E-28	5.920E-28	5.920E-28
U-236	Th-228	1.000E+00	6.230E-34	8.481E-33	8.035E-32	1.114E-30	7.734E-30	3.837E-29	1.614E-28	1.380E-27	1.318E-24	1.318E-24	1.318E-24	1.318E-24
U-236	ΣDSR(j)		6.241E-34	8.488E-33	8.038E-32	1.114E-30	7.735E-30	3.838E-29	1.614E-28	1.381E-27	1.318E-24	1.318E-24	1.318E-24	1.318E-24
U-238	U-238	1.000E+00	2.084E-27	2.088E-27	2.094E-27	2.118E-27	2.186E-27	2.443E-27	3.355E-27	1.019E-26	5.817E-24	5.817E-24	5.817E-24	5.817E-24
U-238	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	Ra-226	1.000E+00	8.935E-18	1.340E-16	1.564E-15	4.148E-14	1.015E-12	3.638E-11	9.782E-10	3.714E-08	5.569E-06	5.569E-06	5.569E-06	5.569E-06
U-238	Pb-210	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238	ΣDSR(j)		8.935E-18	1.340E-16	1.564E-15	4.148E-14	1.015E-12	3.638E-11	9.782E-10	3.714E-08	5.569E-06	5.569E-06	5.569E-06	5.569E-06
Zn-65	Zn-65	1.000E+00	5.380E-24	1.908E-24	2.401E-25	1.696E-28	1.686E-37	0.000E+00						

*Branch Fraction is the cumulative factor for the j't principal radionuclide daughter: CUMBRF(j) = BRF(1)*BRF(2)* ... BRF(j).
 The DSR includes contributions from associated (half-life ≤ 0.5 yr) daughters.

Single Radionuclide Soil Guidelines G(i,t) in pCi/g
Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Nuclide (i)	t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
Ac-227	*7.230E+13	*7.230E+13	*7.230E+13	*7.230E+13	*7.230E+13	*7.230E+13	*7.230E+13	*7.230E+13	*7.230E+13
Ag-108m	*2.608E+13	*2.608E+13	*2.608E+13	*2.608E+13	*2.608E+13	*2.608E+13	*2.608E+13	*2.608E+13	*2.608E+13
Ag-110m	*4.752E+15	*4.752E+15	*4.752E+15	*4.752E+15	*4.752E+15	*4.752E+15	*4.752E+15	*4.752E+15	*4.752E+15
Am-241	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12	*3.430E+12
Am-243	*1.992E+11	*1.992E+11	*1.992E+11	*1.992E+11	*1.992E+11	*1.992E+11	*1.992E+11	*1.992E+11	*1.992E+11
Au-195	*3.658E+15	*3.658E+15	*3.658E+15	*3.658E+15	*3.658E+15	*3.658E+15	*3.658E+15	*3.658E+15	*3.658E+15
Ba-133	*2.503E+14	*2.503E+14	*2.503E+14	*2.503E+14	*2.503E+14	*2.503E+14	*2.503E+14	*2.503E+14	*2.503E+14
C-14	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	*4.454E+12	6.155E+01	2.840E+02
Ca-41	*6.232E+10	*6.232E+10	*6.232E+10	*6.232E+10	*6.232E+10	*6.232E+10	*6.232E+10	*6.232E+10	2.033E+02
Cd-109	*2.584E+15	*2.584E+15	*2.584E+15	*2.584E+15	*2.584E+15	*2.584E+15	*2.584E+15	*2.584E+15	*2.584E+15
Ce-144	*3.190E+15	*3.190E+15	*3.190E+15	*3.190E+15	*3.190E+15	*3.190E+15	*3.190E+15	*3.190E+15	*3.190E+15
Cf-252	*5.374E+14	*5.374E+14	*5.374E+14	*5.374E+14	*5.374E+14	*5.374E+14	*5.374E+14	*5.374E+14	*5.374E+14
Cm-243	*5.159E+13	*5.159E+13	*5.159E+13	*5.159E+13	*5.159E+13	*5.159E+13	*5.159E+13	*5.159E+13	*5.159E+13
Cm-244	*8.086E+13	*8.086E+13	*8.086E+13	*8.086E+13	*8.086E+13	*8.086E+13	*8.086E+13	*8.086E+13	*8.086E+13
Cm-245	*1.716E+11	*1.716E+11	*1.716E+11	*1.716E+11	*1.716E+11	*1.716E+11	*1.716E+11	*1.716E+11	*1.716E+11
Cm-246	*3.071E+11	*3.071E+11	*3.071E+11	*3.071E+11	*3.071E+11	*3.071E+11	*3.071E+11	*3.071E+11	*3.071E+11
Cm-247	*9.278E+07	*9.278E+07	*9.278E+07	*9.278E+07	*9.278E+07	*9.278E+07	*9.278E+07	*9.278E+07	*9.278E+07
Co-57	*8.464E+15	*8.464E+15	*8.464E+15	*8.464E+15	*8.464E+15	*8.464E+15	*8.464E+15	*8.464E+15	*8.464E+15
Co-60	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15	*1.131E+15
Cr-51	*1.294E+15	*1.294E+15	*1.294E+15	*1.294E+15	*1.294E+15	*1.294E+15	*1.294E+15	*1.294E+15	*1.294E+15
Cr-52	*1.152E+09	*1.152E+09	*1.152E+09	*1.152E+09	*1.152E+09	*1.152E+09	*1.152E+09	*1.152E+09	*1.152E+09
Cr-52	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13	*8.701E+13
Cr-52	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14	*1.765E+14
Eu-154	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14	*2.639E+14
Eu-155	*4.651E+14	*4.651E+14	*4.651E+14	*4.651E+14	*4.651E+14	*4.651E+14	*4.651E+14	*4.651E+14	*4.651E+14
Fe-55	*2.409E+15	*2.409E+15	*2.409E+15	*2.409E+15	*2.409E+15	*2.409E+15	*2.409E+15	*2.409E+15	*2.409E+15
Gd-152	*2.178E+01	*2.178E+01	*2.178E+01	*2.178E+01	*2.178E+01	*2.178E+01	*2.178E+01	*2.178E+01	*2.178E+01
Gd-153	*3.527E+15	*3.527E+15	*3.527E+15	*3.527E+15	*3.527E+15	*3.527E+15	*3.527E+15	*3.527E+15	*3.527E+15
Ge-68	*6.672E+15	*6.672E+15	*6.672E+15	*6.672E+15	*6.672E+15	*6.672E+15	*6.672E+15	*6.672E+15	*6.672E+15
H-3	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	*9.594E+15	4.441E+09	*9.594E+15	*9.594E+15
I-129	*1.766E+08	*1.766E+08	*1.766E+08	*1.766E+08	*1.766E+08	*1.766E+08	7.112E-02	1.029E+00	1.300E+08
K-40	*6.986E+06	*6.986E+06	*6.986E+06	*6.986E+06	*6.986E+06	*6.986E+06	*6.986E+06	*6.986E+06	*6.986E+06
Mn-54	*7.744E+15	*7.744E+15	*7.744E+15	*7.744E+15	*7.744E+15	*7.744E+15	*7.744E+15	*7.744E+15	*7.744E+15
Na-22	*6.244E+15	*6.244E+15	*6.244E+15	*6.244E+15	*6.244E+15	*6.244E+15	*6.244E+15	*6.244E+15	*6.244E+15
Nb-93m	*2.826E+14	*2.826E+14	*2.826E+14	*2.826E+14	*2.826E+14	*2.826E+14	*2.826E+14	*2.826E+14	*2.826E+14
Nb-94	*1.875E+11	*1.875E+11	*1.875E+11	*1.875E+11	*1.875E+11	*1.875E+11	*1.875E+11	*1.875E+11	*1.875E+11
Ni-59	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10	*8.085E+10
Ni-63	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13	*5.916E+13
Np-237	*7.045E+08	*7.045E+08	*7.045E+08	*7.045E+08	*7.045E+08	*7.045E+08	*7.045E+08	*7.045E+08	*7.045E+08
Pa-231	*4.722E+10	*4.722E+10	*4.722E+10	*4.722E+10	*4.722E+10	*4.722E+10	*4.722E+10	*4.722E+10	*4.722E+10
Pb-210	*7.631E+13	*7.631E+13	*7.631E+13	*7.631E+13	*7.631E+13	*7.631E+13	*7.631E+13	*7.631E+13	*7.631E+13
Pm-147	*9.267E+14	*9.267E+14	*9.267E+14	*9.267E+14	*9.267E+14	*9.267E+14	*9.267E+14	*9.267E+14	*9.267E+14
Pu-238	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	*1.711E+13	8.281E+11	4.220E+10	2.308E+09	6.867E+07
Pu-239	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10	*6.212E+10
Pu-240	*2.277E+11	*2.277E+11	*2.277E+11	*2.277E+11	*2.277E+11	*2.277E+11	*2.277E+11	*2.277E+11	*2.277E+11
Pu-241	*1.030E+14	*1.030E+14	*1.030E+14	*1.030E+14	*1.030E+14	*1.030E+14	*1.030E+14	*1.030E+14	*1.030E+14
U-235	*3.923E+09	*3.923E+09	*3.923E+09	*3.923E+09	*3.923E+09	*3.923E+09	*3.923E+09	*3.923E+09	*3.923E+09
U-238	*1.773E+07	*1.773E+07	*1.773E+07	*1.773E+07	*1.773E+07	*1.773E+07	*1.773E+07	*1.773E+07	*1.773E+07
U-238	1.289E+03	1.290E+03	1.290E+03	1.293E+03	1.300E+03	1.327E+03	1.405E+03	1.709E+03	5.404E+03

228	*2.726E+14									
106	*3.347E+15									
25	*1.033E+15									
Sm-147	*2.294E+04									
Sm-151	*2.631E+13									
Sr-90	*1.365E+14									
Tc-99	*1.696E+10	*1.696E+10	*1.696E+10	*1.696E+10	*1.696E+10	*1.696E+10	9.903E+00	1.308E+04	*1.696E+10	
Th-228	*8.192E+14									
Th-229	*2.126E+11									
Th-230	5.951E+06	1.984E+06	8.503E+05	2.836E+05	9.775E+04	2.979E+04	1.009E+04	3.125E+03	6.651E+02	
Th-232	*1.096E+05									
Tl-204	*4.636E+14									
U-233	*9.675E+09									
U-234	*6.245E+09	*6.245E+09	*6.245E+09	5.992E+09	7.106E+08	6.547E+07	7.324E+06	6.554E+05	2.379E+04	
U-235	*2.160E+06									
U-236	*6.466E+07									
U-238	*3.360E+05									
Zn-65	*8.241E+15									

*At specific activity limit

Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 at tmin = time of minimum single radionuclide soil guideline
 and at tmax = time of maximum total dose = 326.0 ± 0.7 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin) (pCi/g)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ac-227	3.200E+00	0.000E+00	0.000E+00	*7.230E+13	0.000E+00	*7.230E+13
Ag-108m	2.500E+01	0.000E+00	5.429E-27	*2.608E+13	1.599E-27	*2.608E+13
Ag-110m	2.500E+01	0.000E+00	3.692E-24	*4.752E+15	0.000E+00	*4.752E+15
Am-241	1.000E-01	0.000E+00	0.000E+00	*3.430E+12	0.000E+00	*3.430E+12
Am-243	1.000E-01	0.000E+00	0.000E+00	*1.992E+11	0.000E+00	*1.992E+11
Au-195	1.000E+02	0.000E+00	0.000E+00	*3.658E+15	0.000E+00	*3.658E+15
Ba-133	2.500E+01	0.000E+00	0.000E+00	*2.503E+14	0.000E+00	*2.503E+14
C-14	1.000E+01	1047 ± 2	5.160E-01	4.845E+01	0.000E+00	*4.454E+12
Ca-41	2.500E+01	4707 ± 9	1.347E-01	1.857E+02	0.000E+00	*6.232E+10
Cd-109	2.500E+01	0.000E+00	0.000E+00	*2.584E+15	0.000E+00	*2.584E+15
Ce-144	2.500E+01	0.000E+00	8.130E-28	*3.190E+15	0.000E+00	*3.190E+15
Cf-252	1.000E-01	0.000E+00	0.000E+00	*5.374E+14	0.000E+00	*5.374E+14
Cm-243	1.000E-01	0.000E+00	0.000E+00	*5.159E+13	0.000E+00	*5.159E+13
Cm-244	1.000E-01	0.000E+00	0.000E+00	*8.086E+13	0.000E+00	*8.086E+13
Cm-245	1.000E-01	0.000E+00	0.000E+00	*1.716E+11	0.000E+00	*1.716E+11
Cm-246	1.000E-01	5.000E+03	2.145E-15	*3.071E+11	1.924E-21	*3.071E+11
Cm-247	1.000E-01	5.000E+03	7.784E-27	*9.278E+07	0.000E+00	*9.278E+07
C-57	1.000E-01	0.000E+00	0.000E+00	*8.464E+15	0.000E+00	*8.464E+15
Co-57	2.500E+01	0.000E+00	1.364E-21	*1.131E+15	0.000E+00	*1.131E+15
Co-60	2.500E+01	0.000E+00	5.881E-26	*1.294E+15	0.000E+00	*1.294E+15
Co-60	2.500E+01	0.000E+00	0.000E+00	*1.152E+09	0.000E+00	*1.152E+09
Cs-137	2.500E+01	0.000E+00	6.850E-27	*8.701E+13	6.359E-30	*8.701E+13
Eu-152	2.500E+01	0.000E+00	1.567E-23	*1.765E+14	0.000E+00	*1.765E+14
Eu-154	2.500E+01	0.000E+00	5.997E-23	*2.639E+14	0.000E+00	*2.639E+14
Eu-155	2.500E+01	0.000E+00	0.000E+00	*4.651E+14	0.000E+00	*4.651E+14
Fe-55	2.500E+01	0.000E+00	0.000E+00	*2.409E+15	0.000E+00	*2.409E+15
Gd-152	2.500E+01	0.000E+00	0.000E+00	*2.178E+01	0.000E+00	*2.178E+01
Gd-153	2.500E+01	0.000E+00	0.000E+00	*3.527E+15	0.000E+00	*3.527E+15
Ge-68	2.500E+01	0.000E+00	5.822E-28	*6.672E+15	0.000E+00	*6.672E+15
H-3	1.000E+03	216.8 ± 0.4	4.199E-07	5.954E+07	1.004E-09	2.489E+10
I-129	1.000E-02	325.9 ± 0.7	5.630E+02	4.440E-02	5.631E+02	4.440E-02
K-40	8.000E+02	5.000E+03	1.157E-19	*6.986E+06	3.249E-22	*6.986E+06
Mn-54	2.500E+01	0.000E+00	6.286E-25	*7.744E+15	0.000E+00	*7.744E+15
Na-22	2.500E+01	0.000E+00	4.106E-24	*6.244E+15	0.000E+00	*6.244E+15
Nb-93m	2.500E+01	0.000E+00	0.000E+00	*2.826E+14	0.000E+00	*2.826E+14
Nb-94	2.500E+01	5.000E+03	6.712E-22	*1.875E+11	4.265E-25	*1.875E+11
Ni-59	2.500E+01	0.000E+00	0.000E+00	*8.085E+10	0.000E+00	*8.085E+10
Ni-63	2.500E+01	0.000E+00	0.000E+00	*5.916E+13	0.000E+00	*5.916E+13
Np-237	1.000E-01	5.000E+03	4.895E-30	*7.045E+08	0.000E+00	*7.045E+08
Pa-231	3.200E+00	5.000E+03	1.054E-28	*4.722E+10	0.000E+00	*4.722E+10
Pb-210	3.330E+02	0.000E+00	0.000E+00	*7.631E+13	0.000E+00	*7.631E+13
Pm-147	2.500E+01	0.000E+00	0.000E+00	*9.267E+14	0.000E+00	*9.267E+14
Pu-238	1.000E-01	5.000E+03	3.640E-07	6.867E+07	7.332E-10	3.410E+10
Pu-239	1.000E-01	0.000E+00	0.000E+00	*6.212E+10	0.000E+00	*6.212E+10
Pu-240	1.000E-01	5.000E+03	8.488E-29	*2.277E+11	0.000E+00	*2.277E+11
Pu-241	1.000E-01	0.000E+00	0.000E+00	*1.030E+14	0.000E+00	*1.030E+14
Pu-242	1.000E-01	5.000E+03	1.215E-12	*3.923E+09	1.604E-17	*3.923E+09
Pu-244	1.000E-01	5.000E+03	2.186E-22	*1.773E+07	9.676E-26	*1.773E+07

Summary : EGL Vadose Zone Analysis

File: USEI_EGL_FINAL_03_25_05.rad

226	1.120E+02	0.000E+00	1.939E-02	1.289E+03	1.766E-02	1.416E+03
28	2.800E+01	4.098 ± 0.008	4.423E-21	*2.726E+14	0.000E+00	*2.726E+14
106	2.500E+01	0.000E+00	9.976E-28	*3.347E+15	0.000E+00	*3.347E+15
Sb-125	2.500E+01	0.000E+00	9.422E-29	*1.033E+15	0.000E+00	*1.033E+15
Sm-147	2.500E+01	0.000E+00	0.000E+00	*2.294E+04	0.000E+00	*2.294E+04
Sm-151	2.500E+01	0.000E+00	0.000E+00	*2.631E+13	0.000E+00	*2.631E+13
Sr-90	2.500E+01	0.000E+00	0.000E+00	*1.365E+14	0.000E+00	*1.365E+14
Tc-99	1.000E+00	247.1 ± 0.5	4.342E+00	5.758E+00	1.934E+00	1.293E+01
Th-228	2.800E+01	0.000E+00	6.398E-21	*8.192E+14	0.000E+00	*8.192E+14
Th-229	2.800E+01	5.000E+03	4.541E-28	*2.126E+11	0.000E+00	*2.126E+11
Th-230	8.300E+01	5.000E+03	3.759E-02	6.651E+02	2.689E-03	9.297E+03
Th-232	2.800E+01	5.000E+03	6.029E-18	*1.096E+05	1.178E-20	*1.096E+05
Tl-204	2.500E+01	206.0 ± 0.4	6.800E-17	*4.636E+14	5.922E-26	*4.636E+14
U-233	3.300E+00	5.000E+03	2.384E-28	*9.675E+09	0.000E+00	*9.675E+09
U-234	8.300E+01	5.000E+03	1.051E-03	2.379E+04	4.029E-06	6.205E+06
U-235	3.200E+00	5.000E+03	1.044E-29	*2.160E+06	0.000E+00	*2.160E+06
U-236	3.200E+00	5.000E+03	1.318E-24	*6.466E+07	1.819E-28	*6.466E+07
U-238	8.300E+01	5.000E+03	5.569E-06	*3.360E+05	1.255E-09	*3.360E+05
Zn-65	2.500E+01	0.000E+00	5.380E-24	*8.241E+15	0.000E+00	*8.241E+15

*At specific activity limit

Individual Nuclide Dose Summed Over All Pathways
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	DOSE(j,t), mrem/yr										
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03		
Ru-106	Ru-106	1.000E+00	2.494E-26	1.256E-26	3.186E-27	2.619E-29	0.000E+00						
Sb-125	Sb-125	1.000E+00	2.355E-27	1.837E-27	1.118E-27	1.963E-28	0.000E+00						
Sm-151	Sm-151	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Tc-99	Tc-99	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.524E+00	1.912E-03	2.812E-21	
Tl-204	Tl-204	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.261E-22	0.000E+00	0.000E+00	
Zn-65	Zn-65	1.000E+00	1.345E-22	4.771E-23	6.002E-24	4.240E-27	0.000E+00						

BRF(i) is the branch fraction of the parent nuclide.

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
Ac-227	Ac-227	1.000E+00	3.200E+00	3.100E+00	2.908E+00	2.327E+00	1.231E+00	1.326E-01	2.275E-04	4.760E-14	0.000E+00
Ac-227	Am-243	1.000E+00	0.000E+00	7.911E-23	6.327E-21	7.477E-19	5.382E-17	4.695E-15	1.984E-13	8.685E-12	9.588E-10
Ac-227	Cm-243	9.976E-01	0.000E+00	7.854E-23	6.221E-21	7.108E-19	4.656E-17	2.994E-15	6.639E-14	1.028E-12	2.515E-11
Ac-227	Cm-243	2.400E-03	0.000E+00	3.556E-30	8.480E-28	3.272E-25	6.654E-23	1.576E-20	1.226E-18	7.122E-17	8.686E-15
Ac-227	Cm-247	1.000E+00	0.000E+00	1.488E-27	3.577E-25	1.419E-22	3.123E-20	9.542E-18	1.294E-15	2.000E-13	1.174E-10
Ac-227	Pa-231	1.000E+00	0.000E+00	1.003E-01	2.915E-01	8.724E-01	1.968E+00	3.062E+00	3.179E+00	3.125E+00	2.836E+00
Ac-227	Pu-239	1.000E+00	0.000E+00	1.097E-17	2.915E-16	1.023E-14	2.388E-13	5.827E-12	7.545E-11	9.457E-10	2.161E-08
Ac-227	U-235	1.000E+00	0.000E+00	1.066E-06	9.397E-06	9.717E-05	7.222E-04	4.718E-03	1.800E-02	6.329E-02	2.806E-01
Ac-227	ΣS(j):		3.200E+00	3.200E+00	3.200E+00	3.200E+00	3.200E+00	3.199E+00	3.197E+00	3.189E+00	3.116E+00
Ag-108m	Ag-108m	1.000E+00	2.500E+01	2.486E+01	2.459E+01	2.367E+01	2.121E+01	1.446E+01	4.835E+00	1.046E-01	3.198E-11
Ag-110m	Ag-110m	1.000E+00	2.500E+01	9.077E+00	1.197E+00	9.957E-04	1.579E-12	2.452E-43	0.000E+00	0.000E+00	0.000E+00
Am-241	Am-241	1.000E+00	1.000E-01	9.984E-02	9.952E-02	9.841E-02	9.530E-02	8.517E-02	6.179E-02	2.010E-02	3.277E-05
Am-241	Cm-245	1.000E+00	0.000E+00	3.796E-06	3.307E-05	3.289E-04	2.224E-03	1.187E-02	3.561E-02	7.526E-02	6.974E-02
Am-241	Pu-241	1.000E+00	0.000E+00	1.564E-04	4.469E-04	1.262E-03	2.471E-03	2.907E-03	2.130E-03	6.926E-04	1.129E-06
Am-241	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.995E-02	9.953E-02	9.605E-02	6.977E-02
Np-237	Am-241	1.000E+00	0.000E+00	3.236E-08	9.694E-08	3.213E-07	9.486E-07	2.991E-06	7.704E-06	1.606E-05	1.957E-05
Np-237	Cm-245	1.000E+00	0.000E+00	4.116E-13	1.084E-11	3.694E-10	8.021E-09	1.658E-07	1.746E-06	1.521E-05	1.161E-04
Np-237	Cm-245	2.450E-05	0.000E+00	1.880E-14	1.639E-13	1.637E-12	1.120E-11	6.276E-11	2.188E-10	7.438E-10	3.178E-09
Np-237	Np-237	1.000E+00	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.993E-02	9.979E-02	9.930E-02	9.656E-02
Np-237	Pu-241	1.000E+00	0.000E+00	2.555E-11	2.225E-10	2.214E-09	1.498E-08	8.011E-08	2.423E-07	5.304E-07	6.520E-07
Np-237	Pu-241	2.450E-05	0.000E+00	7.748E-13	2.217E-12	6.298E-12	1.259E-11	1.634E-11	1.645E-11	1.637E-11	1.592E-11
Np-237	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.993E-02	9.980E-02	9.933E-02	9.669E-02
U-233	Am-241	1.000E+00	0.000E+00	7.078E-14	6.364E-13	7.043E-12	6.269E-11	6.705E-10	5.429E-09	4.333E-08	3.383E-07
U-233	Cm-245	1.000E+00	0.000E+00	4.511E-19	3.583E-17	4.136E-15	2.806E-13	2.122E-11	7.424E-10	2.414E-08	1.108E-06
U-233	Cm-245	2.450E-05	0.000E+00	2.751E-20	7.253E-19	2.478E-17	5.425E-16	1.158E-14	1.342E-13	1.589E-12	3.402E-11
U-233	Np-237	1.000E+00	0.000E+00	4.373E-07	1.312E-06	4.372E-06	1.311E-05	4.360E-05	1.300E-04	4.244E-04	1.885E-03
U-233	Pu-241	1.000E+00	0.000E+00	3.739E-17	9.851E-16	3.357E-14	7.289E-13	1.508E-11	1.590E-10	1.397E-09	1.122E-08
U-233	Pu-241	2.450E-05	0.000E+00	1.708E-18	1.489E-17	1.487E-16	1.018E-15	5.709E-15	1.996E-14	6.854E-14	3.096E-13
U-233	U-233	1.000E+00	3.300E+00	3.300E+00	3.299E+00	3.298E+00	3.295E+00	3.282E+00	3.248E+00	3.129E+00	2.527E+00
U-233	ΣS(j):		3.300E+00	3.300E+00	3.299E+00	3.298E+00	3.295E+00	3.282E+00	3.248E+00	3.129E+00	2.529E+00
Th-229	Am-241	1.000E+00	0.000E+00	2.228E-18	6.011E-17	2.220E-15	5.941E-14	2.134E-12	5.296E-11	1.497E-09	6.468E-08
Th-229	Cm-245	1.000E+00	0.000E+00	8.534E-24	2.040E-21	7.935E-19	1.660E-16	4.464E-14	5.053E-12	5.904E-10	1.486E-07
Th-229	Cm-245	2.450E-05	0.000E+00	6.510E-25	5.173E-23	5.985E-21	4.086E-19	3.164E-17	1.188E-15	4.845E-14	5.027E-12
Th-229	Np-237	1.000E+00	0.000E+00	2.065E-11	1.858E-10	2.064E-09	1.856E-08	2.054E-07	1.830E-06	1.961E-05	4.001E-04
Th-229	Pu-241	1.000E+00	0.000E+00	8.850E-22	7.028E-20	8.113E-18	5.504E-16	4.161E-14	1.455E-12	4.721E-11	2.137E-09
Th-229	Pu-241	2.450E-05	0.000E+00	5.397E-23	1.423E-21	4.861E-20	1.064E-18	2.271E-17	2.630E-16	3.104E-15	6.548E-14
Th-229	Th-229	1.000E+00	2.800E+01	2.800E+01	2.799E+01	2.797E+01	2.792E+01	2.774E+01	2.721E+01	2.546E+01	1.742E+01
Th-229	U-233	1.000E+00	0.000E+00	3.116E-04	9.347E-04	3.114E-03	9.328E-03	3.093E-02	9.143E-02	2.894E-01	1.077E+00
Th-229	ΣS(j):		2.800E+01	2.800E+01	2.799E+01	2.798E+01	2.793E+01	2.777E+01	2.730E+01	2.575E+01	1.849E+01
Pu-243	Am-243	1.000E+00	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.972E-02	9.906E-02	9.720E-02	9.095E-02	6.224E-02
Pu-243	Cm-243	2.400E-03	0.000E+00	2.227E-08	6.521E-08	2.000E-07	4.792E-07	8.399E-07	9.037E-07	8.462E-07	5.791E-07
Pu-243	Cm-247	1.000E+00	0.000E+00	9.392E-06	2.817E-05	9.388E-05	2.814E-04	9.347E-04	2.777E-03	8.955E-03	3.727E-02
Pu-243	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.951E-02

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide	Parent	BRF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
(j)	(i)										
Pu-239	Am-243	1.000E+00	0.000E+00	2.880E-06	8.639E-06	2.878E-05	8.625E-05	2.862E-04	8.478E-04	2.704E-03	1.053E-02
Pu-239	Cm-243	9.976E-01	0.000E+00	2.839E-06	8.313E-06	2.550E-05	6.115E-05	1.075E-04	1.171E-04	1.146E-04	1.008E-04
Pu-239	Cm-243	2.400E-03	0.000E+00	3.220E-13	2.852E-12	2.997E-11	2.321E-10	1.660E-09	6.796E-09	2.409E-08	9.706E-08
Pu-239	Cm-247	1.000E+00	0.000E+00	1.353E-10	1.217E-09	1.352E-08	1.216E-07	1.347E-06	1.202E-05	1.296E-04	2.745E-03
Pu-239	Pu-239	1.000E+00	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.990E-02	9.968E-02	9.905E-02	9.686E-02	8.524E-02
Pu-239	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.001E-01	1.001E-01	1.000E-01	9.981E-02	9.862E-02
U-235	Am-243	1.000E+00	0.000E+00	1.418E-15	1.276E-14	1.418E-13	1.274E-12	1.410E-11	1.254E-10	1.338E-09	2.651E-08
U-235	Cm-243	9.976E-01	0.000E+00	1.404E-15	1.243E-14	1.307E-13	1.012E-12	7.249E-12	2.980E-11	1.073E-10	4.722E-10
U-235	Cm-243	2.400E-03	0.000E+00	1.059E-22	2.825E-21	1.004E-19	2.417E-18	6.359E-17	8.890E-16	1.145E-14	2.423E-13
U-235	Cm-247	1.000E+00	0.000E+00	4.440E-20	1.199E-18	4.439E-17	1.197E-15	4.421E-14	1.183E-12	4.249E-11	4.461E-09
U-235	Pu-239	1.000E+00	0.000E+00	9.848E-11	2.954E-10	9.845E-10	2.951E-09	9.809E-09	2.919E-08	9.458E-08	4.024E-07
U-235	U-235	1.000E+00	3.200E+00	3.200E+00	3.200E+00	3.198E+00	3.195E+00	3.184E+00	3.153E+00	3.047E+00	2.505E+00
U-235	ΣS(j):		3.200E+00	3.200E+00	3.200E+00	3.198E+00	3.195E+00	3.184E+00	3.153E+00	3.047E+00	2.505E+00
Pa-231	Am-243	1.000E+00	0.000E+00	1.000E-20	2.701E-19	9.998E-18	2.697E-16	9.953E-15	2.661E-13	9.516E-12	9.756E-10
Pa-231	Cm-243	9.976E-01	0.000E+00	9.919E-21	2.646E-19	9.398E-18	2.265E-16	5.966E-15	8.378E-14	1.096E-12	2.545E-11
Pa-231	Cm-243	2.400E-03	0.000E+00	5.610E-28	4.500E-26	5.372E-24	3.968E-22	3.697E-20	1.694E-18	7.832E-17	8.840E-15
Pa-231	Cm-247	1.000E+00	0.000E+00	2.349E-25	1.902E-23	2.348E-21	1.900E-19	2.339E-17	1.880E-15	2.256E-13	1.203E-10
Pa-231	Pa-231	1.000E+00	3.200E+00	3.200E+00	3.200E+00	3.199E+00	3.198E+00	3.192E+00	3.177E+00	3.123E+00	2.834E+00
Pa-231	Pu-239	1.000E+00	0.000E+00	1.042E-15	9.376E-15	1.042E-13	9.367E-13	1.038E-11	9.279E-11	1.006E-09	2.187E-08
Pa-231	U-235	1.000E+00	0.000E+00	6.770E-05	2.031E-04	6.768E-04	2.029E-03	6.746E-03	2.009E-02	6.527E-02	2.821E-01
Pa-231	ΣS(j):		3.200E+00	3.200E+00	3.200E+00	3.200E+00	3.200E+00	3.199E+00	3.197E+00	3.188E+00	3.116E+00
Au-195	Au-195	1.000E+00	1.000E+02	2.481E+01	1.528E+00	8.844E-05	6.918E-17	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ba-133	Ba-133	1.000E+00	2.500E+01	2.344E+01	2.060E+01	1.311E+01	3.603E+00	3.922E-02	9.656E-08	2.260E-27	0.000E+00
C-14	C-14	1.000E+00	1.000E+01	9.995E+00	9.986E+00	9.955E+00	9.865E+00	9.556E+00	8.726E+00	6.349E+00	1.032E+00
Ca-41	Ca-41	1.000E+00	2.500E+01	2.499E+01	2.497E+01	2.492E+01	2.475E+01	2.417E+01	2.259E+01	1.783E+01	4.607E+00
Cd-109	Cd-109	1.000E+00	2.500E+01	1.448E+01	4.860E+00	1.064E-01	1.927E-06	4.876E-23	0.000E+00	0.000E+00	0.000E+00
Ce-144	Ce-144	1.000E+00	2.500E+01	1.026E+01	1.729E+00	3.393E-03	6.252E-11	5.307E-38	0.000E+00	0.000E+00	0.000E+00
Cf-252	Cf-252	9.691E-01	1.000E-01	7.689E-02	4.546E-02	7.225E-03	3.772E-05	3.878E-13	5.834E-36	0.000E+00	0.000E+00
Cm-248	Cf-252	9.691E-01	0.000E+00	1.743E-07	4.113E-07	6.996E-07	7.538E-07	7.539E-07	7.534E-07	7.516E-07	7.418E-07
Pu-244	Cf-252	9.691E-01	0.000E+00	7.001E-16	5.367E-15	3.756E-14	1.521E-13	5.583E-13	1.718E-12	5.765E-12	2.854E-11
Pu-244	Pu-244	9.987E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.969E-02	9.844E-02
Pu-244	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.969E-02	9.844E-02
Pu-240	Cf-252	9.691E-01	0.000E+00	2.524E-20	6.036E-19	1.560E-17	2.151E-16	2.838E-15	2.667E-14	2.937E-13	6.378E-12
Pu-240	Cm-244	1.000E+00	0.000E+00	1.040E-05	3.005E-05	8.805E-05	1.888E-04	2.688E-04	2.689E-04	2.491E-04	1.610E-04
Pu-240	Pu-240	1.000E+00	1.000E-01	9.999E-02	9.997E-02	9.989E-02	9.967E-02	9.891E-02	9.678E-02	8.966E-02	5.794E-02
Pu-240	Pu-244	9.987E-01	0.000E+00	1.059E-05	3.177E-05	1.058E-04	3.172E-04	1.053E-03	3.124E-03	1.002E-02	4.046E-02
Pu-240	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.001E-01	1.002E-01	1.002E-01	1.002E-01	9.992E-02	9.856E-02

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide Parent (j)	BRF(i) (i)	S(j,t), pCi/g									
		t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03	
U-236	Cf-252	9.691E-01	0.000E+00	1.892E-28	1.389E-26	1.275E-24	5.757E-23	2.702E-21	7.791E-20	2.879E-18	3.094E-16
U-236	Cm-244	1.000E+00	0.000E+00	1.550E-13	1.360E-12	1.386E-11	9.956E-11	6.065E-10	2.197E-09	7.395E-09	2.763E-08
U-236	Pu-240	1.000E+00	0.000E+00	2.960E-09	8.879E-09	2.958E-08	8.860E-08	2.937E-07	8.673E-07	2.736E-06	1.000E-05
U-236	Pu-244	9.987E-01	0.000E+00	1.567E-13	1.411E-12	1.567E-11	1.408E-10	1.559E-09	1.388E-08	1.486E-07	3.013E-06
U-236	U-236	1.000E+00	3.200E+00	3.200E+00	3.200E+00	3.198E+00	3.195E+00	3.184E+00	3.153E+00	3.047E+00	2.505E+00
U-236	ΣS(j):		3.200E+00	3.200E+00	3.200E+00	3.198E+00	3.195E+00	3.184E+00	3.153E+00	3.047E+00	2.505E+00
Th-232	Cf-252	9.691E-01	0.000E+00	1.883E-39	4.214E-37	1.346E-34	1.946E-32	3.222E-30	2.854E-28	3.566E-26	1.984E-23
Th-232	Cm-244	1.000E+00	0.000E+00	2.556E-24	6.772E-23	2.351E-21	5.345E-20	1.230E-18	1.509E-17	1.824E-16	3.870E-15
Th-232	Pu-240	1.000E+00	0.000E+00	7.302E-20	6.571E-19	7.298E-18	6.562E-17	7.264E-16	6.469E-15	6.928E-14	1.410E-12
Th-232	Pu-244	9.987E-01	0.000E+00	2.578E-24	6.959E-23	2.577E-21	6.951E-20	2.567E-18	6.876E-17	2.476E-15	2.645E-13
Th-232	Th-232	1.000E+00	2.800E+01	2.798E+01	2.792E+01						
Th-232	U-236	1.000E+00	0.000E+00	1.579E-10	4.736E-10	1.578E-09	4.733E-09	1.575E-08	4.701E-08	1.540E-07	6.991E-07
Th-232	ΣS(j):		2.800E+01	2.798E+01	2.792E+01						
Ra-228	Cf-252	9.691E-01	0.000E+00	3.741E-41	2.455E-38	2.403E-35	8.147E-33	2.356E-30	2.560E-28	3.450E-26	1.971E-23
Ra-228	Cm-244	1.000E+00	0.000E+00	7.536E-26	5.736E-24	5.758E-22	2.793E-20	1.009E-18	1.421E-17	1.793E-16	3.858E-15
Ra-228	Pu-240	1.000E+00	0.000E+00	2.848E-21	7.254E-20	2.226E-18	3.910E-17	6.160E-16	6.122E-15	6.815E-14	1.406E-12
Ra-228	Pu-244	9.987E-01	0.000E+00	7.585E-26	5.863E-24	6.213E-22	3.516E-20	2.026E-18	6.337E-17	2.416E-15	2.632E-13
Ra-228	Ra-228	1.000E+00	2.800E+01	2.482E+01	1.950E+01	8.385E+00	7.521E-01	1.625E-04	5.471E-15	0.000E+00	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	3.180E+00	8.497E+00	1.961E+01	2.724E+01	2.799E+01	2.799E+01	2.798E+01	2.792E+01
Ra-228	U-236	1.000E+00	0.000E+00	9.144E-12	7.618E-11	6.612E-10	3.459E-09	1.444E-08	4.571E-08	1.527E-07	6.979E-07
Ra-228	ΣS(j):		2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.799E+01	2.799E+01	2.799E+01	2.798E+01	2.792E+01
Th-228	Cf-252	9.691E-01	0.000E+00	1.865E-42	3.410E-39	8.823E-36	5.441E-33	2.093E-30	2.465E-28	3.413E-26	1.967E-23
Th-228	Cm-244	1.000E+00	0.000E+00	5.173E-27	1.066E-24	2.625E-22	2.097E-20	9.380E-19	1.393E-17	1.784E-16	3.854E-15
Th-228	Pu-240	1.000E+00	0.000E+00	2.417E-22	1.634E-20	1.165E-18	3.134E-17	5.804E-16	6.008E-15	6.778E-14	1.404E-12
Th-228	Pu-244	9.987E-01	0.000E+00	5.200E-27	1.086E-24	2.807E-22	2.600E-20	1.856E-18	6.161E-17	2.396E-15	2.628E-13
Th-228	Ra-228	1.000E+00	0.000E+00	7.988E+00	1.508E+01	1.145E+01	1.126E+00	2.435E-04	8.199E-15	0.000E+00	0.000E+00
Th-228	Th-228	1.000E+00	2.800E+01	1.949E+01	9.443E+00	7.475E-01	5.328E-04	5.152E-15	0.000E+00	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	5.220E-01	3.481E+00	1.580E+01	2.687E+01	2.799E+01	2.799E+01	2.798E+01	2.792E+01
Th-228	U-236	1.000E+00	0.000E+00	1.021E-12	2.201E-11	4.154E-10	3.041E-09	1.401E-08	4.528E-08	1.523E-07	6.976E-07
Th-228	ΣS(j):		2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.799E+01	2.799E+01	2.799E+01	2.798E+01	2.792E+01
Cm-243	Cm-243	9.976E-01	9.976E-02	9.736E-02	9.274E-02	7.822E-02	4.809E-02	8.763E-03	6.762E-05	2.729E-12	0.000E+00
Cm-243	Cm-243	2.400E-03	2.400E-04	2.342E-04	2.231E-04	1.882E-04	1.157E-04	2.108E-05	1.627E-07	6.565E-15	0.000E+00
Cm-243	ΣS(j):		1.000E-01	9.760E-02	9.296E-02	7.841E-02	4.821E-02	8.784E-03	6.778E-05	2.735E-12	0.000E+00
Cm-244	Cm-244	1.000E+00	1.000E-01	9.624E-02	8.915E-02	6.820E-02	3.172E-02	2.176E-03	1.031E-06	2.383E-18	0.000E+00
Cm-245	Cm-245	1.000E+00	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.975E-02	9.917E-02	9.754E-02	9.205E-02	6.610E-02
Cm-245	Cm-245	2.450E-05	2.450E-06	2.450E-06	2.449E-06	2.448E-06	2.444E-06	2.430E-06	2.390E-06	2.255E-06	1.619E-06
Cm-245	ΣS(j):		1.000E-01	9.999E-02	9.998E-02	9.992E-02	9.975E-02	9.918E-02	9.755E-02	9.205E-02	6.610E-02
Pu-241	Cm-245	1.000E+00	0.000E+00	4.699E-03	1.344E-02	3.819E-02	7.628E-02	9.852E-02	9.771E-02	9.220E-02	6.621E-02
Pu-241	Pu-241	1.000E+00	1.000E-01	9.530E-02	8.655E-02	6.179E-02	2.359E-02	8.116E-04	5.347E-08	1.241E-22	0.000E+00
Pu-241	ΣS(j):		1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.988E-02	9.934E-02	9.771E-02	9.220E-02	6.621E-02
Pu-241	Cm-245	2.450E-05	0.000E+00	1.151E-07	3.294E-07	9.356E-07	1.869E-06	2.414E-06	2.394E-06	2.259E-06	1.622E-06
Pu-241	Pu-241	2.450E-05	2.450E-06	2.335E-06	2.121E-06	1.514E-06	5.781E-07	1.989E-08	1.310E-12	3.041E-27	0.000E+00
Pu-241	ΣS(j):		2.450E-06	2.450E-06	2.450E-06	2.450E-06	2.447E-06	2.434E-06	2.394E-06	2.259E-06	1.622E-06

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g									
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03	
Cm-246	Cm-246	9.997E-01	1.000E-01	9.999E-02	9.996E-02	9.985E-02	9.956E-02	9.853E-02	9.566E-02	8.626E-02	4.776E-02	
Pu-242	Cm-246	9.997E-01	0.000E+00	1.841E-07	5.523E-07	1.840E-06	5.512E-06	1.827E-05	5.400E-05	1.707E-04	6.419E-04	
Pu-242	Pu-242	1.000E+00	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.995E-02	9.985E-02	9.950E-02	9.754E-02	
Pu-242	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.990E-02	9.967E-02	9.819E-02	
U-238	Cm-246	9.997E-01	0.000E+00	1.428E-17	1.285E-16	1.427E-15	1.283E-14	1.419E-13	1.260E-12	1.336E-11	2.579E-10	
U-238	Pu-242	1.000E+00	0.000E+00	1.551E-11	4.654E-11	1.551E-10	4.650E-10	1.547E-09	4.617E-09	1.510E-08	6.792E-08	
U-238	U-238	1.000E+00	8.300E+01	8.300E+01	8.299E+01	8.296E+01	8.288E+01	8.259E+01	8.179E+01	7.903E+01	6.497E+01	
U-238	ΣS(j):		8.300E+01	8.300E+01	8.299E+01	8.296E+01	8.288E+01	8.259E+01	8.179E+01	7.903E+01	6.497E+01	
U-234	Cm-246	9.997E-01	0.000E+00	1.350E-23	3.644E-22	1.349E-20	3.638E-19	1.341E-17	3.576E-16	1.267E-14	1.237E-12	
U-234	Pu-238	1.000E+00	0.000E+00	2.824E-07	8.404E-07	2.725E-06	7.566E-06	1.954E-05	3.218E-05	3.427E-05	2.787E-05	
U-234	Pu-242	1.000E+00	0.000E+00	2.199E-17	1.979E-16	2.198E-15	1.977E-14	2.191E-13	1.958E-12	2.123E-11	4.616E-10	
U-234	U-234	1.000E+00	8.300E+01	8.300E+01	8.299E+01	8.296E+01	8.287E+01	8.257E+01	8.172E+01	7.881E+01	6.406E+01	
U-234	U-238	1.000E+00	0.000E+00	2.353E-04	7.058E-04	2.352E-03	7.048E-03	2.341E-02	6.953E-02	2.237E-01	9.145E-01	
U-234	ΣS(j):		8.300E+01	8.300E+01	8.299E+01	8.296E+01	8.288E+01	8.259E+01	8.179E+01	7.903E+01	6.497E+01	
Th-230	Cm-246	9.997E-01	0.000E+00	3.038E-29	2.460E-27	3.036E-25	2.457E-23	3.022E-21	2.422E-19	2.883E-17	1.467E-14	
Th-230	Pu-238	1.000E+00	0.000E+00	1.273E-12	1.139E-11	1.243E-10	1.062E-09	9.949E-09	5.941E-08	2.745E-07	1.357E-06	
Th-230	Pu-242	1.000E+00	0.000E+00	6.598E-23	1.781E-21	6.597E-20	1.780E-18	6.579E-17	1.766E-15	6.411E-14	7.149E-12	
Th-230	Th-230	1.000E+00	8.300E+01	8.300E+01	8.300E+01	8.299E+01	8.298E+01	8.292E+01	8.276E+01	8.221E+01	7.913E+01	
Th-230	U-234	1.000E+00	0.000E+00	7.471E-04	2.241E-03	7.469E-03	2.239E-02	7.449E-02	2.221E-01	7.246E-01	3.211E+00	
Th-230	U-238	1.000E+00	0.000E+00	1.059E-09	9.531E-09	1.059E-07	9.521E-07	1.055E-05	9.427E-05	1.021E-03	2.206E-02	
Th-230	ΣS(j):		8.300E+01	8.300E+01	8.300E+01	8.300E+01	8.300E+01	8.300E+01	8.298E+01	8.294E+01	8.237E+01	
Ra-226	Cm-246	9.997E-01	0.000E+00	2.632E-33	6.393E-31	2.629E-28	6.373E-26	2.601E-23	6.170E-21	2.338E-18	4.698E-15	
Ra-226	Pu-238	1.000E+00	0.000E+00	1.839E-16	4.944E-15	1.804E-13	4.675E-12	1.509E-10	2.890E-09	4.679E-08	7.975E-07	
Ra-226	Pu-242	1.000E+00	0.000E+00	7.146E-27	5.787E-25	7.138E-23	5.769E-21	7.065E-19	5.594E-17	6.388E-15	2.661E-12	
Ra-226	Ra-226	1.000E+00	1.120E+02	1.119E+02	1.118E+02	1.115E+02	1.105E+02	1.070E+02	9.763E+01	7.086E+01	1.136E+01	
Ra-226	Th-230	1.000E+00	0.000E+00	3.595E-02	1.078E-01	3.587E-01	1.071E+00	3.513E+00	1.006E+01	2.870E+01	6.835E+01	
Ra-226	U-234	1.000E+00	0.000E+00	1.618E-07	1.456E-06	1.616E-05	1.449E-04	1.591E-03	1.384E-02	1.368E-01	1.911E+00	
Ra-226	U-238	1.000E+00	0.000E+00	1.529E-13	4.128E-12	1.527E-10	4.112E-09	1.508E-07	3.958E-06	1.331E-04	1.012E-02	
Ra-226	ΣS(j):		1.120E+02	1.120E+02	1.120E+02	1.118E+02	1.115E+02	1.105E+02	1.077E+02	9.970E+01	8.163E+01	
Pb-210	Cm-246	9.997E-01	0.000E+00	1.357E-35	9.806E-33	1.304E-29	8.728E-27	9.216E-24	3.921E-21	2.012E-18	4.564E-15	
Pb-210	Pb-210	1.000E+00	3.330E+02	3.228E+02	3.033E+02	2.440E+02	1.310E+02	1.487E+01	2.964E-02	1.049E-11	0.000E+00	
Pb-210	Pu-238	1.000E+00	0.000E+00	1.421E-18	1.133E-16	1.325E-14	9.245E-13	7.204E-11	2.220E-09	4.374E-08	7.901E-07	
Pb-210	Pu-242	1.000E+00	0.000E+00	4.419E-29	1.063E-26	4.218E-24	9.290E-22	2.841E-19	3.827E-17	5.657E-15	2.601E-12	
Pb-210	Ra-226	1.000E+00	0.000E+00	3.427E+00	9.965E+00	2.985E+01	6.738E+01	1.035E+02	9.906E+01	7.191E+01	1.152E+01	
Pb-210	Th-230	1.000E+00	0.000E+00	5.530E-04	4.874E-03	5.043E-02	3.753E-01	2.444E+00	9.042E+00	2.796E+01	6.824E+01	
Pb-210	U-234	1.000E+00	0.000E+00	1.664E-09	4.422E-08	1.552E-06	3.627E-05	8.841E-04	1.123E-02	1.289E-01	1.894E+00	
Pb-210	U-238	1.000E+00	0.000E+00	1.181E-15	9.446E-14	1.117E-11	8.048E-10	7.024E-08	2.938E-06	1.215E-04	9.965E-03	
Pb-210	ΣS(j):		3.330E+02	3.262E+02	3.133E+02	2.739E+02	1.988E+02	1.208E+02	1.081E+02	1.000E+02	8.167E+01	
Cm-247	Cm-247	1.000E+00	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.996E-02	9.987E-02	9.936E-02	
Co-57	Co-57	1.000E+00	1.000E-01	3.928E-02	6.059E-03	8.734E-06	6.663E-14	2.584E-42	0.000E+00	0.000E+00	0.000E+00	
Co-60	Co-60	1.000E+00	2.500E+01	2.192E+01	1.685E+01	6.710E+00	4.833E-01	4.849E-05	1.824E-16	0.000E+00	0.000E+00	

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide Parent (j)	Parent (i)	BRF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
Cs-134	Cs-134	1.000E+00	2.500E+01	1.786E+01	9.119E+00	8.670E-01	1.043E-03	6.291E-14	3.854E-43	0.000E+00	0.000E+00
Cs-135	Cs-135	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.498E+01	2.495E+01	2.484E+01	2.421E+01
Cs-137	Cs-137	1.000E+00	2.500E+01	2.443E+01	2.333E+01	1.984E+01	1.250E+01	2.479E+00	2.437E-02	2.296E-09	0.000E+00
Eu-152	Eu-152	7.208E-01	1.802E+01	1.711E+01	1.542E+01	1.071E+01	3.787E+00	9.940E-02	3.024E-06	4.698E-22	0.000E+00
Eu-152	Eu-152	2.792E-01	6.980E+00	6.626E+00	5.972E+00	4.150E+00	1.467E+00	3.850E-02	1.171E-06	1.820E-22	0.000E+00
Eu-152	ΣS(j):		2.500E+01	2.373E+01	2.139E+01	1.486E+01	5.253E+00	1.379E-01	4.196E-06	6.518E-22	0.000E+00
Gd-152	Eu-152	2.792E-01	0.000E+00	4.365E-14	1.244E-13	3.493E-13	6.804E-13	8.566E-13	8.610E-13	8.597E-13	8.526E-13
Gd-152	Gd-152	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01	2.474E+01
Gd-152	ΣS(j):		2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01	2.474E+01
Eu-154	Eu-154	1.000E+00	2.500E+01	2.311E+01	1.974E+01	1.137E+01	2.353E+00	9.485E-03	1.365E-09	1.546E-33	0.000E+00
Eu-155	Eu-155	1.000E+00	2.500E+01	2.174E+01	1.644E+01	6.180E+00	3.777E-01	2.132E-05	1.550E-17	0.000E+00	0.000E+00
Fe-55	Fe-55	1.000E+00	2.500E+01	1.934E+01	1.157E+01	1.919E+00	1.130E-02	1.772E-10	8.895E-33	0.000E+00	0.000E+00
Gd-153	Gd-153	1.000E+00	2.500E+01	8.783E+00	1.084E+00	7.158E-04	5.867E-13	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ge-68	Ge-68	1.000E+00	2.500E+01	1.027E+01	1.735E+00	3.431E-03	6.462E-11	5.927E-38	0.000E+00	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	1.000E+03	9.357E+02	8.193E+02	5.146E+02	1.363E+02	1.303E+00	2.212E-06	1.410E-26	0.000E+00
I-129	I-129	1.000E+00	1.000E-02	9.953E-03	9.860E-03	9.542E-03	8.687E-03	6.255E-03	2.448E-03	9.174E-05	6.498E-13
K-40	K-40	1.000E+00	8.000E+02	7.999E+02	7.997E+02	7.991E+02	7.973E+02	7.910E+02	7.732E+02	7.141E+02	4.534E+02
Mn-54	Mn-54	1.000E+00	2.500E+01	1.112E+01	2.200E+00	7.576E-03	6.957E-10	1.633E-34	0.000E+00	0.000E+00	0.000E+00
Na-22	Na-22	1.000E+00	2.500E+01	1.915E+01	1.124E+01	1.739E+00	8.414E-03	6.628E-11	4.659E-34	0.000E+00	0.000E+00
Nb-93m	Nb-93m	1.000E+00	2.500E+01	2.376E+01	2.145E+01	1.502E+01	5.417E+00	1.528E-01	5.704E-06	1.814E-21	0.000E+00
Nb-94	Nb-94	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.497E+01	2.489E+01	2.467E+01	2.390E+01	1.997E+01
Ni-59	Ni-59	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.497E+01	2.490E+01	2.466E+01	2.336E+01
Ni-63	Ni-63	1.000E+00	2.500E+01	2.482E+01	2.446E+01	2.326E+01	2.013E+01	1.214E+01	2.862E+00	1.821E-02	5.128E-15
Pm-147	Pm-147	1.000E+00	2.500E+01	1.920E+01	1.132E+01	1.780E+00	9.026E-03	8.376E-11	9.403E-34	0.000E+00	0.000E+00
Sm-147	Pm-147	1.000E+00	0.000E+00	1.437E-10	3.387E-10	5.747E-10	6.185E-10	6.186E-10	6.183E-10	6.174E-10	6.123E-10
Sm-147	Sm-147	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01	2.474E+01
Sm-147	ΣS(j):		2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01	2.474E+01
Pu-238	Pu-238	1.000E+00	1.000E-01	9.921E-02	9.766E-02	9.240E-02	7.889E-02	4.537E-02	9.339E-03	3.696E-05	6.895E-19

Individual Nuclide Soil Concentration
 Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	BRF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	5.000E+03
Ru-106	Ru-106	1.000E+00	2.500E+01	1.257E+01	3.177E+00	2.580E-02	2.749E-08	3.431E-29	0.000E+00	0.000E+00	0.000E+00
Sb-125	Sb-125	1.000E+00	2.500E+01	1.946E+01	1.180E+01	2.047E+00	1.371E-02	3.379E-10	6.172E-32	0.000E+00	0.000E+00
Sm-151	Sm-151	1.000E+00	2.500E+01	2.481E+01	2.443E+01	2.315E+01	1.984E+01	1.157E+01	2.479E+00	1.128E-02	4.672E-16
Sr-90	Sr-90	1.000E+00	2.500E+01	2.441E+01	2.327E+01	1.968E+01	1.220E+01	2.287E+00	1.914E-02	1.026E-09	0.000E+00
Tc-99	Tc-99	1.000E+00	1.000E+00	9.897E-01	9.695E-01	9.020E-01	7.340E-01	3.567E-01	4.537E-02	3.332E-05	4.107E-23
Tl-204	Tl-204	1.000E+00	2.500E+01	2.060E+01	1.398E+01	3.602E+00	7.480E-02	9.649E-08	1.437E-24	0.000E+00	0.000E+00
Zn-65	Zn-65	1.000E+00	2.500E+01	8.854E+00	1.111E+00	7.765E-04	7.490E-13	3.503E-44	0.000E+00	0.000E+00	0.000E+00

BRF(i) is the branch fraction of the parent nuclide.

RESCALC.EXE execution time = 91.61 seconds

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	DCF's for external ground radiation, (mrem/yr)/(pCi/g)			
A-1	Ac-225 (Source: FGR 12)	6.371E-02	6.371E-02	DCF1(1)
A-1	Ac-227 (Source: FGR 12)	4.951E-04	4.951E-04	DCF1(2)
A-1	Ac-228 (Source: FGR 12)	5.978E+00	5.978E+00	DCF1(3)
A-1	Ag-108 (Source: FGR 12)	1.143E-01	1.143E-01	DCF1(4)
A-1	Ag-108m (Source: FGR 12)	9.640E+00	9.640E+00	DCF1(5)
A-1	Ag-110 (Source: FGR 12)	2.242E-01	2.242E-01	DCF1(6)
A-1	Ag-110m (Source: FGR 12)	1.717E+01	1.717E+01	DCF1(7)
A-1	Am-241 (Source: FGR 12)	4.372E-02	4.372E-02	DCF1(8)
A-1	Am-243 (Source: FGR 12)	1.420E-01	1.420E-01	DCF1(9)
A-1	At-217 (Source: FGR 12)	1.773E-03	1.773E-03	DCF1(10)
A-1	At-218 (Source: FGR 12)	5.847E-03	5.847E-03	DCF1(11)
A-1	Au-195 (Source: FGR 12)	2.074E-01	2.074E-01	DCF1(12)
A-1	Ba-133 (Source: FGR 12)	1.980E+00	1.980E+00	DCF1(13)
A-1	Ba-137m (Source: FGR 12)	3.606E+00	3.606E+00	DCF1(14)
A-1	Bi-210 (Source: FGR 12)	3.606E-03	3.606E-03	DCF1(15)
A-1	Bi-211 (Source: FGR 12)	2.559E-01	2.559E-01	DCF1(16)
A-1	Bi-212 (Source: FGR 12)	1.171E+00	1.171E+00	DCF1(17)
A-1	Bi-213 (Source: FGR 12)	7.660E-01	7.660E-01	DCF1(18)
A-1	Bi-214 (Source: FGR 12)	9.808E+00	9.808E+00	DCF1(19)
A-1	C-14 (Source: FGR 12)	1.345E-05	1.345E-05	DCF1(20)
A-1	Ca-41 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(21)
A-1	Cd-109 (Source: FGR 12)	1.470E-02	1.470E-02	DCF1(22)
A-1	Ce-144 (Source: FGR 12)	7.174E-02	7.174E-02	DCF1(23)
A-1	Cf-252 (Source: FGR 12)	1.758E-04	1.758E-04	DCF1(24)
A-1	Cm-243 (Source: FGR 12)	5.829E-01	5.829E-01	DCF1(25)
A-1	Cm-244 (Source: FGR 12)	1.259E-04	1.259E-04	DCF1(26)
A-1	Cm-245 (Source: FGR 12)	3.400E-01	3.400E-01	DCF1(27)
A-1	Cm-246 (Source: FGR 12)	1.162E-04	1.162E-04	DCF1(28)
A-1	Cm-247 (Source: FGR 12)	1.780E+00	1.780E+00	DCF1(29)
A-1	Cm-248 (Source: FGR 12)	8.781E-05	8.781E-05	DCF1(30)
A-1	Co-57 (Source: FGR 12)	5.007E-01	5.007E-01	DCF1(31)
A-1	Co-60 (Source: FGR 12)	1.622E+01	1.622E+01	DCF1(32)
A-1	Cs-134 (Source: FGR 12)	9.472E+00	9.472E+00	DCF1(33)
A-1	Cs-135 (Source: FGR 12)	3.830E-05	3.830E-05	DCF1(34)
A-1	Cs-137 (Source: FGR 12)	7.510E-04	7.510E-04	DCF1(35)
A-1	Eu-152 (Source: FGR 12)	7.006E+00	7.006E+00	DCF1(36)
A-1	Eu-154 (Source: FGR 12)	7.678E+00	7.678E+00	DCF1(37)
A-1	Eu-155 (Source: FGR 12)	1.822E-01	1.822E-01	DCF1(38)
A-1	Fe-55 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(39)
A-1	Fr-221 (Source: FGR 12)	1.536E-01	1.536E-01	DCF1(40)
A-1	Fr-223 (Source: FGR 12)	1.980E-01	1.980E-01	DCF1(41)
A-1	Ga-68 (Source: FGR 12)	5.623E+00	5.623E+00	DCF1(42)
A-1	Gd-152 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(43)
A-1	Gd-153 (Source: FGR 12)	2.447E-01	2.447E-01	DCF1(44)
A-1	Ge-68 (Source: FGR 12)	7.959E-07	7.959E-07	DCF1(45)
A-1	H-3 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1(46)
A-1	Ir-192 (Source: FGR 12)	1.295E-02	1.295E-02	DCF1(47)
A-1	K-40 (Source: FGR 12)	1.041E+00	1.041E+00	DCF1(48)
A-1	Mn-54 (Source: FGR 12)	5.156E+00	5.156E+00	DCF1(49)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	Na-22 (Source: FGR 12)	1.368E+01	1.368E+01	DCF1 (50)
A-1	Nb-93m (Source: FGR 12)	1.041E-04	1.041E-04	DCF1 (51)
A-1	Nb-94 (Source: FGR 12)	9.677E+00	9.677E+00	DCF1 (52)
A-1	Ni-59 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (53)
A-1	Ni-63 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (54)
A-1	Np-237 (Source: FGR 12)	7.790E-02	7.790E-02	DCF1 (55)
A-1	Np-239 (Source: FGR 12)	7.529E-01	7.529E-01	DCF1 (56)
A-1	Np-240m (Source: FGR 12)	2.018E+00	2.018E+00	DCF1 (57)
A-1	Pa-231 (Source: FGR 12)	1.906E-01	1.906E-01	DCF1 (58)
A-1	Pa-233 (Source: FGR 12)	1.020E+00	1.020E+00	DCF1 (59)
A-1	Pa-234 (Source: FGR 12)	1.155E+01	1.155E+01	DCF1 (60)
A-1	Pa-234m (Source: FGR 12)	8.967E-02	8.967E-02	DCF1 (61)
A-1	Pb-209 (Source: FGR 12)	7.734E-04	7.734E-04	DCF1 (62)
A-1	Pb-210 (Source: FGR 12)	2.447E-03	2.447E-03	DCF1 (63)
A-1	Pb-211 (Source: FGR 12)	3.064E-01	3.064E-01	DCF1 (64)
A-1	Pb-212 (Source: FGR 12)	7.043E-01	7.043E-01	DCF1 (65)
A-1	Pb-214 (Source: FGR 12)	1.341E+00	1.341E+00	DCF1 (66)
A-1	Pm-147 (Source: FGR 12)	5.007E-05	5.007E-05	DCF1 (67)
A-1	Po-210 (Source: FGR 12)	5.231E-05	5.231E-05	DCF1 (68)
A-1	Po-211 (Source: FGR 12)	4.764E-02	4.764E-02	DCF1 (69)
A-1	Po-212 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (70)
A-1	Po-213 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (71)
A-1	Po-214 (Source: FGR 12)	5.138E-04	5.138E-04	DCF1 (72)
A-1	Po-215 (Source: FGR 12)	1.016E-03	1.016E-03	DCF1 (73)
A-1	Po-216 (Source: FGR 12)	1.042E-04	1.042E-04	DCF1 (74)
A-1	Po-218 (Source: FGR 12)	5.642E-05	5.642E-05	DCF1 (75)
A-1	Pr-144 (Source: FGR 12)	2.522E-01	2.522E-01	DCF1 (76)
A-1	Pr-144m (Source: FGR 12)	1.437E-02	1.437E-02	DCF1 (77)
A-1	Pu-238 (Source: FGR 12)	1.513E-04	1.513E-04	DCF1 (78)
A-1	Pu-239 (Source: FGR 12)	2.952E-04	2.952E-04	DCF1 (79)
A-1	Pu-240 (Source: FGR 12)	1.467E-04	1.467E-04	DCF1 (80)
A-1	Pu-241 (Source: FGR 12)	5.904E-06	5.904E-06	DCF1 (81)
A-1	Pu-242 (Source: FGR 12)	1.280E-04	1.280E-04	DCF1 (82)
A-1	Pu-243 (Source: FGR 12)	7.959E-02	7.959E-02	DCF1 (83)
A-1	Pu-244 (Source: FGR 12)	7.548E-05	7.548E-05	DCF1 (84)
A-1	Ra-223 (Source: FGR 12)	6.034E-01	6.034E-01	DCF1 (85)
A-1	Ra-224 (Source: FGR 12)	5.119E-02	5.119E-02	DCF1 (86)
A-1	Ra-225 (Source: FGR 12)	1.102E-02	1.102E-02	DCF1 (87)
A-1	Ra-226 (Source: FGR 12)	3.176E-02	3.176E-02	DCF1 (88)
A-1	Ra-228 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (89)
A-1	Rh-106 (Source: FGR 12)	1.291E+00	1.291E+00	DCF1 (90)
A-1	Rn-219 (Source: FGR 12)	3.083E-01	3.083E-01	DCF1 (91)
A-1	Rn-220 (Source: FGR 12)	2.298E-03	2.298E-03	DCF1 (92)
A-1	Rn-222 (Source: FGR 12)	2.354E-03	2.354E-03	DCF1 (93)
A-1	Ru-106 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (94)
A-1	Sb-125 (Source: FGR 12)	2.447E+00	2.447E+00	DCF1 (95)
A-1	Sm-147 (Source: FGR 12)	0.000E+00	0.000E+00	DCF1 (96)
A-?	Sm-151 (Source: FGR 12)	9.845E-07	9.845E-07	DCF1 (97)
A-1	Sr-90 (Source: FGR 12)	7.043E-04	7.043E-04	DCF1 (98)
A-1	Tc-99 (Source: FGR 12)	1.255E-04	1.255E-04	DCF1 (99)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
A-1	Te-125m (Source: FGR 12)	1.515E-02	1.515E-02	DCF1(100)
A-1	Th-227 (Source: FGR 12)	5.212E-01	5.212E-01	DCF1(101)
A-1	Th-228 (Source: FGR 12)	7.940E-03	7.940E-03	DCF1(102)
A-1	Th-229 (Source: FGR 12)	3.213E-01	3.213E-01	DCF1(103)
A-1	Th-230 (Source: FGR 12)	1.209E-03	1.209E-03	DCF1(104)
A-1	Th-231 (Source: FGR 12)	3.643E-02	3.643E-02	DCF1(105)
A-1	Th-232 (Source: FGR 12)	5.212E-04	5.212E-04	DCF1(106)
A-1	Th-234 (Source: FGR 12)	2.410E-02	2.410E-02	DCF1(107)
A-1	Tl-204 (Source: FGR 12)	4.054E-03	4.054E-03	DCF1(108)
A-1	Tl-207 (Source: FGR 12)	1.980E-02	1.980E-02	DCF1(109)
A-1	Tl-208 (Source: FGR 12)	2.298E+01	2.298E+01	DCF1(110)
A-1	Tl-209 (Source: FGR 12)	1.293E+01	1.293E+01	DCF1(111)
A-1	Tl-210 (Source: no data)	0.000E+00	-2.000E+00	DCF1(112)
A-1	U-233 (Source: FGR 12)	1.397E-03	1.397E-03	DCF1(113)
A-1	U-234 (Source: FGR 12)	4.017E-04	4.017E-04	DCF1(114)
A-1	U-235 (Source: FGR 12)	7.211E-01	7.211E-01	DCF1(115)
A-1	U-236 (Source: FGR 12)	2.148E-04	2.148E-04	DCF1(116)
A-1	U-237 (Source: FGR 12)	5.306E-01	5.306E-01	DCF1(117)
A-1	U-238 (Source: FGR 12)	1.031E-04	1.031E-04	DCF1(118)
A-1	U-240 (Source: FGR 12)	1.424E-03	1.424E-03	DCF1(119)
A-1	Y-90 (Source: FGR 12)	2.391E-02	2.391E-02	DCF1(120)
A-1	Zn-65 (Source: FGR 12)	3.699E+00	3.699E+00	DCF1(121)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.724E+00	6.700E+00	DCF2(1)
B-1	Ag-108m+D	2.830E-04	2.830E-04	DCF2(2)
B-1	Ag-110m+D	8.030E-05	8.030E-05	DCF2(3)
B-1	Am-241	4.440E-01	4.440E-01	DCF2(4)
B-1	Am-243+D	4.400E-01	4.400E-01	DCF2(5)
B-1	Au-195	1.300E-05	1.300E-05	DCF2(6)
B-1	Ba-133	7.810E-06	7.810E-06	DCF2(7)
B-1	C-14 (Class: ORGANIC)	2.090E-06	2.090E-06	DCF2(8)
B-1	C-14 (Class: CO2)	2.350E-08	2.350E-08	C14GIhhDCF
B-1	Ca-41	1.350E-06	1.350E-06	DCF2(9)
B-1	Cd-109	1.140E-04	1.140E-04	DCF2(10)
B-1	Ce-144+D	3.740E-04	3.740E-04	DCF2(11)
B-1	Cf-252	1.570E-01	1.570E-01	DCF2(12)
B-1	Cm-243	3.070E-01	3.070E-01	DCF2(17)
B-1	Cm-244	2.480E-01	2.480E-01	DCF2(19)
B-1	Cm-245	4.550E-01	4.550E-01	DCF2(22)
B-1	Cm-246	4.510E-01	4.510E-01	DCF2(24)
B-1	Cm-247+D	4.140E-01	4.140E-01	DCF2(28)
B-1	Cm-248	1.650E+00	1.650E+00	DCF2(29)
B-1	Co-57	9.070E-06	9.070E-06	DCF2(33)
B-1	Co-60	2.190E-04	2.190E-04	DCF2(34)
B-1	Cs-134	4.620E-05	4.620E-05	DCF2(35)
B-1	Cs-135	4.550E-06	4.550E-06	DCF2(36)
B-1	Cs-137+D	3.190E-05	3.190E-05	DCF2(37)
B-1	Eu-152	2.210E-04	2.210E-04	DCF2(38)
B-1	Eu-154	2.860E-04	2.860E-04	DCF2(40)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value#	Base Case*	Parameter Name
B-1	Eu-155	4.140E-05	4.140E-05	DCF2(41)
B-1	Fe-55	2.690E-06	2.690E-06	DCF2(42)
B-1	Gd-152	2.430E-01	2.430E-01	DCF2(43)
B-1	Gd-153	2.380E-05	2.380E-05	DCF2(44)
B-1	Ge-68+D	5.194E-05	5.180E-05	DCF2(45)
B-1	H-3	6.400E-08	6.400E-08	DCF2(46)
B-1	I-129	1.740E-04	1.740E-04	DCF2(47)
B-1	K-40	1.240E-05	1.240E-05	DCF2(48)
B-1	Mn-54	6.700E-06	6.700E-06	DCF2(49)
B-1	Na-22	7.660E-06	7.660E-06	DCF2(50)
B-1	Nb-93m	2.920E-05	2.920E-05	DCF2(51)
B-1	Nb-94	4.140E-04	4.140E-04	DCF2(52)
B-1	Ni-59	2.700E-06	2.700E-06	DCF2(53)
B-1	Ni-63	6.290E-06	6.290E-06	DCF2(54)
B-1	Np-237+D	5.400E-01	5.400E-01	DCF2(55)
B-1	Pa-231	1.280E+00	1.280E+00	DCF2(56)
B-1	Pb-210+D	2.320E-02	1.360E-02	DCF2(57)
B-1	Pm-147	3.920E-05	3.920E-05	DCF2(58)
B-1	Pu-238	3.920E-01	3.920E-01	DCF2(59)
B-1	Pu-239	4.290E-01	4.290E-01	DCF2(61)
B-1	Pu-240	4.290E-01	4.290E-01	DCF2(62)
B-1	Pu-241	8.250E-03	8.250E-03	DCF2(64)
B-1	Pu-241+D	8.254E-03	8.250E-03	DCF2(65)
B-1	Pu-242	4.110E-01	4.110E-01	DCF2(66)
B-1	Pu-244	4.030E-01	4.030E-01	DCF2(69)
B-1	Pu-244+D	4.030E-01	4.030E-01	DCF2(70)
B-1	Ra-226+D	8.594E-03	8.580E-03	DCF2(72)
B-1	Ra-228+D	5.078E-03	4.770E-03	DCF2(73)
B-1	Ru-106+D	4.770E-04	4.770E-04	DCF2(74)
B-1	Sb-125+D	1.386E-05	1.220E-05	DCF2(75)
B-1	Sm-147	7.470E-02	7.470E-02	DCF2(76)
B-1	Sm-151	3.000E-05	3.000E-05	DCF2(77)
B-1	Sr-90+D	1.308E-03	1.300E-03	DCF2(78)
B-1	Tc-99	8.320E-06	8.320E-06	DCF2(79)
B-1	Th-228+D	3.454E-01	3.420E-01	DCF2(80)
B-1	Th-229+D	2.169E+00	2.150E+00	DCF2(81)
B-1	Th-230	3.260E-01	3.260E-01	DCF2(82)
B-1	Th-232	1.640E+00	1.640E+00	DCF2(83)
B-1	Tl-204	2.410E-06	2.410E-06	DCF2(84)
B-1	U-233	1.350E-01	1.350E-01	DCF2(85)
B-1	U-234	1.320E-01	1.320E-01	DCF2(86)
B-1	U-235+D	1.230E-01	1.230E-01	DCF2(87)
B-1	U-236	1.250E-01	1.250E-01	DCF2(88)
B-1	U-238	1.180E-01	1.180E-01	DCF2(89)
B-1	U-238+D	1.180E-01	1.180E-01	DCF2(90)
B-1	Zn-65	2.040E-05	2.040E-05	DCF2(91)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.480E-02	1.410E-02	DCF3(1)
D-1	Ag-108m+D	7.620E-06	7.620E-06	DCF3(2)

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Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	Ag-110m+D	1.080E-05	1.080E-05	DCF3(3)
D-1	Am-241	3.640E-03	3.640E-03	DCF3(4)
D-1	Am-243+D	3.623E-03	3.620E-03	DCF3(5)
D-1	Au-195	1.060E-06	1.060E-06	DCF3(6)
D-1	Ba-133	3.400E-06	3.400E-06	DCF3(7)
D-1	C-14	2.090E-06	2.090E-06	DCF3(8)
D-1	Ca-41	1.270E-06	1.270E-06	DCF3(9)
D-1	Cd-109	1.310E-05	1.310E-05	DCF3(10)
D-1	Ce-144+D	2.112E-05	2.100E-05	DCF3(11)
D-1	Cf-252	1.080E-03	1.080E-03	DCF3(12)
D-1	Cm-243	2.510E-03	2.510E-03	DCF3(17)
D-1	Cm-244	2.020E-03	2.020E-03	DCF3(19)
D-1	Cm-245	3.740E-03	3.740E-03	DCF3(22)
D-1	Cm-246	3.700E-03	3.700E-03	DCF3(24)
D-1	Cm-247+D	3.420E-03	3.420E-03	DCF3(28)
D-1	Cm-248	1.360E-02	1.360E-02	DCF3(29)
D-1	Co-57	1.180E-06	1.180E-06	DCF3(33)
D-1	Co-60	2.690E-05	2.690E-05	DCF3(34)
D-1	Cs-134	7.330E-05	7.330E-05	DCF3(35)
D-1	Cs-135	7.070E-06	7.070E-06	DCF3(36)
D-1	Cs-137+D	5.000E-05	5.000E-05	DCF3(37)
D-1	Eu-152	6.480E-06	6.480E-06	DCF3(38)
D-1	Eu-154	9.550E-06	9.550E-06	DCF3(40)
D-1	Eu-155	1.530E-06	1.530E-06	DCF3(41)
D-1	Fe-55	6.070E-07	6.070E-07	DCF3(42)
D-1	Gd-152	1.610E-04	1.610E-04	DCF3(43)
D-1	Gd-153	1.170E-06	1.170E-06	DCF3(44)
D-1	Ge-68+D	1.412E-06	1.070E-06	DCF3(45)
D-1	H-3	6.400E-08	6.400E-08	DCF3(46)
D-1	I-129	2.760E-04	2.760E-04	DCF3(47)
D-1	K-40	1.860E-05	1.860E-05	DCF3(48)
D-1	Mn-54	2.770E-06	2.770E-06	DCF3(49)
D-1	Na-22	1.150E-05	1.150E-05	DCF3(50)
D-1	Nb-93m	5.220E-07	5.220E-07	DCF3(51)
D-1	Nb-94	7.140E-06	7.140E-06	DCF3(52)
D-1	Ni-59	2.100E-07	2.100E-07	DCF3(53)
D-1	Ni-63	5.770E-07	5.770E-07	DCF3(54)
D-1	Np-237+D	4.444E-03	4.440E-03	DCF3(55)
D-1	Pa-231	1.060E-02	1.060E-02	DCF3(56)
D-1	Pb-210+D	7.276E-03	5.370E-03	DCF3(57)
D-1	Pm-147	1.050E-06	1.050E-06	DCF3(58)
D-1	Pu-238	3.200E-03	3.200E-03	DCF3(59)
D-1	Pu-239	3.540E-03	3.540E-03	DCF3(61)
D-1	Pu-240	3.540E-03	3.540E-03	DCF3(62)
D-1	Pu-241	6.840E-05	6.840E-05	DCF3(64)
D-1	Pu-241+D	7.157E-05	6.840E-05	DCF3(65)
D-1	Pu-242	3.360E-03	3.360E-03	DCF3(66)
D-1	Pu-244	3.320E-03	3.320E-03	DCF3(69)
D-1	Pu-244+D	3.324E-03	3.320E-03	DCF3(70)
D-1	Ra-226+D	1.321E-03	1.320E-03	DCF3(72)

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Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-1	Ra-228+D	1.442E-03	1.440E-03	DCF3(73)
D-1	Ru-106+D	2.740E-05	2.740E-05	DCF3(74)
D-1	Sb-125+D	3.647E-06	2.810E-06	DCF3(75)
D-1	Sm-147	1.850E-04	1.850E-04	DCF3(76)
D-1	Sm-151	3.890E-07	3.890E-07	DCF3(77)
D-1	Sr-90+D	1.528E-04	1.420E-04	DCF3(78)
D-1	Tc-99	1.460E-06	1.460E-06	DCF3(79)
D-1	Th-228+D	8.086E-04	3.960E-04	DCF3(80)
D-1	Th-229+D	4.027E-03	3.530E-03	DCF3(81)
D-1	Th-230	5.480E-04	5.480E-04	DCF3(82)
D-1	Th-232	2.730E-03	2.730E-03	DCF3(83)
D-1	Tl-204	3.360E-06	3.360E-06	DCF3(84)
D-1	U-233	2.890E-04	2.890E-04	DCF3(85)
D-1	U-234	2.830E-04	2.830E-04	DCF3(86)
D-1	U-235+D	2.673E-04	2.660E-04	DCF3(87)
D-1	U-236	2.690E-04	2.690E-04	DCF3(88)
D-1	U-238	2.550E-04	2.550E-04	DCF3(89)
D-1	U-238+D	2.687E-04	2.550E-04	DCF3(90)
D-1	Zn-65	1.440E-05	1.440E-05	DCF3(91)
D-34	Food transfer factors:			
D-3	Ac-227+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(1,1)
D-3	Ac-227+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,2)
D-34	Ac-227+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(1,3)
D-34				
D-34	Ag-108m+D , plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(2,1)
D-34	Ag-108m+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(2,2)
D-34	Ag-108m+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(2,3)
D-34				
D-34	Ag-110m+D , plant/soil concentration ratio, dimensionless	1.500E-01	1.500E-01	RTF(3,1)
D-34	Ag-110m+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-03	3.000E-03	RTF(3,2)
D-34	Ag-110m+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.500E-02	2.500E-02	RTF(3,3)
D-34				
D-34	Am-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(4,1)
D-34	Am-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(4,2)
D-34	Am-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(4,3)
D-34				
D-34	Am-243+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Am-243+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-05	5.000E-05	RTF(5,2)
D-34	Am-243+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(5,3)
D-34				
D-34	Au-195 , plant/soil concentration ratio, dimensionless	1.000E-01	1.000E-01	RTF(6,1)
D-34	Au-195 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(6,2)
D-34	Au-195 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-05	1.000E-05	RTF(6,3)
D-34				
D-34	Ba-133 , plant/soil concentration ratio, dimensionless	5.000E-03	5.000E-03	RTF(7,1)
D-34	Ba-133 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-04	2.000E-04	RTF(7,2)
D-3	Ba-133 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-04	5.000E-04	RTF(7,3)
D-3				

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Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	C-14 , plant/soil concentration ratio, dimensionless	5.500E+00	5.500E+00	RTF(8,1)
D-34	C-14 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.100E-02	3.100E-02	RTF(8,2)
D-34	C-14 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.200E-02	1.200E-02	RTF(8,3)
D-34				
D-34	Ca-41 , plant/soil concentration ratio, dimensionless	5.000E-01	5.000E-01	RTF(9,1)
D-34	Ca-41 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.600E-03	1.600E-03	RTF(9,2)
D-34	Ca-41 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-03	3.000E-03	RTF(9,3)
D-34				
D-34	Cd-109 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(10,1)
D-34	Cd-109 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	4.000E-04	4.000E-04	RTF(10,2)
D-34	Cd-109 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(10,3)
D-34				
D-34	Ce-144+D , plant/soil concentration ratio, dimensionless	2.000E-03	2.000E-03	RTF(11,1)
D-34	Ce-144+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(11,2)
D-34	Ce-144+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-05	5.000E-05	RTF(11,3)
D-34				
D-34	Cf-252 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(12,1)
D-34	Cf-252 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	6.000E-05	6.000E-05	RTF(12,2)
D-34	Cf-252 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	7.500E-07	7.500E-07	RTF(12,3)
D-34				
D-34	Cm-243 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(17,1)
D-34	Cm-243 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(17,2)
D-34	Cm-243 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(17,3)
D-34				
D-34	Cm-244 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(19,1)
D-34	Cm-244 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(19,2)
D-34	Cm-244 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(19,3)
D-34				
D-34	Cm-245 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(22,1)
D-34	Cm-245 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(22,2)
D-34	Cm-245 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(22,3)
D-34				
D-34	Cm-246 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(24,1)
D-34	Cm-246 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(24,2)
D-34	Cm-246 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(24,3)
D-34				
D-34	Cm-247+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(28,1)
D-34	Cm-247+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(28,2)
D-34	Cm-247+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(28,3)
D-34				
D-34	Cm-248 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(29,1)
D-34	Cm-248 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-05	2.000E-05	RTF(29,2)
D-34	Cm-248 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(29,3)
D-34				
D-34	Co-57 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(33,1)
D-34	Co-57 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(33,2)
D-34	Co-57 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(33,3)
D-34				

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Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Co-60 , plant/soil concentration ratio, dimensionless	8.000E-02	8.000E-02	RTF(34,1)
D-34	Co-60 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(34,2)
D-34	Co-60 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(34,3)
D-34				
D-34	Cs-134 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(35,1)
D-34	Cs-134 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(35,2)
D-34	Cs-134 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(35,3)
D-34				
D-34	Cs-135 , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(36,1)
D-34	Cs-135 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(36,2)
D-34	Cs-135 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(36,3)
D-34				
D-34	Cs-137+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(37,1)
D-34	Cs-137+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-02	3.000E-02	RTF(37,2)
D-34	Cs-137+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	8.000E-03	8.000E-03	RTF(37,3)
D-34				
D-34	Eu-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(38,1)
D-34	Eu-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(38,2)
D-34	Eu-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-05	5.000E-05	RTF(38,3)
D-34				
D-34	Eu-154 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(40,1)
D-34	Eu-154 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(40,2)
D-34	Eu-154 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-05	5.000E-05	RTF(40,3)
D-34				
D-34	Eu-155 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(41,1)
D-34	Eu-155 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(41,2)
D-34	Eu-155 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-05	5.000E-05	RTF(41,3)
D-34				
D-34	Fe-55 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(42,1)
D-34	Fe-55 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(42,2)
D-34	Fe-55 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(42,3)
D-34				
D-34	Gd-152 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(43,1)
D-34	Gd-152 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(43,2)
D-34	Gd-152 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(43,3)
D-34				
D-34	Gd-153 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(44,1)
D-34	Gd-153 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(44,2)
D-34	Gd-153 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(44,3)
D-34				
D-34	Ge-68+D , plant/soil concentration ratio, dimensionless	4.000E-01	4.000E-01	RTF(45,1)
D-34	Ge-68+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-01	2.000E-01	RTF(45,2)
D-34	Ge-68+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(45,3)
D-34				
D-34	H-3 , plant/soil concentration ratio, dimensionless	4.800E+00	4.800E+00	RTF(46,1)
D-34	H-3 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.200E-02	1.200E-02	RTF(46,2)
D-34	H-3 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(46,3)
D-34				

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	I-129 , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(47,1)
D-34	I-129 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	7.000E-03	7.000E-03	RTF(47,2)
D-34	I-129 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(47,3)
D-34				
D-34	K-40 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(48,1)
D-34	K-40 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(48,2)
D-34	K-40 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	7.000E-03	7.000E-03	RTF(48,3)
D-34				
D-34	Mn-54 , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(49,1)
D-34	Mn-54 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-04	5.000E-04	RTF(49,2)
D-34	Mn-54 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(49,3)
D-34				
D-34	Na-22 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(50,1)
D-34	Na-22 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-02	8.000E-02	RTF(50,2)
D-34	Na-22 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	4.000E-02	4.000E-02	RTF(50,3)
D-34				
D-34	Nb-93m , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(51,1)
D-34	Nb-93m , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(51,2)
D-34	Nb-93m , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(51,3)
D-34				
D-34	Nb-94 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(52,1)
D-34	Nb-94 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.000E-07	3.000E-07	RTF(52,2)
D-34	Nb-94 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-06	2.000E-06	RTF(52,3)
D-34				
D-34	Ni-59 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(53,1)
D-34	Ni-59 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(53,2)
D-34	Ni-59 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(53,3)
D-34				
D-34	Ni-63 , plant/soil concentration ratio, dimensionless	5.000E-02	5.000E-02	RTF(54,1)
D-34	Ni-63 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(54,2)
D-34	Ni-63 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-02	2.000E-02	RTF(54,3)
D-34				
D-34	Np-237+D , plant/soil concentration ratio, dimensionless	2.000E-02	2.000E-02	RTF(55,1)
D-34	Np-237+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(55,2)
D-34	Np-237+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(55,3)
D-34				
D-34	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(56,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(56,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(56,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(57,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(57,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(57,3)
D-34				
D-34	Pm-147 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(58,1)
D-34	Pm-147 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(58,2)
D-34	Pm-147 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(58,3)
D-34				

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Pu-238 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(59,1)
D-34	Pu-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(59,2)
D-34	Pu-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(59,3)
D-34				
D-34	Pu-239 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(61,1)
D-34	Pu-239 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(61,2)
D-34	Pu-239 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(61,3)
D-34				
D-34	Pu-240 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(62,1)
D-34	Pu-240 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(62,2)
D-34	Pu-240 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(62,3)
D-34				
D-34	Pu-241 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(64,1)
D-34	Pu-241 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(64,2)
D-34	Pu-241 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(64,3)
D-34				
D-34	Pu-241+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(65,1)
D-34	Pu-241+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(65,2)
D-34	Pu-241+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(65,3)
D-34				
D-34	Pu-242 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(66,1)
D-34	Pu-242 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(66,2)
D-34	Pu-242 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(66,3)
D-34				
D-34	Pu-244 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(69,1)
D-34	Pu-244 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(69,2)
D-34	Pu-244 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(69,3)
D-34				
D-34	Pu-244+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(70,1)
D-34	Pu-244+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(70,2)
D-34	Pu-244+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-06	1.000E-06	RTF(70,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(72,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(72,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(72,3)
D-34				
D-34	Ra-228+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(73,1)
D-34	Ra-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(73,2)
D-34	Ra-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(73,3)
D-34				
D-34	Ru-106+D , plant/soil concentration ratio, dimensionless	3.000E-02	3.000E-02	RTF(74,1)
D-34	Ru-106+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(74,2)
D-34	Ru-106+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.300E-06	3.300E-06	RTF(74,3)
D-34				
D-34	Sb-125+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(75,1)
D-34	Sb-125+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(75,2)
D-34	Sb-125+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-04	1.000E-04	RTF(75,3)
D-				

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)
Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	Sm-147 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(76,1)
D-34	Sm-147 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(76,2)
D-34	Sm-147 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(76,3)
D-34				
D-34	Sm-151 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(77,1)
D-34	Sm-151 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-03	2.000E-03	RTF(77,2)
D-34	Sm-151 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-05	2.000E-05	RTF(77,3)
D-34				
D-34	Sr-90+D , plant/soil concentration ratio, dimensionless	3.000E-01	3.000E-01	RTF(78,1)
D-34	Sr-90+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-03	8.000E-03	RTF(78,2)
D-34	Sr-90+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	2.000E-03	2.000E-03	RTF(78,3)
D-34				
D-34	Tc-99 , plant/soil concentration ratio, dimensionless	5.000E+00	5.000E+00	RTF(79,1)
D-34	Tc-99 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(79,2)
D-34	Tc-99 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(79,3)
D-34				
D-34	Th-228+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(80,1)
D-34	Th-228+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(80,2)
D-34	Th-228+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(80,3)
D-34				
D-34	Th-229+D , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(81,1)
D-34	Th-229+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(81,2)
D-34	Th-229+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(81,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(82,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(82,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(82,3)
D-34				
D-34	Th-232 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(83,1)
D-34	Th-232 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(83,2)
D-34	Th-232 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(83,3)
D-34				
D-34	Tl-204 , plant/soil concentration ratio, dimensionless	2.000E-01	2.000E-01	RTF(84,1)
D-34	Tl-204 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	2.000E-02	2.000E-02	RTF(84,2)
D-34	Tl-204 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-03	3.000E-03	RTF(84,3)
D-34				
D-34	U-233 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(85,1)
D-34	U-233 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(85,2)
D-34	U-233 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(85,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(86,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(86,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(86,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(87,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(87,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(87,3)
D-34				

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Dose Conversion Factor (and Related) Parameter Summary (continued)

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Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-34	U-236 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(88,1)
D-34	U-236 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(88,2)
D-34	U-236 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(88,3)
D-34	U-238 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(89,1)
D-34	U-238 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(89,2)
D-34	U-238 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(89,3)
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(90,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(90,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(90,3)
D-34	Zn-65 , plant/soil concentration ratio, dimensionless	4.000E-01	4.000E-01	RTF(91,1)
D-34	Zn-65 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-01	1.000E-01	RTF(91,2)
D-34	Zn-65 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-02	1.000E-02	RTF(91,3)
D-5	Bioaccumulation factors, fresh water, L/kg:			
D-5	Ac-227+D , fish	1.500E+01	1.500E+01	BIOFAC(1,1)
D-5	Ac-227+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(1,2)
D-5	Ag-108m+D , fish	5.000E+00	5.000E+00	BIOFAC(2,1)
D-5	Ag-108m+D , crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(2,2)
D-5	Ag-110m+D , fish	5.000E+00	5.000E+00	BIOFAC(3,1)
D-5	Ag-110m+D , crustacea and mollusks	7.700E+02	7.700E+02	BIOFAC(3,2)
D-5	Am-241 , fish	3.000E+01	3.000E+01	BIOFAC(4,1)
D-5	Am-241 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(4,2)
D-5	Am-243+D , fish	3.000E+01	3.000E+01	BIOFAC(5,1)
D-5	Am-243+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(5,2)
D-5	Au-195 , fish	3.500E+01	3.500E+01	BIOFAC(6,1)
D-5	Au-195 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(6,2)
D-5	Ba-133 , fish	4.000E+00	4.000E+00	BIOFAC(7,1)
D-5	Ba-133 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(7,2)
D-5	C-14 , fish	5.000E+04	5.000E+04	BIOFAC(8,1)
D-5	C-14 , crustacea and mollusks	9.100E+03	9.100E+03	BIOFAC(8,2)
D-5	Ca-41 , fish	1.000E+03	1.000E+03	BIOFAC(9,1)
D-5	Ca-41 , crustacea and mollusks	3.300E+02	3.300E+02	BIOFAC(9,2)
D-5	Cd-109 , fish	2.000E+02	2.000E+02	BIOFAC(10,1)
D-5	Cd-109 , crustacea and mollusks	2.000E+03	2.000E+03	BIOFAC(10,2)
D-5	Ce-144+D , fish	3.000E+01	3.000E+01	BIOFAC(11,1)
D-5	Ce-144+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(11,2)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Cf-252 , fish	2.500E+01	2.500E+01	BIOFAC(12,1)
D-5	Cf-252 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(12,2)
D-5				
D-5	Cm-243 , fish	3.000E+01	3.000E+01	BIOFAC(17,1)
D-5	Cm-243 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(17,2)
D-5				
D-5	Cm-244 , fish	3.000E+01	3.000E+01	BIOFAC(19,1)
D-5	Cm-244 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(19,2)
D-5				
D-5	Cm-245 , fish	3.000E+01	3.000E+01	BIOFAC(22,1)
D-5	Cm-245 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(22,2)
D-5				
D-5	Cm-246 , fish	3.000E+01	3.000E+01	BIOFAC(24,1)
D-5	Cm-246 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(24,2)
D-5				
D-5	Cm-247+D , fish	3.000E+01	3.000E+01	BIOFAC(28,1)
D-5	Cm-247+D , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(28,2)
D-5				
D-5	Cm-248 , fish	3.000E+01	3.000E+01	BIOFAC(29,1)
D-5	Cm-248 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(29,2)
D-5				
D-5	Co-57 , fish	3.000E+02	3.000E+02	BIOFAC(33,1)
D-5	Co-57 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(33,2)
D-5				
D-5	Co-60 , fish	3.000E+02	3.000E+02	BIOFAC(34,1)
D-5	Co-60 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(34,2)
D-5				
D-5	Cs-134 , fish	2.000E+03	2.000E+03	BIOFAC(35,1)
D-5	Cs-134 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(35,2)
D-5				
D-5	Cs-135 , fish	2.000E+03	2.000E+03	BIOFAC(36,1)
D-5	Cs-135 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(36,2)
D-5				
D-5	Cs-137+D , fish	2.000E+03	2.000E+03	BIOFAC(37,1)
D-5	Cs-137+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(37,2)
D-5				
D-5	Eu-152 , fish	5.000E+01	5.000E+01	BIOFAC(38,1)
D-5	Eu-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(38,2)
D-5				
D-5	Eu-154 , fish	5.000E+01	5.000E+01	BIOFAC(40,1)
D-5	Eu-154 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(40,2)
D-5				
D-5	Eu-155 , fish	5.000E+01	5.000E+01	BIOFAC(41,1)
D-5	Eu-155 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(41,2)
D-5				
D-5	Fe-55 , fish	2.000E+02	2.000E+02	BIOFAC(42,1)
D-5	Fe-55 , crustacea and mollusks	3.200E+03	3.200E+03	BIOFAC(42,2)
D-5				
D-5	Gd-152 , fish	2.500E+01	2.500E+01	BIOFAC(43,1)
D-5	Gd-152 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(43,2)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Gd-153 , fish	2.500E+01	2.500E+01	BIOFAC(44,1)
D-5	Gd-153 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(44,2)
D-5				
D-5	Ge-68+D , fish	4.000E+03	4.000E+03	BIOFAC(45,1)
D-5	Ge-68+D , crustacea and mollusks	2.000E+04	2.000E+04	BIOFAC(45,2)
D-5				
D-5	H-3 , fish	1.000E+00	1.000E+00	BIOFAC(46,1)
D-5	H-3 , crustacea and mollusks	1.000E+00	1.000E+00	BIOFAC(46,2)
D-5				
D-5	I-129 , fish	4.000E+01	4.000E+01	BIOFAC(47,1)
D-5	I-129 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(47,2)
D-5				
D-5	K-40 , fish	1.000E+03	1.000E+03	BIOFAC(48,1)
D-5	K-40 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(48,2)
D-5				
D-5	Mn-54 , fish	4.000E+02	4.000E+02	BIOFAC(49,1)
D-5	Mn-54 , crustacea and mollusks	9.000E+04	9.000E+04	BIOFAC(49,2)
D-5				
D-5	Na-22 , fish	2.000E+01	2.000E+01	BIOFAC(50,1)
D-5	Na-22 , crustacea and mollusks	2.000E+02	2.000E+02	BIOFAC(50,2)
D-5				
D-5	Nb-93m , fish	3.000E+02	3.000E+02	BIOFAC(51,1)
D-5	Nb-93m , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(51,2)
D-5				
D-5	Nb-94 , fish	3.000E+02	3.000E+02	BIOFAC(52,1)
D-5	Nb-94 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(52,2)
D-5				
D-5	Ni-59 , fish	1.000E+02	1.000E+02	BIOFAC(53,1)
D-5	Ni-59 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(53,2)
D-5				
D-5	Ni-63 , fish	1.000E+02	1.000E+02	BIOFAC(54,1)
D-5	Ni-63 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(54,2)
D-5				
D-5	Np-237+D , fish	3.000E+01	3.000E+01	BIOFAC(55,1)
D-5	Np-237+D , crustacea and mollusks	4.000E+02	4.000E+02	BIOFAC(55,2)
D-5				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(56,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(56,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(57,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(57,2)
D-5				
D-5	Pm-147 , fish	3.000E+01	3.000E+01	BIOFAC(58,1)
D-5	Pm-147 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(58,2)
D-5				
D-5	Pu-238 , fish	3.000E+01	3.000E+01	BIOFAC(59,1)
D-5	Pu-238 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(59,2)
D-5				
D-5	Pu-239 , fish	3.000E+01	3.000E+01	BIOFAC(61,1)
D-5	Pu-239 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(61,2)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Pu-240 , fish	3.000E+01	3.000E+01	BIOFAC(62,1)
D-5	Pu-240 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(62,2)
D-5				
D-5	Pu-241 , fish	3.000E+01	3.000E+01	BIOFAC(64,1)
D-5	Pu-241 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(64,2)
D-5				
D-5	Pu-241+D , fish	3.000E+01	3.000E+01	BIOFAC(65,1)
D-5	Pu-241+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(65,2)
D-5				
D-5	Pu-242 , fish	3.000E+01	3.000E+01	BIOFAC(66,1)
D-5	Pu-242 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(66,2)
D-5				
D-5	Pu-244 , fish	3.000E+01	3.000E+01	BIOFAC(69,1)
D-5	Pu-244 , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(69,2)
D-5				
D-5	Pu-244+D , fish	3.000E+01	3.000E+01	BIOFAC(70,1)
D-5	Pu-244+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(70,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(72,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(72,2)
D-5				
D-5	Ra-228+D , fish	5.000E+01	5.000E+01	BIOFAC(73,1)
D-5	Ra-228+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(73,2)
D-5				
D-5	Ru-106+D , fish	1.000E+01	1.000E+01	BIOFAC(74,1)
D-5	Ru-106+D , crustacea and mollusks	3.000E+02	3.000E+02	BIOFAC(74,2)
D-5				
D-5	Sb-125+D , fish	1.000E+02	1.000E+02	BIOFAC(75,1)
D-5	Sb-125+D , crustacea and mollusks	1.000E+01	1.000E+01	BIOFAC(75,2)
D-5				
D-5	Sm-147 , fish	2.500E+01	2.500E+01	BIOFAC(76,1)
D-5	Sm-147 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(76,2)
D-5				
D-5	Sm-151 , fish	2.500E+01	2.500E+01	BIOFAC(77,1)
D-5	Sm-151 , crustacea and mollusks	1.000E+03	1.000E+03	BIOFAC(77,2)
D-5				
D-5	Sr-90+D , fish	6.000E+01	6.000E+01	BIOFAC(78,1)
D-5	Sr-90+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(78,2)
D-5				
D-5	Tc-99 , fish	2.000E+01	2.000E+01	BIOFAC(79,1)
D-5	Tc-99 , crustacea and mollusks	5.000E+00	5.000E+00	BIOFAC(79,2)
D-5				
D-5	Th-228+D , fish	1.000E+02	1.000E+02	BIOFAC(80,1)
D-5	Th-228+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(80,2)
D-5				
D-5	Th-229+D , fish	1.000E+02	1.000E+02	BIOFAC(81,1)
D-5	Th-229+D , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(81,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(82,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(82,2)

Summary : EGL Vadose Zone Analysis

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Dose Conversion Factor (and Related) Parameter Summary (continued)

Dose Library: FGR 11

Menu	Parameter	Current Value#	Base Case*	Parameter Name
D-5	Th-232 , fish	1.000E+02	1.000E+02	BIOFAC(83,1)
D-5	Th-232 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(83,2)
D-5				
D-5	Tl-204 , fish	1.000E+04	1.000E+04	BIOFAC(84,1)
D-5	Tl-204 , crustacea and mollusks	1.500E+04	1.500E+04	BIOFAC(84,2)
D-5				
D-5	U-233 , fish	1.000E+01	1.000E+01	BIOFAC(85,1)
D-5	U-233 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(85,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(86,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(86,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(87,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(87,2)
D-5				
D-5	U-236 , fish	1.000E+01	1.000E+01	BIOFAC(88,1)
D-5	U-236 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(88,2)
D-5				
D-5	U-238 , fish	1.000E+01	1.000E+01	BIOFAC(89,1)
D-5	U-238 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(89,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(90,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(90,2)
D-5				
D-5	Zn-65 , fish	1.000E+03	1.000E+03	BIOFAC(91,1)
D-5	Zn-65 , crustacea and mollusks	1.000E+04	1.000E+04	BIOFAC(91,2)

#For DCF1(xxx) only, factors are for infinite depth & area. See ETEG table in Ground Pathway of Detailed Report.

*Base Case means Default.Lib w/o Associate Nuclide contributions.

Summary : EGL Vadose Zone Analysis

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Site-Specific Parameter Summary

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R011	Area of contaminated zone (m**2)	8.822E+04	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.360E+01	2.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	5.820E+02	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	2.500E+01	3.000E+01	---	BRDL
R011	Time since placement of material (yr)	0.000E+00	0.000E+00	---	TI
R011	Times for calculations (yr)	1.000E+00	1.000E+00	---	T(2)
R011	Times for calculations (yr)	3.000E+00	3.000E+00	---	T(3)
R011	Times for calculations (yr)	1.000E+01	1.000E+01	---	T(4)
R011	Times for calculations (yr)	3.000E+01	3.000E+01	---	T(5)
R011	Times for calculations (yr)	1.000E+02	1.000E+02	---	T(6)
R011	Times for calculations (yr)	3.000E+02	3.000E+02	---	T(7)
R011	Times for calculations (yr)	1.000E+03	1.000E+03	---	T(8)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(9)
R011	Times for calculations (yr)	not used	0.000E+00	---	T(10)
R012	Initial principal radionuclide (pCi/g): Ac-227	3.500E+00	0.000E+00	---	S1(1)
R012	Initial principal radionuclide (pCi/g): Ag-108m	2.500E+01	0.000E+00	---	S1(2)
R012	Initial principal radionuclide (pCi/g): Ag-110m	2.500E+01	0.000E+00	---	S1(3)
R012	Initial principal radionuclide (pCi/g): Am-241	1.000E-01	0.000E+00	---	S1(4)
R012	Initial principal radionuclide (pCi/g): Am-243	1.000E-01	0.000E+00	---	S1(5)
R012	Initial principal radionuclide (pCi/g): Au-195	1.000E+02	0.000E+00	---	S1(6)
R012	Initial principal radionuclide (pCi/g): Ba-133	2.500E+01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): C-14	1.000E+01	0.000E+00	---	S1(8)
R012	Initial principal radionuclide (pCi/g): Ca-41	2.500E+01	0.000E+00	---	S1(9)
R012	Initial principal radionuclide (pCi/g): Cd-109	2.500E+01	0.000E+00	---	S1(10)
R012	Initial principal radionuclide (pCi/g): Ce-144	2.500E+01	0.000E+00	---	S1(11)
R012	Initial principal radionuclide (pCi/g): Cf-252	1.000E-01	0.000E+00	---	S1(12)
R012	Initial principal radionuclide (pCi/g): Cm-243	1.000E-01	0.000E+00	---	S1(17)
R012	Initial principal radionuclide (pCi/g): Cm-244	1.000E-01	0.000E+00	---	S1(19)
R012	Initial principal radionuclide (pCi/g): Cm-245	1.000E-01	0.000E+00	---	S1(22)
R012	Initial principal radionuclide (pCi/g): Cm-246	1.000E-01	0.000E+00	---	S1(24)
R012	Initial principal radionuclide (pCi/g): Cm-247	1.000E-01	0.000E+00	---	S1(28)
R012	Initial principal radionuclide (pCi/g): Co-57	2.500E+01	0.000E+00	---	S1(33)
R012	Initial principal radionuclide (pCi/g): Co-60	2.500E+01	0.000E+00	---	S1(34)
R012	Initial principal radionuclide (pCi/g): Cs-134	2.500E+01	0.000E+00	---	S1(35)
R012	Initial principal radionuclide (pCi/g): Cs-135	2.500E+01	0.000E+00	---	S1(36)
R012	Initial principal radionuclide (pCi/g): Cs-137	2.500E+01	0.000E+00	---	S1(37)
R012	Initial principal radionuclide (pCi/g): Eu-152	2.500E+01	0.000E+00	---	S1(38)
R012	Initial principal radionuclide (pCi/g): Eu-154	2.500E+01	0.000E+00	---	S1(40)
R012	Initial principal radionuclide (pCi/g): Eu-155	2.500E+01	0.000E+00	---	S1(41)
R012	Initial principal radionuclide (pCi/g): Fe-55	2.500E+01	0.000E+00	---	S1(42)
R012	Initial principal radionuclide (pCi/g): Gd-152	2.500E+01	0.000E+00	---	S1(43)
R012	Initial principal radionuclide (pCi/g): Gd-153	2.500E+01	0.000E+00	---	S1(44)
R012	Initial principal radionuclide (pCi/g): Ge-68	2.500E+01	0.000E+00	---	S1(45)
R012	Initial principal radionuclide (pCi/g): H-3	1.000E+03	0.000E+00	---	S1(46)
R012	Initial principal radionuclide (pCi/g): I-129	1.000E-02	0.000E+00	---	S1(47)
R012	Initial principal radionuclide (pCi/g): K-40	8.000E+02	0.000E+00	---	S1(48)
R012	Initial principal radionuclide (pCi/g): Mn-54	2.500E+01	0.000E+00	---	S1(49)
R012	Initial principal radionuclide (pCi/g): Na-22	2.500E+01	0.000E+00	---	S1(50)
R012	Initial principal radionuclide (pCi/g): Nb-93m	2.500E+01	0.000E+00	---	S1(51)

Summary : EGL Vadose Zone Analysis

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R012	Initial principal radionuclide (pCi/g): Nb-94	2.500E+01	0.000E+00	---	S1(52)
R012	Initial principal radionuclide (pCi/g): Ni-59	2.500E+01	0.000E+00	---	S1(53)
R012	Initial principal radionuclide (pCi/g): Ni-63	2.500E+01	0.000E+00	---	S1(54)
R012	Initial principal radionuclide (pCi/g): Np-237	1.000E-01	0.000E+00	---	S1(55)
R012	Initial principal radionuclide (pCi/g): Pa-231	3.200E+00	0.000E+00	---	S1(56)
R012	Initial principal radionuclide (pCi/g): Pb-210	1.500E+03	0.000E+00	---	S1(57)
R012	Initial principal radionuclide (pCi/g): Pm-147	2.500E+01	0.000E+00	---	S1(58)
R012	Initial principal radionuclide (pCi/g): Pu-238	1.000E-01	0.000E+00	---	S1(59)
R012	Initial principal radionuclide (pCi/g): Pu-239	1.000E-01	0.000E+00	---	S1(61)
R012	Initial principal radionuclide (pCi/g): Pu-240	1.000E-01	0.000E+00	---	S1(62)
R012	Initial principal radionuclide (pCi/g): Pu-241	1.000E-01	0.000E+00	---	S1(64)
R012	Initial principal radionuclide (pCi/g): Pu-242	1.000E-01	0.000E+00	---	S1(66)
R012	Initial principal radionuclide (pCi/g): Pu-244	1.000E-01	0.000E+00	---	S1(69)
R012	Initial principal radionuclide (pCi/g): Ra-226	1.500E+03	0.000E+00	---	S1(72)
R012	Initial principal radionuclide (pCi/g): Ra-228	1.500E+03	0.000E+00	---	S1(73)
R012	Initial principal radionuclide (pCi/g): Ru-106	2.500E+01	0.000E+00	---	S1(74)
R012	Initial principal radionuclide (pCi/g): Sb-125	2.500E+01	0.000E+00	---	S1(75)
R012	Initial principal radionuclide (pCi/g): Sm-147	2.500E+01	0.000E+00	---	S1(76)
R012	Initial principal radionuclide (pCi/g): Sm-151	2.500E+01	0.000E+00	---	S1(77)
R012	Initial principal radionuclide (pCi/g): Sr-90	2.500E+01	0.000E+00	---	S1(78)
R012	Initial principal radionuclide (pCi/g): Tc-99	1.000E+00	0.000E+00	---	S1(79)
R012	Initial principal radionuclide (pCi/g): Th-228	2.800E+01	0.000E+00	---	S1(80)
R01	Initial principal radionuclide (pCi/g): Th-229	2.800E+01	0.000E+00	---	S1(81)
R012	Initial principal radionuclide (pCi/g): Th-230	8.300E+01	0.000E+00	---	S1(82)
R012	Initial principal radionuclide (pCi/g): Th-232	2.800E+01	0.000E+00	---	S1(83)
R012	Initial principal radionuclide (pCi/g): Tl-204	2.500E+01	0.000E+00	---	S1(84)
R012	Initial principal radionuclide (pCi/g): U-233	3.300E+00	0.000E+00	---	S1(85)
R012	Initial principal radionuclide (pCi/g): U-234	8.300E+01	0.000E+00	---	S1(86)
R012	Initial principal radionuclide (pCi/g): U-235	3.300E+00	0.000E+00	---	S1(87)
R012	Initial principal radionuclide (pCi/g): U-236	3.200E+00	0.000E+00	---	S1(88)
R012	Initial principal radionuclide (pCi/g): U-238	8.300E+01	0.000E+00	---	S1(89)
R012	Initial principal radionuclide (pCi/g): Zn-65	2.500E+01	0.000E+00	---	S1(91)
R012	Concentration in groundwater (pCi/L): Ac-227	not used	0.000E+00	---	W1(1)
R012	Concentration in groundwater (pCi/L): Ag-108m	not used	0.000E+00	---	W1(2)
R012	Concentration in groundwater (pCi/L): Ag-110m	not used	0.000E+00	---	W1(3)
R012	Concentration in groundwater (pCi/L): Am-241	not used	0.000E+00	---	W1(4)
R012	Concentration in groundwater (pCi/L): Am-243	not used	0.000E+00	---	W1(5)
R012	Concentration in groundwater (pCi/L): Au-195	not used	0.000E+00	---	W1(6)
R012	Concentration in groundwater (pCi/L): Ba-133	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): C-14	not used	0.000E+00	---	W1(8)
R012	Concentration in groundwater (pCi/L): Ca-41	not used	0.000E+00	---	W1(9)
R012	Concentration in groundwater (pCi/L): Cd-109	not used	0.000E+00	---	W1(10)
R012	Concentration in groundwater (pCi/L): Ce-144	not used	0.000E+00	---	W1(11)
R012	Concentration in groundwater (pCi/L): Cf-252	not used	0.000E+00	---	W1(12)
R012	Concentration in groundwater (pCi/L): Cm-243	not used	0.000E+00	---	W1(17)
R012	Concentration in groundwater (pCi/L): Cm-244	not used	0.000E+00	---	W1(19)
R012	Concentration in groundwater (pCi/L): Cm-245	not used	0.000E+00	---	W1(22)
R012	Concentration in groundwater (pCi/L): Cm-246	not used	0.000E+00	---	W1(24)
R012	Concentration in groundwater (pCi/L): Cm-247	not used	0.000E+00	---	W1(28)
R012	Concentration in groundwater (pCi/L): Co-57	not used	0.000E+00	---	W1(33)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R012	Concentration in groundwater (pCi/L): Co-60	not used	0.000E+00	---	W1(34)
R012	Concentration in groundwater (pCi/L): Cs-134	not used	0.000E+00	---	W1(35)
R012	Concentration in groundwater (pCi/L): Cs-135	not used	0.000E+00	---	W1(36)
R012	Concentration in groundwater (pCi/L): Cs-137	not used	0.000E+00	---	W1(37)
R012	Concentration in groundwater (pCi/L): Eu-152	not used	0.000E+00	---	W1(38)
R012	Concentration in groundwater (pCi/L): Eu-154	not used	0.000E+00	---	W1(40)
R012	Concentration in groundwater (pCi/L): Eu-155	not used	0.000E+00	---	W1(41)
R012	Concentration in groundwater (pCi/L): Fe-55	not used	0.000E+00	---	W1(42)
R012	Concentration in groundwater (pCi/L): Gd-152	not used	0.000E+00	---	W1(43)
R012	Concentration in groundwater (pCi/L): Gd-153	not used	0.000E+00	---	W1(44)
R012	Concentration in groundwater (pCi/L): Ge-68	not used	0.000E+00	---	W1(45)
R012	Concentration in groundwater (pCi/L): H-3	not used	0.000E+00	---	W1(46)
R012	Concentration in groundwater (pCi/L): I-129	not used	0.000E+00	---	W1(47)
R012	Concentration in groundwater (pCi/L): K-40	not used	0.000E+00	---	W1(48)
R012	Concentration in groundwater (pCi/L): Mn-54	not used	0.000E+00	---	W1(49)
R012	Concentration in groundwater (pCi/L): Na-22	not used	0.000E+00	---	W1(50)
R012	Concentration in groundwater (pCi/L): Nb-93m	not used	0.000E+00	---	W1(51)
R012	Concentration in groundwater (pCi/L): Nb-94	not used	0.000E+00	---	W1(52)
R012	Concentration in groundwater (pCi/L): Ni-59	not used	0.000E+00	---	W1(53)
R012	Concentration in groundwater (pCi/L): Ni-63	not used	0.000E+00	---	W1(54)
R012	Concentration in groundwater (pCi/L): Np-237	not used	0.000E+00	---	W1(55)
R012	Concentration in groundwater (pCi/L): Pa-231	not used	0.000E+00	---	W1(56)
R012	Concentration in groundwater (pCi/L): Pb-210	not used	0.000E+00	---	W1(57)
R012	Concentration in groundwater (pCi/L): Pm-147	not used	0.000E+00	---	W1(58)
R012	Concentration in groundwater (pCi/L): Pu-238	not used	0.000E+00	---	W1(59)
R012	Concentration in groundwater (pCi/L): Pu-239	not used	0.000E+00	---	W1(61)
R012	Concentration in groundwater (pCi/L): Pu-240	not used	0.000E+00	---	W1(62)
R012	Concentration in groundwater (pCi/L): Pu-241	not used	0.000E+00	---	W1(64)
R012	Concentration in groundwater (pCi/L): Pu-242	not used	0.000E+00	---	W1(66)
R012	Concentration in groundwater (pCi/L): Pu-244	not used	0.000E+00	---	W1(69)
R012	Concentration in groundwater (pCi/L): Ra-226	not used	0.000E+00	---	W1(72)
R012	Concentration in groundwater (pCi/L): Ra-228	not used	0.000E+00	---	W1(73)
R012	Concentration in groundwater (pCi/L): Ru-106	not used	0.000E+00	---	W1(74)
R012	Concentration in groundwater (pCi/L): Sb-125	not used	0.000E+00	---	W1(75)
R012	Concentration in groundwater (pCi/L): Sm-147	not used	0.000E+00	---	W1(76)
R012	Concentration in groundwater (pCi/L): Sm-151	not used	0.000E+00	---	W1(77)
R012	Concentration in groundwater (pCi/L): Sr-90	not used	0.000E+00	---	W1(78)
R012	Concentration in groundwater (pCi/L): Tc-99	not used	0.000E+00	---	W1(79)
R012	Concentration in groundwater (pCi/L): Th-228	not used	0.000E+00	---	W1(80)
R012	Concentration in groundwater (pCi/L): Th-229	not used	0.000E+00	---	W1(81)
R012	Concentration in groundwater (pCi/L): Th-230	not used	0.000E+00	---	W1(82)
R012	Concentration in groundwater (pCi/L): Th-232	not used	0.000E+00	---	W1(83)
R012	Concentration in groundwater (pCi/L): Tl-204	not used	0.000E+00	---	W1(84)
R012	Concentration in groundwater (pCi/L): U-233	not used	0.000E+00	---	W1(85)
R012	Concentration in groundwater (pCi/L): U-234	not used	0.000E+00	---	W1(86)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(87)
R012	Concentration in groundwater (pCi/L): U-236	not used	0.000E+00	---	W1(88)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(89)
R012	Concentration in groundwater (pCi/L): Zn-65	not used	0.000E+00	---	W1(91)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R013	Cover depth (m)	6.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.780E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	1.000E-04	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.000E-03	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	4.000E-01	4.000E-01	---	TPCZ
R013	Contaminated zone field capacity	2.000E-01	2.000E-01	---	FCCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	5.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	5.300E+00	5.300E+00	---	BCZ
R013	Average annual wind speed (m/sec)	2.000E+00	2.000E+00	---	WIND
R013	Humidity in air (g/m**3)	8.000E+00	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	7.500E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	1.840E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	2.000E-01	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	2.000E-01	2.000E-01	---	RUNOFF
R013	Watershed area for nearby stream or pond (m**2)	1.000E+06	1.000E+06	---	WAREA
R013	Accuracy for water/soil computations	1.000E-03	1.000E-03	---	EPS
R014	Density of saturated zone (g/cm**3)	1.500E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	4.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	4.000E-01	2.000E-01	---	EPSZ
R01	Saturated zone field capacity	4.000E-01	2.000E-01	---	FCSZ
R01	Saturated zone hydraulic conductivity (m/yr)	2.500E+01	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	1.000E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.000E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	1.000E-03	1.000E-03	---	VWT
R014	Well pump intake depth (m below water table)	1.000E+01	1.000E+01	---	DWIBWT
R014	Model: Nondispersion (ND) or Mass-Balance (MB)	ND	ND	---	MODEL
R014	Well pumping rate (m**3/yr)	2.500E+02	2.500E+02	---	UW
R015	Number of unsaturated zone strata	5	1	---	NS
R015	Unsat. zone 1, thickness (m)	1.000E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.630E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	5.200E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	1.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, field capacity	4.500E-01	2.000E-01	---	FCUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	1.100E+01	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	1.500E-02	1.000E+01	---	HCUZ(1)
R015	Unsat. zone 2, thickness (m)	4.600E+00	0.000E+00	---	H(2)
R015	Unsat. zone 2, soil density (g/cm**3)	1.690E+00	1.500E+00	---	DENSUZ(2)
R015	Unsat. zone 2, total porosity	3.400E-01	4.000E-01	---	TPUZ(2)
R015	Unsat. zone 2, effective porosity	3.300E-01	2.000E-01	---	EPUZ(2)
R015	Unsat. zone 2, field capacity	7.000E-02	2.000E-01	---	FCUZ(2)
R015	Unsat. zone 2, soil-specific b parameter	2.000E+00	5.300E+00	---	BUZ(2)
R015	Unsat. zone 2, hydraulic conductivity (m/yr)	2.200E+03	1.000E+01	---	HCUZ(2)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 3, thickness (m)	2.130E+01	0.000E+00	---	H(3)
R015	Unsat. zone 3, soil density (g/cm**3)	1.300E+00	1.500E+00	---	DENSUZ(3)
R015	Unsat. zone 3, total porosity	5.200E-01	4.000E-01	---	TPUZ(3)
R015	Unsat. zone 3, effective porosity	4.000E-01	2.000E-01	---	EPUZ(3)
R015	Unsat. zone 3, field capacity	4.900E-01	2.000E-01	---	FCUZ(3)
R015	Unsat. zone 3, soil-specific b parameter	3.000E+00	5.300E+00	---	BUZ(3)
R015	Unsat. zone 3, hydraulic conductivity (m/yr)	9.000E+02	1.000E+01	---	HCUZ(3)
R015	Unsat. zone 4, thickness (m)	1.680E+01	0.000E+00	---	H(4)
R015	Unsat. zone 4, soil density (g/cm**3)	1.310E+00	1.500E+00	---	DENSUZ(4)
R015	Unsat. zone 4, total porosity	4.900E-01	4.000E-01	---	TPUZ(4)
R015	Unsat. zone 4, effective porosity	4.300E-01	2.000E-01	---	EPUZ(4)
R015	Unsat. zone 4, field capacity	4.800E-01	2.000E-01	---	FCUZ(4)
R015	Unsat. zone 4, soil-specific b parameter	5.000E+00	5.300E+00	---	BUZ(4)
R015	Unsat. zone 4, hydraulic conductivity (m/yr)	6.000E+01	1.000E+01	---	HCUZ(4)
R015	Unsat. zone 5, thickness (m)	1.220E+01	0.000E+00	---	H(5)
R015	Unsat. zone 5, soil density (g/cm**3)	1.500E+00	1.500E+00	---	DENSUZ(5)
R015	Unsat. zone 5, total porosity	5.200E-01	4.000E-01	---	TPUZ(5)
R015	Unsat. zone 5, effective porosity	1.500E-01	2.000E-01	---	EPUZ(5)
R015	Unsat. zone 5, field capacity	3.200E-01	2.000E-01	---	FCUZ(5)
R015	Unsat. zone 5, soil-specific b parameter	8.000E+00	5.300E+00	---	BUZ(5)
R01	Unsat. zone 5, hydraulic conductivity (m/yr)	1.000E-01	1.000E+01	---	HCUZ(5)
R016	Distribution coefficients for Ac-227				
R016	Contaminated zone (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCC(1)
R016	Unsat. zone 1 (cm**3/g)	2.400E+03	2.000E+01	---	DCNUCU(1,1)
R016	Unsat. zone 2 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,2)
R016	Unsat. zone 3 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,3)
R016	Unsat. zone 4 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,4)
R016	Unsat. zone 5 (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCU(1,5)
R016	Saturated zone (cm**3/g)	4.500E+02	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.826E-06	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for Ag-108m				
R016	Contaminated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCC(2)
R016	Unsat. zone 1 (cm**3/g)	1.800E+02	0.000E+00	---	DCNUCU(2,1)
R016	Unsat. zone 2 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,2)
R016	Unsat. zone 3 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,3)
R016	Unsat. zone 4 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,4)
R016	Unsat. zone 5 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU(2,5)
R016	Saturated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.910E-05	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ag-110m				
R016	Contaminated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCC (3)
R016	Unsaturated zone 1 (cm**3/g)	1.800E+02	0.000E+00	---	DCNUCU (3,1)
R016	Unsaturated zone 2 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,2)
R016	Unsaturated zone 3 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,3)
R016	Unsaturated zone 4 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,4)
R016	Unsaturated zone 5 (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCU (3,5)
R016	Saturated zone (cm**3/g)	9.000E+01	0.000E+00	---	DCNUCS (3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.910E-05	ALEACH (3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (3)
R016	Distribution coefficients for Am-241				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC (4)
R016	Unsaturated zone 1 (cm**3/g)	8.400E+03	2.000E+01	---	DCNUCU (4,1)
R016	Unsaturated zone 2 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,2)
R016	Unsaturated zone 3 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,3)
R016	Unsaturated zone 4 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,4)
R016	Unsaturated zone 5 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (4,5)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS (4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.064E-07	ALEACH (4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (4)
R016	Distribution coefficients for Am-243				
R016	Contaminated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCC (5)
R016	Unsaturated zone 1 (cm**3/g)	8.400E+03	2.000E+01	---	DCNUCU (5,1)
R016	Unsaturated zone 2 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,2)
R016	Unsaturated zone 3 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,3)
R016	Unsaturated zone 4 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,4)
R016	Unsaturated zone 5 (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCU (5,5)
R016	Saturated zone (cm**3/g)	1.900E+03	2.000E+01	---	DCNUCS (5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	9.064E-07	ALEACH (5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (5)
R016	Distribution coefficients for Au-195				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (6)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (6,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (6)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ba-133				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC (7)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (7,5)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS (7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.433E-05	ALEACH (7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (7)
R016	Distribution coefficients for C-14				
R016	Contaminated zone (cm**3/g)	5.000E+00	0.000E+00	---	DCNUCC (8)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,3)
R016	Unsaturated zone 4 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,4)
R016	Unsaturated zone 5 (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCU (8,5)
R016	Saturated zone (cm**3/g)	1.000E+00	0.000E+00	---	DCNUCS (8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.333E-04	ALEACH (8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (8)
R016	Distribution coefficients for Ca-41				
R016	Contaminated zone (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCC (9)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU (9,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCU (9,5)
R016	Saturated zone (cm**3/g)	5.000E+00	5.000E+01	---	DCNUCS (9)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.333E-04	ALEACH (9)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (9)
R016	Distribution coefficients for Cd-109				
R016	Contaminated zone (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCC (10)
R016	Unsaturated zone 1 (cm**3/g)	5.600E+02	0.000E+00	---	DCNUCU (10,1)
R016	Unsaturated zone 2 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU (10,2)
R016	Unsaturated zone 3 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU (10,3)
R016	Unsaturated zone 4 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU (10,4)
R016	Unsaturated zone 5 (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCU (10,5)
R016	Saturated zone (cm**3/g)	1.100E+01	0.000E+00	---	DCNUCS (10)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.542E-04	ALEACH (10)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (10)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ce-144				
R016	Contaminated zone (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCC(11)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+04	1.000E+03	---	DCNUCU(11,1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCU(11,5)
R016	Saturated zone (cm**3/g)	5.000E+02	1.000E+03	---	DCNUCS(11)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.443E-06	ALEACH(11)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(11)
R016	Distribution coefficients for Cf-252				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(12)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(12,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(12)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(12)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(12)
R016	Distribution coefficients for Cm-243				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(17)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(17,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(17,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(17,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(17,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(17,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(17)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(17)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(17)
R016	Distribution coefficients for Cm-244				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC(19)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(19,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(19,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(19,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(19,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU(19,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS(19)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH(19)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(19)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Cm-245				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (22)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (22, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (22, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (22, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (22, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (22, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (22)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (22)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (22)
R016	Distribution coefficients for Cm-246				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (24)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (24, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (24, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (24, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (24, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (24, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (24)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (24)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (24)
R01	Distribution coefficients for Cm-247				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (28)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (28, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (28, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (28, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (28, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (28, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (28)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (28)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (28)
R016	Distribution coefficients for Co-57				
R016	Contaminated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCC (33)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+03	---	DCNUCU (33, 1)
R016	Unsaturated zone 2 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (33, 2)
R016	Unsaturated zone 3 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (33, 3)
R016	Unsaturated zone 4 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (33, 4)
R016	Unsaturated zone 5 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (33, 5)
R016	Saturated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCS (33)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.862E-05	ALEACH (33)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (33)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Co-60				
R016	Contaminated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCC (34)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+03	---	DCNUCU (34, 1)
R016	Unsaturated zone 2 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (34, 2)
R016	Unsaturated zone 3 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (34, 3)
R016	Unsaturated zone 4 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (34, 4)
R016	Unsaturated zone 5 (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCU (34, 5)
R016	Saturated zone (cm**3/g)	6.000E+01	1.000E+03	---	DCNUCS (34)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.862E-05	ALEACH (34)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (34)
R016	Distribution coefficients for Cs-134				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC (35)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	4.600E+03	---	DCNUCU (35, 1)
R016	Unsaturated zone 2 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (35, 2)
R016	Unsaturated zone 3 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (35, 3)
R016	Unsaturated zone 4 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (35, 4)
R016	Unsaturated zone 5 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (35, 5)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS (35)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.147E-06	ALEACH (35)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (35)
R016	Distribution coefficients for Cs-135				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC (36)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	4.600E+03	---	DCNUCU (36, 1)
R016	Unsaturated zone 2 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (36, 2)
R016	Unsaturated zone 3 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (36, 3)
R016	Unsaturated zone 4 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (36, 4)
R016	Unsaturated zone 5 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (36, 5)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS (36)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.147E-06	ALEACH (36)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (36)
R016	Distribution coefficients for Cs-137				
R016	Contaminated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCC (37)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+02	4.600E+03	---	DCNUCU (37, 1)
R016	Unsaturated zone 2 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (37, 2)
R016	Unsaturated zone 3 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (37, 3)
R016	Unsaturated zone 4 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (37, 4)
R016	Unsaturated zone 5 (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCU (37, 5)
R016	Saturated zone (cm**3/g)	2.800E+02	4.600E+03	---	DCNUCS (37)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.147E-06	ALEACH (37)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (37)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Eu-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (38)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (38, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (38, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (38, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (38, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (38, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (38)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (38)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (38)
R016	Distribution coefficients for Eu-154				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (40)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (40, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (40, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (40, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (40, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (40, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (40)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (40)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (40)
R07	Distribution coefficients for Eu-155				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (41)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (41, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (41, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (41, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (41, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (41, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (41)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (41)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (41)
R016	Distribution coefficients for Fe-55				
R016	Contaminated zone (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCC (42)
R016	Unsaturated zone 1 (cm**3/g)	1.650E+02	1.000E+03	---	DCNUCU (42, 1)
R016	Unsaturated zone 2 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (42, 2)
R016	Unsaturated zone 3 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (42, 3)
R016	Unsaturated zone 4 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (42, 4)
R016	Unsaturated zone 5 (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCU (42, 5)
R016	Saturated zone (cm**3/g)	2.200E+02	1.000E+03	---	DCNUCS (42)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.822E-06	ALEACH (42)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (42)

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Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Gd-152				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (43)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (43,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (43,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (43,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (43,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (43,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (43)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (43)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (43)
R016	Distribution coefficients for Gd-153				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (44)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (44,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (44,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (44,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (44,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (44,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (44)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (44)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (44)
R016	Distribution coefficients for Ge-68				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (45)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (45,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (45,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (45,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (45,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (45,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (45)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (45)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (45)
R016	Distribution coefficients for H-3				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (46)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (46,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (46,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (46,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (46,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (46,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (46)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (46)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (46)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for I-129				
R016	Contaminated zone (cm**3/g)	2.000E-01	1.000E-01	---	DCNUCC (47)
R016	Unsaturated zone 1 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (47, 1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (47, 2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (47, 3)
R016	Unsaturated zone 4 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (47, 4)
R016	Unsaturated zone 5 (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCU (47, 5)
R016	Saturated zone (cm**3/g)	1.000E-01	1.000E-01	---	DCNUCS (47)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.691E-03	ALEACH (47)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (47)
R016	Distribution coefficients for K-40				
R016	Contaminated zone (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCC (48)
R016	Unsaturated zone 1 (cm**3/g)	7.500E+01	5.500E+00	---	DCNUCU (48, 1)
R016	Unsaturated zone 2 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (48, 2)
R016	Unsaturated zone 3 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (48, 3)
R016	Unsaturated zone 4 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (48, 4)
R016	Unsaturated zone 5 (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCU (48, 5)
R016	Saturated zone (cm**3/g)	1.500E+01	5.500E+00	---	DCNUCS (48)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.135E-04	ALEACH (48)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (48)
R01	Distribution coefficients for Mn-54				
R016	Contaminated zone (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCC (49)
R016	Unsaturated zone 1 (cm**3/g)	1.800E+02	2.000E+02	---	DCNUCU (49, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (49, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (49, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (49, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCU (49, 5)
R016	Saturated zone (cm**3/g)	5.000E+01	2.000E+02	---	DCNUCS (49)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.433E-05	ALEACH (49)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (49)
R016	Distribution coefficients for Na-22				
R016	Contaminated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCC (50)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (50, 1)
R016	Unsaturated zone 2 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (50, 2)
R016	Unsaturated zone 3 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (50, 3)
R016	Unsaturated zone 4 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (50, 4)
R016	Unsaturated zone 5 (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCU (50, 5)
R016	Saturated zone (cm**3/g)	1.000E+01	1.000E+01	---	DCNUCS (50)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.694E-04	ALEACH (50)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (50)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Nb-93m				
R016	Contaminated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCC (51)
R016	Unsaturated zone 1 (cm**3/g)	9.000E+02	0.000E+00	---	DCNUCU (51,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (51,2)
R016	Unsaturated zone 3 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (51,3)
R016	Unsaturated zone 4 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (51,4)
R016	Unsaturated zone 5 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (51,5)
R016	Saturated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCS (51)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.075E-05	ALEACH (51)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (51)
R016	Distribution coefficients for Nb-94				
R016	Contaminated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCC (52)
R016	Unsaturated zone 1 (cm**3/g)	9.000E+02	0.000E+00	---	DCNUCU (52,1)
R016	Unsaturated zone 2 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (52,2)
R016	Unsaturated zone 3 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (52,3)
R016	Unsaturated zone 4 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (52,4)
R016	Unsaturated zone 5 (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCU (52,5)
R016	Saturated zone (cm**3/g)	1.600E+02	0.000E+00	---	DCNUCS (52)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.075E-05	ALEACH (52)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (52)
R01	Distribution coefficients for Ni-59				
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCC (53)
R016	Unsaturated zone 1 (cm**3/g)	6.500E+02	1.000E+03	---	DCNUCU (53,1)
R016	Unsaturated zone 2 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (53,2)
R016	Unsaturated zone 3 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (53,3)
R016	Unsaturated zone 4 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (53,4)
R016	Unsaturated zone 5 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (53,5)
R016	Saturated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS (53)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.304E-06	ALEACH (53)
R016	Solubility constant	4.000E+02	0.000E+00	Sol. Kd =-1.671E-01 not used	SOLUBK (53)
R016	Distribution coefficients for Ni-63				
R016	Contaminated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCC (54)
R016	Unsaturated zone 1 (cm**3/g)	6.500E+02	1.000E+03	---	DCNUCU (54,1)
R016	Unsaturated zone 2 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (54,2)
R016	Unsaturated zone 3 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (54,3)
R016	Unsaturated zone 4 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (54,4)
R016	Unsaturated zone 5 (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCU (54,5)
R016	Saturated zone (cm**3/g)	4.000E+02	1.000E+03	---	DCNUCS (54)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.304E-06	ALEACH (54)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (54)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Np-237				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCC (55)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (55, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (55, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (55, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (55, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCU (55, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	2.574E+02	DCNUCS (55)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.686E-06	ALEACH (55)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (55)
R016	Distribution coefficients for Pa-231				
R016	Contaminated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCC (56)
R016	Unsaturated zone 1 (cm**3/g)	2.700E+03	5.000E+01	---	DCNUCU (56, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (56, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (56, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (56, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCU (56, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	5.000E+01	---	DCNUCS (56)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (56)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (56)
R01	Distribution coefficients for Pb-210				
R016	Contaminated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCC (57)
R016	Unsaturated zone 1 (cm**3/g)	5.500E+02	1.000E+02	---	DCNUCU (57, 1)
R016	Unsaturated zone 2 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (57, 2)
R016	Unsaturated zone 3 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (57, 3)
R016	Unsaturated zone 4 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (57, 4)
R016	Unsaturated zone 5 (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCU (57, 5)
R016	Saturated zone (cm**3/g)	2.700E+02	1.000E+02	---	DCNUCS (57)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.375E-06	ALEACH (57)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (57)
R016	Distribution coefficients for Pm-147				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (58)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (58, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (58)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (58)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (58)

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Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Pu-238				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (59)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (59, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (59, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (59, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (59, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (59, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (59)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (59)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (59)
R016	Distribution coefficients for Pu-239				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (61)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (61, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (61, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (61, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (61, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (61, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (61)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (61)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (61)
R016	Distribution coefficients for Pu-240				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (62)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (62, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (62, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (62, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (62, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (62, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (62)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (62)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (62)
R016	Distribution coefficients for Pu-241				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (64)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (64, 1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (64, 2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (64, 3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (64, 4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (64, 5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (64)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (64)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (64)

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R016	Distribution coefficients for Pu-242				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (66)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (66,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (66,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (66,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (66,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (66,5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (66)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (66)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (66)
R016	Distribution coefficients for Pu-244				
R016	Contaminated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCC (69)
R016	Unsaturated zone 1 (cm**3/g)	5.100E+03	2.000E+03	---	DCNUCU (69,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (69,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (69,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (69,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCU (69,5)
R016	Saturated zone (cm**3/g)	5.500E+02	2.000E+03	---	DCNUCS (69)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.130E-06	ALEACH (69)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (69)
R0	Distribution coefficients for Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC (72)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (72,1)
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (72,2)
R016	Unsaturated zone 3 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (72,3)
R016	Unsaturated zone 4 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (72,4)
R016	Unsaturated zone 5 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (72,5)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS (72)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.454E-05	ALEACH (72)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (72)
R016	Distribution coefficients for Ra-228				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC (73)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (73,1)
R016	Unsaturated zone 2 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (73,2)
R016	Unsaturated zone 3 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (73,3)
R016	Unsaturated zone 4 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (73,4)
R016	Unsaturated zone 5 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU (73,5)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS (73)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.454E-05	ALEACH (73)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (73)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Ru-106				
R016	Contaminated zone (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCC (74)
R016	Unsaturated zone 1 (cm**3/g)	8.000E+02	0.000E+00	---	DCNUCU (74,1)
R016	Unsaturated zone 2 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (74,2)
R016	Unsaturated zone 3 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (74,3)
R016	Unsaturated zone 4 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (74,4)
R016	Unsaturated zone 5 (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCU (74,5)
R016	Saturated zone (cm**3/g)	5.500E+01	0.000E+00	---	DCNUCS (74)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.122E-05	ALEACH (74)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (74)
R016	Distribution coefficients for Sb-125				
R016	Contaminated zone (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCC (75)
R016	Unsaturated zone 1 (cm**3/g)	2.500E+02	0.000E+00	---	DCNUCU (75,1)
R016	Unsaturated zone 2 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (75,2)
R016	Unsaturated zone 3 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (75,3)
R016	Unsaturated zone 4 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (75,4)
R016	Unsaturated zone 5 (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCU (75,5)
R016	Saturated zone (cm**3/g)	4.500E+01	0.000E+00	---	DCNUCS (75)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	3.813E-05	ALEACH (75)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (75)
R01	Distribution coefficients for Sm-147				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (76)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (76,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (76,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (76,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (76,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (76,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (76)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (76)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (76)
R016	Distribution coefficients for Sm-151				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCC (77)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (77,1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (77,2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (77,3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (77,4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCU (77,5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	8.249E+02	DCNUCS (77)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.087E-06	ALEACH (77)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (77)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Sr-90				
R016	Contaminated zone (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCC (78)
R016	Unsaturated zone 1 (cm**3/g)	1.100E+02	3.000E+01	---	DCNUCU (78,1)
R016	Unsaturated zone 2 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (78,2)
R016	Unsaturated zone 3 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (78,3)
R016	Unsaturated zone 4 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (78,4)
R016	Unsaturated zone 5 (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCU (78,5)
R016	Saturated zone (cm**3/g)	1.500E+01	3.000E+01	---	DCNUCS (78)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.135E-04	ALEACH (78)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (78)
R016	Distribution coefficients for Tc-99				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (79)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (79,1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (79,2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (79,3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (79,4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (79,5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (79)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (79)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (79)
R016	Distribution coefficients for Th-228				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (80)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (80,1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (80,2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (80,3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (80,4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (80,5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (80)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (80)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (80)
R016	Distribution coefficients for Th-229				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (81)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (81,1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (81,2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (81,3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (81,4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (81,5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (81)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (81)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (81)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Th-230				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (82)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (82, 1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (82, 2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (82, 3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (82, 4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (82, 5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (82)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (82)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (82)
R016	Distribution coefficients for Th-232				
R016	Contaminated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCC (83)
R016	Unsaturated zone 1 (cm**3/g)	5.800E+03	6.000E+04	---	DCNUCU (83, 1)
R016	Unsaturated zone 2 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (83, 2)
R016	Unsaturated zone 3 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (83, 3)
R016	Unsaturated zone 4 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (83, 4)
R016	Unsaturated zone 5 (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCU (83, 5)
R016	Saturated zone (cm**3/g)	3.200E+03	6.000E+04	---	DCNUCS (83)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	5.382E-07	ALEACH (83)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (83)
R016	Distribution coefficients for Tl-204				
R016	Contaminated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCC (84)
R016	Unsaturated zone 1 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (84, 1)
R016	Unsaturated zone 2 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (84, 2)
R016	Unsaturated zone 3 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (84, 3)
R016	Unsaturated zone 4 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (84, 4)
R016	Unsaturated zone 5 (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCU (84, 5)
R016	Saturated zone (cm**3/g)	0.000E+00	0.000E+00	---	DCNUCS (84)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.031E-02	ALEACH (84)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (84)
R016	Distribution coefficients for U-233				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (85)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (85, 1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (85, 2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (85, 3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (85, 4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (85, 5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (85)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (85)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (85)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for U-234				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (86)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (86,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (86,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (86,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (86,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (86,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (86)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (86)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (86)
R016	Distribution coefficients for U-235				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (87)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (87,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (87,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (87,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (87,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (87,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (87)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (87)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (87)
R016	Distribution coefficients for U-236				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (88)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (88,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (88,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (88,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (88,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (88,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (88)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (88)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (88)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCC (89)
R016	Unsaturated zone 1 (cm**3/g)	1.600E+03	5.000E+01	---	DCNUCU (89,1)
R016	Unsaturated zone 2 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (89,2)
R016	Unsaturated zone 3 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (89,3)
R016	Unsaturated zone 4 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (89,4)
R016	Unsaturated zone 5 (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCU (89,5)
R016	Saturated zone (cm**3/g)	3.500E+01	5.000E+01	---	DCNUCS (89)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.897E-05	ALEACH (89)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (89)

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for Zn-65				
R016	Contaminated zone (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCC (91)
R016	Unsaturated zone 1 (cm**3/g)	2.400E+03	0.000E+00	---	DCNUCU (91, 1)
R016	Unsaturated zone 2 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU (91, 2)
R016	Unsaturated zone 3 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU (91, 3)
R016	Unsaturated zone 4 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU (91, 4)
R016	Unsaturated zone 5 (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCU (91, 5)
R016	Saturated zone (cm**3/g)	2.000E+02	0.000E+00	---	DCNUCS (91)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.604E-06	ALEACH (91)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (91)
R016	Distribution coefficients for daughter Cm-248				
R016	Contaminated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCC (29)
R016	Unsaturated zone 1 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (29, 1)
R016	Unsaturated zone 2 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (29, 2)
R016	Unsaturated zone 3 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (29, 3)
R016	Unsaturated zone 4 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (29, 4)
R016	Unsaturated zone 5 (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCU (29, 5)
R016	Saturated zone (cm**3/g)	-1.000E+00	-1.000E+00	1.378E+03	DCNUCS (29)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	1.250E-06	ALEACH (29)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK (29)
R01	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	1.000E-04	1.000E-04	---	MLINH
R017	Exposure duration	3.000E+01	3.000E+01	---	ED
R017	Shielding factor, inhalation	4.000E-01	4.000E-01	---	SHF3
R017	Shielding factor, external gamma	7.000E-01	7.000E-01	---	SHF1
R017	Fraction of time spent indoors	5.000E-01	5.000E-01	---	FIND
R017	Fraction of time spent outdoors (on site)	2.500E-01	2.500E-01	---	FOTD
R017	Shape factor flag, external gamma	1.000E+00	1.000E+00	>0 shows circular AREA.	FS
R017	Radii of shape factor array (used if FS = -1):				
R017	Outer annular radius (m), ring 1:	not used	5.000E+01	---	RAD_SHAPE (1)
R017	Outer annular radius (m), ring 2:	not used	7.071E+01	---	RAD_SHAPE (2)
R017	Outer annular radius (m), ring 3:	not used	0.000E+00	---	RAD_SHAPE (3)
R017	Outer annular radius (m), ring 4:	not used	0.000E+00	---	RAD_SHAPE (4)
R017	Outer annular radius (m), ring 5:	not used	0.000E+00	---	RAD_SHAPE (5)
R017	Outer annular radius (m), ring 6:	not used	0.000E+00	---	RAD_SHAPE (6)
R017	Outer annular radius (m), ring 7:	not used	0.000E+00	---	RAD_SHAPE (7)
R017	Outer annular radius (m), ring 8:	not used	0.000E+00	---	RAD_SHAPE (8)
R017	Outer annular radius (m), ring 9:	not used	0.000E+00	---	RAD_SHAPE (9)
R017	Outer annular radius (m), ring 10:	not used	0.000E+00	---	RAD_SHAPE (10)
R017	Outer annular radius (m), ring 11:	not used	0.000E+00	---	RAD_SHAPE (11)
R017	Outer annular radius (m), ring 12:	not used	0.000E+00	---	RAD_SHAPE (12)

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R017	Fractions of annular areas within AREA:				
R017	Ring 1	not used	1.000E+00	---	FRACA(1)
R017	Ring 2	not used	2.732E-01	---	FRACA(2)
R017	Ring 3	not used	0.000E+00	---	FRACA(3)
R017	Ring 4	not used	0.000E+00	---	FRACA(4)
R017	Ring 5	not used	0.000E+00	---	FRACA(5)
R017	Ring 6	not used	0.000E+00	---	FRACA(6)
R017	Ring 7	not used	0.000E+00	---	FRACA(7)
R017	Ring 8	not used	0.000E+00	---	FRACA(8)
R017	Ring 9	not used	0.000E+00	---	FRACA(9)
R017	Ring 10	not used	0.000E+00	---	FRACA(10)
R017	Ring 11	not used	0.000E+00	---	FRACA(11)
R017	Ring 12	not used	0.000E+00	---	FRACA(12)
R018	Fruits, vegetables and grain consumption (kg/yr)	1.600E+02	1.600E+02	---	DIET(1)
R018	Leafy vegetable consumption (kg/yr)	1.400E+01	1.400E+01	---	DIET(2)
R018	Milk consumption (L/yr)	9.200E+01	9.200E+01	---	DIET(3)
R018	Meat and poultry consumption (kg/yr)	6.300E+01	6.300E+01	---	DIET(4)
R018	Fish consumption (kg/yr)	not used	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	not used	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	5.100E+02	5.100E+02	---	DWI
R01	Contamination fraction of drinking water	1.000E+00	1.000E+00	---	FDW
R018	Contamination fraction of household water	1.000E+00	1.000E+00	---	FHHW
R018	Contamination fraction of livestock water	1.000E+00	1.000E+00	---	FLW
R018	Contamination fraction of irrigation water	1.000E+00	1.000E+00	---	FIRW
R018	Contamination fraction of aquatic food	not used	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.100E+01	FMEAT
R018	Contamination fraction of milk	-1	-1	0.100E+01	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFIS
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFIS
R019	Livestock water intake for meat (L/day)	5.000E+01	5.000E+01	---	LWI5
R019	Livestock water intake for milk (L/day)	1.600E+02	1.600E+02	---	LWI6
R019	Livestock soil intake (kg/day)	5.000E-01	5.000E-01	---	LSI
R019	Mass loading for foliar deposition (g/m**3)	1.000E-04	1.000E-04	---	MLFD
R019	Depth of soil mixing layer (m)	1.500E-01	1.500E-01	---	DM
R019	Depth of roots (m)	9.000E-01	9.000E-01	---	DROOT
R019	Drinking water fraction from ground water	1.000E+00	1.000E+00	---	FGWDW
R019	Household water fraction from ground water	1.000E+00	1.000E+00	---	FGWHH
R019	Livestock water fraction from ground water	1.000E+00	1.000E+00	---	FGWLW
R019	Irrigation fraction from ground water	1.000E+00	1.000E+00	---	FGWIR
R19B	Wet weight crop yield for Non-Leafy (kg/m**2)	7.000E-01	7.000E-01	---	YV(1)
R19B	Wet weight crop yield for Leafy (kg/m**2)	1.500E+00	1.500E+00	---	YV(2)
R19B	Wet weight crop yield for Fodder (kg/m**2)	1.100E+00	1.100E+00	---	YV(3)
R19B	Growing Season for Non-Leafy (years)	1.700E-01	1.700E-01	---	TE(1)
R19B	Growing Season for Leafy (years)	2.500E-01	2.500E-01	---	TE(2)
R19B	Growing Season for Fodder (years)	8.000E-02	8.000E-02	---	TE(3)

Summary : EGL Vadose Zone Analysis

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R19B	Translocation Factor for Non-Leafy	1.000E-01	1.000E-01	---	TIV(1)
R19B	Translocation Factor for Leafy	1.000E+00	1.000E+00	---	TIV(2)
R19B	Translocation Factor for Fodder	1.000E+00	1.000E+00	---	TIV(3)
R19B	Dry Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RDRY(1)
R19B	Dry Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RDRY(2)
R19B	Dry Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RDRY(3)
R19B	Wet Foliar Interception Fraction for Non-Leafy	2.500E-01	2.500E-01	---	RWET(1)
R19B	Wet Foliar Interception Fraction for Leafy	2.500E-01	2.500E-01	---	RWET(2)
R19B	Wet Foliar Interception Fraction for Fodder	2.500E-01	2.500E-01	---	RWET(3)
R19B	Weathering Removal Constant for Vegetation	2.000E+01	2.000E+01	---	WLAM
C14	C-12 concentration in water (g/cm**3)	2.000E-05	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	3.000E-02	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	2.000E-02	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	9.800E-01	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	3.000E-01	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (l/sec)	7.000E-07	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (l/sec)	1.000E-10	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	8.000E-01	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	2.000E-01	2.000E-01	---	AVFG5
STOR	Storage times of contaminated foodstuffs (days):				
STC	Fruits, non-leafy vegetables, and grain	1.400E+01	1.400E+01	---	STOR_T(1)
STOR	Leafy vegetables	1.000E+00	1.000E+00	---	STOR_T(2)
STOR	Milk	1.000E+00	1.000E+00	---	STOR_T(3)
STOR	Meat and poultry	2.000E+01	2.000E+01	---	STOR_T(4)
STOR	Fish	7.000E+00	7.000E+00	---	STOR_T(5)
STOR	Crustacea and mollusks	7.000E+00	7.000E+00	---	STOR_T(6)
STOR	Well water	1.000E+00	1.000E+00	---	STOR_T(7)
STOR	Surface water	1.000E+00	1.000E+00	---	STOR_T(8)
STOR	Livestock fodder	4.500E+01	4.500E+01	---	STOR_T(9)
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR1
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	4.130E-01	4.000E-01	---	TPCV
R021	Total porosity of the building foundation	1.000E-01	1.000E-01	---	TPFL
R021	Volumetric water content of the cover material	2.650E-02	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	3.000E-02	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	7.233E-07	2.000E-06	---	DIFCV
R021	in foundation material	3.000E-07	3.000E-07	---	DIFFL
R021	in contaminated zone soil	3.000E-07	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021	Average building air exchange rate (1/hr)	1.500E+00	5.000E-01	---	REXG
R021	Height of the building (room) (m)	2.500E+00	2.500E+00	---	HRM
R021	Building interior area factor	1.000E+00	0.000E+00	---	FAI
R021	Building depth below ground surface (m)	0.000E+00	-1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	2.500E-01	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	1.500E-01	1.500E-01	---	EMANA(2)
TITL	Number of graphical time points	512	---	---	NPTS

Summary : EGL Vadose Zone Analysis

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Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
TITL	Maximum number of integration points for dose	17	---	---	LYMAX
TITL	Maximum number of integration points for risk	1	---	---	KYMAX

Summary of Pathway Selections

Pathway	User Selection
1 -- external gamma	active
2 -- inhalation (w/o radon)	active
3 -- plant ingestion	active
4 -- meat ingestion	active
5 -- milk ingestion	active
6 -- aquatic foods	suppressed
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	active
Find peak pathway doses	active

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Contaminated Zone Dimensions

Area: 88221.00 square meters
Thickness: 33.60 meters
Cover Depth: 6.00 meters

Initial Soil Concentrations, pCi/g

Ac-227	3.500E+00
Ag-108m	2.500E+01
Ag-110m	2.500E+01
Am-241	1.000E-01
Am-243	1.000E-01
Au-195	1.000E+02
Ba-133	2.500E+01
C-14	1.000E+01
Ca-41	2.500E+01
Cd-109	2.500E+01
Ce-144	2.500E+01
Cf-252	1.000E-01
Cm-243	1.000E-01
Cm-244	1.000E-01
Cm-245	1.000E-01
Cm-246	1.000E-01
Cm-247	1.000E-01
Co-57	2.500E+01
Co-60	2.500E+01
Cs-134	2.500E+01
Cs-135	2.500E+01
Cs-137	2.500E+01
Eu-152	2.500E+01
Eu-154	2.500E+01
Eu-155	2.500E+01
Fe-55	2.500E+01
Gd-152	2.500E+01
Gd-153	2.500E+01
Ge-68	2.500E+01
H-3	1.000E+03
I-129	1.000E-02
K-40	8.000E+02
Mn-54	2.500E+01
Na-22	2.500E+01
Nb-93m	2.500E+01
Nb-94	2.500E+01
Ni-59	2.500E+01
Ni-63	2.500E+01
Np-237	1.000E-01
Pa-231	3.200E+00
Pb-210	1.500E+03
Pm-147	2.500E+01
Pu-238	1.000E-01
Pu-239	1.000E-01
Pu-240	1.000E-01
Pu-241	1.000E-01
Pu-242	1.000E-01
Pu-244	1.000E-01
Ra-226	1.500E+03
Ra-228	1.500E+03
Ru-106	2.500E+01
Sb-125	2.500E+01
Sm-147	2.500E+01

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Sm-151	2.500E+01
Sr-90	2.500E+01
Tc-99	1.000E+00
Th-228	2.800E+01
Th-229	2.800E+01
Th-230	8.300E+01
Th-232	2.800E+01
Tl-204	2.500E+01
U-233	3.300E+00
U-234	8.300E+01
U-235	3.300E+00
U-236	3.200E+00
U-238	8.300E+01
Zn-65	2.500E+01

Total Dose TDOSE(t), mrem/yr

Basic Radiation Dose Limit = 2.500E+01 mrem/yr

Total Mixture Sum M(t) = Fraction of Basic Dose Limit Received at Time (t)

t (years):	0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
TDOSE(t):	6.882E-27	1.570E-26	2.301E-26	1.635E-26	2.334E-27	8.434E-28	6.040E+00	4.307E+00
M(t):	2.753E-28	6.278E-28	9.204E-28	6.541E-28	9.335E-29	3.374E-29	2.416E-01	1.723E-01

Maximum TDOSE(t): 7.565E+00 mrem/yr at t = 325.8 ± 0.7 years

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-244	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	1.576E+00	0.2083	0.000E+00	0.0000	0.000E+00	0.0000	2.792E-01	0.0369	3.733E-03	0.0005	7.807E-02	0.0103	1.937E+00	0.2561
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000	1.086E-27	0.0000										
Tl-204	9.250E-25	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	7.484E-26	0.0000	3.984E-25	0.0000	1.304E-25	0.0000	1.529E-24	0.0000
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	4.895E+00	0.6471	0.000E+00	0.0000	0.000E+00	0.0000	5.357E-01	0.0708	5.011E-01	0.0662	1.633E+00	0.2159	7.565E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-244	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000	6.249E-27	0.9081										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000	6.326E-28	0.0919										
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000												
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	6.882E-27	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00												
Pu-	0.000E+00												
Pu-244	0.000E+00												
Ra-226	0.000E+00												
Ra-228	0.000E+00	1.523E-26	0.9700										
Ru-106	0.000E+00												
Sb-125	0.000E+00												
Sm-147	0.000E+00												
Sm-151	0.000E+00												
Sr-90	0.000E+00												
Tc-99	0.000E+00												
Th-228	0.000E+00	4.408E-28	0.0281										
Th-229	0.000E+00												
Th-230	0.000E+00												
Th-232	0.000E+00	2.995E-29	0.0019										
Tl-204	0.000E+00												
U-233	0.000E+00												
U-234	0.000E+00												
U-235	0.000E+00												
U-236	0.000E+00												
U-238	0.000E+00												
Zn-65	0.000E+00												
Total	0.000E+00	1.570E-26	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-239	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000	2.268E-26	0.9855										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000	2.141E-28	0.0093										
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000	1.193E-28	0.0052										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	2.301E-26	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu-	0.000E+00	0.0000												
Pu-244	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000	1.590E-26	0.9726										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000	4.486E-28	0.0274										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	1.635E-26	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-244	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000	1.584E-27	0.6785										
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000	7.502E-28	0.3215										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	2.334E-27	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	0.000E+00	0.0000												
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000												
Tl-204	0.000E+00	0.0000	8.434E-28	1.0000										
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	0.000E+00	0.0000	8.434E-28	1.0000										

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-244	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	2.054E+00	0.3401	0.000E+00	0.0000	0.000E+00	0.0000	3.639E-01	0.0603	4.865E-03	0.0008	1.017E-01	0.0168	2.524E+00	0.4180
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000	1.055E-27	0.0000										
Tl-204	1.368E-22	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.107E-23	0.0000	5.893E-23	0.0000	1.929E-23	0.0000	2.261E-22	0.0000
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	4.128E+00	0.6835	0.000E+00	0.0000	0.000E+00	0.0000	5.241E-01	0.0868	3.148E-01	0.0521	1.073E+00	0.1776	6.040E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Pu-241	0.000E+00	0.0000												
Pu	0.000E+00	0.0000												
Pu-244	0.000E+00	0.0000												
Ra-226	0.000E+00	0.0000												
Ra-228	0.000E+00	0.0000												
Ru-106	0.000E+00	0.0000												
Sb-125	0.000E+00	0.0000												
Sm-147	0.000E+00	0.0000												
Sm-151	0.000E+00	0.0000												
Sr-90	0.000E+00	0.0000												
Tc-99	1.556E-03	0.0004	0.000E+00	0.0000	0.000E+00	0.0000	2.756E-04	0.0001	3.685E-06	0.0000	7.705E-05	0.0000	1.912E-03	0.0004
Th-228	0.000E+00	0.0000												
Th-229	0.000E+00	0.0000												
Th-230	0.000E+00	0.0000												
Th-232	0.000E+00	0.0000	2.313E-27	0.0000										
Tl-204	0.000E+00	0.0000												
U-233	0.000E+00	0.0000												
U-234	0.000E+00	0.0000												
U-235	0.000E+00	0.0000												
U-236	0.000E+00	0.0000												
U-238	0.000E+00	0.0000												
Zn-65	0.000E+00	0.0000												
Total	1.527E+00	0.3546	0.000E+00	0.0000	0.000E+00	0.0000	1.738E+00	0.4036	4.827E-01	0.1121	5.589E-01	0.1298	4.307E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)								
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Cm-245	Cm-245	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-245	Pu-241+D	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-245	Np-237+D	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-245	U-233	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-245	Th-229+D	2.450E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-245	ΣDSR (j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Cm-246	2.614E-04	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Cm-246	5.499E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Pu-242	5.499E-06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	ΣDSR (j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Cm-246	5.399E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Pu-242	5.399E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	U-238	5.399E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	ΣDSR (j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Cm-246	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Pu-242	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	U-238+D	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	U-234	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Th-230	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Ra-226+D	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	Pb-210+D	9.997E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-246	ΣDSR (j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	Cm-247+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	Am-243+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	Pu-239	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	U-235+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	Ac-227+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cm-247+D	ΣDSR (j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Co-57	Co-57	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Co-60	Co-60	1.000E+00	5.591E-36	4.908E-36	3.783E-36	1.521E-36	1.127E-37	1.246E-41	0.000E+00	0.000E+00	
Cs-134	Cs-134	1.000E+00	3.279E-43	2.340E-43	1.191E-43	1.121E-44	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cs-135	Cs-135	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	
Cs-137+D	Cs-137+D	1.000E+00	1.962E-44	1.962E-44	1.822E-44	1.541E-44	9.809E-45	1.401E-45	0.000E+00	0.000E+00	
Eu-152	Eu-152	7.208E-01	2.939E-39	2.794E-39	2.525E-39	1.773E-39	6.458E-40	1.882E-41	1.401E-45	0.000E+00	

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Dose/Source Ratios Summed Over All Pathways
Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)								
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Pu-242	Pu-242	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	U-238+D	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	U-234	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	Th-230	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	Ra-226+D	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	Pb-210+D	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244	Pu-244	1.250E-03	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	Pu-244+D	4.944E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	Pu-240	4.944E-08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	Pu-244+D	9.987E-01	2.007E-42	2.011E-42	2.018E-42	2.040E-42	2.105E-42	2.357E-42	3.245E-42	9.935E-42	
Pu-244+D	Pu-240	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	U-236	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	Th-232	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	Ra-228+D	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244+D	Th-228+D	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.382E-44	1.984E-42	
Pu-244+D	ΣDSR(j)		2.007E-42	2.011E-42	2.018E-42	2.040E-42	2.105E-42	2.357E-42	3.269E-42	1.192E-41	
Ra-226+D	Ra-226+D	1.000E+00	8.778E-35	8.786E-35	8.801E-35	8.856E-35	9.012E-35	9.583E-35	1.142E-34	2.110E-34	
Ra-226+D	Pb-210+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ra-226+D	ΣDSR(j)		8.778E-35	8.786E-35	8.801E-35	8.856E-35	9.012E-35	9.583E-35	1.142E-34	2.110E-34	
Ra-228+D	Ra-228+D	1.000E+00	9.785E-39	8.686E-39	6.845E-39	2.974E-39	2.747E-40	6.586E-44	0.000E+00	0.000E+00	
Ra-228+D	Th-228+D	1.000E+00	4.166E-30	1.015E-29	1.512E-29	1.060E-29	1.056E-30	2.469E-34	1.121E-44	0.000E+00	
Ra-228+D	ΣDSR(j)		4.166E-30	1.015E-29	1.512E-29	1.060E-29	1.056E-30	2.469E-34	1.121E-44	0.000E+00	
Ru-106+D	Ru-106+D	1.000E+00	1.401E-45	0.000E+00							
Sb-125+D	Sb-125+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sm-147	Sm-147	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sm-151	Sm-151	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90+D	Sr-90+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Tc-99	Tc-99	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.524E+00	1.912E-03	
Th-228+D	Th-228+D	1.000E+00	2.259E-29	1.574E-29	7.645E-30	6.100E-31	4.447E-34	5.605E-45	0.000E+00	0.000E+00	
Th-229+D	Th-229+D	1.000E+00	3.519E-38	3.524E-38	3.533E-38	3.566E-38	3.660E-38	4.012E-38	5.215E-38	1.306E-37	

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Dose/Source Ratios Summed Over All Pathways
 Parent and Progeny Principal Radionuclide Contributions Indicated

Parent (i)	Product (j)	Thread Fraction	DSR(j,t) At Time in Years (mrem/yr)/(pCi/g)								
			0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Th-230	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	Ra-226+D	1.000E+00	1.902E-38	5.712E-38	1.336E-37	4.038E-37	1.199E-36	4.268E-36	1.592E-35	1.154E-34	
Th-230	Pb-210+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-230	ΣDSR(j)		1.902E-38	5.712E-38	1.336E-37	4.038E-37	1.199E-36	4.268E-36	1.592E-35	1.154E-34	
Th-232	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Th-232	Ra-228+D	1.000E+00	6.018E-40	1.715E-39	3.587E-39	7.566E-39	1.058E-38	1.204E-38	1.617E-38	4.548E-38	
Th-232	Th-228+D	1.000E+00	1.742E-31	1.070E-30	4.262E-30	1.602E-29	2.679E-29	3.012E-29	3.769E-29	8.260E-29	
Th-232	ΣDSR(j)		1.742E-31	1.070E-30	4.262E-30	1.602E-29	2.679E-29	3.012E-29	3.769E-29	8.260E-29	
Tl-204	Tl-204	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	9.045E-24	0.000E+00	
U-233	U-233	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-233	Th-229+D	1.000E+00	1.662E-42	4.991E-42	1.168E-41	3.536E-41	1.055E-40	3.816E-40	1.489E-39	1.260E-38	
U-233	ΣDSR(j)		1.662E-42	4.991E-42	1.168E-41	3.536E-41	1.055E-40	3.816E-40	1.489E-39	1.260E-38	
U-234	U-234	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Th-230	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	Ra-226+D	1.000E+00	5.745E-44	3.994E-43	2.119E-42	1.911E-41	1.649E-40	1.942E-39	2.192E-38	5.505E-37	
U-234	Pb-210+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-234	ΣDSR(j)		5.745E-44	3.994E-43	2.119E-42	1.911E-41	1.649E-40	1.942E-39	2.192E-38	5.505E-37	
U-235+D	U-235+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235+D	Pa-231	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235+D	Ac-227+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-235+D	ΣDSR(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-236	U-236	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-236	Th-232	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-236	Ra-228+D	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.803E-45	
U-236	Th-228+D	1.000E+00	2.200E-42	2.994E-41	2.835E-40	3.925E-39	2.714E-38	1.326E-37	5.345E-37	3.937E-36	
U-236	ΣDSR(j)		2.200E-42	2.994E-41	2.835E-40	3.925E-39	2.714E-38	1.326E-37	5.345E-37	3.937E-36	
U-238	U-238	5.400E-05	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238+D	U-238+D	9.999E-01	3.503E-43	3.503E-43	3.517E-43	3.545E-43	3.671E-43	4.092E-43	5.521E-43	1.602E-42	
U-238+D	U-234	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238+D	Th-230	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238+D	Ra-226+D	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	5.605E-45	1.850E-43	6.281E-42	5.359E-40	
U-238+D	Pb-210+D	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
U-238+D	ΣDSR(j)		3.503E-43	3.503E-43	3.517E-43	3.545E-43	3.727E-43	5.942E-43	6.833E-42	5.375E-40	
Zn-65	Zn-65	1.000E+00	1.400E-39	4.965E-40	6.246E-41	4.344E-44	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

The DSR includes contributions from associated (half-life ≤ 180 days) daughters.

Summary : EGL Vadose Zone Analysis

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Ra-226	*9.885E+11								
Ra-	*2.726E+14								
Ru-106	*3.348E+15								
Sb-125	*1.033E+15								
Sm-147	*2.296E+04								
Sm-151	*2.632E+13								
Sr-90	*1.365E+14								
Tc-99	*1.697E+10	9.903E+00	1.308E+04						
Th-228	*8.195E+14								
Th-229	*2.126E+11								
Th-230	*2.018E+10								
Th-232	*1.097E+05								
Tl-204	*4.638E+14								
U-233	*9.678E+09								
U-234	*6.247E+09								
U-235	*2.161E+06								
U-236	*6.468E+07								
U-238	*3.361E+05								
Zn-65	*8.245E+15								

*At specific activity limit

Summary : EGL Vadose Zone Analysis

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Summed Dose/Source Ratios DSR(i,t) in (mrem/yr)/(pCi/g)
 and Single Radionuclide Soil Guidelines G(i,t) in pCi/g
 at tmin = time of minimum single radionuclide soil guideline
 and at tmax = time of maximum total dose = 325.8 ± 0.7 years

Nuclide (i)	Initial (pCi/g)	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
Ac-227	3.500E+00	0.000E+00	0.000E+00	*7.232E+13	0.000E+00	*7.232E+13
Ag-108m	2.500E+01	0.000E+00	0.000E+00	*2.609E+13	0.000E+00	*2.609E+13
Ag-110m	2.500E+01	0.000E+00	0.000E+00	*4.754E+15	0.000E+00	*4.754E+15
Am-241	1.000E-01	0.000E+00	0.000E+00	*3.431E+12	0.000E+00	*3.431E+12
Am-243	1.000E-01	0.000E+00	0.000E+00	*1.993E+11	0.000E+00	*1.993E+11
Au-195	1.000E+02	0.000E+00	0.000E+00	*3.660E+15	0.000E+00	*3.660E+15
Ba-133	2.500E+01	0.000E+00	0.000E+00	*2.504E+14	0.000E+00	*2.504E+14
C-14	1.000E+01	1.000E+03	4.062E-01	6.155E+01	0.000E+00	*4.455E+12
Ca-41	2.500E+01	0.000E+00	0.000E+00	*6.234E+10	0.000E+00	*6.234E+10
Cd-109	2.500E+01	0.000E+00	0.000E+00	*2.584E+15	0.000E+00	*2.584E+15
Ce-144	2.500E+01	0.000E+00	0.000E+00	*3.191E+15	0.000E+00	*3.191E+15
Cf-252	1.000E-01	0.000E+00	0.000E+00	*5.376E+14	0.000E+00	*5.376E+14
Cm-243	1.000E-01	0.000E+00	0.000E+00	*5.161E+13	0.000E+00	*5.161E+13
Cm-244	1.000E-01	0.000E+00	0.000E+00	*8.088E+13	0.000E+00	*8.088E+13
Cm-245	1.000E-01	0.000E+00	0.000E+00	*1.716E+11	0.000E+00	*1.716E+11
Cm-246	1.000E-01	0.000E+00	0.000E+00	*3.071E+11	0.000E+00	*3.071E+11
Cm-247	1.000E-01	0.000E+00	0.000E+00	*9.275E+07	0.000E+00	*9.275E+07
Co-57	2.500E+01	0.000E+00	0.000E+00	*8.465E+15	0.000E+00	*8.465E+15
Co-60	2.500E+01	0.000E+00	0.000E+00	*1.132E+15	0.000E+00	*1.132E+15
Cs-	2.500E+01	0.000E+00	0.000E+00	*1.295E+15	0.000E+00	*1.295E+15
Cs-135	2.500E+01	0.000E+00	0.000E+00	*1.152E+09	0.000E+00	*1.152E+09
Cs-137	2.500E+01	0.000E+00	0.000E+00	*8.704E+13	0.000E+00	*8.704E+13
Eu-152	2.500E+01	0.000E+00	0.000E+00	*1.765E+14	0.000E+00	*1.765E+14
Eu-154	2.500E+01	0.000E+00	0.000E+00	*2.639E+14	0.000E+00	*2.639E+14
Eu-155	2.500E+01	0.000E+00	0.000E+00	*4.652E+14	0.000E+00	*4.652E+14
Fe-55	2.500E+01	0.000E+00	0.000E+00	*2.410E+15	0.000E+00	*2.410E+15
Gd-152	2.500E+01	0.000E+00	0.000E+00	*2.179E+01	0.000E+00	*2.179E+01
Gd-153	2.500E+01	0.000E+00	0.000E+00	*3.528E+15	0.000E+00	*3.528E+15
Ge-68	2.500E+01	0.000E+00	0.000E+00	*6.674E+15	0.000E+00	*6.674E+15
H-3	1.000E+03	217.1 ± 0.4	4.199E-07	5.954E+07	1.015E-09	2.462E+10
I-129	1.000E-02	326.1 ± 0.7	5.629E+02	4.441E-02	5.628E+02	4.442E-02
K-40	8.000E+02	0.000E+00	0.000E+00	*6.988E+06	0.000E+00	*6.988E+06
Mn-54	2.500E+01	0.000E+00	0.000E+00	*7.746E+15	0.000E+00	*7.746E+15
Na-22	2.500E+01	0.000E+00	0.000E+00	*6.247E+15	0.000E+00	*6.247E+15
Nb-93m	2.500E+01	0.000E+00	0.000E+00	*2.829E+14	0.000E+00	*2.829E+14
Nb-94	2.500E+01	0.000E+00	0.000E+00	*1.875E+11	0.000E+00	*1.875E+11
Ni-59	2.500E+01	0.000E+00	0.000E+00	*8.088E+10	0.000E+00	*8.088E+10
Ni-63	2.500E+01	0.000E+00	0.000E+00	*5.917E+13	0.000E+00	*5.917E+13
Np-237	1.000E-01	0.000E+00	0.000E+00	*7.047E+08	0.000E+00	*7.047E+08
Pa-231	3.200E+00	0.000E+00	0.000E+00	*4.723E+10	0.000E+00	*4.723E+10
Pb-210	1.500E+03	0.000E+00	0.000E+00	*7.634E+13	0.000E+00	*7.634E+13
Pm-147	2.500E+01	0.000E+00	0.000E+00	*9.275E+14	0.000E+00	*9.275E+14
Pu-238	1.000E-01	0.000E+00	0.000E+00	*1.712E+13	0.000E+00	*1.712E+13
Pu-239	1.000E-01	0.000E+00	0.000E+00	*6.214E+10	0.000E+00	*6.214E+10
Pu-240	1.000E-01	0.000E+00	0.000E+00	*2.278E+11	0.000E+00	*2.278E+11
Pu-	1.000E-01	0.000E+00	0.000E+00	*1.030E+14	0.000E+00	*1.030E+14
Pu-242	1.000E-01	0.000E+00	0.000E+00	*3.925E+09	0.000E+00	*3.925E+09

Summary : EGL Vadose Zone Analysis

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Pu-244	1.000E-01	0.000E+00	0.000E+00	*1.773E+07	0.000E+00	*1.773E+07
Ra	1.500E+03	0.000E+00	0.000E+00	*9.885E+11	0.000E+00	*9.885E+11
Ra-228	1.500E+03	4.098 ± 0.008	1.560E-29	*2.726E+14	0.000E+00	*2.726E+14
Ru-106	2.500E+01	0.000E+00	0.000E+00	*3.348E+15	0.000E+00	*3.348E+15
Sb-125	2.500E+01	0.000E+00	0.000E+00	*1.033E+15	0.000E+00	*1.033E+15
Sm-147	2.500E+01	0.000E+00	0.000E+00	*2.296E+04	0.000E+00	*2.296E+04
Sm-151	2.500E+01	0.000E+00	0.000E+00	*2.632E+13	0.000E+00	*2.632E+13
Sr-90	2.500E+01	0.000E+00	0.000E+00	*1.365E+14	0.000E+00	*1.365E+14
Tc-99	1.000E+00	246.9 ± 0.5	4.341E+00	5.759E+00	1.937E+00	1.291E+01
Th-228	2.800E+01	0.000E+00	2.259E-29	*8.195E+14	0.000E+00	*8.195E+14
Th-229	2.800E+01	0.000E+00	0.000E+00	*2.126E+11	0.000E+00	*2.126E+11
Th-230	8.300E+01	0.000E+00	0.000E+00	*2.018E+10	0.000E+00	*2.018E+10
Th-232	2.800E+01	1.000E+03	8.260E-29	*1.097E+05	3.880E-29	*1.097E+05
Tl-204	2.500E+01	206.0 ± 0.4	6.801E-17	*4.638E+14	6.115E-26	*4.638E+14
U-233	3.300E+00	0.000E+00	0.000E+00	*9.678E+09	0.000E+00	*9.678E+09
U-234	8.300E+01	0.000E+00	0.000E+00	*6.247E+09	0.000E+00	*6.247E+09
U-235	3.300E+00	0.000E+00	0.000E+00	*2.161E+06	0.000E+00	*2.161E+06
U-236	3.200E+00	0.000E+00	0.000E+00	*6.468E+07	0.000E+00	*6.468E+07
U-238	8.300E+01	0.000E+00	0.000E+00	*3.361E+05	0.000E+00	*3.361E+05
Zn-65	2.500E+01	0.000E+00	0.000E+00	*8.245E+15	0.000E+00	*8.245E+15

*At specific activity limit

Summary : EGL Vadose Zone Analysis

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Individual Nuclide Dose Summed Over All Pathways
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	DOSE(j,t), mrem/yr								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Pu-242	Pu-242	9.999E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-242	ΣDOSE(j)		0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Pu-244	Pu-244	9.987E-01	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Ru-106	Ru-106	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sb-125	Sb-125	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sm-151	Sm-151	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Sr-90	Sr-90	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
Tc-99	Tc-99	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.524E+00	1.912E-03
Tl-204	Tl-204	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	2.261E-22	0.000E+00
Zn-65	Zn-65	1.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

THF(i) is the thread fraction of the parent nuclide.

Summary : EGL Vadose Zone Analysis

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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Ac-227	Ac-227	1.000E+00	3.500E+00	3.390E+00	3.181E+00	2.546E+00	1.347E+00	1.450E-01	2.488E-04	5.207E-14
Ac-227	Am-243	1.000E+00	0.000E+00	7.911E-23	6.327E-21	7.477E-19	5.382E-17	4.695E-15	1.984E-13	8.685E-12
Ac-227	Cm-243	2.400E-03	0.000E+00	3.556E-30	8.480E-28	3.272E-25	6.654E-23	1.576E-20	1.226E-18	7.122E-17
Ac-227	Cm-243	9.976E-01	0.000E+00	7.854E-23	6.221E-21	7.108E-19	4.656E-17	2.994E-15	6.639E-14	1.028E-12
Ac-227	Cm-247	1.000E+00	0.000E+00	1.488E-27	3.577E-25	1.419E-22	3.123E-20	9.542E-18	1.294E-15	2.000E-13
Ac-227	Pa-231	1.000E+00	0.000E+00	1.003E-01	2.915E-01	8.724E-01	1.968E+00	3.062E+00	3.179E+00	3.125E+00
Ac-227	Pu-239	1.000E+00	0.000E+00	1.097E-17	2.915E-16	1.023E-14	2.388E-13	5.827E-12	7.545E-11	9.457E-10
Ac-227	U-235	1.000E+00	0.000E+00	1.100E-06	9.691E-06	1.002E-04	7.448E-04	4.865E-03	1.857E-02	6.526E-02
Ac-227	ΣS(j):		3.500E+00	3.491E+00	3.473E+00	3.418E+00	3.315E+00	3.211E+00	3.197E+00	3.190E+00
Ag-108m	Ag-108m	1.000E+00	2.500E+01	2.486E+01	2.459E+01	2.367E+01	2.121E+01	1.446E+01	4.835E+00	1.046E-01
Ag-110m	Ag-110m	1.000E+00	2.500E+01	9.077E+00	1.197E+00	9.955E-04	1.579E-12	2.452E-43	0.000E+00	0.000E+00
Am-241	Am-241	1.000E+00	1.000E-01	9.984E-02	9.952E-02	9.841E-02	9.530E-02	8.517E-02	6.179E-02	2.010E-02
Am-241	Cm-245	1.000E+00	0.000E+00	3.796E-06	3.307E-05	3.289E-04	2.224E-03	1.187E-02	3.561E-02	7.526E-02
Am-241	Pu-241	1.000E+00	0.000E+00	1.564E-04	4.469E-04	1.262E-03	2.471E-03	2.907E-03	2.130E-03	6.926E-04
Am-241	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.995E-02	9.953E-02	9.605E-02
Np-237	Am-241	1.000E+00	0.000E+00	3.236E-08	9.694E-08	3.213E-07	9.486E-07	2.991E-06	7.704E-06	1.606E-05
Np-237	Cm-245	1.000E+00	0.000E+00	4.116E-13	1.084E-11	3.694E-10	8.021E-09	1.658E-07	1.746E-06	1.521E-05
Np-237	Cm-245	2.450E-05	0.000E+00	1.880E-14	1.639E-13	1.637E-12	1.120E-11	6.276E-11	2.188E-10	7.438E-10
Np-237	Np-237	1.000E+00	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.993E-02	9.979E-02	9.930E-02
Np-237	Pu-241	1.000E+00	0.000E+00	2.555E-11	2.225E-10	2.214E-09	1.498E-08	8.011E-08	2.423E-07	5.304E-07
Np-237	Pu-241	2.450E-05	0.000E+00	7.748E-13	2.217E-12	6.298E-12	1.259E-11	1.634E-11	1.645E-11	1.637E-11
Np-237	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.993E-02	9.980E-02	9.933E-02
U-233	Am-241	1.000E+00	0.000E+00	7.078E-14	6.364E-13	7.043E-12	6.269E-11	6.705E-10	5.429E-09	4.333E-08
U-233	Cm-245	1.000E+00	0.000E+00	4.511E-19	3.583E-17	4.136E-15	2.806E-13	2.122E-11	7.424E-10	2.414E-08
U-233	Cm-245	2.450E-05	0.000E+00	2.751E-20	7.253E-19	2.478E-17	5.425E-16	1.158E-14	1.342E-13	1.589E-12
U-233	Np-237	1.000E+00	0.000E+00	4.373E-07	1.312E-06	4.372E-06	1.311E-05	4.360E-05	1.300E-04	4.244E-04
U-233	Pu-241	1.000E+00	0.000E+00	3.739E-17	9.851E-16	3.357E-14	7.289E-13	1.508E-11	1.590E-10	1.397E-09
U-233	Pu-241	2.450E-05	0.000E+00	1.708E-18	1.489E-17	1.487E-16	1.018E-15	5.709E-15	1.996E-14	6.854E-14
U-233	U-233	1.000E+00	3.300E+00	3.300E+00	3.299E+00	3.298E+00	3.295E+00	3.282E+00	3.248E+00	3.129E+00
U-233	ΣS(j):		3.300E+00	3.300E+00	3.299E+00	3.298E+00	3.295E+00	3.282E+00	3.248E+00	3.129E+00
Th-229	Am-241	1.000E+00	0.000E+00	2.228E-18	6.011E-17	2.220E-15	5.941E-14	2.134E-12	5.296E-11	1.497E-09
Th-229	Cm-245	1.000E+00	0.000E+00	8.534E-24	2.040E-21	7.935E-19	1.660E-16	4.464E-14	5.053E-12	5.904E-10
Th-229	Cm-245	2.450E-05	0.000E+00	6.510E-25	5.173E-23	5.985E-21	4.086E-19	3.164E-17	1.188E-15	4.845E-14
Th-229	Np-237	1.000E+00	0.000E+00	2.065E-11	1.858E-10	2.064E-09	1.856E-08	2.054E-07	1.830E-06	1.961E-05
Th-229	Pu-241	1.000E+00	0.000E+00	8.850E-22	7.028E-20	8.113E-18	5.504E-16	4.161E-14	1.455E-12	4.721E-11
Th-229	Pu-241	2.450E-05	0.000E+00	5.397E-23	1.423E-21	4.861E-20	1.064E-18	2.271E-17	2.630E-16	3.104E-15
Th-229	Th-229	1.000E+00	2.800E+01	2.800E+01	2.799E+01	2.797E+01	2.792E+01	2.774E+01	2.721E+01	2.546E+01
Th-229	U-233	1.000E+00	0.000E+00	3.116E-04	9.347E-04	3.114E-03	9.328E-03	3.093E-02	9.143E-02	2.894E-01
Th-229	ΣS(j):		2.800E+01	2.800E+01	2.799E+01	2.798E+01	2.793E+01	2.777E+01	2.730E+01	2.575E+01
Am-243	Am-243	1.000E+00	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.972E-02	9.906E-02	9.720E-02	9.095E-02
Am-243	Cm-243	2.400E-03	0.000E+00	2.227E-08	6.521E-08	2.000E-07	4.792E-07	8.399E-07	9.037E-07	8.462E-07
Am-243	Cm-247	1.000E+00	0.000E+00	9.392E-06	2.817E-05	9.388E-05	2.814E-04	9.347E-04	2.777E-03	8.955E-03
Am-243	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.991E-02

Summary : EGL Vadose Zone Analysis

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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pu-239	Am-243	1.000E+00	0.000E+00	2.880E-06	8.639E-06	2.878E-05	8.625E-05	2.862E-04	8.478E-04	2.704E-03
Pu-239	Cm-243	2.400E-03	0.000E+00	3.220E-13	2.852E-12	2.997E-11	2.321E-10	1.660E-09	6.796E-09	2.409E-08
Pu-239	Cm-243	9.976E-01	0.000E+00	2.839E-06	8.313E-06	2.550E-05	6.115E-05	1.075E-04	1.171E-04	1.146E-04
Pu-239	Cm-247	1.000E+00	0.000E+00	1.353E-10	1.217E-09	1.352E-08	1.216E-07	1.347E-06	1.202E-05	1.296E-04
Pu-239	Pu-239	1.000E+00	1.000E-01	1.000E-01	9.999E-02	9.997E-02	9.990E-02	9.968E-02	9.905E-02	9.686E-02
Pu-239	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.001E-01	1.001E-01	1.000E-01	9.981E-02
U-235	Am-243	1.000E+00	0.000E+00	1.418E-15	1.276E-14	1.418E-13	1.274E-12	1.410E-11	1.254E-10	1.338E-09
U-235	Cm-243	2.400E-03	0.000E+00	1.059E-22	2.825E-21	1.004E-19	2.417E-18	6.359E-17	8.890E-16	1.145E-14
U-235	Cm-243	9.976E-01	0.000E+00	1.404E-15	1.243E-14	1.307E-13	1.012E-12	7.249E-12	2.980E-11	1.073E-10
U-235	Cm-247	1.000E+00	0.000E+00	4.440E-20	1.199E-18	4.439E-17	1.197E-15	4.421E-14	1.183E-12	4.249E-11
U-235	Pu-239	1.000E+00	0.000E+00	9.848E-11	2.954E-10	9.845E-10	2.951E-09	9.809E-09	2.919E-08	9.458E-08
U-235	U-235	1.000E+00	3.300E+00	3.300E+00	3.300E+00	3.298E+00	3.295E+00	3.284E+00	3.252E+00	3.142E+00
U-235	ΣS(j):		3.300E+00	3.300E+00	3.300E+00	3.298E+00	3.295E+00	3.284E+00	3.252E+00	3.142E+00
Pa-231	Am-243	1.000E+00	0.000E+00	1.000E-20	2.701E-19	9.998E-18	2.697E-16	9.953E-15	2.661E-13	9.516E-12
Pa-231	Cm-243	2.400E-03	0.000E+00	5.610E-28	4.500E-26	5.372E-24	3.968E-22	3.697E-20	1.694E-18	7.832E-17
Pa-231	Cm-243	9.976E-01	0.000E+00	9.919E-21	2.646E-19	9.398E-18	2.265E-16	5.966E-15	8.378E-14	1.096E-12
Pa-231	Cm-247	1.000E+00	0.000E+00	2.349E-25	1.902E-23	2.348E-21	1.900E-19	2.339E-17	1.880E-15	2.256E-13
Pa-231	Pa-231	1.000E+00	3.200E+00	3.200E+00	3.200E+00	3.199E+00	3.198E+00	3.192E+00	3.177E+00	3.123E+00
Pa-231	Pu-239	1.000E+00	0.000E+00	1.042E-15	9.376E-15	1.042E-13	9.367E-13	1.038E-11	9.279E-11	1.006E-09
Pa-231	U-235	1.000E+00	0.000E+00	6.982E-05	2.094E-04	6.980E-04	2.092E-03	6.957E-03	2.072E-02	6.731E-02
Pa-231	ΣS(j):		3.200E+00	3.200E+00	3.200E+00	3.200E+00	3.200E+00	3.199E+00	3.197E+00	3.191E+00
Au-195	Au-195	1.000E+00	1.000E+02	2.481E+01	1.528E+00	8.851E-05	6.933E-17	0.000E+00	0.000E+00	0.000E+00
Ba-133	Ba-133	1.000E+00	2.500E+01	2.344E+01	2.060E+01	1.311E+01	3.603E+00	3.922E-02	9.656E-08	2.260E-27
C-14	C-14	1.000E+00	1.000E+01	9.995E+00	9.986E+00	9.955E+00	9.865E+00	9.556E+00	8.726E+00	6.349E+00
Ca-41	Ca-41	1.000E+00	2.500E+01	2.499E+01	2.497E+01	2.492E+01	2.475E+01	2.417E+01	2.259E+01	1.783E+01
Cd-109	Cd-109	1.000E+00	2.500E+01	1.448E+01	4.862E+00	1.066E-01	1.936E-06	4.952E-23	0.000E+00	0.000E+00
Ce-144	Ce-144	1.000E+00	2.500E+01	1.026E+01	1.729E+00	3.392E-03	6.246E-11	5.290E-38	0.000E+00	0.000E+00
Cf-252	Cf-252	3.092E-02	3.092E-03	2.378E-03	1.406E-03	2.234E-04	1.166E-06	1.199E-14	1.804E-37	0.000E+00
Cf-252	Cf-252	8.005E-02	8.005E-03	6.155E-03	3.639E-03	5.784E-04	3.019E-06	3.104E-14	4.670E-37	0.000E+00
Cf-252	ΣS(j):		1.110E-02	8.533E-03	5.045E-03	8.018E-04	4.186E-06	4.304E-14	6.474E-37	0.000E+00
Cm-248	Cf-252	8.005E-02	0.000E+00	1.439E-08	3.397E-08	5.779E-08	6.226E-08	6.227E-08	6.223E-08	6.209E-08
Cm-248	Cf-252	4.395E-08	0.000E+00	7.903E-15	1.865E-14	3.173E-14	3.419E-14	3.419E-14	3.417E-14	3.409E-14
Cm-248	Cf-252	8.879E-01	0.000E+00	1.597E-07	3.768E-07	6.410E-07	6.906E-07	6.907E-07	6.903E-07	6.887E-07
Cm-248	ΣS(j):		0.000E+00	1.741E-07	4.108E-07	6.988E-07	7.529E-07	7.530E-07	7.525E-07	7.508E-07
Cf-252	Cf-252	1.111E-03	1.111E-04	8.545E-05	5.052E-05	8.030E-06	4.192E-08	4.310E-16	6.483E-39	0.000E+00
Cf-252	Cf-252	4.395E-08	4.395E-09	3.380E-09	1.998E-09	3.176E-10	1.658E-12	1.705E-20	2.564E-43	0.000E+00
Cf-252	ΣS(j):		1.111E-04	8.545E-05	5.052E-05	8.030E-06	4.192E-08	4.310E-16	6.483E-39	0.000E+00
Cm-248	Cf-252	1.111E-03	0.000E+00	1.998E-10	4.716E-10	8.023E-10	8.644E-10	8.645E-10	8.639E-10	8.619E-10

Summary : EGL Vadose Zone Analysis

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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Pu-244	Cf-252	1.111E-03	0.000E+00	8.751E-19	6.708E-18	4.694E-17	1.901E-16	6.978E-16	2.147E-15	7.206E-15
Pu-244	Pu-244	1.250E-03	1.250E-04	1.250E-04	1.250E-04	1.250E-04	1.250E-04	1.250E-04	1.249E-04	1.246E-04
Pu-244	ΣS(j):		1.250E-04	1.250E-04	1.250E-04	1.250E-04	1.250E-04	1.250E-04	1.249E-04	1.246E-04
Pu-244	Cf-252	4.395E-08	0.000E+00	3.461E-23	2.653E-22	1.857E-21	7.518E-21	2.760E-20	8.493E-20	2.850E-19
Pu-244	Pu-244	4.944E-08	4.944E-09	4.944E-09	4.944E-09	4.944E-09	4.943E-09	4.942E-09	4.939E-09	4.928E-09
Pu-244	ΣS(j):		4.944E-09	4.944E-09	4.944E-09	4.944E-09	4.943E-09	4.942E-09	4.939E-09	4.928E-09
Pu-240	Cf-252	4.395E-08	0.000E+00	1.250E-27	2.988E-26	7.721E-25	1.065E-23	1.405E-22	1.320E-21	1.454E-20
Pu-240	Cm-244	4.950E-08	0.000E+00	5.149E-13	1.487E-12	4.358E-12	9.345E-12	1.330E-11	1.331E-11	1.233E-11
Pu-240	Cm-244	1.000E+00	0.000E+00	1.040E-05	3.005E-05	8.805E-05	1.888E-04	2.688E-04	2.689E-04	2.491E-04
Pu-240	Pu-240	4.950E-08	4.950E-09	4.949E-09	4.948E-09	4.945E-09	4.934E-09	4.896E-09	4.791E-09	4.438E-09
Pu-240	Pu-244	4.944E-08	0.000E+00	5.242E-13	1.572E-12	5.239E-12	1.570E-11	5.213E-11	1.546E-10	4.958E-10
Pu-240	Pu-244	9.987E-01	0.000E+00	1.059E-05	3.177E-05	1.058E-04	3.172E-04	1.053E-03	3.124E-03	1.002E-02
Pu-240	ΣS(j):		4.950E-09	2.100E-05	6.182E-05	1.939E-04	5.060E-04	1.322E-03	3.393E-03	1.027E-02
Cf-252	Cf-252	8.879E-01	8.879E-02	6.827E-02	4.037E-02	6.416E-03	3.349E-05	3.444E-13	5.180E-36	0.000E+00
Pu-244	Cf-252	8.879E-01	0.000E+00	6.992E-16	5.360E-15	3.751E-14	1.519E-13	5.576E-13	1.716E-12	5.758E-12
Pu-240	Cf-252	8.879E-01	0.000E+00	2.524E-20	6.036E-19	1.560E-17	2.151E-16	2.838E-15	2.667E-14	2.937E-13
U-235	Cf-252	8.879E-01	0.000E+00	1.892E-28	1.389E-26	1.275E-24	5.757E-23	2.702E-21	7.791E-20	2.879E-18
U-236	Cm-244	1.000E+00	0.000E+00	1.550E-13	1.360E-12	1.386E-11	9.956E-11	6.065E-10	2.197E-09	7.395E-09
U-236	Pu-240	1.000E+00	0.000E+00	2.960E-09	8.879E-09	2.958E-08	8.860E-08	2.937E-07	8.673E-07	2.736E-06
U-236	Pu-244	9.987E-01	0.000E+00	1.567E-13	1.411E-12	1.567E-11	1.408E-10	1.559E-09	1.388E-08	1.486E-07
U-236	U-236	1.000E+00	3.200E+00	3.200E+00	3.200E+00	3.198E+00	3.195E+00	3.184E+00	3.153E+00	3.047E+00
U-236	ΣS(j):		3.200E+00	3.200E+00	3.200E+00	3.198E+00	3.195E+00	3.184E+00	3.153E+00	3.047E+00
Th-232	Cf-252	8.879E-01	0.000E+00	1.883E-39	4.214E-37	1.346E-34	1.946E-32	3.222E-30	2.854E-28	3.566E-26
Th-232	Cm-244	1.000E+00	0.000E+00	2.556E-24	6.772E-23	2.351E-21	5.345E-20	1.230E-18	1.509E-17	1.824E-16
Th-232	Pu-240	1.000E+00	0.000E+00	7.302E-20	6.571E-19	7.298E-18	6.562E-17	7.264E-16	6.469E-15	6.928E-14
Th-232	Pu-244	9.987E-01	0.000E+00	2.578E-24	6.959E-23	2.577E-21	6.951E-20	2.567E-18	6.876E-17	2.476E-15
Th-232	Th-232	1.000E+00	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.798E+01
Th-232	U-236	1.000E+00	0.000E+00	1.579E-10	4.736E-10	1.578E-09	4.733E-09	1.575E-08	4.701E-08	1.540E-07
Th-232	ΣS(j):		2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.800E+01	2.798E+01
Ra-228	Cf-252	8.879E-01	0.000E+00	3.741E-41	2.455E-38	2.403E-35	8.147E-33	2.356E-30	2.560E-28	3.450E-26
Ra-228	Cm-244	1.000E+00	0.000E+00	7.536E-26	5.736E-24	5.758E-22	2.793E-20	1.009E-18	1.421E-17	1.793E-16
Ra-228	Pu-240	1.000E+00	0.000E+00	2.848E-21	7.254E-20	2.226E-18	3.910E-17	6.160E-16	6.122E-15	6.815E-14
Ra-228	Pu-244	9.987E-01	0.000E+00	7.585E-26	5.863E-24	6.213E-22	3.516E-20	2.026E-18	6.337E-17	2.416E-15
Ra-228	Ra-228	1.000E+00	1.500E+03	1.330E+03	1.045E+03	4.492E+02	4.029E+01	8.704E-03	2.931E-13	0.000E+00
Ra-228	Th-232	1.000E+00	0.000E+00	3.180E+00	8.497E+00	1.961E+01	2.724E+01	2.799E+01	2.799E+01	2.798E+01
Ra-228	U-236	1.000E+00	0.000E+00	9.144E-12	7.618E-11	6.612E-10	3.459E-09	1.444E-08	4.571E-08	1.527E-07
Ra-228	ΣS(j):		1.500E+03	1.333E+03	1.053E+03	4.688E+02	6.753E+01	2.800E+01	2.799E+01	2.798E+01
Th-228	Cf-252	8.879E-01	0.000E+00	1.865E-42	3.410E-39	8.823E-36	5.441E-33	2.093E-30	2.465E-28	3.413E-26
Th-228	Cm-244	1.000E+00	0.000E+00	5.173E-27	1.066E-24	2.625E-22	2.097E-20	9.380E-19	1.393E-17	1.784E-16
Th-228	Pu-240	1.000E+00	0.000E+00	2.417E-22	1.634E-20	1.165E-18	3.134E-17	5.804E-16	6.008E-15	6.778E-14

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Th-228	Pu-244	9.987E-01	0.000E+00	5.200E-27	1.086E-24	2.807E-22	2.600E-20	1.856E-18	6.161E-17	2.396E-15
Th-228	Ra-228	1.000E+00	0.000E+00	4.279E+02	8.076E+02	6.132E+02	6.034E+01	1.305E-02	4.392E-13	0.000E+00
Th-228	Th-228	1.000E+00	2.800E+01	1.949E+01	9.443E+00	7.475E-01	5.328E-04	5.152E-15	0.000E+00	0.000E+00
Th-228	Th-232	1.000E+00	0.000E+00	5.220E-01	3.481E+00	1.580E+01	2.687E+01	2.799E+01	2.799E+01	2.798E+01
Th-228	U-236	1.000E+00	0.000E+00	1.021E-12	2.201E-11	4.154E-10	3.041E-09	1.401E-08	4.528E-08	1.523E-07
Th-228	ΣS(j):		2.800E+01	4.479E+02	8.205E+02	6.298E+02	8.721E+01	2.801E+01	2.799E+01	2.798E+01
Cm-243	Cm-243	2.400E-03	2.400E-04	2.342E-04	2.231E-04	1.882E-04	1.157E-04	2.108E-05	1.627E-07	6.565E-15
Cm-243	Cm-243	9.976E-01	9.976E-02	9.736E-02	9.274E-02	7.822E-02	4.809E-02	8.763E-03	6.762E-05	2.729E-12
Cm-243	ΣS(j):		1.000E-01	9.760E-02	9.296E-02	7.841E-02	4.821E-02	8.784E-03	6.778E-05	2.735E-12
Cm-244	Cm-244	1.350E-06	1.350E-07	1.299E-07	1.204E-07	9.207E-08	4.282E-08	2.938E-09	1.391E-12	3.217E-24
Cm-244	Cm-244	4.950E-08	4.950E-09	4.764E-09	4.413E-09	3.376E-09	1.570E-09	1.077E-10	5.102E-14	1.180E-25
Cm-244	ΣS(j):		1.400E-07	1.347E-07	1.248E-07	9.544E-08	4.439E-08	3.046E-09	1.443E-12	3.335E-24
Cm-244	Cm-244	1.000E+00	1.000E-01	9.624E-02	8.915E-02	6.820E-02	3.172E-02	2.176E-03	1.031E-06	2.383E-18
Cm-245	Cm-245	1.000E+00	1.000E-01	9.999E-02	9.997E-02	9.991E-02	9.975E-02	9.917E-02	9.754E-02	9.205E-02
Cm-245	Cm-245	2.450E-05	2.450E-06	2.450E-06	2.449E-06	2.448E-06	2.444E-06	2.430E-06	2.390E-06	2.255E-06
Cm-245	ΣS(j):		1.000E-01	9.999E-02	9.998E-02	9.992E-02	9.975E-02	9.918E-02	9.755E-02	9.205E-02
Pu-241	Cm-245	1.000E+00	0.000E+00	4.699E-03	1.344E-02	3.819E-02	7.628E-02	9.852E-02	9.771E-02	9.220E-02
Pu-241	Pu-241	1.000E+00	1.000E-01	9.530E-02	8.655E-02	6.179E-02	2.359E-02	8.116E-04	5.347E-08	1.241E-22
Pu-241	ΣS(j):		1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.988E-02	9.934E-02	9.771E-02	9.220E-02
Pu-241	Cm-245	2.450E-05	0.000E+00	1.151E-07	3.294E-07	9.356E-07	1.869E-06	2.414E-06	2.394E-06	2.259E-06
Pu-241	Pu-241	2.450E-05	2.450E-06	2.335E-06	2.121E-06	1.514E-06	5.781E-07	1.989E-08	1.310E-12	3.041E-27
Pu-241	ΣS(j):		2.450E-06	2.450E-06	2.450E-06	2.450E-06	2.447E-06	2.434E-06	2.394E-06	2.259E-06
Cm-246	Cm-246	2.614E-04	2.614E-05	2.614E-05	2.613E-05	2.610E-05	2.602E-05	2.576E-05	2.501E-05	2.255E-05
Cm-246	Cm-246	5.499E-06	5.499E-07	5.498E-07	5.496E-07	5.490E-07	5.474E-07	5.418E-07	5.260E-07	4.743E-07
Cm-246	ΣS(j):		2.669E-05	2.669E-05	2.668E-05	2.665E-05	2.657E-05	2.630E-05	2.553E-05	2.302E-05
Pu-242	Cm-246	5.499E-06	0.000E+00	1.013E-12	3.038E-12	1.012E-11	3.032E-11	1.005E-10	2.970E-10	9.392E-10
Pu-242	Cm-246	9.997E-01	0.000E+00	1.841E-07	5.523E-07	1.840E-06	5.512E-06	1.827E-05	5.400E-05	1.707E-04
Pu-242	Pu-242	5.500E-06	5.500E-07	5.500E-07	5.500E-07	5.500E-07	5.499E-07	5.497E-07	5.492E-07	5.473E-07
Pu-242	ΣS(j):		5.500E-07	7.341E-07	1.102E-06	2.390E-06	6.062E-06	1.882E-05	5.454E-05	1.713E-04
Cm-246	Cm-246	5.399E-05	5.399E-06	5.398E-06	5.396E-06	5.391E-06	5.375E-06	5.319E-06	5.164E-06	4.657E-06
Cm-246	Cm-246	9.997E-01	9.997E-02	9.995E-02	9.992E-02	9.982E-02	9.953E-02	9.850E-02	9.563E-02	8.623E-02
Cm-246	ΣS(j):		9.997E-02	9.996E-02	9.993E-02	9.983E-02	9.953E-02	9.851E-02	9.564E-02	8.624E-02
Pu-242	Cm-246	5.399E-05	0.000E+00	9.943E-12	2.983E-11	9.937E-11	2.976E-10	9.869E-10	2.916E-09	9.221E-09
U-238	Cm-246	5.399E-05	0.000E+00	7.713E-22	6.941E-21	7.708E-20	6.928E-19	7.662E-18	6.804E-17	7.215E-16
U-238	Pu-242	5.400E-05	0.000E+00	8.377E-16	2.513E-15	8.375E-15	2.511E-14	8.355E-14	2.493E-13	8.155E-13
U-238	U-238	5.400E-05	4.482E-03	4.482E-03	4.481E-03	4.480E-03	4.475E-03	4.460E-03	4.417E-03	4.268E-03
U-238	ΣS(j):		4.482E-03	4.482E-03	4.481E-03	4.480E-03	4.475E-03	4.460E-03	4.417E-03	4.268E-03

Summary : EGL Vadose Zone Analysis

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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
U-238	Cm-246	9.997E-01	0.000E+00	1.428E-17	1.285E-16	1.427E-15	1.283E-14	1.419E-13	1.260E-12	1.336E-11
U-238	Pu-242	9.999E-01	0.000E+00	1.551E-11	4.653E-11	1.551E-10	4.650E-10	1.547E-09	4.616E-09	1.510E-08
U-238	U-238	9.999E-01	8.300E+01	8.299E+01	8.298E+01	8.295E+01	8.287E+01	8.259E+01	8.179E+01	7.903E+01
U-238	ΣS(j):		8.300E+01	8.299E+01	8.298E+01	8.295E+01	8.287E+01	8.259E+01	8.179E+01	7.903E+01
U-234	Cm-246	9.997E-01	0.000E+00	1.350E-23	3.644E-22	1.349E-20	3.637E-19	1.341E-17	3.576E-16	1.267E-14
U-234	Pu-238	1.000E+00	0.000E+00	2.824E-07	8.404E-07	2.725E-06	7.566E-06	1.954E-05	3.218E-05	3.427E-05
U-234	Pu-242	9.999E-01	0.000E+00	2.199E-17	1.979E-16	2.198E-15	1.977E-14	2.191E-13	1.958E-12	2.123E-11
U-234	U-234	1.000E+00	8.300E+01	8.300E+01	8.299E+01	8.296E+01	8.287E+01	8.257E+01	8.172E+01	7.881E+01
U-234	U-238	9.999E-01	0.000E+00	2.353E-04	7.058E-04	2.352E-03	7.048E-03	2.341E-02	6.953E-02	2.237E-01
U-234	ΣS(j):		8.300E+01	8.300E+01	8.299E+01	8.296E+01	8.288E+01	8.259E+01	8.179E+01	7.903E+01
Th-230	Cm-246	9.997E-01	0.000E+00	3.037E-29	2.460E-27	3.036E-25	2.457E-23	3.022E-21	2.422E-19	2.883E-17
Th-230	Pu-238	1.000E+00	0.000E+00	1.273E-12	1.139E-11	1.243E-10	1.062E-09	9.949E-09	5.941E-08	2.745E-07
Th-230	Pu-242	9.999E-01	0.000E+00	6.598E-23	1.781E-21	6.596E-20	1.780E-18	6.579E-17	1.766E-15	6.411E-14
Th-230	Th-230	1.000E+00	8.300E+01	8.300E+01	8.300E+01	8.299E+01	8.298E+01	8.292E+01	8.276E+01	8.221E+01
Th-230	U-234	1.000E+00	0.000E+00	7.471E-04	2.241E-03	7.469E-03	2.239E-02	7.449E-02	2.221E-01	7.246E-01
Th-230	U-238	9.999E-01	0.000E+00	1.059E-09	9.530E-09	1.059E-07	9.521E-07	1.055E-05	9.427E-05	1.021E-03
Th-230	ΣS(j):		8.300E+01	8.300E+01	8.300E+01	8.300E+01	8.300E+01	8.300E+01	8.298E+01	8.294E+01
Ra-226	Cm-246	9.997E-01	0.000E+00	2.632E-33	6.393E-31	2.629E-28	6.373E-26	2.601E-23	6.170E-21	2.338E-18
Ra-226	Pu-238	1.000E+00	0.000E+00	1.839E-16	4.944E-15	1.804E-13	4.675E-12	1.509E-10	2.890E-09	4.679E-08
Ra-226	Pu-242	9.999E-01	0.000E+00	7.145E-27	5.786E-25	7.138E-23	5.768E-21	7.065E-19	5.594E-17	6.388E-15
Ra-226	Ra-226	1.000E+00	1.500E+03	1.499E+03	1.498E+03	1.493E+03	1.480E+03	1.433E+03	1.308E+03	9.490E+02
Ra-226	Th-230	1.000E+00	0.000E+00	3.595E-02	1.078E-01	3.587E-01	1.071E+00	3.513E+00	1.006E+01	2.870E+01
Ra-226	U-234	1.000E+00	0.000E+00	1.618E-07	1.456E-06	1.616E-05	1.449E-04	1.591E-03	1.384E-02	1.368E-01
Ra-226	U-238	9.999E-01	0.000E+00	1.529E-13	4.127E-12	1.527E-10	4.112E-09	1.508E-07	3.958E-06	1.331E-04
Ra-226	ΣS(j):		1.500E+03	1.499E+03	1.498E+03	1.494E+03	1.481E+03	1.436E+03	1.318E+03	9.779E+02
Pb-210	Cm-246	9.997E-01	0.000E+00	1.357E-35	9.806E-33	1.304E-29	8.728E-27	9.216E-24	3.920E-21	2.012E-18
Pb-210	Pb-210	1.000E+00	1.500E+03	1.454E+03	1.366E+03	1.099E+03	5.902E+02	6.697E+01	1.335E-01	4.723E-11
Pb-210	Pu-238	1.000E+00	0.000E+00	1.421E-18	1.133E-16	1.325E-14	9.245E-13	7.204E-11	2.220E-09	4.374E-08
Pb-210	Pu-242	9.999E-01	0.000E+00	4.419E-29	1.063E-26	4.218E-24	9.290E-22	2.841E-19	3.827E-17	5.657E-15
Pb-210	Ra-226	1.000E+00	0.000E+00	4.590E+01	1.335E+02	3.998E+02	9.024E+02	1.386E+03	1.327E+03	9.630E+02
Pb-210	Th-230	1.000E+00	0.000E+00	5.530E-04	4.874E-03	5.043E-02	3.753E-01	2.444E+00	9.042E+00	2.796E+01
Pb-210	U-234	1.000E+00	0.000E+00	1.664E-09	4.422E-08	1.552E-06	3.627E-05	8.841E-04	1.123E-02	1.289E-01
Pb-210	U-238	9.999E-01	0.000E+00	1.181E-15	9.446E-14	1.117E-11	8.048E-10	7.024E-08	2.938E-06	1.215E-04
Pb-210	ΣS(j):		1.500E+03	1.500E+03	1.500E+03	1.499E+03	1.493E+03	1.455E+03	1.336E+03	9.911E+02
Cm-247	Cm-247	1.000E+00	1.000E-01	1.000E-01	1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.996E-02	9.987E-02
Co-57	Co-57	1.000E+00	2.500E+01	9.819E+00	1.515E+00	2.183E-03	1.665E-11	6.447E-40	0.000E+00	0.000E+00
Co-60	Co-60	1.000E+00	2.500E+01	2.192E+01	1.685E+01	6.710E+00	4.833E-01	4.849E-05	1.824E-16	0.000E+00
Cs-134	Cs-134	1.000E+00	2.500E+01	1.786E+01	9.119E+00	8.670E-01	1.043E-03	6.291E-14	3.854E-43	0.000E+00
Cs-137	Cs-135	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.498E+01	2.495E+01	2.484E+01
Cs-137	Cs-137	1.000E+00	2.500E+01	2.443E+01	2.333E+01	1.984E+01	1.250E+01	2.479E+00	2.437E-02	2.296E-09

Summary : EGL Vadose Zone Analysis

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Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g							
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03
Eu-152	Eu-152	7.208E-01	1.802E+01	1.711E+01	1.542E+01	1.071E+01	3.787E+00	9.940E-02	3.024E-06	4.698E-22
Eu-152	Eu-152	2.792E-01	6.980E+00	6.626E+00	5.972E+00	4.150E+00	1.467E+00	3.850E-02	1.171E-06	1.820E-22
Eu-152	ΣS(j):		2.500E+01	2.373E+01	2.139E+01	1.486E+01	5.253E+00	1.379E-01	4.196E-06	6.518E-22
Gd-152	Eu-152	2.792E-01	0.000E+00	4.365E-14	1.244E-13	3.493E-13	6.804E-13	8.566E-13	8.610E-13	8.597E-13
Gd-152	Gd-152	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01
Gd-152	ΣS(j):		2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01
Eu-154	Eu-154	1.000E+00	2.500E+01	2.311E+01	1.974E+01	1.137E+01	2.353E+00	9.485E-03	1.365E-09	1.546E-33
Eu-155	Eu-155	1.000E+00	2.500E+01	2.174E+01	1.644E+01	6.180E+00	3.777E-01	2.132E-05	1.550E-17	0.000E+00
Fe-55	Fe-55	1.000E+00	2.500E+01	1.934E+01	1.157E+01	1.919E+00	1.130E-02	1.772E-10	8.895E-33	0.000E+00
Gd-153	Gd-153	1.000E+00	2.500E+01	8.782E+00	1.084E+00	7.153E-04	5.856E-13	0.000E+00	0.000E+00	0.000E+00
Ge-68	Ge-68	1.000E+00	2.500E+01	1.027E+01	1.735E+00	3.431E-03	6.463E-11	5.927E-38	0.000E+00	0.000E+00
H-3	H-3	1.000E+00	1.000E+03	9.357E+02	8.193E+02	5.146E+02	1.363E+02	1.303E+00	2.212E-06	1.410E-26
I-129	I-129	1.000E+00	1.000E-02	9.953E-03	9.860E-03	9.542E-03	8.687E-03	6.255E-03	2.448E-03	9.174E-05
K-40	K-40	1.000E+00	8.000E+02	7.999E+02	7.997E+02	7.991E+02	7.973E+02	7.910E+02	7.732E+02	7.141E+02
Mn-54	Mn-54	1.000E+00	2.500E+01	1.112E+01	2.200E+00	7.574E-03	6.953E-10	1.629E-34	0.000E+00	0.000E+00
Na-22	Na-22	1.000E+00	2.500E+01	1.915E+01	1.124E+01	1.739E+00	8.414E-03	6.628E-11	4.659E-34	0.000E+00
Nb-93m	Nb-93m	1.000E+00	2.500E+01	2.376E+01	2.145E+01	1.502E+01	5.417E+00	1.528E-01	5.704E-06	1.814E-21
Nb-94	Nb-94	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.497E+01	2.489E+01	2.467E+01	2.390E+01
Ni-59	Ni-59	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.497E+01	2.490E+01	2.466E+01
Ni-63	Ni-63	1.000E+00	2.500E+01	2.482E+01	2.446E+01	2.326E+01	2.013E+01	1.214E+01	2.862E+00	1.821E-02
Pm-147	Pm-147	1.000E+00	2.500E+01	1.920E+01	1.132E+01	1.780E+00	9.026E-03	8.376E-11	9.403E-34	0.000E+00
Sm-147	Pm-147	1.000E+00	0.000E+00	1.437E-10	3.387E-10	5.747E-10	6.185E-10	6.186E-10	6.183E-10	6.174E-10
Sm-147	Sm-147	1.000E+00	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01
Sm-147	ΣS(j):		2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.500E+01	2.499E+01	2.498E+01	2.495E+01
Pu-238	Pu-238	1.840E-09	1.840E-10	1.826E-10	1.797E-10	1.700E-10	1.452E-10	8.348E-11	1.718E-11	6.800E-14
Pu-238	Pu-238	1.000E+00	1.000E-01	9.921E-02	9.766E-02	9.240E-02	7.889E-02	4.537E-02	9.339E-03	3.696E-05
Pu-238	ΣS(j):		1.000E-01	9.921E-02	9.766E-02	9.240E-02	7.889E-02	4.537E-02	9.339E-03	3.696E-05
Pu-240	Pu-240	1.000E+00	1.000E-01	9.999E-02	9.997E-02	9.989E-02	9.967E-02	9.891E-02	9.678E-02	8.966E-02
Pu-242	Pu-242	5.400E-05	5.400E-06	5.400E-06	5.400E-06	5.400E-06	5.399E-06	5.397E-06	5.392E-06	5.373E-06

Summary : EGL Vadose Zone Analysis

File : C:\RESRAD_FAMILY\RESRAD\RADIUM MOD.RAD

Individual Nuclide Soil Concentration
Parent Nuclide and Branch Fraction Indicated

Nuclide (j)	Parent (i)	THF(i)	S(j,t), pCi/g								
			t= 0.000E+00	1.000E+00	3.000E+00	1.000E+01	3.000E+01	1.000E+02	3.000E+02	1.000E+03	
Pu-242	Pu-242	9.999E-01	9.999E-02	9.999E-02	9.999E-02	9.999E-02	9.998E-02	9.994E-02	9.984E-02	9.950E-02	
Pu-242	ΣS(j):		1.000E-01	1.000E-01	1.000E-01	9.999E-02	9.998E-02	9.995E-02	9.985E-02	9.950E-02	
Pu-244	Pu-244	9.987E-01	9.987E-02	9.987E-02	9.987E-02	9.987E-02	9.987E-02	9.984E-02	9.978E-02	9.956E-02	
Ru-106	Ru-106	1.000E+00	2.500E+01	1.257E+01	3.177E+00	2.580E-02	2.748E-08	3.427E-29	0.000E+00	0.000E+00	
Sb-125	Sb-125	1.000E+00	2.500E+01	1.946E+01	1.180E+01	2.047E+00	1.371E-02	3.379E-10	6.172E-32	0.000E+00	
Sm-151	Sm-151	1.000E+00	2.500E+01	2.481E+01	2.443E+01	2.315E+01	1.984E+01	1.157E+01	2.479E+00	1.128E-02	
Sr-90	Sr-90	1.000E+00	2.500E+01	2.441E+01	2.327E+01	1.968E+01	1.220E+01	2.287E+00	1.914E-02	1.026E-09	
Tc-99	Tc-99	1.000E+00	1.000E+00	9.897E-01	9.695E-01	9.020E-01	7.340E-01	3.567E-01	4.537E-02	3.332E-05	
Tl-204	Tl-204	1.000E+00	2.500E+01	2.060E+01	1.398E+01	3.602E+00	7.480E-02	9.649E-08	1.437E-24	0.000E+00	
Zn-65	Zn-65	1.000E+00	2.500E+01	8.854E+00	1.110E+00	7.760E-04	7.476E-13	3.503E-44	0.000E+00	0.000E+00	

THF(i) is the thread fraction of the parent nuclide.

RESRAD .EXE execution time = 40.72 seconds

ERMP-01 RECEIPT OF MATERIAL

Equipment Required/Prerequisites:

Bicron MicroRem Gamma Radiation Detector or Equivalent
Ludlum Alpha/Beta Scintillator – Phoswich detector (Model 43-2-2) or equivalent
Ludlum Scaler/Ratemeter (Model 2224-1) or equivalent, Ludlum Sample Holder (Model 180-1) or equivalent
Personal Protection Equipment as specified in the Health and Safety Manual
Personnel monitoring devices when working with exempt radioactive materials

Portable radiological survey instruments are to be operated in accordance with ERMP-06.

Note: Radiological instruments are calibrated annually with NIST traceable sources.

1.0 RECEIPT INSPECTION PROCEDURE AT THE RAIL TRANSFER FACILITY (RTF)

A. WASTE ACCEPTANCE CRITERIA TABLE C-1a FOR NATURAL URANIUM (U-NAT) IN WASTE ANALYSIS PLAN (WAP)

- 1.1 Verify that the serial numbers of the rail cars that arrived at the RTF match the serial numbers provided by the Transportation Coordinator. The serial numbers must match the list provided by the Transportation Personnel; otherwise the rail car cannot be unloaded until the discrepancy is resolved.
- 1.2 Prior to unloading, perform a direct gamma radiation survey on the rail car per ERMP-06.
- 1.3 Prior to unloading, perform a wipe survey on the railcar to determine removable contamination and analyze the wipes per ERMP-02.
- 1.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the rail car to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the rail car. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

500 uR/hr ≤ any reading ≤ 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

221 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2a) for approximate activity concentrations. If the converted activity exceeds the screening level of 167 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 1.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.
- 1.6 If the shipment doesn't exceed any action levels, record the readings (Figure 1-1) on the manifest paperwork accompanying the subsequent truck to Site B. The completed survey form is maintained in the operating record.

B. WASTE ACCEPTANCE CRITERIA TABLE C-1b FOR NATURAL THORIUM (TH-NAT) IN WAP

- 1.1 Verify that the serial numbers of the rail cars that arrived at the RTF match the serial numbers provided by the Transportation Coordinator. The serial numbers must match the list provided by the Transportation Personnel; otherwise the rail car cannot be unloaded until the discrepancy is resolved.
- 1.2 Prior to unloading, perform a direct gamma radiation survey on the rail car per ERMP-06.
- 1.3 Prior to unloading, perform a wipe survey on the railcar and analyze the wipes per ERMP-02.
- 1.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the rail car to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the rail car. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

500 uR/hr ≤ any reading ≤ 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

107.8 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2b) for approximate activity concentrations. If the converted activity exceeds the screening level of 55 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 1.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.
- 1.6 If the shipment doesn't exceed any action levels, record the readings (Figure 1-1) on the manifest paperwork accompanying the subsequent truck to Site B. The completed

survey form is maintained in the operating record.

C. WASTE ACCEPTANCE CRITERIA TABLE C-2a- RADIUM

- 1.1 Verify that the serial numbers of the rail cars that arrived at the RTF match the serial numbers provided by the Transportation Coordinator. The serial numbers must match the list provided by the Transportation Personnel; otherwise the rail car cannot be unloaded until the discrepancy is resolved.
- 1.2 Prior to untarping, perform a direct gamma radiation survey on the rail car per ERMP-06.
- 1.3 Prior to untarping, perform a wipe survey on the railcar and analyze the wipes per ERMP-02.
- 1.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the rail car to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the rail car. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

1000 uR/hr ≤ any reading ≤ 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

650 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2c) for approximate activity concentrations. If the converted activity exceeds the screening level of 500 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 1.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.
- 1.6 If the shipment doesn't exceed any action levels, record the readings (Figure 1-1) on the manifest paperwork accompanying the subsequent truck to Site B. The completed survey form is maintained in the operating record.

2.0 SURVEY OF TRANSFER TRUCKS AT THE RTF

A. WASTE ACCEPTANCE CRITERIA TABLE C-1a (U-NAT)

- 2.1 When loading a transfer truck at the RTF destined for Site B, surveys will be performed as follows.

- 2.2 After tarping, perform a direct gamma radiation survey on the truck per ERMP-06.
- 2.3 After tarping, perform a wipe survey on the truck and analyze the wipes per ERMP-02.
- 2.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the truck to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the truck. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

500 uR/hr \leq any reading \leq 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

270 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2d) for approximate activity concentrations. If the converted activity exceeds the screening level of 167 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 2.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

B. WASTE ACCEPTANCE CRITERIA TABLE C-1b (TH-NAT)

- 2.1 When loading a transfer truck at the RTF destined for Site B, surveys will be performed as follows.
- 2.2 After tarping, perform a direct gamma radiation survey on the truck per ERMP-06.
- 2.3 After tarping, perform a wipe survey on the truck and analyze the wipes per ERMP-02.
- 2.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the truck to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the truck. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

500 uR/hr \leq any reading \leq 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

128 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2e) for approximate activity concentrations. If the converted activity exceeds the screening level of 55 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 2.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

C. WASTE ACCEPTANCE CRITERIA TABLE C-2a (RADIUM)

- 2.1 When loading a transfer truck at the RTF destined for Site B, surveys will be performed as follows.
- 2.2 After tarping, perform a direct gamma radiation survey on the truck per ERMP-06.
- 2.3 After tarping, perform a wipe survey on the truck and analyze the wipes per ERMP-02.
- 2.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the truck to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the truck. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

1000 uR/hr ≤ any reading ≤ 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

795 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2f) for approximate activity concentrations. If the converted activity exceeds the screening level of 500 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 2.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

3.0 RECEIPT INSPECTION PROCEDURE FOR DIFFUSE MATERIALS AT SITE B

A. WASTE ACCEPTANCE CRITERIA TABLE C-1a (U-NAT)

- 3.1 This section applies to a bulk load truck arriving at Site B with a shipment for disposal that has not been loaded at the RTF, where the survey would have already been performed.
- 3.2 Prior to untopping, perform a direct gamma radiation survey on the truck per ERMP-06.
- 3.3 Prior to untopping, perform a wipe survey on the truck and analyze the wipes per ERMP-02.
- 3.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the truck to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the truck. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

500 uR/hr \leq any reading \leq 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

217 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2g) for approximate activity concentrations. If the converted activity exceeds the screening level of 167 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 3.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

B. WASTE ACCEPTANCE CRITERIA TABLE C-1b (TH-NAT)

- 3.1 This section applies to a bulk load truck arriving at Site B with a shipment for disposal that has not been loaded at the RTF, where the survey would have already been performed.
- 3.2 Prior to untopping, perform a direct gamma radiation survey on the truck per ERMP-06.

3.3 Prior to untarping, perform a wipe survey on the truck and analyze the wipes per ERMP-02.

3.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the truck to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the truck. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

500 uR/hr \leq any reading \leq 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

104 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2h) for approximate activity concentrations. If the converted activity exceeds the screening level of 55 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

3.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

C. WASTE ACCEPTANCE CRITERIA TABLE C-2a (RADIUM)

3.1 This section applies to a bulk load truck arriving at Site B with a shipment for disposal that has not been loaded at the RTF, where the survey would have already been performed.

3.2 Prior to untarping, perform a direct gamma radiation survey on the truck per ERMP-06.

3.3 Prior to untarping, perform a wipe survey on the truck and analyze the wipes per ERMP-02.

3.4 Action Levels

Gamma

2000 uR/hr:

Stop surveying, contact the RPS, move the truck to a remote location (a sufficient distance from any occupied building) and restrict access to the vicinity of the truck. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

1000 uR/hr ≤ any reading ≤ 2000 uR/hr

Continue surveying and contact the RPS. The RPS or his designee will evaluate the waste shipment as described in ERMP-05.

640 uR/hr (Average of all readings)

Continue surveys and then calculate the average of all gamma readings. Compare the average reading to the conversion chart (ERMP-01, Figure 1-2i) for approximate activity concentrations. If the converted activity exceeds the screening level of 500 pCi/g, contact the RPS.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the conveyance.

- 3.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

4.0 RECEIPT INSPECTION PROCEDURE FOR TABLE C-1a OR C-1b (U-NAT OR TH-NAT) AND TABLE C-2a (RADIUM) DIFFUSE MATERIALS IN CONTAINERS AT SITE B

- 4.1 Non-Bulk containers may be in the form of bags, boxes, pallets or drums.
- 4.2 Perform a direct gamma radiation survey on the non-bulk container per ERMP-06.
- 4.3 Perform a wipe survey on the non-bulk container and analyze the wipes per ERMP-02.
- 4.4 Action Levels

Gamma

The average dose rate will be compared to the waste stream specific activity vs. exposure rate chart developed in the profiling approval process. Should the dose rate exceed the average concentration limits the RPS will be notified.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the container. The RPS will perform a confirmatory wipe survey.

- 4.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

5.0 RECEIPT AND INSPECTION PROCEDURES FOR EXEMPT ACCELERATOR-PRODUCED RADIOACTIVE MATERIALS AND FILTER MEDIA CONTAINING RA-226 AND RA-228 AT CONCENTRATIONS GREATER THAN 500 PICOCURIES PER GRAM AT SITE B

Caution: Exempt, accelerator produced materials and materials containing ^{226}Ra and ^{228}Ra at concentrations greater than 500 pCi/g shall only be offloaded, surveyed and inspected by USEI personnel who are wearing personnel dosimeters. All unnecessary personnel (e.g. truck drivers, contractors or other visitors) will be restricted from access to those areas where offloading, inspections and surveys are being performed.

- 5.1 Each shipment shall be accompanied by a bill of lading and inventory that gives the total activity of each radionuclide in the shipment. Discrepancies shall be investigated and if not resolved, referred to the RPS or the RSO.
- 5.2 Perform a direct gamma radiation survey on the non-bulk container per ERMP-06.
- 5.3 Perform a wipe survey on the non-bulk container and analyze the wipes per ERMP-02.
- 5.4 Action Levels

Gamma

10 mR/hr for all radionuclides except Radium.

Waste stream specific average dose rate for packages containing Radium.

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the package. The RPS will perform a confirmatory wipe survey.

- 5.5 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

6.0 RECEIPT AND INSPECTION PROCEDURES FOR TABLE C-4a, EXEMPT PRODUCTS, DEVICES OR ITEMS OR TABLE C-4b, MATERIALS SPECIFICALLY EXEMPTED BY NRC OR NRC AGREEMENT STATE, OR TABLE C-4c, MATERIALS RELEASED BY OTHER GOVERNMENT AGENCIES. ,

- 6.1 Perform a direct gamma radiation survey on the container per ERMP-06.
- 6.2 Perform a wipe survey on the container and analyze the wipes per ERMP-02.
- 6.3 Action Levels

Gamma

Table C-4a- 10 mR/hr average of all readings in bulk and non bulk containers

Table C-4b, C-4c - Waste stream specific activity vs. exposure rate chart in bulk or non bulk containers

Surface Contamination (DOT Class 7 shipments only)

6,600 dpm/300 cm²

Contact the RPS and alert others to avoid touching the container. The RPS will perform a confirmatory wipe survey.

- 6.4 For Table C-4b or C-4c, calculate the average of all gamma readings. Compare the average reading to the waste stream specific activity vs. exposure rate chart developed in the profiling approval process. Should the dose rate exceed the average concentration limits the RPS will be notified.
- 6.5 The RPS will evaluate the waste shipment using the procedures described in ERMP-05.
- 6.6 If the RPS determines that a portion or all of a waste shipment is to be rejected, procedures described in ERMP-05 will be followed.

7.0 RECEIPT AND INSPECTION PROCEDURES FOR LIQUIDS WITH A DOSE RATE OF LESS THAN 40 μ R/HR.

Attention: Liquid materials may originate from the wash water holding tank at the RTF or from a customer. Both shall be handled in the same manner. Containers that hold these liquids may be drums, totes, tankers, or other appropriate devices.

- 7.1 Perform a direct gamma radiation survey on tanker, tote or drum.
- 7.2 Action Levels

Gamma

40 μ R/hr:

If the average reading exceeds 40 μ R/hr, move the tanker to a remote location and resurvey. If the radiation level still exceeds 40 μ R/hr contact the RPS. The RPS will verify the reported readings and if confirmed follow the guidance provided in ERMP-05.

- 7.3 Surveys of liquids which exceeds 40 μ R/hr at one inch.

Attention: This type of material can only be received with prior approval of the IDEQ. The submission to IDEQ will contain calculations of the expected average dose rate on the liquid based on the concentrations of the various radionuclides present. The RPS will make the expected dose rate available to the technicians for verification upon receipt of the material. The same procedure as described in Section 6.2 will be followed for receipt of shipments of these materials with the exception that the acceptance criteria will be changed from 40 μ R/hour to the dose rate provided to the IDEQ in the request for approval.

8.0 GENERAL RECEIPT PRACTICES

- 8.1 Once a truck or shipment of packages has been cleared, it is moved to the Site B disposal cell or staged in a designated storage area.
- 8.2 Conveyances or packages awaiting a determination of disposition will be stored temporarily in a secure and remote area. The area will be posted "Caution Radioactive Material."

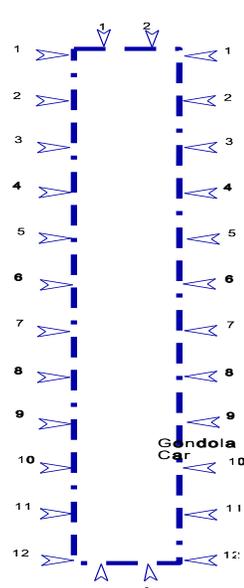
ERMP-01 Figure 1-1

RAIL TRANSFER FACILITY IN-BOUND GONDOLA GAMMA SURVEY

Figure 1-1
USEI RAIL TRANSFER FACILITY
Gamma Radiation Survey
In-Bound Rail Cars

Generator: _____ Car #: _____
 Date: _____ Time: _____
 Meter Serial #: _____ Model: _____ MicroRem

Readings (in microrems/hour):

<u>Left</u>	<u>Front</u>	<u>Right</u>
1. _____	1. _____ 2. _____	1. _____
2. _____		2. _____
3. _____		3. _____
4. _____		4. _____
5. _____		5. _____
6. _____		6. _____
7. _____		7. _____
8. _____		8. _____
9. _____		9. _____
10. _____		10. _____
11. _____		11. _____
12. _____		12. _____
	<u>Rear</u>	
	1. _____ 2. _____	

Maximum Reading=_____ Activity Concentration: _____ vs U+Th-167 pCi/g
 Ra-500 pCi/g

Average Reading=_____

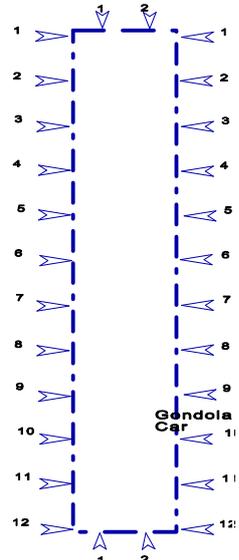
Name (Print): _____ Signature: _____

File completed original with ICF(s):

Figure 1-1a
USEI RAIL TRANSFER FACILITY
Gamma Radiation Survey
In-Bound Rail Cars

Generator: _____ Car #: _____
 Date: _____ Time: _____
 Meter Serial #: _____ Model: _____ MicroRem

Readings (in microrems/hour):

<u>Left</u>	<u>Front</u>	<u>Right</u>
1. _____	1. _____ 2. _____	1. _____
2. _____		2. _____
3. _____		3. _____
4. _____		4. _____
5. _____		5. _____
6. _____		6. _____
7. _____		7. _____
8. _____		8. _____
9. _____		9. _____
10. _____		10. _____
11. _____		11. _____
12. _____		12. _____
	<u>Rear</u>	
	1. _____ 2. _____	

Maximum Reading= _____ Activity Concentration: _____ vs U+Th-167 pCi/g
 Ra-500 pCi/g

Average Reading= _____

HDP-SS# _____ Is the seal intact? YES NO *
 *Notify Supervisor if Seal is not intact

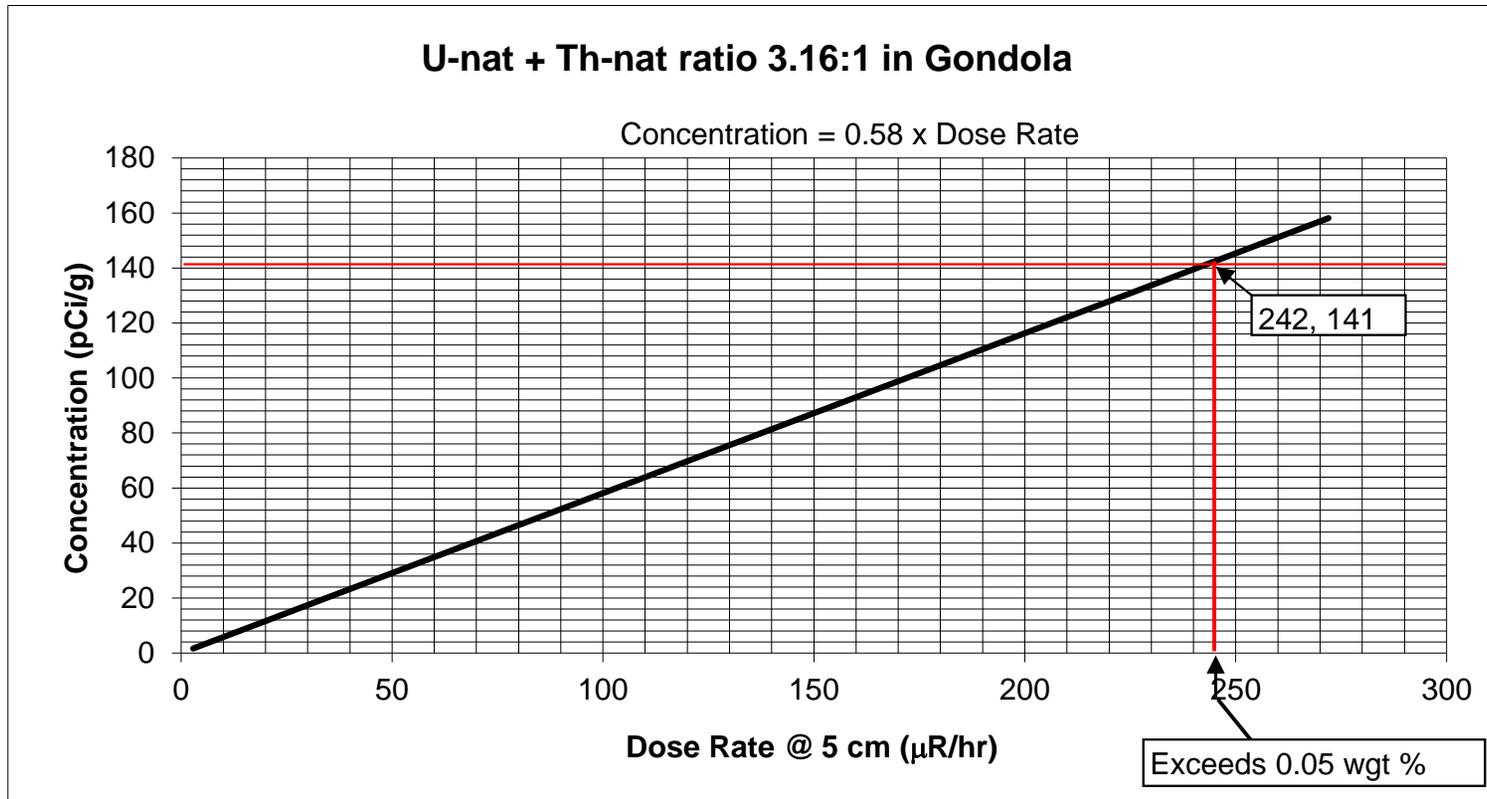
Name (Print): _____ Signature: _____

File completed original with ICF(s):

ERMP-01 Figure 1-2a

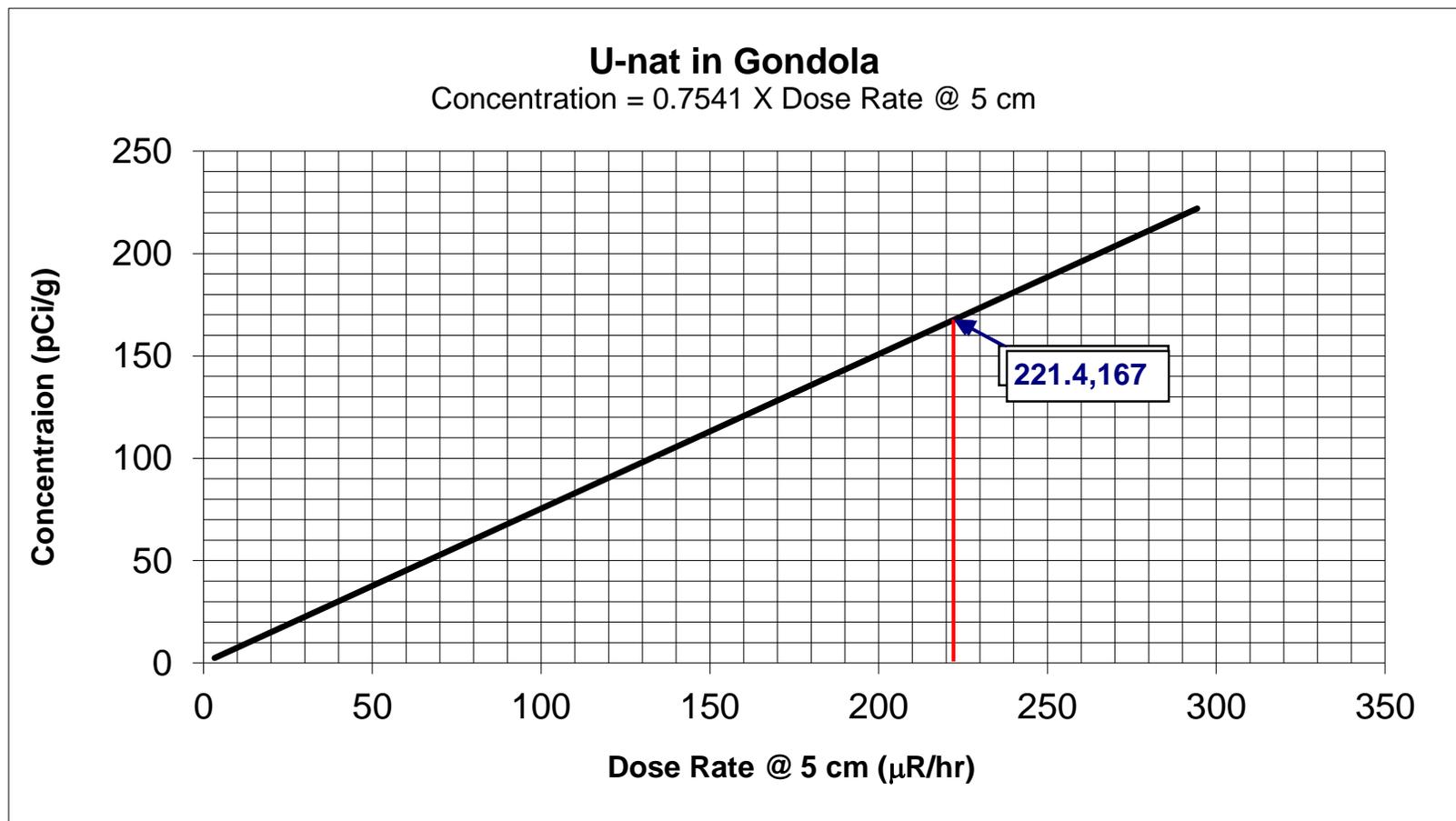
U-NAT IN GONDOLA
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

Figure 1-2



The original version of this chart used a higher specific activity for U-238 than is used by USEI. This partially explains the reduction in the dose rate that indicates that the concentration of uranium or thorium present is greater than an unimportant quantity. The age of the thorium also explains some of the difference. Most, if not all, of the thorium received was separated from its progeny about 40 years ago. It, consequently, has only aged that many years and the Tl-208, a major contributor to gamma activity for thorium has not yet reached its final, maximum concentration, which will be 36% of the thorium activity.

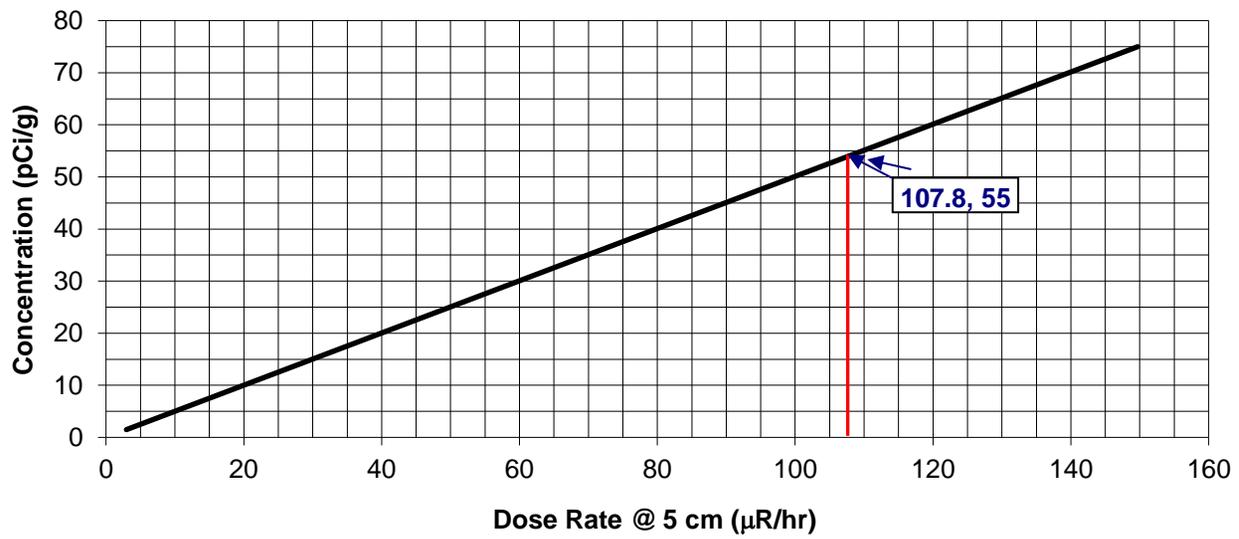
Figure 1-2a



ERMP-01 Figure 1-2b

TH-NAT IN GONDOLA
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

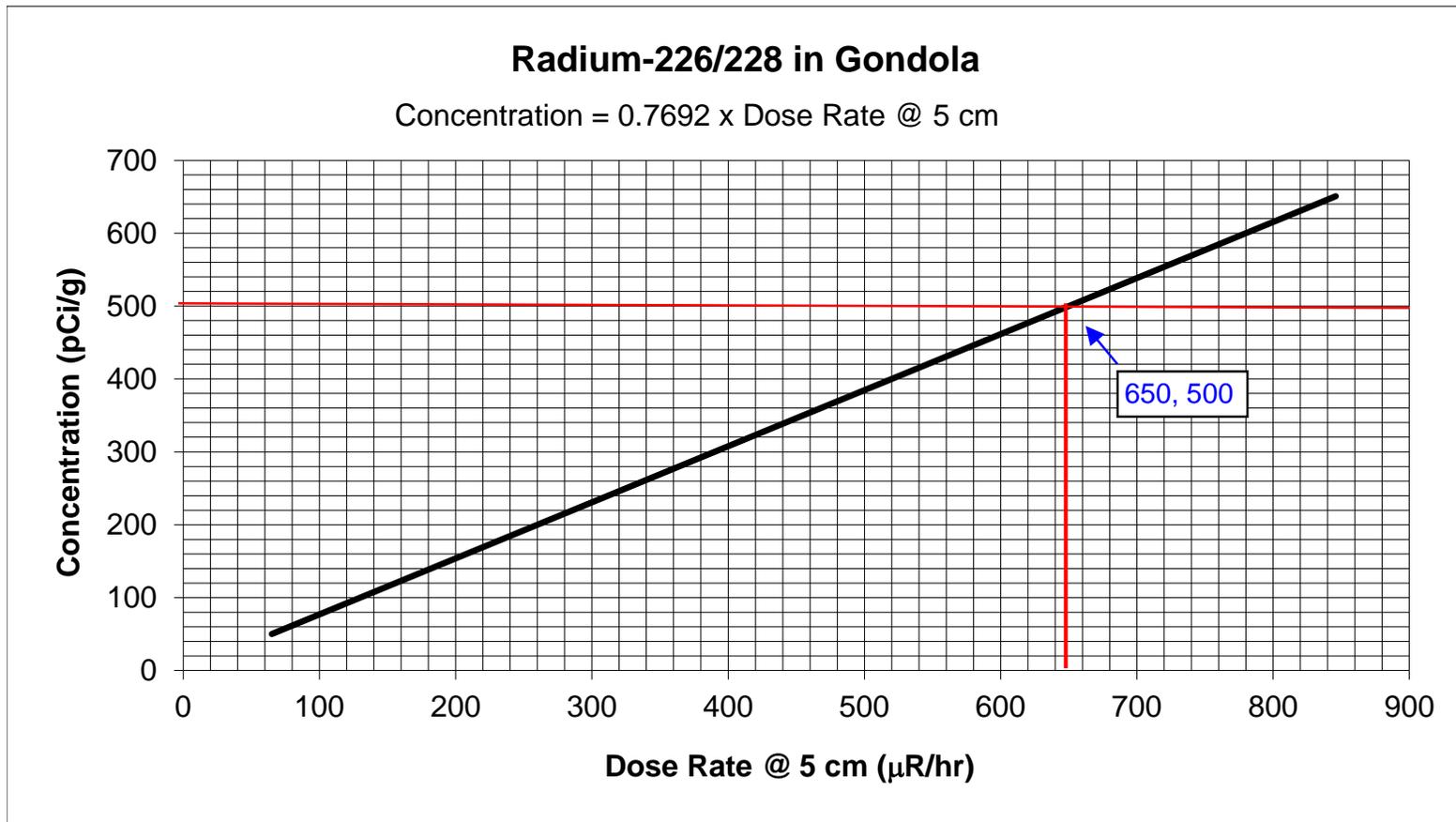
Th-Nat in Gondola
Concentration = 0.501 X Dose Rate @ 5 cm



ERMP-01 Figure 1-2c

RADIUM 226/228 IN GONDOLA
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

Figure 1-2c

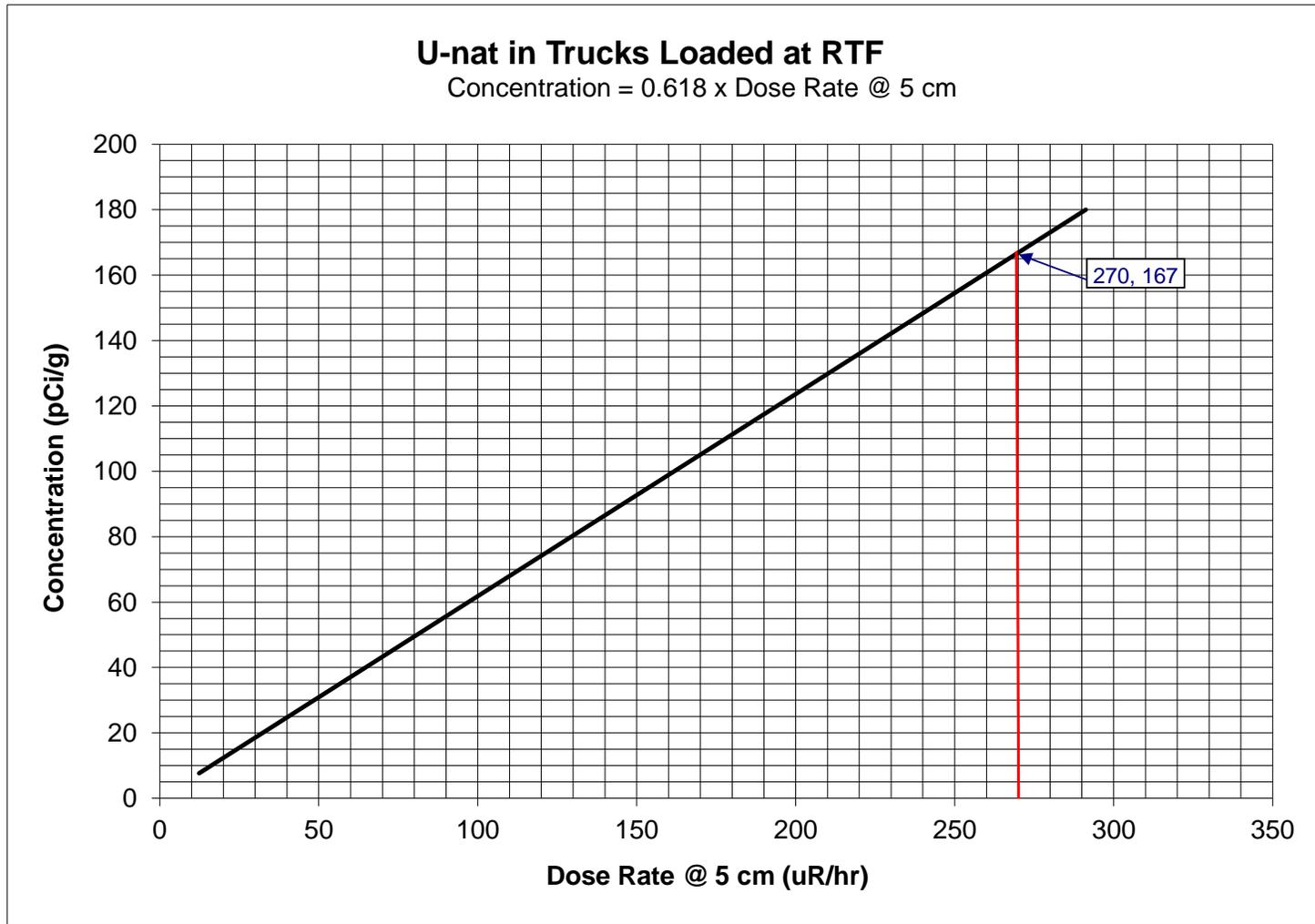


The same dose rate per unit of activity is attributed to Ra-226 and Ra-228 for the following reason. When Ra-228 is separated from its parent, Th-232, it will become the parent of its own decay chain. Ra-228 has a relatively short half-life of 6.7 years. In this amount of time, due to the intervening progeny, Th-228 (T/2 1.6 years), Tl-208 activity will not reach its maximum concentration. Since the Ra-228 decays significantly while the Th-228 is growing in, the Tl-208 will never reach a concentration it would were Th-232 present. The consequence of these properties of Ra-228 is that the maximum dose rate of its gamma emitting progeny (Ac-228, Bi-212 and Tl-208) per unit activity is very close to that of the gamma emitting progeny of Ra-226 (within a few tenths of a microR/hr). The difference is of absolutely no dosimetric consequence. Therefore, they are treated as identical.

ERMP-01 Figure 1-2d

U-NAT IN TRUCKS LOADED AT RTF
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

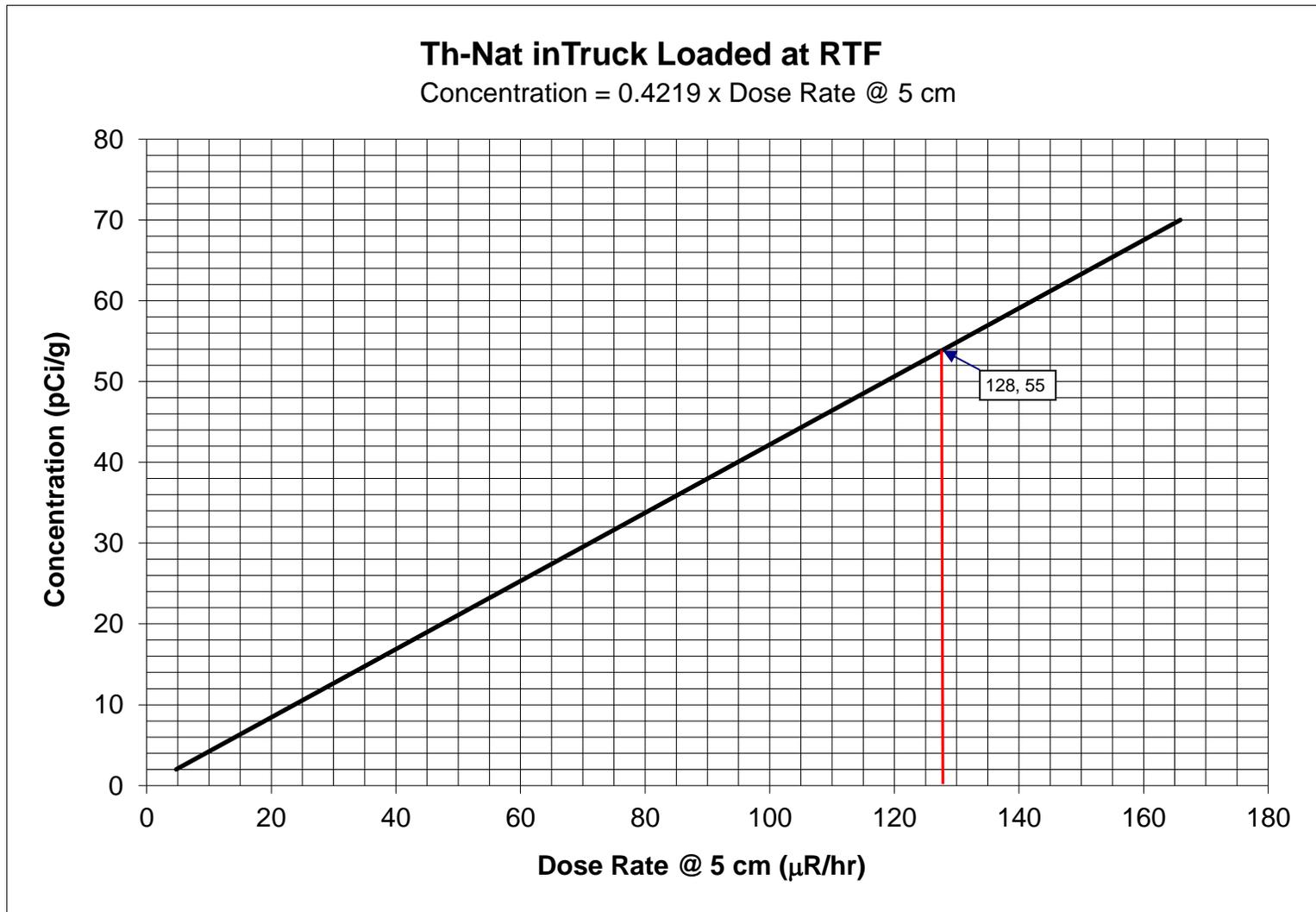
Figure 1-2d



ERMP-01 Figure 1-2e

TH-NAT IN TRUCKS LOADED AT RTF
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

Figure 1-2e



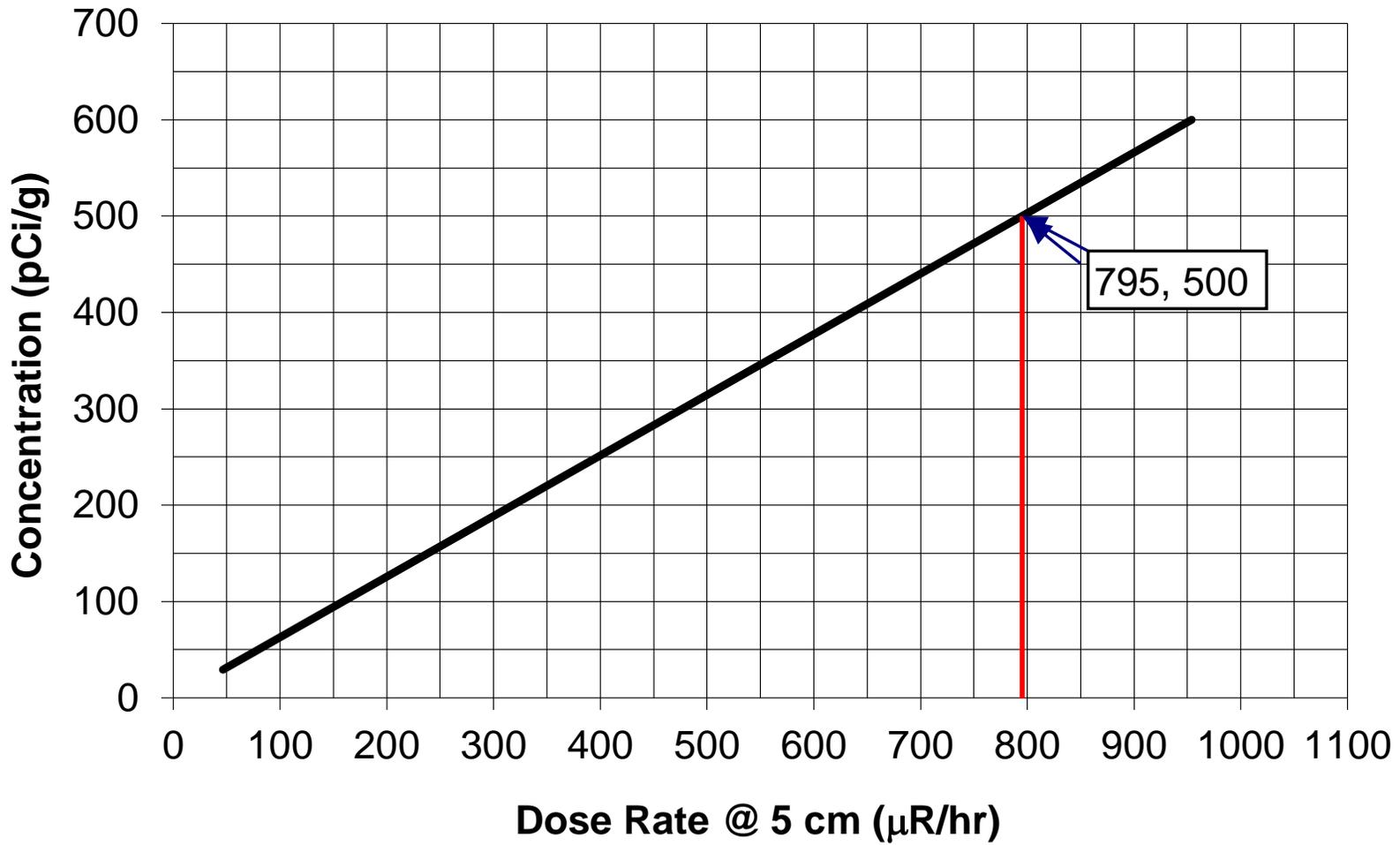
ERMP-01 Figure 1-2f

RADIUM 226/228 IN TRUCKS LOADED AT RTF
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

Figure 1-2f

Ra in Trucks loaded at RTF

Concentration = 0.6289 x Dose Rate @ 5 cm



ERMP-01 Figure 1-2g

U-NAT IN TRUCKS AT SITE B
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

Figure 1-2g

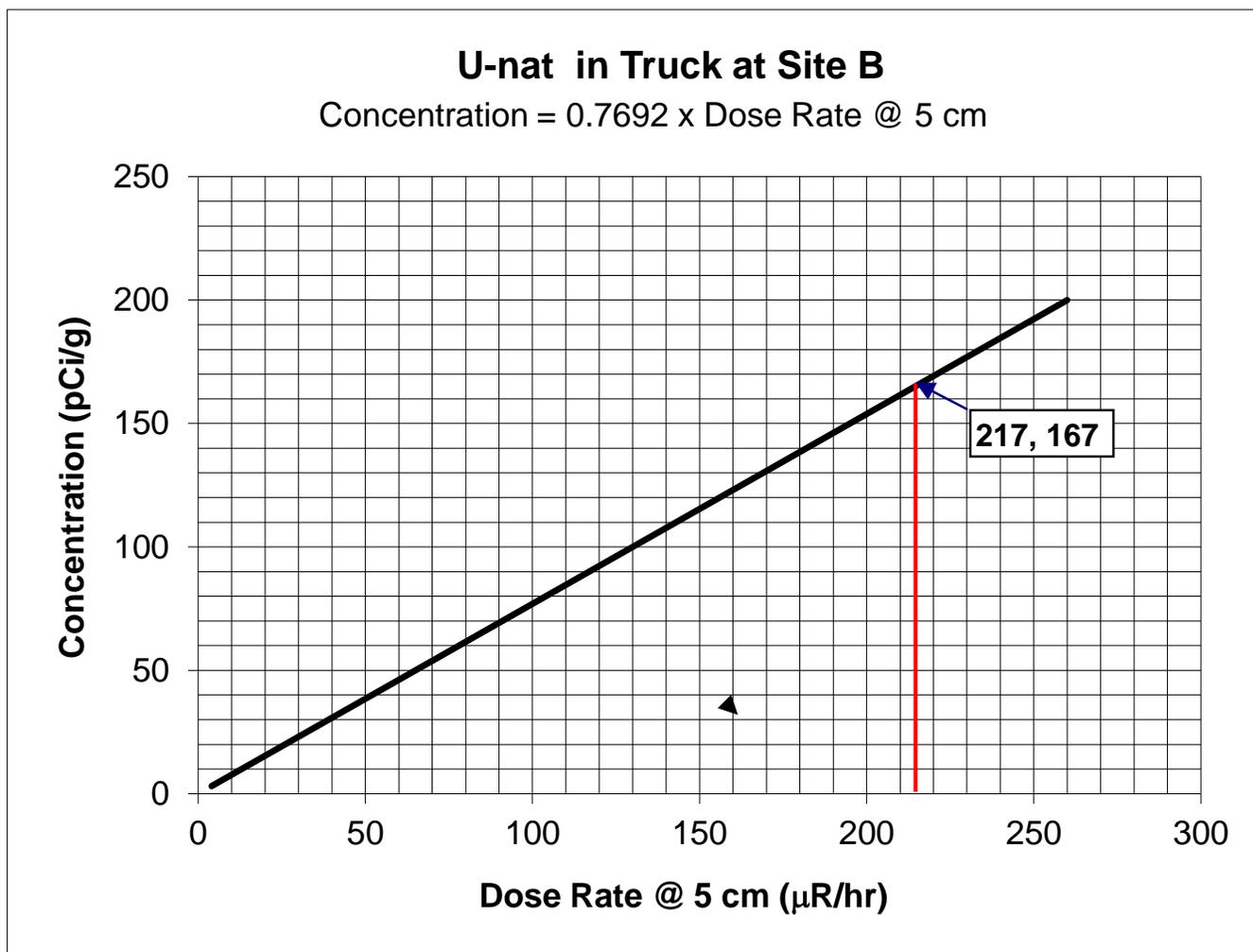
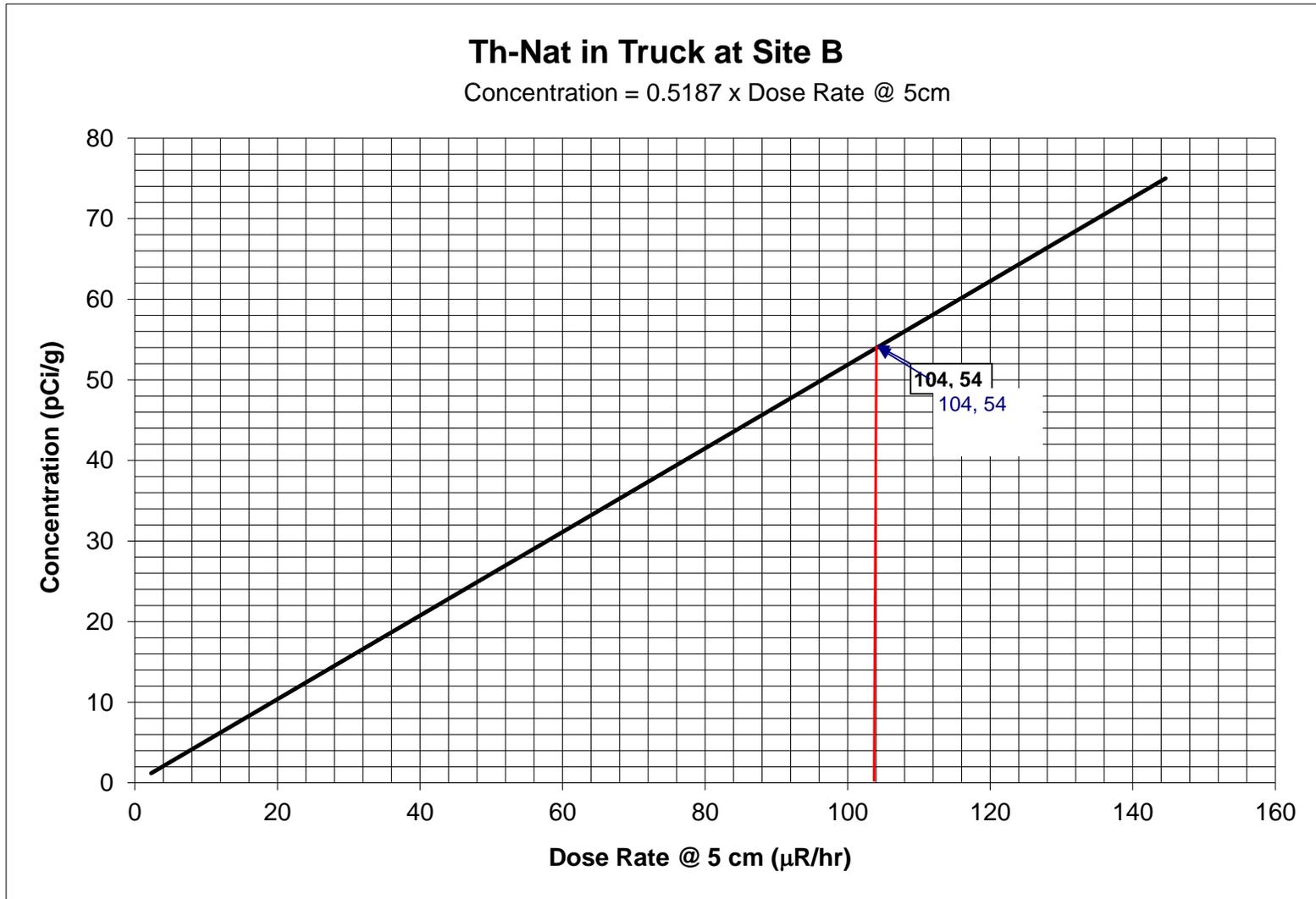


Figure 1-2g

ERMP-01 Figure 1-2h

TH-NAT IN TRUCKS AT SITE B
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

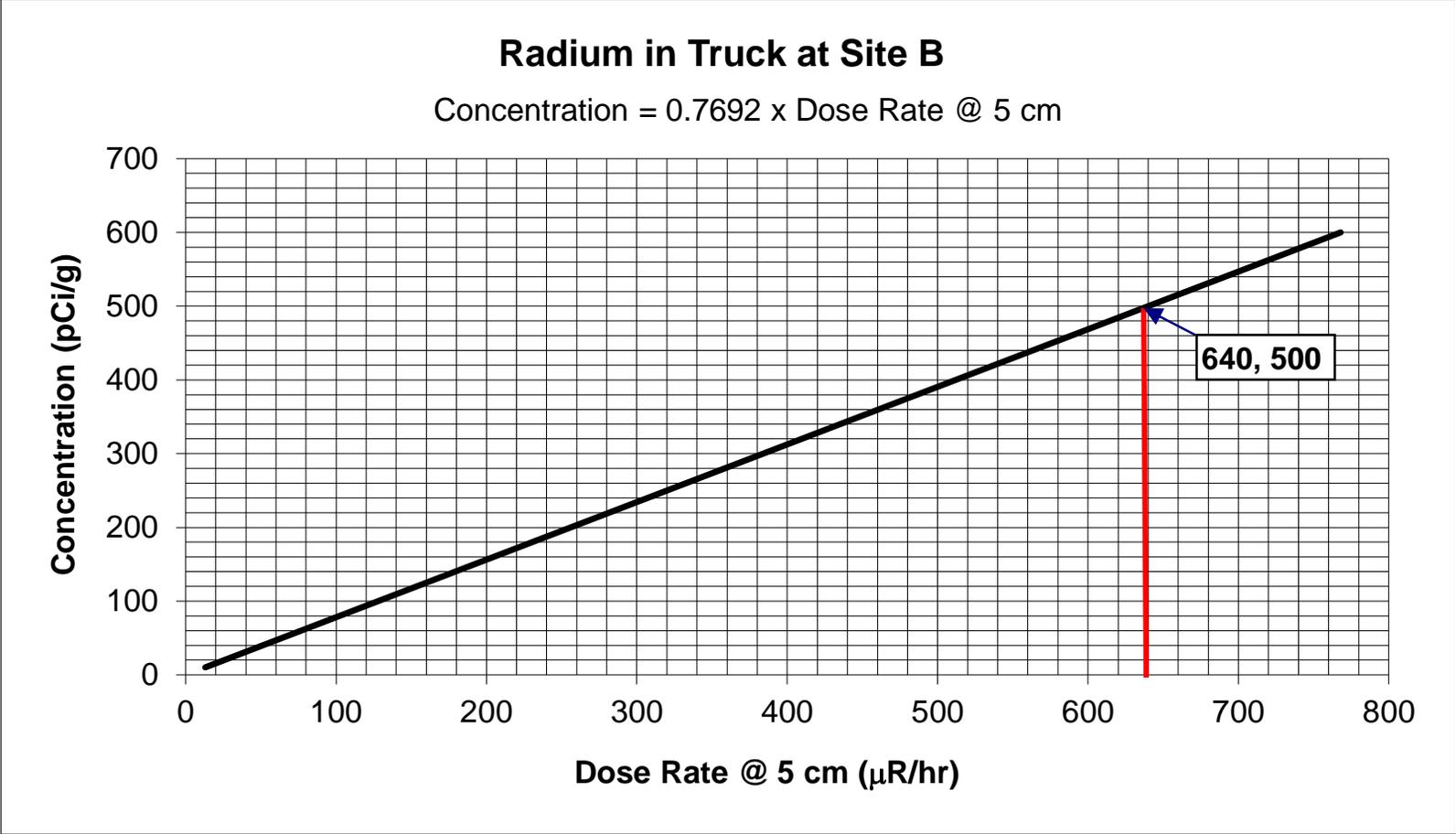
Figure 1-2h



ERMP-01 Figure 1-2i

RADIUM 226/228 IN TRUCKS AT SITE B
ACTIVITY CONCENTRATIONS VS. BULK LOAD EXPOSURE RATE

Figure1-2i



ERMP-01 Figure 1-3

GAMMA RADIATION SURVEY - TRAILERS

ERMP-01 Figure 1-4

NON-BULK CONTAINER GAMMA RADIATION SURVEY

Figure 1-4 (Example)

- Yes No Table C.1 or Table C.2 Waste Material
- Yes No Table C.3 or Table C.4a Waste Material
- Yes No Table C.4b Waste Material

Generator: _____

Date: _____

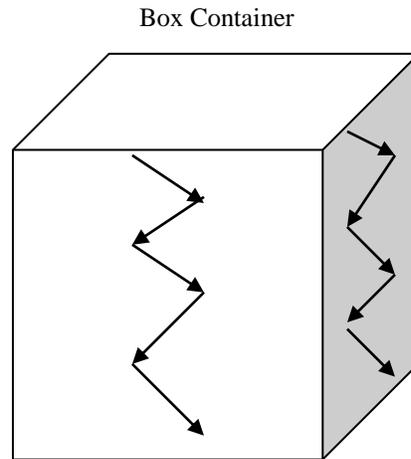
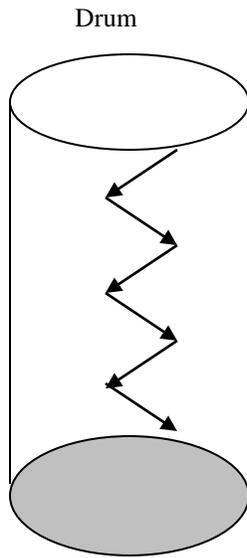
WO#: _____

Survey By: _____

Meter Serial #: _____

Model #: _____

If necessary, draw sketch of container on separate sheet



Survey direction: \longrightarrow

Survey process: At a rate of approx. 1 ft/sec sweep meter in a zigzag movement (6" side to side) from the top of the container to the bottom of the container. At a minimum, the survey shall cover three equally spaced sides of a drum and all four sides of a box (or equivalent).

Total Number of Drums/Containers on load or manifest : _____

Container Type(s): _____

Average Reading¹: _____ Maximum Reading² = _____

¹Table C.1 or Table C.2 - Contact RPS if Dose rates are greater than 500 uR/hr

²Table C.3 or Table C.4a - Contact RPS if Dose rates are greater than 10 mR/hr

^{1 2} Only record the highest results encountered per Manifest or Manifest line items.

ERMP-02 DECONTAMINATION AND RETURN TO SERVICE OF EMPTY CONTAINERS

Equipment Required:

Ludlum Alpha/Beta Scintillator - *Phoswich detector* (Model 43-2-2) or equivalent
 Ludlum Scaler/Ratemeter (Model 2224-1) or equivalent, Ludlum Sample Holder (Model 180-1) or equivalent
 Bicron Micro Rem Survey Meter

Note: Radiological instruments are calibrated annually with NIST traceable sources.

1.0 PRE-RETURN TO SERVICE PROCEDURES FOR EMPTY CONTAINERS

Regardless of the type of container, the general requirement is that they must all be visibly clean. Visibly clean means: potentially contaminated material on the interior of each EXEMPT MATERIAL container, which can practically be removed with a broom, shovel or other similar hand tool is removed. Material that is practical to remove with a broom and/or shovel implies that there will be some “non-fixed” residue remaining. The amount of residue left on the container surface could include streaks and clumped particles left by the broom or shovel. However, a representative wipe sample of this residue will be obtained and analyzed using this Returned to Service procedure. This general requirement will be noted on the “*Empty Container Decontamination/Return to Service*” form, ERMP-02, Figure 2-1.

1.1 Decontamination/Returned to Service Criteria for Empty Containers

Trucks, rail cars or useable containers hauling LSA or EXEMPT MATERIAL waste to USEI will be Returned to Service to the standards of 49 CFR 173.443(a), as set forth in Table 9 as specified in 49 CFR 177.843 and 174.715. The non-fixed radioactive contamination limits are presented in the following table:

Department of Transportation Table 9 (Modified) 49 CFR 173.443 REMOVABLE EXTERNAL RADIOACTIVE CONTAMINATION* WIPE LIMITS		
CONTAMINANT	MAXIMUM PERMISSIBLE LIMITS	
	$\mu\text{Ci}/\text{cm}^2$	Dpm/cm ²
1. Beta-gamma emitting radionuclides; <i>all radionuclides with half-lives less than ten days; natural uranium; natural thorium; uranium-235; uranium-238; thorium-232; thorium-228; and thorium-230 when contained in ores or physical concentrates</i>	10 ⁻⁴ *	240**
2. All other alpha emitting radionuclides	10 ⁻⁵ *	24**

*Wipe efficiency assumed to be 10% (this equals 6,600 dpm/300cm² for 1 and 660 dpm/300cm² for 2)

** The amount of radioactivity measured on any single wiping material, when averaged over the surface wiped (i.e., 300 cm²), may not exceed the limit set forth in Table 9.

1.2 Returned to Service Survey Criteria for Empty Containers

Each wipe shall be taken over a specified area of 300 cm² (46.5 in², roughly a 7 inch by 7 inch square) using absorbent material and moderate hand pressure. This is consistent with US DOT regulations found in 49 CFR.173.4413 (a).

Each wipe must be less than the US DOT Table 9 criteria above. The disintegrations per minute (DPM) limit per wipe is noted on the "*Empty Container Decontamination/Return to Service*" form ERMP-02, Figure 2-1. Additionally, gamma radiation levels, indicating the total, fixed and non-fixed contamination cannot exceed 0.005 mSv per hour (500 µrem per hour).

2.0 RETURN TO SERVICE PROCEDURES FOR EMPTY CONTAINERS

Empty EXEMPT MATERIAL containers leaving the RTF and/or the Site B Facility that are Returned to Service from the control of and management by USEI must be monitored, decontaminated if necessary, and Returned to Service using the wipe sampling and survey technique and criteria established in this procedure.

2.1 Decontamination/Return to Service Sample Points for Empty Containers

The most appropriate locations on the internal surface of the empty EXEMPT MATERIAL containers will be wiped to yield a representative assessment of the non-fixed contamination levels. Radiation readings shall be taken at or near each wipe location using a Bicron Micro Rem instrument or equivalent in order to evaluate total radiation levels. For 16 cubic yard or greater containers (e.g. roll-offs) five (5) locations on the internal surface of the empty EXEMPT MATERIAL container will be located as identified on Figure 2-1 (i.e., one sample for each side of the container and one sample on the bottom surface). The sample locations will be noted on the *Empty Container Decontamination/Return to Service* form.

NOTE

The five sample locations noted on the form may need to be moved by annotating the designated location on the form to depict the actual location physically wiped for the sample. As stated above, the most appropriate location may not be in the center of the container sides, but where non-fixed contamination is visibly present to provide a representative assessment of the contamination levels for that particular side of the container.

For containers less than 16 cubic yards the number of wipes will be proportional to the size of the container (e.g. less than 4 cubic yards- 1 wipe, 4 to 8 cubic yards- 2 wipes, 8-12 cubic yards- 3 wipes, 12 to 16 cubic yards- 4 wipes and 16 cubic yards or greater- 5 wipes).

2.2 Decontamination Wiping Procedure for Empty Containers

Obtain five wipes within the empty container using the technique listed in Section 1.2 of this procedure. These wipe samples will then be measured using the procedure described in Section 2.3.

2.3 Wipe Measurement Procedure for Empty Containers

Count each wipe using a Ludlum Alpha/Beta Scintillator 43-2-2 or equivalent instrument by placing it in a planchette and inserting it in the sample holder connected to a Ludlum Model 2224-1 or equivalent counter/scaler. The wipe measurement is determined as follows:

2.3.1 Background Count and Performance Test for instrument reliability Determination

Prior to determining the wipe count the background count and source count efficiency check for the two detectors is established. This determination is performed on a daily basis.

2.3.1.1 Background Count Determination

Count background for one (1) minute with a clean wipe (called a "blank") placed in a planchette and then inserted into the sample holder. On the *Empty Container Decontamination/Returned to Service Form*, record alpha (α) background counts per minute. Next record the beta (β) background counts per minute. The alpha/beta switch on the Ludlum 2224-1 scaler/ratemeter is used to count background alpha and beta particles separately.

2.3.1.2 Performance Test to Confirm Instrument Reliability

To assure proper operation of the instrument between calibrations, the instrument shall be tested with the check source prior to each intermittent use.

Count the alpha (α) and beta (β) check source for five (5) minutes daily as follows:

Alpha Performance Test

Divide the total α counts by five (5) and subtract α background. Record this number of net α counts per minute on the Quality Assurance (QA) chart (Figure 2-2).

Beta Performance Test

Divide the total β counts by five (5) and subtract β background. Record this number of the net β counts per minute on the QA chart (Figure 2-2).

If the net α and/or net β counts per minute fall outside the ± 3 standard deviations (σ) range from the documented check source count rate, as provided by RSA, notify the RPS and do not count the samples.

If the net α and/or net β counts per minute fall within the ± 3 standard deviations (σ) range from the documented check source count rate the sample measurement determination can proceed as outlined herein. The performance check will be noted on the day performed using Figure 2-2.

When calculating the activities on the wipe samples, use the efficiency determination that was performed during the annual calibration. This count efficiency determination is recorded on the *Empty Container Decontamination/Returned to Service Form*.

2.3.2 Wipe Sample Count Per Minute Determination Procedure

Prior to counting any samples the wipe samples must be dried. The sample should be placed in the microwave oven and heated until it is visibly dry.

Insert a wipe sample on a planchette into the sample holder. Count this sample for one (1) minute. On the form, record the gross alpha and gross beta counts per minute detected for each sample.

2.3.3 Wipe Sample Disintegrations Per Minute Calculation

Use the following formula to determine the dpm for each sample:

TOTAL DPM PER WIPE SAMPLE CALCULATION

$$\frac{\text{dpm}}{\text{per Wipe}} = \left[\frac{\alpha \text{ cpm/wipe} - \alpha \text{ background cpm}}{\alpha \text{ counting efficiency}} \right] + \left[\frac{\beta \text{ cpm/wipe} - \beta \text{ background cpm}}{\beta \text{ counting efficiency}} \right]$$

The dpm determination for each wipe sample is recorded on the Decontamination/Returned to Service form.

2.4 Returned to Service Evaluation Procedure of Wipe Samples for Non-fixed Contamination.

The non-fixed contaminated residue activity per wipe is compared to US DOT Table 9 limits listed in Section 1.1 of this procedure. If the measured activity is below the limits, the container may be then Returned to Service. If the measured activity per wipe is greater than the limits, notify the RPS who will follow the procedures outlined in ERMP-05.

2.5 Return to Service Evaluation Procedure.

Each container that is Returned to Service will be surveyed using a Bicron Micro Rem (or equivalent).

2.5.1 Survey for Dose Rates on Accessible Surfaces.

A survey of the inside of a container to be returned to service will be performed to ensure that the dose rate on any accessible surface does not exceed 500 $\mu\text{rem/hr}$ per the requirements of 49 CFR 174.715 and 177.843.

2.5.2 Exceedance of Accessible Surface Dose Rate Limit

Should any single area have a dose rate greater than 500 $\mu\text{rem/hr}$ the RPS or designee will be notified. The RPS will follow the procedures of ERMP-05.

2.5.3 Dose Rate Surveys

Document the dose rate surveys on the *Empty Container Decontamination/Returned to Service Form*, and file in the operating record.

See Figure 2-4 for guidance regarding the Returned to Service of empty containers.

ERMP-02 Figure 2-1

EMPTY CONTAINER DECONTAMINATION/RETURNED TO SERVICE FORM

Figure 2-1

EMPTY CONTAINER DECONTAMINATION / RETURNED TO SERVICE FORM¹
 EXEMPT MATERIAL CONTAINER WIPE SAMPLES (300 SQ. CM.)

CONTAINER NUMBER (IMC)/ID. No: _____ SHIPPING DOCUMENT NUMBER: _____

Step 1: Is container "Visibly Clean?"² Yes No .

If Step 1 is answered "yes", then proceed to Step 2.

Step 2: Equipment Required:

- a. Ludlum alpha/beta scintillator – *Phoswich detector* (Model 43-2-2) or equivalent...
 Serial Number: _____ Calibration Due: _____
- b. Ludlum Sample Holder (Model 180-1) or equivalent
- c. Ludlum Scaler/Ratemeter (Model 2224-1) or equivalent...
 Serial Number: _____ Calibration Due: _____
- d. Bicron MicroRem or equivalent.....Serial Number: _____ Calibration Due: _____

A. ALPHA

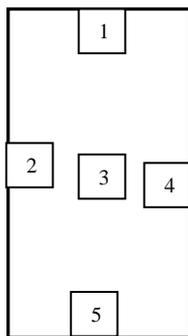
Background: _____ cpm
 Efficiency: _____ % (cpm/dpm)

B. BETA

Background: _____ cpm
 Efficiency: _____ % (cpm/dpm)

Sample #	Gross CPM	Net CPM (Gross CPM - Bkg)	alpha DPM* (Net CPM / Efficiency)
1			
2			
3			
4			
5			

Inside Front JS:



Rear

*Enter the total alpha and beta DPM for each

Sample #	Gross CPM	Net CPM (Gross CPM - Bkg)	beta DPM* (Net CPM / Efficiency)
1			
2			
3			
4			
5			

Inside Reading

sample into Step 3.A. For example, add the alpha DPM results of sample 1 to the beta DPM results of sample 1 and enter the total in Step 3.A.

Step 3. Survey Results Evaluation

TOTAL CONTAMINATION - DPM/WIPE (ALPHA+BETA):

A. 1 _____ dpm, 2 _____ dpm, 3 _____ dpm, 4 _____ dpm, 5 _____ dpm

Is Fixed Contamination <500 µrem (Class 7 Only)? Yes No N/A

Can the container be Returned to Service (≤6600 dpm/wipe sample)? Yes No

B. Approved for Returned to Service by:	Date: _____
Printed name of Radiation Technician _____	Start Time: _____
C. Signed: _____	End Time: _____
Radiation Technician	

¹This survey form does not provide or constitute the "unrestricted (free) release" of the package or conveyance.

²"Visibly clean" means: Potentially contaminated material on the interior of each EXEMPT MATERIAL container, which can practically be removed with a broom, shovel or other similar hand tool is removed. Material that is practical to remove with a broom and/or shovel implies that there will be some "non-fixed" residue remaining. The amount of residue left on the container surface could include streaks and clumped particles left by the broom or shoveling activity. However, a representative wipe sample of this residue will be obtained and analyzed utilizing this Returned to Service procedure.

ERMP-02 Figure 2-2

EFFICIENCY DETERMINATION CHECK

Figure 2-2
EFFICIENCY DETERMINATION CHECK

Count a blank planchette for five (5) minutes, divide the gross counts by 5 and record the background count rate.

The check source will be a piece of material containing natural thorium, fastened by epoxy to a stainless steel planchette. Mark the planchette and the sample holder slide tray so that the planchette is oriented under the detector in exactly the same way each time it's counted. For example, put a "dot" on the planchette and on the slide tray with a "Sharpie" pen.

Count the check source a minimum of three (3) times for five (5) minutes each time.

After each count, divide the gross counts by five (5), subtract background and record the net cpm.

Add the three (3) net count rates, divide the sum by three (3) and record the mean count rate (\bar{x}).

Estimate the standard deviation (σ) by taking the square root of \bar{x} , then multiply it by three (3).

Subtract this value from \bar{x} and record the value. Then add $3\sqrt{\bar{x}}$ to \bar{x} and record the value.

Establish a graph showing $\bar{x} \pm 3\sqrt{\bar{x}}$ on the y axis. Label the x axis 1 through 31 for the days of the month.

Mark the results of the daily source performance test on the graph. If the result of the performance test falls outside the $\pm 3\sigma$ range twice in a row, discontinue use of the instrument and have it repaired and/or recalibrated. A sample graph follows:

ALPHA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
1065 cpm																																
972 cpm																																
878 cpm																																

BETA	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
3946 cpm																																
3762 cpm																																
3580 cpm																																

ERMP-02 Figure 2-3

DETECTION LIMIT CALCULATION AID FOR WIPE SAMPLES

Figure 2-3

COUNTING STATISTICS

A table summarizing the results of the calculation of three minimum detectability indicators is provided below.

	ALPHA	BETA
Critical Level (L_c)	4 cpm above R_b	14.7 cpm above R_b
Detection Limit (L_d)	10.8 cpm above R_b	32.1 cpm above R_b
Minimum Detectable Activity at the 95% Confidence Level ($MDA_{95\%}$)	35.9 dpm per 300 cm^2 wipe = 0.12 dpm/ cm^2	321.3 dpm per 300 cm^2 wipe = 1.1 dpm/ cm^2

ASSUMPTIONS:	
ALPHA	BETA
R_b <input type="checkbox"/> 3 cpm	R_b <input type="checkbox"/> 40 cpm
Estimated Detector Efficiency (30%) <input type="checkbox"/>	Estimated Detector Efficiency (10%) <input type="checkbox"/>
Sample Count time (t_s) = 1 m	Sample Count time (t_s) = 1 m
Background Count time (t_b) = 1 m	Background Count time (t_b) = 1 m

CRITICAL LEVEL is the smallest net counting rate which is potentially statistically different from background. Confidence level is roughly 50%.

$$L_c = k_1 \sqrt{\frac{R_b}{t_b} \times \left(1 + \frac{t_b}{t_s}\right)} = k_1 \sqrt{\frac{R_b}{t_b} - \frac{R_b}{t_s}}$$

Where:

- L_c = Critical Level in net cpm
- R_b = Background Count Rate in cpm
- t_b = Background Count Time in minutes
- t_s = Sample Count Time in minutes
- K_1 = 1.645

Figure 2-3 continued

DETECTION LIMIT is the net counting rate above which a sample can be said to contain a quantifiable amount of radioactive material with the confidence indicated by k_1 .

$$L_d = 1.645 \sqrt{\frac{R_b}{t_b} \times \left(1 + \frac{t_b}{t_s}\right)} = 1.645 \sqrt{\frac{R_b}{t_b} + \frac{R_b}{t_s}}$$

where:

L_c	=	Critical Level in net cpm
R_b	=	Background Count Rate in cpm
t_b	=	Background Count Time in minutes
t_s	=	Sample Count Time in minutes
k_1	=	1.645 (96% Confidence Level)

MINIMUM DETECTABLE ACTIVITY is the L_c converted to dpm (or another unit of radioactivity).

$$MDA = \frac{k_1^2 + 2k_1 \sqrt{R_b t_s \times \left(1 + \frac{t_s}{t_b}\right)}}{t_s (E)}$$

where:

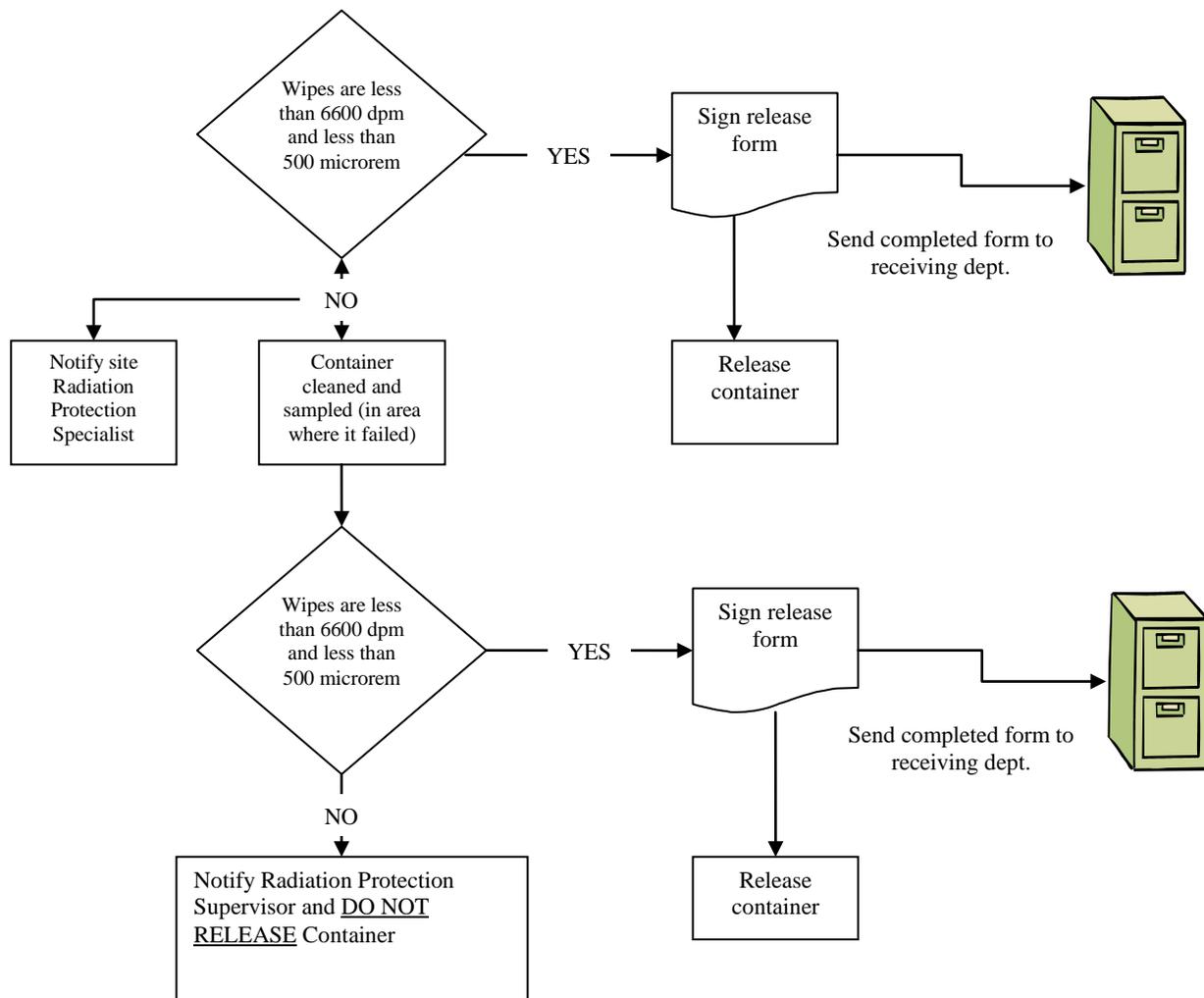
R_b	=	Background Count Rate in cpm
t_s	=	Sample Count Time in minutes
t_b	=	Background Count Time in minutes
E	=	Detector Efficiency in counts per disintegration
C	=	Conversion Factor from dpm to other desired activity unit, if applicable
k_1	=	1.645 at 95% Confidence Level

$$MDA = \frac{2.71 + 3.29 \sqrt{R_b t_s \times \left(1 + \frac{t_s}{t_b}\right)}}{(t_s)(E)(C)}$$

ERMP-02 Figure 2-4

CONTAINER RETURNED TO SERVICE FLOW CHART

ERMP-02 FIGURE 2-4
Container Release Flow Chart



ERMP-03 ENVIRONMENTAL MONITORING PROGRAM OVERVIEW

The environmental monitoring program will consist of the following samples collected at the indicated frequencies and locations found on Table 3-1. Action levels are established at fractions of the published, regulatory limits* where applicable. Results are evaluated either by plotting and comparison with the action level or by review of data as reported by the Radiation Safety Officer (RSO), RPS or designee. Instruments used by USEI to collect samples or make measurements are required by procedure to be calibrated at specified intervals in order to assure accuracy of measurement. Specific procedures for replacing and handling air filters can be found in the Health and Safety Manual.

Table 3-1

Medium	Type	Locations	Frequency	Investigation Level
Air, Radon	Track-etch, passive	Fence line	Continuous, exchanged quarterly	2.0 pCi/l
Air, Radon Occupational	Track-etch	RTF, Cells 14, 15, and 16 while open Container storage area- Pad at the least and most frequent down-wind directions	Continuous, Exchanged quarterly	400 pCi/l
Air Particulate-Non-Occupational	Active	Admin Area	Continuous (Filters replaced approximately every seven days)	²³⁸ U - 0.3 pCi/m ³ ²³⁴ U - 0.1 pCi/m ³ ²³² Th - 4.0E-4 pCi/m ³ ²²⁶ Ra - 0.09 pCi/m ³ ²³⁹ Pu - 3 x 10 ⁻³ pCi/m ³ ²⁴¹ Am - 3 x 10 ⁻³ pCi/m ³ Any man-made gamma emitting Radionuclide- 20 pCi/m ³ Sum of all man-made gamma emitters not to exceed 200 pCi/m
Soil	Grab	Predominant downwind direction 50-100 ft. of either side of centerline	Semi-annually Spring and Fall	²³⁸ U - 4 pCi/g ²³⁴ U - 4 pCi/g ²³² Th - 4 pCi/g ²²⁶ Ra - 3 pCi/g ²³⁹ Pu - 0.06 pCi/g ²⁴¹ Am - 0.06 pCi/g
Ground Water(filtered)	Grab	Three Monitoring Wells	Semi-annually Spring and Fall	Gross alpha-2.5 pCi/l ¹ Gross Beta-25 pCi/l Ra ²²⁶⁺²²⁸ – 5pCi/l Uranium – 30ug/L
Landfill Leachate	Grab	Active Landfill Sumps ²	Annually	³⁶ Cl – 25pCi/L ⁹⁹ Tc – 25pCi/L Gamma – Sum of all isotopes > 100pCi/L
Ambient Gamma	TLD, passive	Fence line	Continuous, exchanged quarterly	25 mrem/quarter

¹ Gross alpha investigation level excludes ²²⁶⁺²²⁸Ra , and Uranium concentrations, however, ²³⁹Pu and ²⁴¹Am are included

² USEI will take an annual sample from landfill sumps where waste streams containing ⁹⁹Tc and/or ³⁶Cl have been deposited

1.0 INVESTIGATION LEVELS

All investigation levels are amounts in excess of background levels. Non-occupation investigation levels for airborne particulates were derived by dividing the applicable effluent concentration for each listed radionuclide found in Appendix B 10 CFR 20 by ten. The limit for occupational exposure to radon is one-tenth of the Nuclear Regulatory Commission (NRC) Appendix B DAC. The limit for fence line radon levels is one-fifth of the NRC's limit for unrestricted areas.

For water, the gross alpha limit is set at one half the $^{226+228}\text{Ra}$ drinking water limit. The beta investigation level is set at one half the EPA drinking water limit as well.

Ambient gamma readings are one-quarter of the permitted annual operational dose limit for all sources, taken at the fence-line.

There are no regulatory limits for radionuclides in soil. NRC currently uses a concentration that can be derived from 10 CFR 40, Appendix A Criterion 6(6) which equates the dose of any other radionuclide in soil to the dose expected from a concentration of 5 pCi/g ^{226}Ra in soil to a depth of 15 cm. The calculated concentration of ^{238}U that would give that dose (from inhalation) would be approximately 30 pCi/g. The NRC has used this concentration as a release criterion for any uranium contamination requiring clean-up. Roughly ten percent of that concentration is, therefore, used for the uranium and thorium isotopes as an investigation level.

2.0 AMBIENT GAMMA RADIATION

Gamma radiation levels are monitored at the fence line and disposal cells and at two locations at the RTF. Monitoring is performed using thermo luminescent dosimeters which are deployed for each calendar quarter. Ambient gamma monitoring locations at Site B are shown on PRMIT04 Windrose.

3.0 AIR

Air is monitored for radionuclide's attached to airborne particles in the administrative area and for radon.

- 3.1 Radon- Radon is monitored in active disposal cells, the staging area, container storage pad #4, and guard station. Radon dosimeters are exchanged quarterly. See PRMIT04 Windrose for locations.

4.0 GROUND WATER SAMPLING PROCEDURES

USEI will take three monitoring well samples on a semi-annual basis. These will be analyzed for those radionuclides specified in Table 3-1. The location of the sampling wells will be determined by the direction of flow of ground water under the impoundment and will be of water that can reasonably be expected to have flowed under a portion of the cell which contains exempt material.

Table 3-2 shows groundwater monitoring wells that would be in the flow direction of cells that have received exempt radiological material:

**Table 3-2
 Groundwater Monitoring Well ID**

L-28	L-38
L-29	L-39
L-30	L-41
L-31	L-42
L-32	L-43
L-32	L-44
L-33 ³	L-45
L-37	L-47
U-1	U-48
U-49	L-50*
L-51*	L-52*
L-53*	U-54

* Associated with future construction of Cell 16

Monitoring well L-33 will be sampled each event. Two other wells from Table 3-2 will normally be sampled on a rotating basis. One of the other wells will be associated with Cell 14 or Cell 15 and the other will be associated with Cell 16. The groundwater sampling procedure for radionuclides will follow the current RCRA/TSCA permit sampling procedures. The groundwater well locations are shown on PRMIT04 Wind rose. Samples will be sent to the lab under chain of custody protocol (Figure 3-1), and analyzed for those radionuclides specified in Table 3-1. The minimum amount of sample will be determined by the laboratory and the analyses required.

5.0 SOIL SAMPLING PROCEDURES

USEI will take six surface soil samples, three each from two general site areas on a semi-annual basis. All will be at least 50 meters from the active disposal area(s). One sample will be taken directly down wind from the designated sampling location at a fixed location, while two more will be collected at a distance of 15-50 meters to the north and south of the prevailing wind direction. Prevailing wind directions are out of the northwest or southeast, depending upon the season. Wind rose⁴ information is provided on PRMIT04 Wind rose. Samples will be taken in the spring and the fall as described along one of these bearings. The samples will be analyzed for those radionuclides specified in Table 3-1. A background soil sample will be taken once a year in a similarly designated area except the background site will be in the direction that the wind blows least frequently (i.e., northeast or southwest of the facility), soil sampling locations are shown on PRMIT04 Wind rose.

5.1 Equipment

500 ml (minimum volume) container
 Small digging utensil

³ Monitoring Well L-33 will be sampled each sampling event for trending analysis. The other wells within the table will be sampled on a random schedule.

⁴ Wind rose diagrams depict the distribution of wind direction over a period of time, in this case 1988 to 1992, Boise Idaho.

Small spray bottle of DI water

5.2 Precautions

Care should be taken to avoid introducing vegetable or animal matter or rocks larger than ¼ inch into the soil sample. In order to not introduce materials from the previous sample location, spray the digging utensil with DI water and allow to dry between sampling locations.

5.3 Soil Sampling

Select an undisturbed area within the designated sampling location. Each sample will be a minimum of 500 ml. The sample shall be taken from an area of approximately 12 inches by 12 inches by 1 inch. Additional areas adjacent to the first may be designated, as required, to obtain required sample volume. Label or mark the container with the date and time of sample, location, and the sampler's initials. Soil samples shall be sent to the off-site lab with a chain of custody (Figure 3-1), and analyzed for those isotopes identified in Table 3-1.

6.0 ENVIRONMENTAL MONITORING QUALITY ASSURANCE

6.1 Procurement

USEI shall use only those laboratories and processing vendors that have the technical expertise to perform such services. That expertise can be evaluated and proven by the vendor's participation in intercomparison programs, validated by independent audits, industry accreditation, or other means as specified by the RSO and RPS. The RPS and RSO shall determine the scope of services required from laboratories and vendors. The scope shall then be recorded in procurement documents or by other means determined by the RPS and RSO. Alternatively, USEI may rely on Approved Vendor Lists from other US Ecology facilities that maintain a quality assurance program.

6.2 Environmental Laboratory Results

Laboratory results will be reviewed by the RPS and forwarded to the Radiation Safety Officer (RSO) for review and approval. The RPS and RSO will determine if the data reports conform to the scope of the services determined in the procurement process. Should the data report be suspect or not conform to the scope of services, the RPS and RSO shall resolve the matter before using the data. Should an environmental monitoring investigation level be exceeded the RSO will validate the data and if necessary investigate the probable cause(s) (e.g. invalid laboratory results, damaged detectors, etc), and propose a corrective action plan.

6.3 Laboratory Result Trending

The RSO will trend and assess environmental monitoring over time.

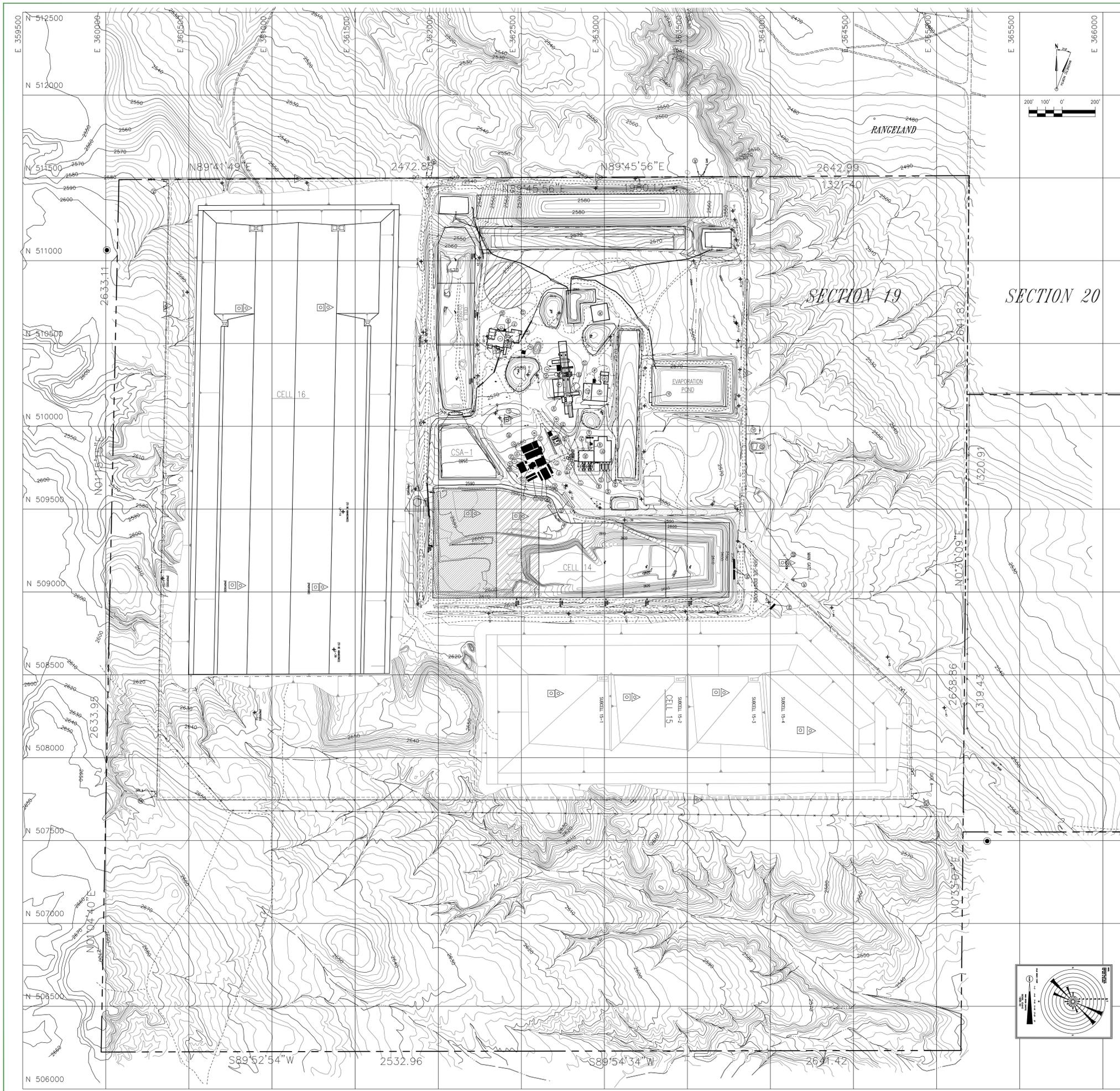
6.4 Reporting

An annual environmental report will be prepared by the RSO. This report will assess environmental trends and potential environmental impact of facility operations.

6.5 Records

Environmental monitoring reports are quality records and shall be maintained by the RPS or designee.

ERMP-03 Figure 3-1
CHAIN OF CUSTODY (EXAMPLE)



MATCH LINE DRAWING NO. PRM1-TO2

- LEGEND**
- -
 -
 -
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 -
 -
 -

- FACILITY KEY**
- | | |
|------------------------------------|--|
| 1 CONTAINER STORAGE PAD 4 | 30 FLAG POLE |
| 2 COMPRESSOR BUILDING | 31 WELDER STATION |
| 3 STABILIZATION FACILITY OFFICE | 32 "MANGROVE" |
| 4 STABILIZATION FACILITY | 33 UNDERGROUND CLEAN WATER TANK |
| 5 PFB PROCESSING BUILDING | 34 EVAPORATION GATES |
| 6 VEHICLE MAINT FACILITY | 35 RCRA STORAGE TANKS-4, 5&6 |
| 7 "MANGROVE" | 36 CONTAINER STORAGE PAD 5 |
| 8 FIELD TEST/PIPE BUILDING | 37 PAD 6-RCRA/PFB STORAGE BUILDING APRON |
| 9 STORAGE BUILDING | 38 "MANGROVE" |
| 10 MAINTENANCE SHOP | 39 STABILIZATION BUILDING |
| 11 DECONTAMINATION BUILDING | 40 HAZ WEDGE |
| 12 LAB OFFICES | 41 HEPA FILTER HOUSE AND FAN |
| 13 RECEIVING OFFICE/LAB | 42 HAZ TRUCK SCALE |
| 14 PAD 4 OFFICE | 43 CONTAINER STORAGE PAD 7 |
| 15 FUEL STORAGE (MANGROVE) STATION | 44 CONTAMINANT BUILDING TRUCK UNLOADING |
| 16 CONTAMINANT BUILDING | 45 CONTAMINANT BUILDING TRUCK UNLOADING RAMP |
| 17 PUMP HOUSE/WATER STORAGE TANKS | 46 STABILIZATION BUILDING TRUCK UNLOADING |
| 18 COMPRESSED GAS STORAGE AREA | 47 APERTURE 1 AND 2 |
| 19 ADMINISTRATION BUILDING | 48 LEACHATE TREATMENT SYSTEM |
| 20 ADMINISTRATION/LUNCH ROOM | 49 STABILIZATION FACILITY ACIDIC SLOPS |
| 21 ADMINISTRATION BUILDING | 50 STABILIZATION BUILDING ACIDIC SLOPS |
| 22 RECEIVING STORAGE BUILDING | 51 EVAPORATION POND LEACHATE UNLOADING AREA |
| 23 REAGENT STORAGE | 52 OFFICE TRAILER SHED/STORAGE |
| 24 "MANGROVE" | 53 LAB WASTE HOLDING TANK |
| 25 SECURITY BUILDING | 54 CONTROL HOUSE |
| 26 PROMOTE TANK | 55 ET CAR TEST PAD |
| 27 SWAGING PLATFORM | 56 TANKWIPER TRAILER |
| 28 STAGING AREA | 57 SAFETY SEA CONTAINER |
| 29 TRUCK SCALE | |

- GENERAL NOTES:**
- EXISTING SITE TOPOGRAPHY, PHYSICAL FEATURES AND DELINEATIONS OBTAINED FROM AERIAL PHOTOGRAPHY AND SURFACE SCAN PROVIDED TO ENDRUSOURCE TECHNOLOGIES BY J.J. HOWARD ENGINEERING-SURVEYING, 1633-A HILL ROAD, BOISE, IDAHO 83702. DATE OF CROSSING SURVEY - NOVEMBER 4, 1991.
 - ADDITIONALLY THE FOLLOWING AREAS OF THE SITE HAVE BEEN UPDATED AND INCORPORATED INTO THE EXISTING SITE PLAN AS FOLLOWS:
 - A. AN ADDITIONAL 1,000 FEET TO THE NORTH OF SECTION 19 HAS BEEN SURVEYED AND INCORPORATED INTO THE EXISTING TOPOGRAPHY SURVEY BY J.J. HOWARD DATED FEBRUARY 20, 1991.
 - B. STABILIZATION AND CONTAMINANT BUILDING UPDATED AS OF JANUARY 14, 1997. SURVEY BY J.J. HOWARD. DESIGN CONTAINS BY ENDRUSOURCE TECHNOLOGIES.
 - C. PAD 4 PROCESS PLANT AREA UPDATED AS OF APRIL 15, 1998. SURVEY BY: J.J. HOWARD.
 - D. LEACHATE FORCE MAIN AND SOIL STOCKPILE SURVEY UPDATED AS OF FEBRUARY 15, 1998. SURVEY BY: J.J. HOWARD.
 - E. THE CURRENT TOP OF WASTE ELEVATIONS FOR CELL 9 AS OF JANUARY 2, 1996. SURVEY BY: J.J. HOWARD.
 - F. THE CURRENT TOP OF WASTE ELEVATIONS FOR CELL 14 AS OF JANUARY 04, 2001. SURVEY BY: J.J. HOWARD.
 - G. TOPOGRAPHY OF TRENCHES 10 AND 11 UPDATED AS OF SEPTEMBER 12, 2000. SURVEY BY: J.J. HOWARD.
 - H. SURVEY OF CONTAINER STORAGE AREA NO. 1 TOPOGRAPHY AS OF JUNE 18, 1999. SURVEY BY: J.J. HOWARD.
 - I. BORROW AREA TOPOGRAPHY UPDATED AS OF DECEMBER 12, 2000. SURVEY BY: J.J. HOWARD.
 - J. WEST HALL ROAD TOPOGRAPHY UPDATED AS OF DECEMBER 01, 2000. SURVEY BY: J.J. HOWARD.
 - K. ET CAR TEST PAD TOPOGRAPHY UPDATED AS OF NOVEMBER 01, 2000. SURVEY BY: J.J. HOWARD.

REV.	BY	CHK'D	DATE	DESCRIPTION	PROJ. SUPERVISOR	DATE
C	MM		5/20/99	AIR MONITOR RELOCATION		
B	MM		6/27/98	CELL 16 MODIFICATIONS		
A	ME		2/28/98	PART B PERMIT RENEWAL APPLICATION		



SITE B
GRAND VIEW (B410)
US EPA ID NO. ID0 073 114 654

TITLE: RADIOLOGICAL ENVIRONMENTAL MONITORING LOCATIONS

DRAWN BY:	DATE:	SCALE:	FILE CODE:	REV. NO.:
MM	2/20/98	1"=200'	PRM1010	
CHECKED:	DATE:	ENGINEER:	DATE:	DWG. NO.:
				PRM104 WINDROSE
PROJ. MGR.:	DATE:	APPROVED:	DATE:	PROJ. NO.:
				PRM1

ERMP-04 LANDFILL OPERATIONS

1.0 Landfill Operations

Landfill operations for the disposal of exempt radiological waste are consistent with the method, means, and placement tracking used for chemical waste landfill operations, with one exception. Radiological wastes that contain Uranium and Thorium must be disposed of to comply with dose modeling (RESRAD) results and the radon limits established in IDAPA 58.01.10.020.03(a)(ii). This is because Uranium and Thorium emit radon gas. Radon gas can be effectively stopped by a diffusion barrier that is thick enough to allow the gas to decay radiologically. The result of the RESRAD dose model indicates that for Table C-1 radiological wastes, a 3.6 meter thickness of non-radiologically impacted material is necessary to provide an effective radon diffusion barrier, and for Table C-2 waste, 6 meters of material are necessary. Clean soils or RCRA, non-RCRA waste may also be used to achieve the required cover thickness provided that the 3.6 and 6 meter requirements are met. When the radon diffusion barrier is discussed in this procedure it assumes that the thickness (cover) includes the non-radiological waste plus the final cap, as designed.

Further details on landfill operations and treatment are provided in Module VI of USEI's RCRA Permit.

Cell 14

Figure 4-1 presents the Cell 14 above-grade configuration and illustrates the upper most elevation relative to radiological waste placement in order to maintain the required thickness of non-radiological waste/final cover. Figure 4-2 is a typical cross section of a landfill unit with above grade containment dikes (e.g. Cell 14).

Cell 15

Figure 4-4 reflects the above-grade design for Cell 15. Figure 4-3 provides information relative to radon flux through multiple layers of soils. Cell 15's above-grade design differs with Cell 14 in that the waste is brought to final grade and slope, and then an exterior dike is placed to provide the final slope stability. The thickness of the designed cover (exterior dike) at the transition from below-grade to above-grade is approximately twenty (20) feet, effectively encompassing both cover thickness requirements for Table C-1 and Table C-2 radiological waste, which are 3.6 and 6 meters, respectively.

Cell 16

Figure 4-5 reflects the typical cover profile for Cell 16 including the lateral and vertical waste limits for radiological material. The required minimum thicknesses (6 meters) of the radiological waste barriers is also illustrated on Figure 4-5. The cover thickness for Cell 16 is uniform across the entire cell, except for a slightly thickened profile near the toe of the slope where the cover flattens out from 3H:1V to 3.5H:1V.

2.0 Waste Containers

Waste may be received in boxes, drums, bulk or other appropriate packages as determined by the Department of Transportation (DOT) regulations.

3.0 Extent of Waste Placement

3.1 Cells 14 and 15

Drums, boxes and debris will not be placed within twenty feet of any exposed landfill liner. This protects the integrity of the liner.

Table C-1 radiological waste shall be placed to ensure there is at least 3.6 meters (approximately 12 feet of cover) of non-radiological waste between any waste containing 222 pCi/g of ²²⁶Ra or less and the nearest surface of the landfill's final cap.

Table C-2 radiological waste shall be placed to ensure that there are at least 6 meters (approximately 20 feet of cover) of other non-radiological waste between waste containing greater than 222 pCi/g of ²²⁶Ra and the nearest surface of the landfill's final cap.

Figures 4-3a and 4-3b depict the alpha-numeric spatial system used to track waste placement in Cell 15.

Figure 4-4 shows the necessary cover thickness and the extent of both Table C-1 and Table C-2 radiological waste placement to maintain the required cover thickness at Cell 15 closure.

3.2 Cell 16

Drums, boxes and debris will not be placed within twenty feet of any exposed landfill liner. This protects the integrity of the liner.

All radiological wastes shall be placed to ensure that there is at least 6 meters (approximately 20 feet of cover) of other non-radiological waste from the nearest surface of the landfill's final cap.

Figure 4-5 shows the necessary cover thickness and the extent of all radiological waste placement (Tables C-1, C-2, C-3, and C-4) to maintain the required cover thickness at Cell 16 closure.

4.0 Control of Wind Dispersal

To prevent wind dispersal within the landfill, all bulk materials within the working face and other waste susceptible to such dispersion are covered with soil, non-hazardous wastes or an asphalt emulsion, as necessary, before the close of business on the day of disposal. Further details on landfill are provided in Module VI of USEI's RCRA Permit.

US Ecology Idaho, Inc.
EPA ID. No.: IDD073114654
Effective Date: July 28, 2016

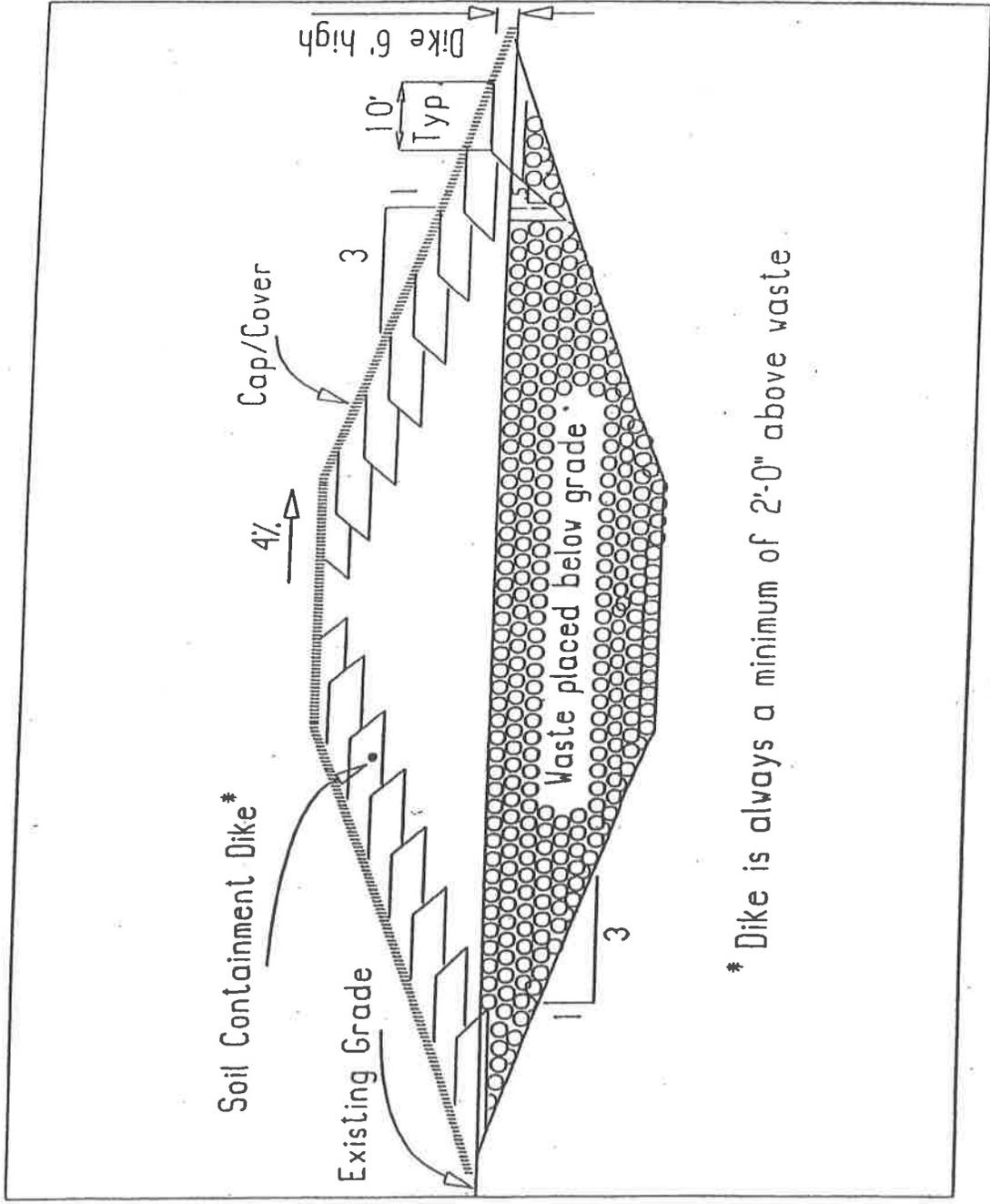
ERMP-04 Figure 4-1

Typical Section Through Cell 14

ERMP-04 Figure 4-2

Typical Cross Section of Cell 14 Above-Grade
Containment Dikes

TYPICAL CROSS SECTION OF CELL 14 ABOVE GRADE CONTAINMENT DIKES



* Dike is always a minimum of 2'-0" above waste

ERMP-04 Figure 4-3

Radon Flux Through Closure Caps

FIGURE 4-3

RADON FLUX THROUGH CLOSURE CAPS

Version 1.2 - Feb. 2, 1989 - G.F. Birchard Tel.# (301)492-7000

U.S. Nuclear Regulatory Commission Office of Research
 RADON FLUX, CONCENTRATION AND TAILINGS COVER THICKNESS ARE
 CALCULATED FOR MULTIPLE LAYERS
 Envirosafe of Idaho--5 Layer Barrier

CONSTANTS		
RADON DECAY CONSTANT	.0000021	S ⁻¹
RADON WATER/AIR PARTITION COEFFICIENT	.26	
SPECIFIC GRAVITY OF COVER & TAILINGS	2.65	

GENERAL INPUT PARAMETERS		
LAYERS OF COVER AND TAILINGS	5	
NO LIMIT ON RADON FLUX		
LAYER THICKNESS NOT OPTIMIZED		
DEFAULT SURFACE RADON CONCENTRATION	0	pCi l ⁻¹
SURFACE FLUX PRECISION	.1	Pci m ⁻² s ⁻¹

LAYER INPUT PARAMETERS		
LAYER 1		
THICKNESS	2880	cm
POROSITY	.4	
MEASURED MASS DENSITY	1.6	g cm ⁻³
MEASURED RADIUM ACTIVITY	174	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	5.116D-04	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	6	%
MOISTURE SATURATION FRACTION	.240	
CALCULATED DIFFUSION COEFFICIENT	3.115D-02	cm ² s ⁻¹

LAYER 2		
THICKNESS	106.7	cm
POROSITY	.5	
MEASURED MASS DENSITY	2.24	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	14	%
MOISTURE SATURATION FRACTION	.827	
CALCULATED DIFFUSION COEFFICIENT	7.233D-03	cm ² s ⁻¹

LAYER 3		
THICKNESS	182.9	cm
POROSITY	.37	
MEASURED MASS DENSITY	2	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	3	%
MOISTURE SATURATION FRACTION	.162	
CALCULATED DIFFUSION COEFFICIENT	3.997D-02	cm ² s ⁻¹

LAYER 4		
THICKNESS	45.72	cm
POROSITY	.412	
MEASURED MASS DENSITY	1.62	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	5.5	%
MOISTURE SATURATION FRACTION	.216	
CALCULATED DIFFUSION COEFFICIENT	3.407D-02	cm ² s ⁻¹

LAYER 5		
THICKNESS	30.48	cm
POROSITY	.37	
MEASURED MASS DENSITY	2	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	3	%
MOISTURE SATURATION FRACTION	.162	
CALCULATED DIFFUSION COEFFICIENT	3.997D-02	cm ² s ⁻¹

DATA SENT TO THE FILE 'RNDATA' ON DRIVE A:

N	F01	CN1	ICOST	CRITJ	ACC
5	-1.000D+00	0.000D+00	0	0.000D+00	1.000D-015

LAYER	DX	D	P	Q	XMS	RHO
1	2.880D+03	3.115D-02	4.000D-01	5.116D-04	2.400D-01	1.600
2	1.067D+02	7.233D-03	5.000D-01	0.000D+00	6.272D-01	2.240
3	1.829D+02	3.997D-02	3.700D-01	0.000D+00	1.622D-01	2.000
4	4.572D+01	3.407D-02	4.120D-01	0.000D+00	2.163D-01	1.620
5	3.048D+01	3.997D-02	3.700D-01	0.000D+00	1.622D-01	2.000

BARE SOURCE LAYER FLUX FROM LAYER 1: 2.492d+02 pCi m⁻² s⁻¹
 RESULTS OF THE RADON DIFFUSION CALCULATIONS

LAYER	THICKNESS (cm)	EXIT FLUX (pCi m ⁻² s ⁻¹)	EXIT CONC. (pCi l ⁻¹)
1	2.880D+03	7.157D+01	1.738D+05
2	1.067D+02	1.718D+01	9.344D+03
3	1.829D+02	5.840D+00	2.884D+03
4	4.572D+01	5.108D+00	9.888D+02
5	3.048D+01	4.986D+00	0.000D+00

FIGURE 4-3, cont.

RADON FLUX THROUGH CLOSURE CAPS

-----*****! RADON !*****-----
 sion 1.2 - feb. 2, 1989 - G.F. Birchard Tel.# (301)492-7000
 U.S. Nuclear Regulatory Commission Office of Research
 RADON FLUX, CONCENTRATION AND TAILINGS COVER THICKNESS ARE
 CALCULATED FOR MULTIPLE LAYERS
 Envirosafe of Idaho--4 Layer Barrier

CONSTANTS		
RADON DECAY CONSTANT	.0000021	S ⁻¹
RADON WATER/AIR PARTITION COEFFICIENT	.26	
SPECIFIC GRAVITY OF COVER & TAILINGS	2.65	

GENERAL INPUT PARAMETERS		
LAYERS OF COVER AND TAILINGS	4	
NO LIMIT ON RADON FLUX		
LAYER THICKNESS NOT OPTIMIZED		
DEFAULT SURFACE RADON CONCENTRATION	0	pCi l ⁻¹
SURFACE FLUX PRECISION	.1	Pci m ⁻² s ⁻¹

LAYER INPUT PARAMETERS		
LAYER 1		
THICKNESS	2880	cm
POROSITY	.4	
MEASURED MASS DENSITY	1.60	g cm ⁻³
MEASURED RADIUM ACTIVITY	174	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	5.116D-04	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	6	%
MOISTURE SATURATION FRACTION	.240	
CALCULATED DIFFUSION COEFFICIENT	3.115D-02	cm ² s ⁻¹

LAYER 2		
THICKNESS	289.56	cm
POROSITY	.37	
MEASURED MASS DENSITY	2	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	3	%
MOISTURE SATURATION FRACTION	.162	
CALCULATED DIFFUSION COEFFICIENT	3.997D-02	cm ² s ⁻¹

LAYER 3		
THICKNESS	45.72	cm
POROSITY	.412	
MEASURED MASS DENSITY	1.62	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	5.5	%
MOISTURE SATURATION FRACTION	.216	
CALCULATED DIFFUSION COEFFICIENT	3.407D-02	cm ² s ⁻¹

LAYER 4		
THICKNESS	30.48	cm
POROSITY	.37	
MEASURED MASS DENSITY	2	g cm ⁻³
MEASURED RADIUM ACTIVITY	0	pCi/g ⁻¹
DEFAULT LAYER EMANATION COEFFICIENT	.35	
CALCULATED SOURCE TERM CONCENTRATION	0.000D+00	pCi cm ⁻³ s ⁻¹
WEIGHT & MOISTURE	3	%
MOISTURE SATURATION FRACTION	.162	
CALCULATED DIFFUSION COEFFICIENT	3.997D-02	cm ² s ⁻¹

DATA SENT TO THE FILE 'RNDATA' ON DRIVE A:

N	F01	CN1	ICOST	CRITJ	ACC
4	-1.000D+00	0.000D+00	0	0.000D+00	1.000D-01

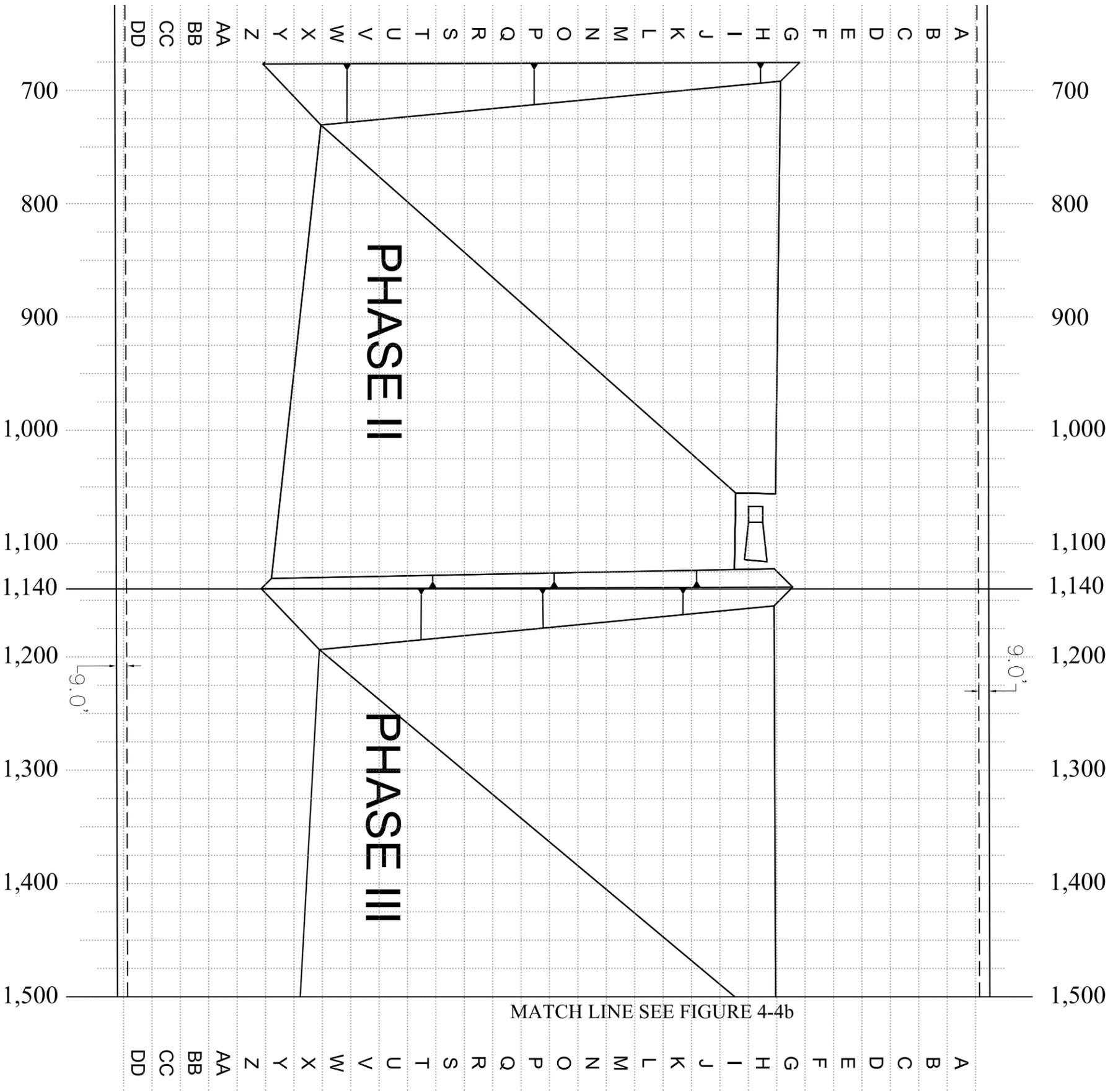
LAYER	DX	D	P	Q	XMS	RHO
1	2.880D+03	3.115D-02	4.000D-01	5.116D-04	2.400D-01	1.600
2	2.896D-02	3.997D-02	3.700D-01	0.000D+00	1.622D-01	2.000
3	4.572D+01	3.407D-02	4.120D-01	0.000D+00	2.163D-01	1.620
4	3.048D+01	3.997D-02	3.700D-01	0.000D+00	1.622D-01	2.000

BARE SOURCE LAYER FLUX FROM LAYER 1: 2.492d+02 pCi m⁻² s⁻¹
 RESULTS OF THE RADON DIFFUSION CALCULATIONS

LAYER	THICKNESS (cm)	EXIT FLUX (pCi m ⁻² s ⁻¹)	EXIT CONC. (pCi l ⁻¹)
1	2.880D+03	1.323D+02	1.430+05
2	2.896D+02	2.111D+01	1.043D+04
3	4.572D+01	1.847D+01	3.575D+03
4	3.048D+01	1.802D+01	0.000D+00

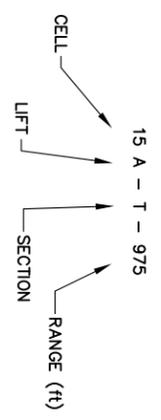
ERMP-04 Figures 4-3a and 4-3b

Cell 15 Phases II, III, and IV Waste Tracking



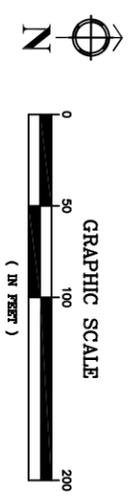
GENERAL NOTES

1. WASTE MAY BE PLACED WITHIN 9 FEET HORIZONTAL DISTANCE FROM THE CREST OF THE NORTH AND SOUTH SLOPES, AS INDICATED.
2. WASTE PLACED ALONG THE EAST CREST MUST BE SET-BACK A MINIMUM OF 40 FEET, AS INDICATED.
3. A 25 FOOT ON-CENTER GRID SYSTEM SHOULD BE SURVEYED FROM THE POINT OF BEGINNING INDICATED ON THE DRAWING. PLANE COORDINATES FOR THE POINT OF BEGINNING ARE AS FOLLOWS:
 NORTHING = 508,666.7
 EASTING = 363,065.5
4. LIFT THICKNESS IS 5 FEET IN ELEVATION.
5. IDENTIFY THE LOCATION OF WASTE PLACEMENT AS FOLLOWS:

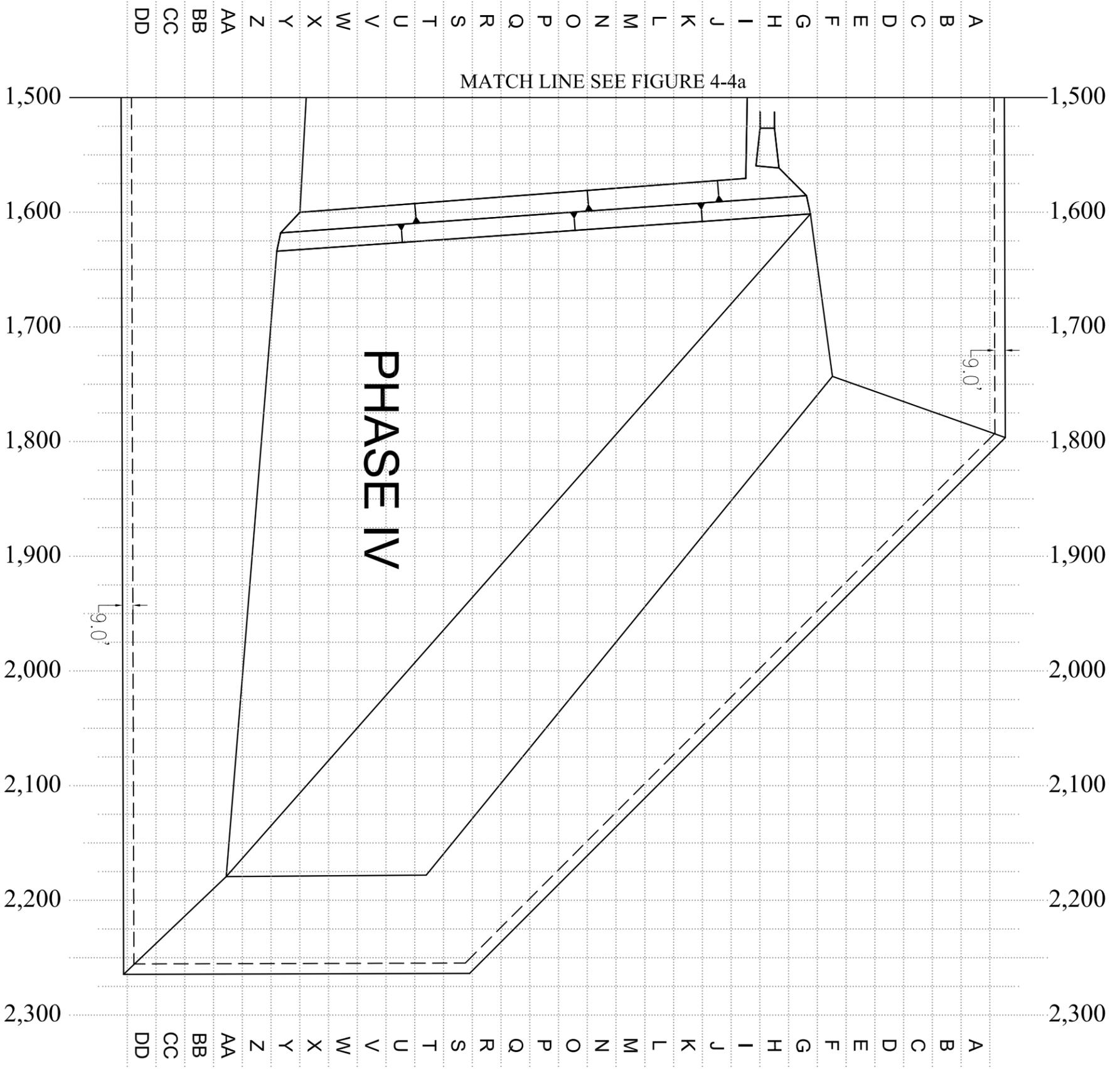


LEGEND

- GRID LINES
- - - - WASTE LIMITS FOR PHASES II, III, IV
- — — GRADE BREAK LINE

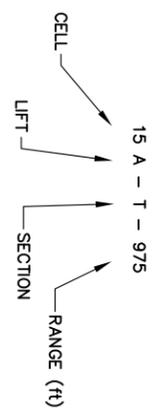


<p>Cell 15 Phases II, III Waste Tracking Grand View, Idaho</p>		<p>FIGURE 4-3a</p> <p>A M E R I C A N G E O</p>
<p>File No. 09B-G1892</p>	<p>February 2009 Revision 0</p>	



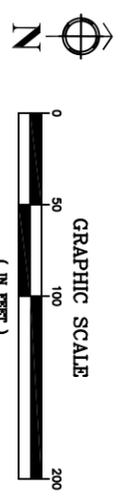
GENERAL NOTES

1. WASTE MAY BE PLACED WITHIN 9 FEET HORIZONTAL DISTANCE FROM THE CREST OF THE NORTH AND SOUTH SLOPES, AS INDICATED.
2. WASTE PLACED ALONG THE EAST CREST MUST BE SET-BACK A MINIMUM OF 40 FEET, AS INDICATED.
3. A 25 FOOT ON-CENTER GRID SYSTEM SHOULD BE SURVEYED FROM THE POINT OF BEGINNING INDICATED ON THE DRAWING. PLANE COORDINATES FOR THE POINT OF BEGINNING ARE AS FOLLOWS:
 NORTHING = 508,666.7
 EASTING = 363,065.5
4. LIFT THICKNESS IS 5 FEET IN ELEVATION.
5. IDENTIFY THE LOCATION OF WASTE PLACEMENT AS FOLLOWS:



LEGEND

- GRID LINES
- - - - WASTE LIMITS FOR PHASES II, III, IV
- GRADE BREAK LINE



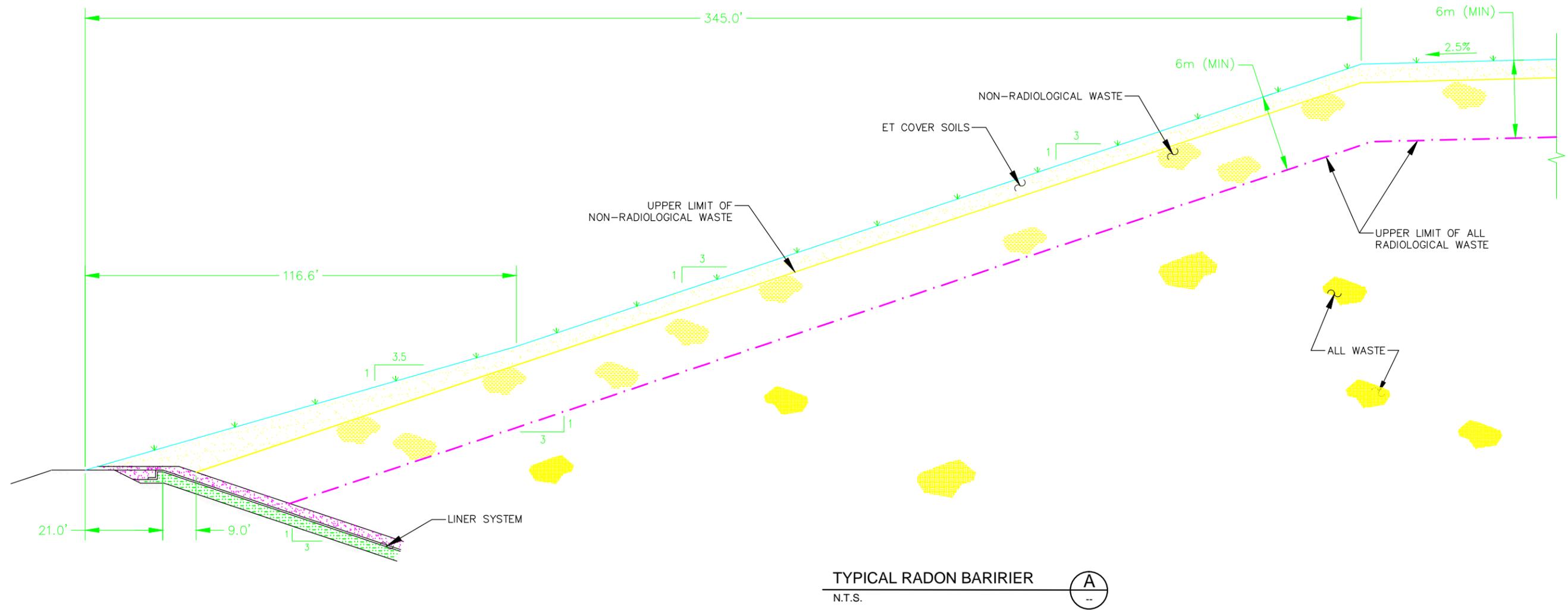
<p>Cell 15 Phase IV Waste Tracking Grand View, Idaho</p>		<p>FIGURE 4-3b</p> <p>AMERICAN TECHNICALS</p>
<p>File No. 09B-G1892</p>	<p>February 2009 Revision 0</p>	

ERMP-04 Figure 4-4

Extent of Radiological Waste Placement for Cell 15

ERMP-04 Figure 4-5

Extent of Radiological Waste Placement for Cell 16



Cell 16 Subcell 16-1 & 16-2 Waste Placement & Cover Profile Grand View, Idaho		FIGURE 4-5 AMERICAN GEO TECHNICS
File No. 07B-G1654	July 2015 Revision 1	

AeccDbFace (AeccLand50)

ERMP-05 WASTE ACCEPTANCE CRITERIA EVALUATION

1.0 PURPOSE

Occasionally, radiological dose rates and contamination surveys of incoming bulk and containerized shipments of exempt radioactive material may reveal one or more elevated readings. These procedures establish a consistent method of addressing these occasions taking into account the facility's current capabilities.

The restrictions placed on concentrations of radionuclides received at USEI and the operating history of the facility provides assurance that radiation doses at the facility will continue to be minimal. The last five years of occupational dose monitoring show that this approach is effective. Although doses are routinely below measurable levels, the principles of As Low as Reasonably Achievable (ALARA) are observed in routine operations. When workers will be required to work with materials that may exceed the WAC, they will receive training on the need to maintain their doses ALARA. The training will consist of a description of the tasks needing to be performed, expected dose rates, contamination control and additional instruction on how to minimize time near the higher dose rate materials and how to take advantage of available shielding.

2.0 ACTION LEVEL EXCEEDANCE

2.1 Bulk Solid Material Table C-1 and Table C-2.

Should a reading on an incoming shipment exceed the action levels listed in ERMP-01, Sections 1.0, 2.0 or 3.0, the RPS or RSO will be notified and an investigation will be conducted to determine the cause of the elevated reading(s) and the appropriate response.

2.1.1 The investigation shall consist of some or all of the following:

- Contact the customer/generator through Client Service Department.
- Review the waste profile and concentration analysis provided by customer/generator.
- Conduct a more detailed exterior reading survey to determine the elevated reading.
- Inspect the interior of the container for general waste characteristics and any off-specification material (e.g. pipes, machine parts, etc.) that may be a source of the elevated reading.
- Obtain a representative sample for laboratory analysis.

2.1.2 If the RPS or RSO concludes that mixing the material will reduce the radiological reading within acceptable limits, remix and then resurvey the shipment using the following criteria:

- If the new reading is less than the action levels in ERMP-01, Sections 1.0,2.0, or 3.0, process the shipment.
- If after mixing the average readings are greater than the action levels in ERMP-01, Sections 1.02.0, or 3.0 follow the guidance provided in 2.1.3 and 2.1.4.

Should a reading exceed 2000 $\mu\text{rem/hr}$ the response shall be the same as described in Section 2.1.1 above with the following additional actions:

2.1.3 The RPS or designee will verify the readings. If the readings are verified a precautionary notification to the RCRA program manager or his representative will be made within 24 hours of the verification survey.

2.1.4 Laboratory analysis will be obtained on the material causing the elevated reading. The results of the analysis will be used to evaluate the waste shipment. This evaluation shall consist of the following:

- An evaluation of the impact of the presence of the elevated concentration of material on the average concentration of radionuclides in the conveyance or container shall be made.
- The waste will be accepted if:
 - The presence of the elevated material does not exceed the WAC for that radionuclide or
 - The sum of the concentration of all radionuclides in the conveyance or container does not exceed the Table C-1 and Table C-2 limits of the USEI Waste Acceptance Criteria.

2.2 Non-Bulk Solid (Drum, box, bag, pallet) Table C-1a and C-1b and Table C-2a and C-2b

Should the average dose rate exceed the concentration value of the waste stream specific activity concentration vs. exposure rate chart reading the RPS or designee will verify the survey readings. If the readings are verified follow the guidance found in Section 3 and 4.

2.3 Bulk and Non-Bulk Solid Table C-3 and Table C-4a

If a reading on a container exceeds 10 mR/hr on a shipment of bulk or non-bulk material, the RPS or RSO will be notified. The RPS or designee will verify the survey readings. If the readings are verified, the RCRA Program Manager or his representative will be notified within 24 hours. Follow the guidance provided in Section 3.

2.4 Bulk and Non-Bulk Solid Table C-4b

2.4.1 The RSO or RPS will evaluate the waste shipment using some or all of the following criteria:

- Review the waste stream to determine if the dose rate is above the specific value based on the specific container type and associated activity/dose rate relationship.
- Contact the customer/generator through the Client Services Department.
- Review the waste profile and concentration analysis provided by the customer/generator.
- Conduct a more detailed exterior reading survey to determine magnitude of elevated reading.
- Inspect interior of the container for general waste characteristics and any off-specification material (e.g., pipes, machine parts, etc.) that may be a source of contamination.
- Conduct interior reading survey to determine extent of elevated reading.
- Obtain a representative sample for analysis using the multi channel analyzer (MCA) or equivalent.
- A correlation will be established between the activity of a prominent gamma emitting fission or activation product and the transuranic(s) or SNM present in the material if the transuranic or SNM does not emit sufficient or energetic gamma or x-rays which may be measured on the MCA. The correlation will be based upon the concentrations of these radionuclides provided in the waste profile. The correlation will be used to verify the activity concentration of the transuranic or SNM.

2.4.2 If the RPS concludes that mixing the material will likely reduce the radiological readings within acceptable limits, remix and then re-survey the shipment using the following criteria:

- If the new readings are less than the waste stream specific activity concentration vs. exposure rate chart, process the shipment, or
- If after mixing one or more of the new readings continue to exceed the waste stream specific activity concentration vs. exposure rate chart, the RPS or the RSO will determine if the WAC has been exceeded, based on (laboratory/MCA) concentration analysis.
- If the material is determined to be within WAC limits based on the results of the laboratory/MCA concentration process the shipment.
- If the material is determined to be outside WAC limits based on the results of the laboratory/MCA concentration the shipment will be rejected and the RCRA Program Manager notified within 24 hours.
- If the RPS concludes the material is not conducive to blending (mixing won't reduce levels within WAC limits), the shipment will be rejected by following the guidance in Section 3.

2.5 Bulk and Non Bulk Liquids

2.5.1 Should the average reading exceed 40 $\mu\text{R/hr}$, including background, be made on an incoming shipment profiled as liquids the RPS or RSO will be notified. The RPS or designee may relocate the container to a lower background area and verify the survey readings. If the average reading is less than 40 $\mu\text{R/hr}$ process the container.

2.5.2 If the average reading exceeds 40 $\mu\text{R/hr}$ including background, the RPS or designee will determine if mixing the material will reduce the reading to acceptable limits. If after mixing, the materials average reading is acceptable, process the material.

2.5.3 If after mixing, the material exceeds 40 $\mu\text{R/hr}$, the waste will be rejected and the RCRA Program Manager or designee will be notified within 24 hours. Follow the guidance found in Section 3.

2.6 U.S. Department of Transportation (US DOT) Removable Contamination Exceedance

If a swipe survey of a container or conveyance is found to contain more than the release criteria listed in ERMP-02, Section 1.2, Table 9 the container or conveyance shall be cleaned again and five (5) additional swipe samples obtained from the area that failed. If all 5 of the follow-up swipes then meet the release criteria, the container is returned to service. If any of the follow-up samples do not meet the criteria, then the RPS or RSO is notified and the container conveyance is not returned to service. The RPS will determine whether the container will be cleaned again or returned to the generator according to US DOT rules and regulations (49 CFR 173.428).

2.6.1 Decontamination Materials

- Materials generated during decontamination will be collected and properly packaged for storage, disposal and/or possible return to the generator.
- The RPS or designee will consult with the RSO concerning the decontamination of the container and the final disposition of the materials generated.

2.7 US DOT Contamination Exceedance

If empty containers that were placarded as a class 7 shipment when received have a reading greater than 500 $\mu\text{R/hr}$, the RPS or RSO will be notified. The RPS or designee will verify the elevated reading. If the RPS or designee does not confirm the reading then the container will be returned to service.

If the reading is verified by the RPS or designee, the container will be returned to the generator in accordance with US DOT regulations (49 CFR 173.428).

3.0 REJECTION OF MATERIAL

3.1 After consultation with the RCRA Program Manager or designee, either all or part of the contents of a conveyance or container may be rejected. This determination shall be made based upon a number of factors such as the number of elevated readings observed, concentration analysis and/or the magnitude of the readings.

3.2 Rejected material will be returned to the customer or, by special arrangement, sent to another facility authorized to accept the material.

3.3 Small volumes of rejected material may be repackaged and sent by freight to the generator or another facility authorized to accept the material.

3.4 All shipments of rejected material shall be packaged, marked, labeled, placarded and otherwise be in accordance with US DOT regulations.

4.0 NOTIFICATION

The RCRA Program Manager or designee shall be notified within 24 hours of a verified reading that may result in a waste rejection.

5.0 REPORTS

5.1 Follow up to the 24 hour notification of rejection:

Within 30 days a preliminary report will be submitted to the RCRA Program Manager. The report will consist of:

- The results of any investigations and any actions taken up to the date of the letter.
 - Additional time may be needed for outside laboratory analysis and operational activities. The RCRA Program Manager or designee will be updated on progress toward resolution.

5.2 Final Report

Once all matters relating to the rejection or disposition of any materials associated with a shipment, that demonstrated readings in excess of the WAC specified limits are completed, a full report of the event will be submitted to the RCRA Program Manager.

ERMP-06 SELECTION, CARE, AND USE OF PORTABLE INSTRUMENTATION

1.0 PURPOSE

USEI routinely receives materials that contain exempt, but measurable, levels of radioactivity. To ensure compliance with the waste acceptance criteria and US DOT regulations, USEI personnel must operate portable radiological survey instrumentation.

This procedure addresses how portable radiological survey instrumentation is to be cared for, selected, and operated at the USEI RTF and Site B.

2.0 INSTRUMENT SELECTION

Radiological survey instruments are designed to detect specific types of radiation. There is no single instrument that can effectively detect all types of radiation from all sources of radioactive material. Consequently, the operator of the instrument must be aware of the types of radioactivity in waste being surveyed, and the types of radiation to be expected. While specific instruments may be listed in this procedure, the RSO and RPS may specify using instruments of equal or better capabilities.

2.1 Gamma Detection Instruments

Gamma detection instruments in use at USEI include the Ludlum Model 19, the Bicon Model RSO 50E, and the Bicon micro rem. These instruments are very effective in detecting gamma radiation. These instruments are not designed for, and are not effective for detecting surface contamination for the levels of radioactive materials received at USEI. Instruments of this type typically display their results in $\mu\text{R}/\text{Hr}$ ("microR per hour" or mR/Hr ("milliRem per hour"). Gamma detection instruments are used for external surveys of conveyances and containers.. For the purposes of USEI ERMPs, microRem and microR are used as generic terms for a gamma dose rate.

2.2 Contamination Detection Instruments

Contamination detection instruments in use at the USEI facilities include the Ludlum Model 2224 equipped with a Model 43-2-2 phoswich detector. This instrument is effective for alpha and beta radiation, but has poor gamma efficiency. Instruments of this type typically display their results in counts per minute. Contamination detection instruments, such as the Ludlum Model 3 equipped with an Ludlum Model 44-9 probe are used for direct surveys of surfaces that may be contaminated. These instruments can also be used for field assessments of swipes taken on surfaces, or personnel surveys

3.0 INSTRUMENT CARE

Radiation detection instruments are delicate and require careful handling. They can be damaged easily by impacts. Corded instruments are vulnerable to connector or cord failures. A damaged instrument will give erroneous measurements or will not function at all. Each instrument is battery and response checked daily to determine whether it is functioning.

3.1 Instrument Inspection Prior to Use

3.1.1 Inspect the instrument's physical condition. It should be in good condition, with intact bezels and cases. The cords and connectors should not be frayed, split, or loose. The instrument should not rattle when moved or shaken gently.

3.1.2 Turn the instrument's switch to the battery check position. The indication on the meter should show that the battery condition is satisfactory. If not, turn off the instrument, and replace the batteries or get another instrument. Repeat the battery test after replacing the batteries.

3.1.3 Instrument voltage is set at the calibration facility. Do not adjust the instrument's voltage. If the instrument is equipped with a voltage check function, turn the meter on, and depress the voltage check button or move the switch. Then compare the needle reading to the voltage range on the meter face or the calibration record. If the voltage does not fall within the established range do not use the instrument.

3.1.4 Response check the instrument daily when in use by taking a check source of radiation that the instrument is designed to detect and holding it to the instrument (or probe) to determine if the instrument responds. If the instrument responds, it may be used. If the instrument does not respond, remove it from service and notify the RPS. Return the check source to its storage location when finished.

3.2 Protecting the Instrument while In Use

3.2.1 Handle the instrument with care, avoiding banging it into surfaces, or snagging cords.

3.2.2 Contamination detection instruments have very delicate membranes. If the membrane is damaged, the instrument will not work. Avoid allowing the instrument's probe to touch the surface being surveyed.

3.2.3 During periods of inclement weather, gamma detection instruments may be operated while covered by a plastic bag. Contamination detection instruments cannot be operated in conditions involving heavy precipitation.

3.3 Instrument Storage

3.3.1 Instruments shall be stored in a dry location when not in use.

3.3.2 Corded instruments shall be stored such that the cords do not become easily snagged by passing personnel or equipment.

4.0 PERFORMING SURVEYS

4.1 Gamma

4.1.1 Perform the inspections listed in 3.1 above.

4.1.2 If so equipped, switch the instrument response to slow and enable the audio function (the speaker is much more responsive than the needle on the instrument).

4.1.3 Turn on the instrument to the highest scale and look for meter deflection. If there is no deflection, switch to the next lower scale, repeating the process until the meter deflection is within mid-scale as much as possible.

4.1.4 The maximum instrument or probe speed is 2 inches per second.

4.1.5 For conveyances, hold the detector as high as is feasible (to obtain the midpoint of the vertical extent of the material in the conveyance) and as close to contact with the side of the rail car or truck as possible (approx. ½ inch from side of conveyance). Observe the meter response, noting the upper and lower

bounds of the variation. Record the "eye-ball average" reading. (See ERMP-01, Figure 1-1).

Move the detector another approximate four (4') feet in the selected direction and record another reading. Continue in this fashion around the conveyance, recording the readings as they are obtained.

4.1.7 For non-bulk packages, hold the detector within ½ inch of the side of the package. Move the detector in a vertical 6 inch zigzag pattern. At a minimum, the survey shall cover three equally spaced tracks on the sides of a drum and all four sides of a box. Observe the meter response, noting the upper and lower bounds of the variation. Record the readings. (See ERMP-01, Figure 1-4).

4.2 Contamination Surveys

4.2.1 For radioactive material known to emit beta radiation, move the detector at no more than 2" per second at a distance of ½ inch above the surface being surveyed.

4.2.2 For radioactive material that only emits alpha radiation, move the detector at no more than 2" per second at a distance of approximately ¼ inch above the surface being surveyed. Alpha radiation does not travel much further than ½ inch air, so the closer the detector to the surface, the better the efficiency.

4.3.3 Record direct surface contamination surveys on a form approved by the RPS.

5.0 INSTRUMENT CALIBRATION

5.1 Each instrument shall be calibrated annually. The calibration certificate must be maintained by the RPS. The instrument must also have a calibration sticker affixed to its outer surface. The sticker must indicate the model number of the instrument and the date the next calibration is due.

5.2 USEI shall use only those calibration vendors that have the technical expertise to perform such services. That expertise can be evaluated and proven by the vendor's participation in intercomparison programs, validated by independent audits, industry accreditation, or other means as specified by the RSO and RPS. The vendor shall then be recorded in procurement documents or by other means determined by the RPS and RSO. Alternatively, USEI may rely on Approved Vendor Lists from other US Ecology facilities that maintain a quality assurance program.