40-8724

CHEMETRON CORPORATION

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Fort Lauderdale, Florida 33301

Wednesday, March 2, 1994

Mr. Timothy C. Johnson
Section Leader
Materials Decommissioning Section
Decommissioning and Regulatory Issues Branch
US Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Johnson:

Your letter of January 12, 1994, to Mr. David R. Sargent forwarded the NRC's comments on our "Site Remediation Plan - Harvard and Bert Avenue Sites" Revision 0, dated October, 1993. These comments supplemented the comments transmitted with your letter of December 23, 1993.

Attached are the Chemetron responses to the comments forwarded with your letter. After you have reviewed our responses and we have resolved any outstanding issues, we will revise the Site Remediation Plan as appropriate.

If you have any questions, please contact me directly.

Sincerely yours,

Barry Koh, Ph.D.
Project Manager

BK/cmw

Enclosure

cc: T. G. Adams
D. R. Sargent
M. J. Wetterhahn
C. D. Berger

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NRC COMMENTS ON SAR AND DOSE ASSESSMENT

1. Page 3, Appendix B., Geology and Hydrology

Please provide typical geologic cross-sections illustrating the existence of 600 feet of clay, providing protection to the confined aquifer, between the water table and bedrock aquifers.

Response:

Geologic cross sections encompassing the Newburgh Heights area were not included in the available literature. However, other investigations have determined that buried stream valleys exist east of the present Cuyahoga River Valley which have accumulated thick beds of sediment. The portion of the buried valley located in the Lake Plain Physiographic Province is filled with Lacustrine deposits and glacial till, and the bottom of the valley is approximately at sea level.[1] The elevation of the bottom of the ravine at the Bert site is approximately 640 feet msl and represents the top of the Lacustrine Unit. Since the top of the Lacustrine Unit is at 640 feet msl and the bottom of the stream valley is at sea level, approximately 640 feet of clay is present to act as an aquiclude.

2. Page 5, Appendix B., Material Characteristics

The distribution represented by Figure 1 appears to approximate a log-normal distribution from 0 pCi/g to 70 pCi/g. However, above 70 pCi/g the uranium concentrations appear to be higher than predicted by a log-normal distribution. To ensure that the estimates of occupational, public, and accident doses are reasonably conservative, the dose calculations should be based on the arithmetic average of results above 20 pCi/g.

Response:

The mean of a population or set of numbers is "a single number that typifies a set of numbers, such as the arithmetic mean, the geometric mean, or the expected value."[2] The issue of importance is how the data points are distributed above and below the mean value. If they are distributed somewhat evenly, one may refer to this population as being "normally distributed", and the "arithmetic average" typifies the population. However, if the members are clustered to only one side of the mean value, one may no longer refer to this population as being normally distributed. It may, on the other hand, exhibit another type of geometric distribution, such as "lognormal", which means that the "geometric average" typifies the population.

To determine how the uranium concentrations in samples collected at the Bert and Harvard Avenue sites are distributed (e.g., normal, lognormal, or

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1 Ford, J.P., "Glacial and Surficial Geology of Cuyahoga County, Ohio", Division of Geological Survey, Columbus, Ohio, 1987.

2 Parker, S. P., Ed., "McGraw-Hill Dictionary of Scientific and Technical Terms", McGraw-Hill Book Company, New York, 1984.

other) about some mean value, the method of D'Agostino was used.[3]

Figure 1 in Appendix B shows that the radionuclide concentrations at both the Harvard and Bert Avenue sites "appear" to be distributed lognormally, since they are clustered at the low end of the graph. From the D'Agostino method, the following results are obtained:

Location	Distribution (Null Hypothesis)	Y-Statistic	Range of Significance (a=0.05)
Bert Avenue	Normal	-56.958	-2.552 to 1.569
Bert Avenue	Lognormal	-7.247	-2.552 to 1.569
Harvard Avenue	Normal	-17.978	-2.757 to 1.192
Harvard Avenue	Lognormal	-5.680	-2.757 to 1.192

At both sites the lognormal distribution provides a better fit for the radionuclide concentrations than does a normal distribution. Consequently, the "geometric" mean is a better representation of the mean uranium concentration at both sites.

At the Bert Avenue site, the geometric mean concentration of 923 samples is 89 pCi/g. At the Harvard Avenue site, the geometric mean concentration of 306 samples is 36 pCi/g. These mean values are reasonably conservative because they were calculated only for those samples with concentrations in excess of 20 pCi/g. Chemetron considers it unrealistic to artificially skew the mean concentration further by weighting the distribution toward those very few samples with concentrations in excess of the mean.

In the equation for the mean concentration, the term s^2 is the variance and not the term "s" as defined under the equation.

Response:

The typographical error in the definition of variance under the equation will be corrected to reflect s^2.

3. Page 6, Appendix B, Volume of Material

In Section 2.1.1.1.1.1 and in Table 3-9, the volumes of material that will be disposed of in the cells are provided. Provide a discussion and calculations of how the surface and subsurface volumes were derived. Note also that Table 3-9 appears to be incomplete.

Response:

A discussion and calculations of how the surface and subsurface volumes were derived was provided as the response to Comment 74 in Chemetron's

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3 D'Agostino, R. B., 1971, "An Omnibus Test of Normality for Moderate and Large Size Samples", Biometrika, 58:341-348.

letter to Mr. Timothy C. Johnson dated February 7, 1994. The missing values will be added to Table 3-9.

4. Page 7, Appendix B, Process Description

The depth of the Harvard Avenue cell is stated to be three meters. In Section 2.1.1.1.1.1.1 the depth is stated to be three feet. It appears that the correct depth should be three feet.

Response:

The depth of the Harvard Avenue cell is three feet. Appendix B will be revised to reflect this change.

Please provide the bases for the estimated times needed to relocate the contaminated soils at the Harvard Avenue and Bert Avenue sites.

Response:

The estimated times are based on our experience with similar remediation projects involving excavation.

5. Pages 9-11, Appendix B, Potential Exposures Under Normal Operating Conditions

First Bullet: Please provide additional justification for selecting the mass loading factor of 200 micrograms/cubic meter of air. The staff typically uses a mass loading factor of 565 micrograms/cubic meter for construction activities, which is referenced in NUREG/CR-1759, "Data Base for Radioactive Waste Management, Vol. 3," to evaluate potential airborne contamination.

Response:

The estimation of air concentration resulting from resuspension of soils is an empirical process. In view of present resuspension concepts and models, the NCRP states the following:

> **"Healy recommends the use of a dust loading model that combines the dust content in the air with the findings of Anspaugh et al., that the concentration in soils could be related to the concentration in air by assuming that the dust loading is 100 micrograms of the soil per cubic meter. Healy recommended an increase to 200 micrograms/cubic meter to allow for increased inhalation by those people working outdoors in dusty occupations."[4]**

This value of 200 micrograms/cubic meter is greater than resuspension values reported by Till for uranium in soil in Surrey, England and in sites

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4 National Council on Radiation Protection and Measurements, "Exposures from the Uranium Series with Emphasis on Radon and its Daughters", NCRP Report No. 77, 1987.

in New York.[5] With so many variables influencing resuspension (e.g., particle size, weathering of surface deposits, wind velocity, friction velocity), Chemetron considers that the NCRP recommendation, if one assumes constant and continuous dust loading along with continuous personnel occupancy, is suitable for work with soils and results in a conservative estimate of dose. It is for this reason, 200 micrograms/cubic meter was selected as the input parameter for the Appendix B assessments as opposed to the mass loading factor referenced in NUREG/CR-1759 for construction activities.

Second Bullet: The respiratory rate is stated to be 20 1/min or 1.2 x 10^{-3} m^3/hr. The correct respiratory rate for 20 1/m is 1.2 m^3/hr. The subsequent calculations using the incorrect respiratory rate should be corrected.

Response:

The equations on pages 10 and 11 will be modified to reflect the re-calculated CEDE's of 7.5 millirem for the Bert Avenue site, and 1.92 millirem for the Harvard Avenue site. In addition, Table 3 on page 21 will also be modified to reflect the correct values.

The dose calculations presented appear to consider only U-238. The doses from U-234 and U-235 should also be included.

Response:

The U-235 concentration at the Harvard Avenue site was reported by GRAU in 1986 to be approximately one percent of the U-238 concentration in soil samples.[6] Therefore, if U-235 is included in the dose calculations, it contributes less than 5% to the total dose.

On the other hand, depleted uranium is obtained from byproduct tails or residues from isotope separation. As a result of this extraction (separation) process, only the following key radionuclides exist in the series:

U-238 → Pa-234 → Th-234

After physical or chemical separation occurs, the other daughters typically found in the natural uranium series will not return to a state of equilibrium with the parent U-238 for many years. Therefore, U-234 is not considered to be present in sufficient concentration to warrant inclusion in this assessment.

The isotope U-235 and daughters will be included in the dose calculations, and all applicable tables and figures will be modified to reflect the revised values.

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5 Till, J. E., "Radiological Assessment", NUREG/CR-3332, 1983.

6 Boerner, A. J., "Preliminary Results: Chemetron-McGean Industrial Dump Site", Oak Ridge Associated Universities, March 27, 1986.

ICRP, 1974 and FGR, 1988 should be included under the REFERENCES.

Response:

The "References" section of Appendix B will be modified to include the missing ICRP and the USEPA documents.

In Sections 3.1.5.1(1) and 3.1.5.3(1), it is stated that TLD measurement results are consistent with background levels. Please provide references for the measured values of 60 millirem over three months at the Harvard Avenue site, and less than 10 millirem at the Bert Avenue site. If the background levels are 10-12 uR/hr, how can the ambient exposure levels between the Harvard Avenue and Bert Avenue sites be so different?

Response:

In the Final Site Characterization Report, it states the following for the Harvard Avenue site:

> **"The environmental TLD results from Tech/OPS Landauer indicated that with the exception of two TLD'S (east - 20 mrem, 7/15/90 to 10/14/90; and north -60 mrem, 1/15/91 to 4/14/91) all other TLD readings for the past six quarters were reported to be minimal (<10 mrem per quarter). 10 mrem represents the equipment minimum detection limit obtainable due to electronic limitations."[7]**

To interject a conservative bias into the findings of Appendix B, the maximum measured value of 60 millirem was taken to be representative of the Harvard Avenue site.

For the Bert Avenue site, the Final Site Characterization Report states:

> **"The environmental TLD results from Tech/OPS Landauer, Inc. indicates that all TLD readings for the past six quarters were reported to be minimal (<10 mrem per quarter). These results are consistent with background levels established by the control TLD also analyzed quarterly."[8]**

Again, to interject a conservative bias into the findings of Appendix B, a detection limit of 10 millirem, which is typical of environmental TLD, was taken to be representative of the Bert Avenue site.

The calculations for external worker radiation doses of 14 millirem and 55 millirem assured that background exposure rates will be applicable during the construction operations. Since the

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7 Dames & Moore, "Final Site Characterization Report, Harvard and Bert Avenue Sites, Newburgh Heights, Ohio", June 15, 1992.

8 ibid.

uranium concentrations in the contaminated material substantially exceed the background nuclide concentrations, the basis for your assumptions are unclear. Please justify the exposure rate assumptions you have made.

Response:

Even though the uranium concentrations in soil are greater than background uranium concentrations, the results from TLD'S placed around the perimeter of the sites, including locations directly over maximum measured exposure rates, demonstrate that the average ambient exposure rate does not differ significantly from background. This is explained by the fact that the external exposure hazard from depleted uranium is not the limiting factor.

Please provide additional information regarding the suitability of using the CAP88PC code for assessing the maximum dose to a member of the public. We understand that this code is inappropriate for assessing doses at receptors located within 100 meters from the source.

Response:

Chemetron recognizes the limitations of the CAP88PC computer code. The basis for the code is a modified Gaussian plume equation for estimating dispersion of radionuclides from points of release. The Gaussian plume model is the one most commonly used in guidance documents, and produces results that agree with experimental data as well as any model. However, like all models, there are limitations. Generally speaking, the Gaussian plume model is not applicable under conditions of low wind speeds, complex terrain, spatial and temporal changes in wind velocity, and deposition and transformation within the plume during travel. The following table is a summary of the estimated uncertainty associated with predictions from Gaussian plume atmospheric dispersion modeling:[9]

Conditions	Range of the ratio (Predicted/Observed)
Highly instrumented site; ground-level centerline concentration within 10 km of a continuous point source	0.8 - 1.2
Specific hour and receptor point, flat terrain, steady meteorological conditions; within 10 km of release point	0.1 - 10
Ensemble average (e.g., monthly, seasonal, or annual averages) for a specific point; flat terrain, within 10 km of release point	0.5 - 2
Monthly and seasonal averages, flat terrain, 10 to 100 km downwind	0.25 - 4
Complex terrain or meteorology (e.g., sea breeze regimes)	0.01 - 300
Low wind speed, inversion conditions Smooth, unforested terrain Flat, forested terrain Hilly, forested terrain	 $\geq$ 1.3 20 - 40 50 - 500

9 Miller, C. W., ed., "Models and Parameters for Environmental Radiological Assessments", DOE/TIC-11468, 1984.

In each case, the greatest uncertainty tends toward over-estimates of deposition/dose, rather than under-estimation.

8.. Pages 13-14, Appendix B, Potential Exposure During Abnormal Conditions

Provide justification for using the average uranium concentration in the accident dose assessment. Since the trucking and truck fire accidents could occur with the trucks containing higher than average concentrations, the highest soil concentration value reported in the Site Characterization Report should be used.

Response:

See response to USNRC Comment No. 2. Since only 31 out of 923 samples collected at the Bert Avenue site have concentrations that exceed the mean concentration of 89 pCi/g, and since at the Harvard Avenue site only six out of 306 samples exceed the mean concentration of 36 pCi/g, it is reasonable to select the average concentration as being representative of all soils being moved. Furthermore, since the process of excavating soil tends to homogenize contaminant concentrations, the mean concentration would be more representative of the actual concentration in a vehicle.

Is the CAP88PC code valid for receptors located 10 meters from the source?

Response:

See response to USNRC Comment 5.

Fifth Bullet: The unit for the resuspension factor of 1×10^{8} appears to be missing. We assume the appropriate units are 1/m. (Also, see fifth bullet on page 14).

Response:

The fifth bullet on page 13 and the fifth bullet on page 14 will be modified to reflect units of m^{-1} for the resuspension factors.

Please provide flood plain information for the Harvard Avenue and Bert Avenue sites. If the sites are in the 100 year flood plain, the doses, to workers and the public, resulting from site flooding conditions, should be analyzed.

Response:

Flood plain information was included in Section 4.4.2 of the Final Site Characterization Report. This section states that neither the Harvard or the Bert sites are in the 100-year flood plain.

9. Page 21, Appendix B, Table 3

Correct this table to reflect revised calculations based on the above comments. The results of the revised calculations should also be reflected in the radiological control plan, site health and safety plan, and emergency plan, as appropriate.

Response:

The appropriate corrections to Appendix B, Table 3, pursuant to the Response to USNRC Comment No. 5. will be made. Likewise, the radiological control plan, site health and safety plan, and emergency plan will be modified accordingly.

10. Appendix C, General

Provide a conceptual sketch of the exposure pathways used in the dose assessment.

Response:

A sketch of the exposure pathways is included as Attachment 1.

11. Appendix C, Groundwater Parameters, General

Groundwater parameters used in the analyses appear to be derived, in part, from the data presented in Figures 1-16 and 1-17. Are these figures based on new groundwater data not presented in the Final Site Characterization Report? If so, please provide these new data.

Response:

Groundwater parameters used in the analyses were derived from tabulated data provided in Section 4.0 of the Final Site Characterization Report. However, after further analysis it appears that more groundwater flows into the site than described in the Final Site Characterization Report.

It appears that the Bert Avenue groundwater elevation curves, on Figures 1-16 and 1-17, depict a groundwater sink, with groundwater entering from all four sides. It is our understanding that the ravine drains toward a creek in the northeast corner of the site, and the groundwater elevation curves should not be completely closed. Please correct the curves or provide the groundwater elevation data that support the diagrams.

Response:

The ravine does drain toward Burke Brook at the northeast portion of the ravine. However, Burke Brook is channeled and buried between 40 and 50 feet below grade as it exits the ravine and enters the adjacent LTV property. The ravine is also enclosed on all four sides and, therefore, will act as a groundwater sink in all directions. Figures 1-16 and 1-17 will be revised to more accurately depict groundwater flow, but the groundwater contour lines will remain closed.

12. Appendix C, General

For the dose assessment, Chemetron used RESRAD Version 4.10, which was released in September 30, 1991. There have been four subsequent revisions to the RESRAD. The most recent version of RESRAD is Version 5.00, which was released on October 29, 1993. Please note that, in the January 27, 1992, latter, to the NRC, Chemetron committed to using the latest approved version of RESRAD for future runs. Therefore, please revise your RESRAD analyses Version 5.00 or justify why Version 4.10 is acceptable.

Response:

Chemetron was unaware of the availability of validated versions of RESRAD between Version 4.10 and Version 5.00. Version 5.00 was released only 10 days before Appendix C was issued. Therefore, there was insufficient time to obtain and validate Version 5.00 for use in generating this Appendix.

Since the time that Appendix C was submitted to the USNRC, a copy of RESRAD Version 5.01 has been obtained and used, without validation, to re-calculate the dose to the hypothetical farm family. The calculation was performed using the input parameters described in response to Comment 17, below. Also, the calculation included U-235 as well as U-238 as discussed in the response to Comment 5.

The maximum TEDE for the farm family members at the Harvard Avenue and Bert Avenue sites are insignificant. Summary results of the calculations for the Bert Avenue site are included as Attachment 2. These results wil' be supplemented with those from the Harvard Avenue site shortly.

13. Page 7, Appendix C, 2nd Bullet

This bullet indicates that the base of the Harvard Avenue cell will be 7.3m above the groundwater table, and for the base of the Bert Avenue cell, 8.8 m above the groundwater table. Do these depths to the groundwater table apply to the base of the cell or to grade level (see Sections 1.5.3.2 and 1.5.3.3)?

Response:

The bullet comment will be revised to indicate that after remediation, the thickness of the unsaturated zone (measured from grade) is 7.3m at the Harvard site, and 8.8m at the Bert Avenue site.

14. Page 7, Appendix C, 3rd Bullet

NRC policy is to perform dose assessments for unrestricted release assuming no cover depth, since, under unrestricted use conditions, there will be no requirements in place to ensure that the cover will be maintained for the 1000 year assessment period. Please revise the dose assessments, taking no credit for the cover material.

Response:

The basis for the Branch Technical Position (BTP) maximum allowable concentration for depleted uranium of 300 pCi/g (Y-class) under Option 2 is that "under the worst modes of exposure including all significant pathways, the maximum individual dose would not exceed 170 mrem/Yr to any critical organ." The critical organs addressed in the BTP are the lung and the bone. Using ICRP 26 organ weighting factors to convert organ dose to effective dose, the BTP organ dose limit is equivalent to a 20.4 millirem effective dose limit. The maximum TEDE calculated by Version 5.01 of the RESRAD code when no credit is taken for a cover at the Bert Avenue sites is 20.2 millirem.[10] Thus, even if no cover is installed on the property, the limiting condition of the BTP are still preserved. Summary results of the calculations are included as Attachment 3. Preliminary calculations for the Harvard Avenue site yield similar results. The summary results will be forwarded to the NRC shortly.

However, Chemetron considers the RESRAD calculation presented in response to Comment 12, above, the proper assessment of radiation doses to "reasonably maximally exposed" individuals (e.g., farm family members) after remedial actions are complete. Under that scenario, the covers, as described in the Remediation Plan, will be installed prior to release of the sites, and they are assumed to erode at a rate of 6×10^{-5} meters per year. Hence, substantial cover remains even after 1000 years. For an "intruder", to significantly exceed the doses in response to Comment 12 would first require removal of the entire cover at either site prior to constructing a home, growing vegetables, and grazing cattle. This scenario is so unrealistic as to be beyond consideration as reasonable.

As requested, Appendix C will be modified to include assessment results when no credit for the cover is taken at either site.

15. Appendix C, General

Because we can not allow credit to be taken for the effectiveness of the Bert Avenue under-drain system for a 1000 year period, provide a dose assessment considering the effects of the groundwater table rising to the level in the surrounding area (about 665 ft above MSL). See Comment No. 18 in our letter to D. Sargent dated December 23, 1993.

Response:

As stated in the Response to Comment No. 18 in Chemetron's letter to Mr. Timothy C. Johnson dated February 3, 1994, the scenario of groundwater rising into the waste layer is unrealistic and is not included in the design basis of the cell.

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10 Consistent with Chemetron's response to USNRC Comment No. 5c, the initial presence of ^{235}U, ^{238}U, and all pertinent daughter radionuclides are included in these results.

16. Appendix C, Assessment Input Parameters

In your fax, dated December 17, 1993, and your letter to Mr. T.C. Johnson, dated December 22, 1993, you provided your justification for the input parameters used in the dose assessments. Provide the rationale for your use of the RESRAD default values, and explain why these parameters are applicable to the Harvard Avenue and Bert Avenue sites.

Response:

Rationales for the use of default values were provided in our correspondence dated December 17, 1993. Default values were used when site specific data were not available. Default values were either conservative, national averages (as specified in RESRAD User's Guide), or RESRAD default calculations (values calculated by RESRAD from other parameters.

Please provide the following information pertaining to the input parameters provided on December 17, 1993, and December 22, 1993:

HARVARD Avenue Site:

Parameter Names	Value	Provide/ Explain
Thickness (m)	3	Figure 2-3, Remediation Plan shows approximately 1 m
Density of Cover Material (gm/cu cm)	1.65	How was the average obtained?
Contaminated Zone Density (gm/cu cm)	1.65	How was the average obtained?
Contaminated Zone Total Porosity	0.41	How was the average obtained?
Contaminated Zone Hydraulic Conductivity (m/Yr)	0.69	How was the average obtained?
Contaminated Zone "B" Parameter	11.4	Provide Calculations
Saturated Zone Density (g/cu cm)	1.9	How was the average obtained?
Saturated Zone Total Porosity	0.298	How was the average obtained?
Saturated Zone Hydraulic	58	How was the average obtained?

Conductivity (m/Yr)		
Saturated Zone Hydraulic Gradient	0.012	How was the average obtained?
Water Table Drop Rate (m/Yr)	(2.23)	Provide Calculations
Zone 1 Thickness (m)	7.3	Provide Calculations
Zone 1 Hydraulic Conductivity (m/Yr)	0.69	How was the average obtained?

BERT Avenue Site:

Parameter Name	Value	Provide/Explain
Contaminated Zone Area (Sq m)	4900	Provide length and width
Length Parallel to Aquifer (m)	69	Figure 2-6 gives 100 m (330 feet) - Clarify.
Density of Cover Material (gm/cu cm)	1.65	How was the average obtained?
Contaminated Zone Density (gm/cu cm)	1.65	How was the average obtained?
Contaminated Zone Hydraulic Conductivity (m/Yr)	20	How was the average obtained?
Contaminated Zone "B" Parameter	11.4	Provide Calculations
Saturated Zone Density (g/cu cm)	1.65	How was the average obtained?
Saturated Zone Total Porosity	0.33	How was the average obtained?
Saturated Zone Hydraulic Conductivity (m/Yr)	2500	How was the average obtained?
Saturated Zone Hydraulic Gradient	0.075	Provide Calculations
Water Table Drop Rate (m/Yr)	(0.62)	Provide Calculations
Zone 1 Thickness (m)	8.8	Is the bottom of cell at grade? (Figure 2-3)

Zone 1 Hydraulic	20	How was the average obtained?

Response:

See Tables 1 and 2 for the requested explanations for each individual parameter.

TABLE 1
RESPONSE TO COMMENT NO. 16
HARVARD AVENUE SITE

Parameter Name	Value	Justification
Thickness (m)	3	Correct Value is 1m. Parameter will be corrected.
Density of Cover Material (g/cu cm)	1.65	Assuming that cover material would be obtained locally, site specific data was used as an estimate of the cover material density.
Contaminated Zone Density (g/cu cm)	1.65	Density data for sample HW-01 was used as an estimate of contaminated zone density
Contaminated Zone Total Porosity	0.298	Porosity data from HW-01 was used as an estimate of contaminated zone total porosity.
Contaminated Zone Hydraulic Conductivity (m/yr)	0.69	Permeability data from HW-01 was used as an estimate of contaminated zone hydraulic conductivity.
Contaminated Zone "B" Parameter	11.4	RESRAD automatically calculates this value from specific input parameters
Saturated Zone Density (g/cu m)	1.9	Density data from HW-01 was used as an estimate of saturated zone density.
Saturated Zone Total Porosity	0.298	Porosity data from HW-01 was used as an estimate of saturated zone total porosity.
Saturated Zone Hydraulic Conductivity (m/yr)	68	Hydraulic conductivities for HW-01, HW-02, and HW-03 were averaged.
Saturated Zone Hydraulic Gradient	0.012	From Figure 1-7: (694-687.5)/542 = 0.012
Water Table Drop Rate (m/yr)	2.23	Average difference between the max. water level and the min. water level: (2.16+5.14+.87+2.77)/4 = 2.73ft. (0.83m) Value will be corrected.
Zone 1 Thickness (m)	7.3	See Response to Comment No. 13.
Zone 1 Hydraulic Conductivity (m/yr)	0.69	Permeability data from HW-01 was used as an estimate of Zone 1 hydraulic conductivity.

TABLE 2
RESPONSE TO COMMENT NO. 16
BERT AVENUE SITE

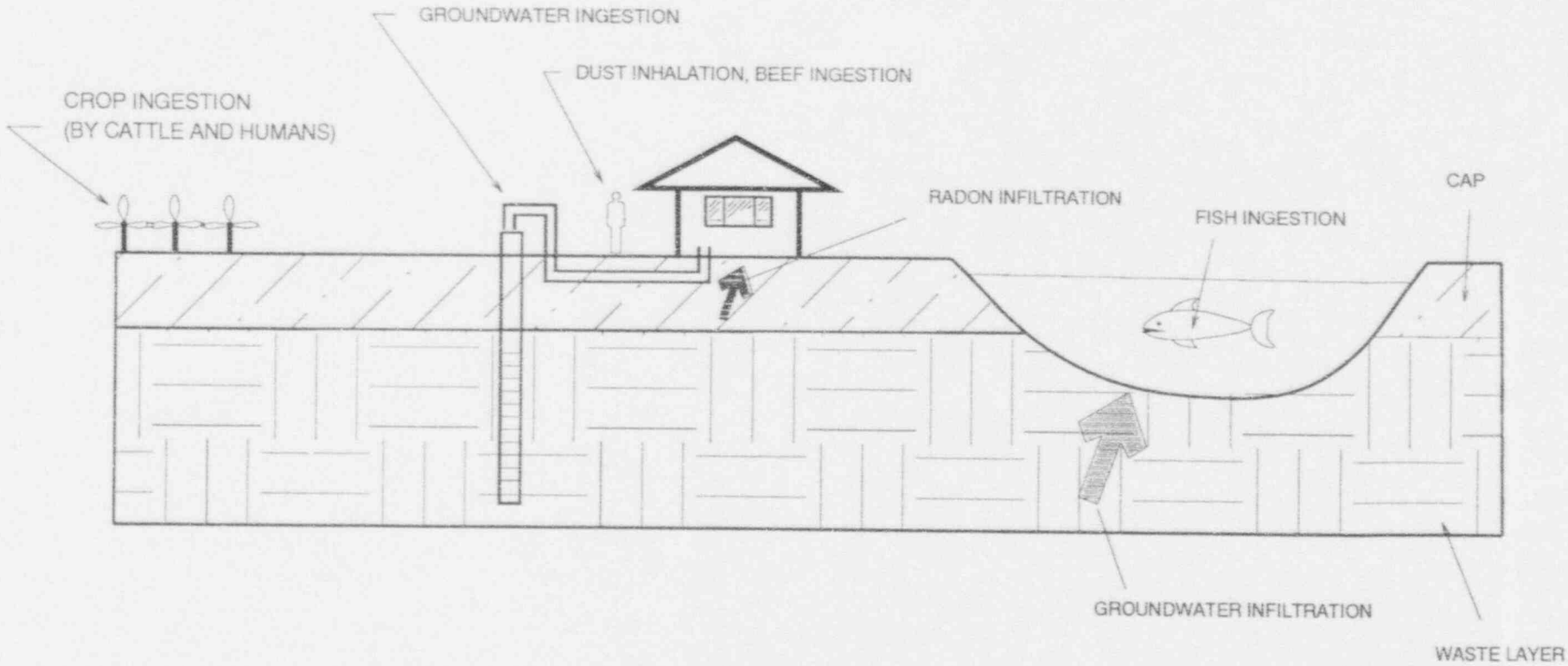
Parameter Name	Value	Justification
Contaminated Zone Area (sq. m.)	4900	This is the correct area for the anticipated waste volume within a 10-foot thick layer. The Bert cell was over-designed. However, additional waste placement exceeding the anticipated waste volume is not expected. Therefore, the specified contaminated zone are is applicable and more accurate.
Length Parallel to Aquifer (m)	69	According to the hydrogeologic data, the long side is oriented perpendicular to groundwater flow direction and, therefore, the aquifer. The short side is parallel to the aquifer. 69m is a conservative estimate of of the side parallel to the aquifer.
Density of Cover Material (g/cu cm)	1.65	Assuming that cover material would be obtained locally, site specific data was used as an estimate of the cover material density.
Contaminated Zone Density (g/cu cm)	1.65	Density data for BB-44 & BB-45 were averaged to estimate density.
Contaminated Zone Total Porosity	0.33	Porosity data for BB-45, BB-55, & BB-56 were averaged to estimate contaminated zone total porosity.
Contaminated Zone Hydraulic Conductivity (m/yr)	20	Conductivity data from BB-44 & BB-45 were averaged to estimate contaminated zone hydraulic conductivity.
Contaminated Zone "B" Parameter	11.4	RESRAD automatically calculates this value from specific input parameters.
Saturated Zone Density (g/cu m)	1.65	Density data for BB-44 & BB-45 were averaged to estimate density.
Saturated Zone Total Porosity	0.33	Porosity data for BB-45, BB-55, & BB-56 were averaged to estimate contaminated zone total porosity.
Saturated Zone Hydraulic Conductivity (m/yr)	2,500	Average of all slug test data for Bert Avenue site that was collected in the Undifferentiated unit.

TABLE 2
RESPONSE TO COMMENT NO. 16
BERT AVENUE SITE

Parameter Name	Value	Justification
Saturated Zone Hydraulic Gradient	0.075	Figure 1-12: (667-638)/390 = .075
Water Table Drop Rate (m/yr)	0.62	Average of minimum and maximum water levels from monitoring wells.
Zone 1 Thickness (m)	8.8	See Response to Comment No. 13.
Zone 1 Hydraulic Conductivity (m/yr)	20	Conductivity data from BB-44 & BB-45 were averaged to estimate contaminated zone hydraulic conductivity.

Attachment 1

Exposure Pathways



SKETCH OF EXPOSURE PATHWAYS
DATE: 2/25/94
SOURCE:

B. Koh & Associates, Inc.

Attachment 2

Summary Results
Bert Avenue Site

Table of Contents

Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary

Menu	Parameter	Current Value	Default	Parameter Name
A-1	Ground external gamma, volume DCF's, (mrem/yr)/(pCi/cm**3):			
A-1	Ac-227+D , soil density = 1.0 g/cm**3	2.760E+00	2.760E+00	DCF1(1,1)
A-1	Ac-227+D , soil density = 1.8 g/cm**3	1.520E+00	1.520E+00	DCF1(1,2)
A-1				
A-1	Pa-231 , soil density = 1.0 g/cm**3	2.210E-01	2.210E-01	DCF1(2,1)
A-1	Pa-231 , soil density = 1.8 g/cm**3	1.210E-01	1.210E-01	DCF1(2,2)
A-1				
A-1	Pb-210+D , soil density = 1.0 g/cm**3	4.870E-03	4.870E-03	DCF1(3,1)
A-1	Pb-210+D , soil density = 1.8 g/cm**3	2.310E-03	2.310E-03	DCF1(3,2)
A-1				
A-1	Ra-226+D , soil density = 1.0 g/cm**3	1.550E+01	1.550E+01	DCF1(4,1)
A-1	Ra-226+D , soil density = 1.8 g/cm**3	8.560E+00	8.560E+00	DCF1(4,2)
A-1				
A-1	Th-230 , soil density = 1.0 g/cm**3	2.110E-03	2.110E-03	DCF1(5,1)
A-1	Th-230 , soil density = 1.8 g/cm**3	1.030E-03	1.030E-03	DCF1(5,2)
A-1				
A-1	U-234 , soil density = 1.0 g/cm**3	1.580E-03	1.580E-03	DCF1(6,1)
A-1	U-234 , soil density = 1.8 g/cm**3	6.970E-04	6.970E-04	DCF1(6,2)
A-1				
A-1	U-235+D , soil density = 1.0 g/cm**3	8.940E-01	8.940E-01	DCF1(7,1)
A-1	U-235+D , soil density = 1.8 g/cm**3	4.900E-01	4.900E-01	DCF1(7,2)
A-1				
A-1	U-238+D , soil density = 1.0 g/cm**3	1.270E-01	1.270E-01	DCF1(8,1)
A-1	U-238+D , soil density = 1.8 g/cm**3	6.970E-02	6.970E-02	DCF1(8,2)
A-3	Depth factors, ground external gamma, dimensionless:			
A-3	Ac-227+D , soil density = 1.0 g/cm**3, thickness = .15 m	7.900E-01	7.900E-01	FD(1,1,1)
A-3	Ac-227+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.700E-01	9.700E-01	FD(1,2,1)
A-3	Ac-227+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,1)
A-3	Ac-227+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.100E-01	9.100E-01	FD(1,1,2)
A-3	Ac-227+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,2)
A-3	Ac-227+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,2)
A-3				
A-3	Pa-231 , soil density = 1.0 g/cm**3, thickness = .15 m	7.900E-01	7.900E-01	FD(2,1,1)
A-3	Pa-231 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,1)
A-3	Pa-231 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,1)
A-3	Pa-231 , soil density = 1.8 g/cm**3, thickness = .15 m	9.200E-01	9.200E-01	FD(2,1,2)
A-3	Pa-231 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,2)
A-3	Pa-231 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,2)
A-3				
A-3	Pb-210+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.800E-01	8.800E-01	FD(3,1,1)
A-3	Pb-210+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,1)
A-3	Pb-210+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,1)
A-3	Pb-210+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.700E-01	9.700E-01	FD(3,1,2)
A-3	Pb-210+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,2)
A-3	Pb-210+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,2)
A-3				

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

Menu	Parameter	Current Value	Default	Parameter Name
A-3	Ra-226+D , soil density = 1.0 g/cm**3, thickness = .15 m	6.300E-01	6.300E-01	FD(4,1,1)
A-3	Ra-226+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.200E-01	9.200E-01	FD(4,2,1)
A-3	Ra-226+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,1)
A-3	Ra-226+D , soil density = 1.8 g/cm**3, thickness = .15 m	8.500E-01	8.500E-01	FD(4,1,2)
A-3	Ra-226+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(4,2,2)
A-3	Ra-226+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,2)
A-3				
A-3	Th-230 , soil density = 1.0 g/cm**3, thickness = .15 m	9.300E-01	9.300E-01	FD(5,1,1)
A-3	Th-230 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(5,2,1)
A-3	Th-230 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(5,3,1)
A-3	Th-230 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(5,1,2)
A-3	Th-230 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(5,2,2)
A-3	Th-230 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(5,3,2)
A-3				
A-3	U-234 , soil density = 1.0 g/cm**3, thickness = .15 m	9.000E-01	9.000E-01	FD(6,1,1)
A-3	U-234 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(6,2,1)
A-3	U-234 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(6,3,1)
A-3	U-234 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(6,1,2)
A-3	U-234 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(6,2,2)
A-3	U-234 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(6,3,2)
A-3				
A-3	U-235+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.700E-01	8.700E-01	FD(7,1,1)
A-3	U-235+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(7,2,1)
A-3	U-235+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(7,3,1)
A-3	U-235+D , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(7,1,2)
A-3	U-235+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(7,2,2)
A-3	U-235+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(7,3,2)
A-3				
A-3	U-238+D , soil density = 1.0 g/cm**3, thickness = .15 m	7.800E-01	7.800E-01	FD(8,1,1)
A-3	U-238+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(8,2,1)
A-3	U-238+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(8,3,1)
A-3	U-238+D , soil density = 1.8 g/cm**3, thickness = .15 m	8.800E-01	8.800E-01	FD(8,1,2)
A-3	U-238+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(8,2,2)
A-3	U-238+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(8,3,2)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.700E+00	6.700E+00	DCF2(1)
B-1	Pa-231	1.300E+00	1.300E+00	DCF2(2)
B-1	Pb-210+D	2.100E-02	2.100E-02	DCF2(3)
B-1	Ra-226+D	7.900E-03	7.900E-03	DCF2(4)
B-1	Th-230	3.200E-01	3.200E-01	DCF2(5)
B-1	U-234	1.300E-01	1.300E-01	DCF2(6)
B-1	U-235+D	1.200E-01	1.200E-01	DCF2(7)
B-1	U-238+D	1.200E-01	1.200E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.500E-02	1.500E-02	DCF3(1)
D-1	Pa-231	1.100E-02	1.100E-02	DCF3(2)
D-1	Pb-210+D	6.700E-03	6.700E-03	DCF3(3)
D-1	Ra-226+D	1.100E-03	1.100E-03	DCF3(4)
D-1	Th-230	5.300E-04	5.300E-04	DCF3(5)
D-1	U-234	2.600E-04	2.600E-04	DCF3(6)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	U-235+D	2.500E-04	2.500E-04	DCF3(7)
D-1	U-238+D	2.500E-04	2.500E-04	DCF3(8)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
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				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

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)	4.900E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICK0
R011	Length parallel to aquifer flow (m)	6.900E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRLD
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)	3.000E+03	3.000E+03	---	T(9)
R011	Times for calculations (yr)	1.000E+04	1.000E+04	---	T(10)
R012	Initial principal radionuclide (pCi/g): U-235	8.700E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	8.700E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	4.000E+00	0.000E+00	---	COVER0
R013	Density of cover material (g/cm**3)	1.650E+00	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	6.000E-05	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.650E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.200E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.140E+01	5.300E+00	---	BCZ
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.700E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-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)	1.650E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.500E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	7.500E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	6.200E-01	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	Individual's use of groundwater (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 1, thickness (m)	8.800E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.910E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	2.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for U-235				
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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.092E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.211E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.012E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
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, external gamma	1.000E+00	1.000E+00	---	FS1
R017	Fractions of annular areas within AREA:				
R017	Outer annular radius (m) = «(1/D)	not used	1.000E+00	---	FRACA(1)
R017	Outer annular radius (m) = «(10/D)	not used	1.000E+00	---	FRACA(2)
R017	Outer annular radius (m) = «(20/D)	not used	1.000E+00	---	FRACA(3)
R017	Outer annular radius (m) = «(50/D)	not used	1.000E+00	---	FRACA(4)
R017	Outer annular radius (m) = «(100/D)	not used	1.000E+00	---	FRACA(5)
R017	Outer annular radius (m) = «(200/D)	not used	1.000E+00	---	FRACA(6)
R017	Outer annular radius (m) = «(500/D)	not used	1.000E+00	---	FRACA(7)
R017	Outer annular radius (m) = «(1000/D)	not used	1.000E+00	---	FRACA(8)
R017	Outer annular radius (m) = «(5000/D)	not used	1.000E+00	---	FRACA(9)
R017	Outer annular radius (m) = «(1.E+04/D)	not used	1.000E+00	---	FRACA(10)
R017	Outer annular radius (m) = «(1.E+05/D)	not used	0.000E+00	---	FRACA(11)
R017	Outer annular radius (m) = «(1.E+06/D)	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)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.100E+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	5.000E-01	5.000E-01	---	FR9
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of meat	-1	-1	0.245E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.245E+00	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
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
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	4.000E-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	5.000E-02	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	1.000E-02	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	2.000E-06	2.000E-06	---	DIFCV
R021	in foundation material	2.000E-08	3.000E-07	---	DIFFL
R021	in contaminated zone soil	2.000E-06	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	6.700E+00	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	1.000E+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)	1.000E+00	1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	2.000E-01	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)

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	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	active

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	4900.00 square meters	U-235	8.700E-01
Thickness:	3.00 meters	U-238	8.700E+01
Cover Depth:	4.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	3.000E+03	1.000E+04
TDOSE(t):	8.984E-23	9.246E-15	2.493E-13	9.194E-12	2.452E-10	8.696E-09	2.076E-07	5.055E-06	4.559E-05	1.303E-04
M(t):	5.989E-24	6.164E-16	1.662E-14	6.129E-13	1.635E-11	5.797E-10	1.384E-08	3.370E-07	3.039E-06	8.690E-06

Maximum TDOSE(t): 1.303E-04 mrem/yr at t = 1.000E+04 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	8.984E-23	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.984E-23	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.984E-23	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.984E-23	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	8.983E-23	0.0000	0.000E+00	0.0000	9.246E-15	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.983E-23	0.0000	0.000E+00	0.0000	9.246E-15	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.246E-15	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.246E-15	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalatior		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	8.982E-23	0.0000	0.000E+00	0.0000	2.493E-13	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.982E-23	0.0000	0.000E+00	0.0000	2.493E-13	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.493E-13	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.493E-13	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	2.208E-30	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	8.979E-23	0.0000	0.000E+00	0.0000	9.194E-12	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.979E-23	0.0000	0.000E+00	0.0000	9.194E-12	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.208E-30	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.194E-12	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.194E-12	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	1.632E-29	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	8.970E-23	0.0000	0.000E+00	0.0000	2.452E-10	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.970E-23	0.0000	0.000E+00	0.0000	2.452E-10	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.632E-29	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.452E-10	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.452E-10	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	1.071E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	8.949E-23	0.0000	0.000E+00	0.0000	8.696E-09	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	8.949E-23	0.0000	0.000E+00	0.0000	8.696E-09	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.071E-28	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.696E-09	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.696E-09	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.081E-28	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	9.131E-23	0.0000	0.000E+00	0.0000	2.076E-07	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	9.131E-23	0.0000	0.000E+00	0.0000	2.076E-07	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.081E-28	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-07	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.076E-07	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	1.489E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	1.905E-22	0.0000	0.000E+00	0.0000	5.055E-06	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	1.905E-22	0.0000	0.000E+00	0.0000	5.055E-06	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.489E-27	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.055E-06	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.055E-06	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.774E-27	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	3.218E-21	0.0000	0.000E+00	0.0000	4.559E-05	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	3.218E-21	0.0000	0.000E+00	0.0000	4.559E-05	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+03 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.774E-27	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.559E-05	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.559E-05	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+04 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	1.885E-26	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
U-238	6.003E-19	0.0000	0.000E+00	0.0000	1.303E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000
Total	6.003E-19	0.0000	0.000E+00	0.0000	1.303E-04	1.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+04 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.885E-26	0.0000
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.303E-04	1.0000
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.303E-04	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	3.000E+03	1.000E+04
U-235	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	0.000E+00	3.316E-41
U-235	Pa-231	1.000E+00	0.000E+00	1.913E 32	5.739E-32	1.914E-31	5.747E-31	1.923E-30	5.829E-30	2.016E-29	6.719E-29	3.240E-28
U-235	Ac-227	1.000E+00	0.000E+00	2.794E-32	2.461E-31	2.538E-30	1.875E-29	1.212E-28	4.633E-28	1.692E-27	5.420E-27	2.134E-26
U-235	ΣDSR(j)		0.000E+00	4.707E-32	3.035E-31	2.730E-30	1.933E-29	1.231E-28	4.691E-28	1.712E-27	5.487E-27	2.166E-26
U-238	U-238	1.000E+00	1.033E-24	1.033E-24	1.032E-24	1.032E-24	1.031E-24	1.027E-24	1.017E-24	9.815E-25	8.867E-25	6.214E-25
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
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
U-238	Ra-226	1.000E+00	0.000E+00	1.063E-16	2.866E-15	1.057E-13	2.818E-12	9.995E-11	2.387E-09	5.811E-08	5.240E-07	1.498E-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	2.803E-44	2.740E-42	2.722E-38
U-238	ΣDSR(j)		1.033E-24	1.063E-16	2.866E-15	1.057E-13	2.818E-12	9.995E-11	2.387E-09	5.811E-08	5.240E-07	1.498E-06

Branch Fraction is the cumulative factor for the j'th 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 = 15 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	3.000E+03	1.000E+04
U-235	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06	*2.160E+06
U-238	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05	*3.360E+05

*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 = 1.000E+04 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
U-235	8.700E-01	1.000E+04	2.166E-26	*2.160E+06	2.166E-26	*2.160E+06
U-238	8.700E+01	1.000E+04	1.498E-06	*3.360E+05	1.498E-06	*3.360E+05

*At specific activity limit

Attachment 3

Summary Results
Bert Avenue Site (no cover)

Summary : Post-closure Pathways Analysis (No Cover) - Bert Avenue Site
File : BERT-4.DAT

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Part I: Mixture Sums and Single Radionuclide Guidelines

Dose Conversion Factor (and Related) Parameter Summary

Menu	Parameter	Current Value	Default	Parameter Name
A-1	Ground external gamma, volume DCF's, (mrem/yr)/(pCi/cm**3):			
A-1	Ac-227+D , soil density = 1.0 g/cm**3	2.760E+00	2.760E+00	DCF1(1,1)
A-1	Ac-227+D , soil density = 1.8 g/cm**3	1.520E+00	1.520E+00	DCF1(1,2)
A-1				
A-1	Pa-231 , soil density = 1.0 g/cm**3	2.210E-01	2.210E-01	DCF1(2,1)
A-1	Pa-231 , soil density = 1.8 g/cm**3	1.210E-01	1.210E-01	DCF1(2,2)
A-1				
A-1	Pb-210+D , soil density = 1.0 g/cm**3	4.870E-03	4.870E-03	DCF1(3,1)
A-1	Pb-210+D , soil density = 1.8 g/cm**3	2.310E-03	2.310E-03	DCF1(3,2)
A-1				
A-1	Ra-226+D , soil density = 1.0 g/cm**3	1.550E+01	1.550E+01	DCF1(4,1)
A-1	Ra-226+D , soil density = 1.8 g/cm**3	8.560E+00	8.560E+00	DCF1(4,2)
A-1				
A-1	Th-230 , soil density = 1.0 g/cm**3	2.110E-03	2.110E-03	DCF1(5,1)
A-1	Th-230 , soil density = 1.8 g/cm**3	1.030E-03	1.030E-03	DCF1(5,2)
A-1				
A-1	U-234 , soil density = 1.0 g/cm**3	1.580E-03	1.580E-03	DCF1(6,1)
A-1	U-234 , soil density = 1.8 g/cm**3	6.970E-04	6.970E-04	DCF1(6,2)
A-1				
A-1	U-235+D , soil density = 1.0 g/cm**3	8.940E-01	8.940E-01	DCF1(7,1)
A-1	U-235+D , soil density = 1.8 g/cm**3	4.900E-01	4.900E-01	DCF1(7,2)
A-1				
A-1	U-238+D , soil density = 1.0 g/cm**3	1.270E-01	1.270E-01	DCF1(8,1)
A-1	U-238+D , soil density = 1.8 g/cm**3	6.970E-02	6.970E-02	DCF1(8,2)
A-3	Depth factors, ground external gamma, dimensionless:			
A-3	Ac-227+D , soil density = 1.0 g/cm**3, thickness = .15 m	7.900E-01	7.900E-01	FD(1,1,1)
A-3	Ac-227+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.700E-01	9.700E-01	FD(1,2,1)
A-3	Ac-227+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,1)
A-3	Ac-227+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.100E-01	9.100E-01	FD(1,1,2)
A-3	Ac-227+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(1,2,2)
A-3	Ac-227+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(1,3,2)
A-3				
A-3	Pa-231 , soil density = 1.0 g/cm**3, thickness = .15 m	7.900E-01	7.900E-01	FD(2,1,1)
A-3	Pa-231 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,1)
A-3	Pa-231 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,1)
A-3	Pa-231 , soil density = 1.8 g/cm**3, thickness = .15 m	9.200E-01	9.200E-01	FD(2,1,2)
A-3	Pa-231 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(2,2,2)
A-3	Pa-231 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(2,3,2)
A-3				
A-3	Pb-210+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.800E-01	8.800E-01	FD(3,1,1)
A-3	Pb-210+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,1)
A-3	Pb-210+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,1)
A-3	Pb-210+D , soil density = 1.8 g/cm**3, thickness = .15 m	9.700E-01	9.700E-01	FD(3,1,2)
A-3	Pb-210+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(3,2,2)
A-3	Pb-210+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(3,3,2)
A-3				

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

Menu	Parameter	Current Value	Default	Parameter Name
A-3	Ra-226+D , soil density = 1.0 g/cm**3, thickness = .15 m	6.300E-01	6.300E-01	FD(4,1,1)
A-3	Ra-226+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	9.200E-01	9.200E-01	FD(4,2,1)
A-3	Ra-226+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,1)
A-3	Ra-226+D , soil density = 1.8 g/cm**3, thickness = .15 m	8.500E-01	8.500E-01	FD(4,1,2)
A-3	Ra-226+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(4,2,2)
A-3	Ra-226+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(4,3,2)
A-3				
A-3	Th-230 , soil density = 1.0 g/cm**3, thickness = .15 m	9.300E-01	9.300E-01	FD(5,1,1)
A-3	Th-230 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(5,2,1)
A-3	Th-230 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(5,3,1)
A-3	Th-230 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(5,1,2)
A-3	Th-230 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(5,2,2)
A-3	Th-230 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(5,3,2)
A-3				
A-3	U-234 , soil density = 1.0 g/cm**3, thickness = .15 m	9.000E-01	9.000E-01	FD(6,1,1)
A-3	U-234 , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(6,2,1)
A-3	U-234 , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(6,3,1)
A-3	U-234 , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(6,1,2)
A-3	U-234 , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(6,2,2)
A-3	U-234 , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(6,3,2)
A-3				
A-3	U-235+D , soil density = 1.0 g/cm**3, thickness = .15 m	8.700E-01	8.700E-01	FD(7,1,1)
A-3	U-235+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(7,2,1)
A-3	U-235+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(7,3,1)
A-3	U-235+D , soil density = 1.8 g/cm**3, thickness = .15 m	1.000E+00	1.000E+00	FD(7,1,2)
A-3	U-235+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(7,2,2)
A-3	U-235+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(7,3,2)
A-3				
A-3	U-238+D , soil density = 1.0 g/cm**3, thickness = .15 m	7.800E-01	7.300E-01	FD(8,1,1)
A-3	U-238+D , soil density = 1.0 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(8,2,1)
A-3	U-238+D , soil density = 1.0 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(8,3,1)
A-3	U-238+D , soil density = 1.8 g/cm**3, thickness = .15 m	8.800E-01	8.800E-01	FD(8,1,2)
A-3	U-238+D , soil density = 1.8 g/cm**3, thickness = 0.5 m	1.000E+00	1.000E+00	FD(8,2,2)
A-3	U-238+D , soil density = 1.8 g/cm**3, thickness = 1.0 m	1.000E+00	1.000E+00	FD(8,3,2)
B-1	Dose conversion factors for inhalation, mrem/pCi:			
B-1	Ac-227+D	6.700E+00	6.700E+00	DCF2(1)
B-1	Pa-231	1.300E+00	1.300E+00	DCF2(2)
B-1	Pb-210+D	2.100E-02	2.100E-02	DCF2(3)
B-1	Ra-226+D	7.900E-03	7.900E-03	DCF2(4)
B-1	Th-230	3.200E-01	3.200E-01	DCF2(5)
B-1	U-234	1.300E-01	1.300E-01	DCF2(6)
B-1	U-235+D	1.200E-01	1.200E-01	DCF2(7)
B-1	U-238+D	1.200E-01	1.200E-01	DCF2(8)
D-1	Dose conversion factors for ingestion, mrem/pCi:			
D-1	Ac-227+D	1.500E-02	1.500E-02	DCF3(1)
D-1	Pa-231	1.100E-02	1.100E-02	DCF3(2)
D-1	Pb-210+D	6.700E-03	6.700E-03	DCF3(3)
D-1	Ra-226+D	1.100E-03	1.100E-03	DCF3(4)
D-1	Th-230	5.300E-04	5.300E-04	DCF3(5)

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

Menu	Parameter	Current Value	Default	Parameter Name
D-1	U-234	2.600E-04	2.600E-04	DCF3(6)
D-1	U-235+D	2.500E-04	2.500E-04	DCF3(7)
D-1	U-238+D	2.500E-04	2.500E-04	DCF3(8)
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	Pa-231 , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(2,1)
D-34	Pa-231 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	5.000E-03	5.000E-03	RTF(2,2)
D-34	Pa-231 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(2,3)
D-34				
D-34	Pb-210+D , plant/soil concentration ratio, dimensionless	1.000E-02	1.000E-02	RTF(3,1)
D-34	Pb-210+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	8.000E-04	8.000E-04	RTF(3,2)
D-34	Pb-210+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	3.000E-04	3.000E-04	RTF(3,3)
D-34				
D-34	Ra-226+D , plant/soil concentration ratio, dimensionless	4.000E-02	4.000E-02	RTF(4,1)
D-34	Ra-226+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,2)
D-34	Ra-226+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	1.000E-03	1.000E-03	RTF(4,3)
D-34				
D-34	Th-230 , plant/soil concentration ratio, dimensionless	1.000E-03	1.000E-03	RTF(5,1)
D-34	Th-230 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	1.000E-04	1.000E-04	RTF(5,2)
D-34	Th-230 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	5.000E-06	5.000E-06	RTF(5,3)
D-34				
D-34	U-234 , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(6,1)
D-34	U-234 , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(6,2)
D-34	U-234 , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(6,3)
D-34				
D-34	U-235+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(7,1)
D-34	U-235+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(7,2)
D-34	U-235+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(7,3)
D-34				
D-34	U-238+D , plant/soil concentration ratio, dimensionless	2.500E-03	2.500E-03	RTF(8,1)
D-34	U-238+D , beef/livestock-intake ratio, (pCi/kg)/(pCi/d)	3.400E-04	3.400E-04	RTF(8,2)
D-34	U-238+D , milk/livestock-intake ratio, (pCi/L)/(pCi/d)	6.000E-04	6.000E-04	RTF(8,3)
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				
D-5	Pa-231 , fish	1.000E+01	1.000E+01	BIOFAC(2,1)
D-5	Pa-231 , crustacea and mollusks	1.100E+02	1.100E+02	BIOFAC(2,2)
D-5				
D-5	Pb-210+D , fish	3.000E+02	3.000E+02	BIOFAC(3,1)
D-5	Pb-210+D , crustacea and mollusks	1.000E+02	1.000E+02	BIOFAC(3,2)
D-5				
D-5	Ra-226+D , fish	5.000E+01	5.000E+01	BIOFAC(4,1)
D-5	Ra-226+D , crustacea and mollusks	2.500E+02	2.500E+02	BIOFAC(4,2)
D-5				

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

Menu	Parameter	Current Value	Default	Parameter Name
D-5	Th-230 , fish	1.000E+02	1.000E+02	BIOFAC(5,1)
D-5	Th-230 , crustacea and mollusks	5.000E+02	5.000E+02	BIOFAC(5,2)
D-5				
D-5	U-234 , fish	1.000E+01	1.000E+01	BIOFAC(6,1)
D-5	U-234 , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(6,2)
D-5				
D-5	U-235+D , fish	1.000E+01	1.000E+01	BIOFAC(7,1)
D-5	U-235+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(7,2)
D-5				
D-5	U-238+D , fish	1.000E+01	1.000E+01	BIOFAC(8,1)
D-5	U-238+D , crustacea and mollusks	6.000E+01	6.000E+01	BIOFAC(8,2)

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)	4.900E+03	1.000E+04	---	AREA
R011	Thickness of contaminated zone (m)	3.000E+00	2.000E+00	---	THICKO
R011	Length parallel to aquifer flow (m)	6.900E+01	1.000E+02	---	LCZPAQ
R011	Basic radiation dose limit (mrem/yr)	1.500E+01	3.000E+01	---	BRLD
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)	3.000E+03	3.000E+03	---	T(9)
R011	Times for calculations (yr)	1.000E+04	1.000E+04	---	T(10)
R012	Initial principal radionuclide (pCi/g): U-235	8.700E-01	0.000E+00	---	S1(7)
R012	Initial principal radionuclide (pCi/g): U-238	8.700E+01	0.000E+00	---	S1(8)
R012	Concentration in groundwater (pCi/L): U-235	not used	0.000E+00	---	W1(7)
R012	Concentration in groundwater (pCi/L): U-238	not used	0.000E+00	---	W1(8)
R013	Cover depth (m)	0.000E+00	0.000E+00	---	COVERO
R013	Density of cover material (g/cm**3)	not used	1.500E+00	---	DENSCV
R013	Cover depth erosion rate (m/yr)	not used	1.000E-03	---	VCV
R013	Density of contaminated zone (g/cm**3)	1.650E+00	1.500E+00	---	DENSCZ
R013	Contaminated zone erosion rate (m/yr)	1.200E-04	1.000E-03	---	VCZ
R013	Contaminated zone total porosity	3.300E-01	4.000E-01	---	TPCZ
R013	Contaminated zone effective porosity	2.000E-01	2.000E-01	---	EPCZ
R013	Contaminated zone hydraulic conductivity (m/yr)	2.000E+01	1.000E+01	---	HCCZ
R013	Contaminated zone b parameter	1.140E+01	5.300E+00	---	BCZ
R013	Humidity in air (g/m**3)	not used	8.000E+00	---	HUMID
R013	Evapotranspiration coefficient	6.000E-01	5.000E-01	---	EVAPTR
R013	Precipitation (m/yr)	8.700E-01	1.000E+00	---	PRECIP
R013	Irrigation (m/yr)	0.000E+00	2.000E-01	---	RI
R013	Irrigation mode	overhead	overhead	---	IDITCH
R013	Runoff coefficient	4.000E-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)	1.650E+00	1.500E+00	---	DENSAQ
R014	Saturated zone total porosity	3.300E-01	4.000E-01	---	TPSZ
R014	Saturated zone effective porosity	2.000E-01	2.000E-01	---	EPSZ
R014	Saturated zone hydraulic conductivity (m/yr)	2.500E+03	1.000E+02	---	HCSZ
R014	Saturated zone hydraulic gradient	7.500E-02	2.000E-02	---	HGWT
R014	Saturated zone b parameter	5.300E+00	5.300E+00	---	BSZ
R014	Water table drop rate (m/yr)	6.200E-01	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	Individual's use of groundwater (m**3/yr)	not used	2.500E+02	---	UW
R015	Number of unsaturated zone strata	1	1	---	NS

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R015	Unsat. zone 1, thickness (m)	8.800E+00	4.000E+00	---	H(1)
R015	Unsat. zone 1, soil density (g/cm**3)	1.910E+00	1.500E+00	---	DENSUZ(1)
R015	Unsat. zone 1, total porosity	3.300E-01	4.000E-01	---	TPUZ(1)
R015	Unsat. zone 1, effective porosity	2.000E-01	2.000E-01	---	EPUZ(1)
R015	Unsat. zone 1, soil-specific b parameter	5.300E+00	5.300E+00	---	BUZ(1)
R015	Unsat. zone 1, hydraulic conductivity (m/yr)	2.000E+01	1.000E+01	---	HCUZ(1)
R016	Distribution coefficients for U-235				
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	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(7)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(7)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(7)
R016	Distribution coefficients for U-238				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(8)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(8,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(8)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(8)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(8)
R016	Distribution coefficients for daughter Ac-227				
R016	Contaminated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCC(1)
R016	Unsaturated zone 1 (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCU(1,1)
R016	Saturated zone (cm**3/g)	2.000E+01	2.000E+01	---	DCNUCS(1)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	2.092E-03	ALEACH(1)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(1)
R016	Distribution coefficients for daughter Pa-231				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(2)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(2,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(2)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(2)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(2)
R016	Distribution coefficients for daughter Pb-210				
R016	Contaminated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCC(3)
R016	Unsaturated zone 1 (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCU(3,1)
R016	Saturated zone (cm**3/g)	1.000E+02	1.000E+02	---	DCNUCS(3)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	4.211E-04	ALEACH(3)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(3)
R016	Distribution coefficients for daughter Ra-226				
R016	Contaminated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCC(4)
R016	Unsaturated zone 1 (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCU(4,1)
R016	Saturated zone (cm**3/g)	7.000E+01	7.000E+01	---	DCNUCS(4)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	6.012E-04	ALEACH(4)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(4)

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R016	Distribution coefficients for daughter Th-230				
R016	Contaminated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCC(5)
R016	Unsaturated zone 1 (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCU(5,1)
R016	Saturated zone (cm**3/g)	6.000E+04	6.000E+04	---	DCNUCS(5)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	7.030E-07	ALEACH(5)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(5)
R016	Distribution coefficients for daughter U-234				
R016	Contaminated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCC(6)
R016	Unsaturated zone 1 (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCU(6,1)
R016	Saturated zone (cm**3/g)	5.000E+01	5.000E+01	---	DCNUCS(6)
R016	Leach rate (/yr)	0.000E+00	0.000E+00	8.408E-04	ALEACH(6)
R016	Solubility constant	0.000E+00	0.000E+00	not used	SOLUBK(6)
R017	Inhalation rate (m**3/yr)	8.400E+03	8.400E+03	---	INHALR
R017	Mass loading for inhalation (g/m**3)	2.000E-04	2.000E-04	---	MLINH
R017	Dilution length for airborne dust, inhalation (m)	3.000E+00	3.000E+00	---	LM
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, external gamma	1.000E+00	1.000E+00	---	FS1
R017	Fractions of annular areas within AREA:				
R017	Outer annular radius (m) = «(1/Ð)	not used	1.000E+00	---	FRACA(1)
R017	Outer annular radius (m) = «(10/D)	not used	1.000E+00	---	FRACA(2)
R017	Outer annular radius (m) = «(20/D)	not used	1.000E+00	---	FRACA(3)
R017	Outer annular radius (m) = «(50/D)	not used	1.000E+00	---	FRACA(4)
R017	Outer annular radius (m) = «(100/D)	not used	1.000E+00	---	FRACA(5)
R017	Outer annular radius (m) = «(200/D)	not used	1.000E+00	---	FRACA(6)
R017	Outer annular radius (m) = «(500/D)	not used	1.000E+00	---	FRACA(7)
R017	Outer annular radius (m) = «(1000/D)	not used	1.000E+00	---	FRACA(8)
R017	Outer annular radius (m) = «(5000/D)	not used	1.000E+00	---	FRACA(9)
R017	Outer annular radius (m) = «(1.E+04/D)	not used	1.000E+00	---	FRACA(10)
R017	Outer annular radius (m) = «(1.E+05/D)	not used	0.000E+00	---	FRACA(11)
R017	Outer annular radius (m) = «(1.E+06/D)	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)	5.400E+00	5.400E+00	---	DIET(5)
R018	Other seafood consumption (kg/yr)	9.000E-01	9.000E-01	---	DIET(6)
R018	Soil ingestion rate (g/yr)	3.650E+01	3.650E+01	---	SOIL
R018	Drinking water intake (L/yr)	4.100E+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	5.000E-01	5.000E-01	---	FR9

Site-Specific Parameter Summary (continued)

Menu	Parameter	User Input	Default	Used by RESRAD (If different from user input)	Parameter Name
R018	Contamination fraction of plant food	-1	-1	0.500E+00	FPLANT
R018	Contamination fraction of meat	-1	-1	0.245E+00	FMEAT
R018	Contamination fraction of milk	-1	-1	0.245E+00	FMILK
R019	Livestock fodder intake for meat (kg/day)	6.800E+01	6.800E+01	---	LFI5
R019	Livestock fodder intake for milk (kg/day)	5.500E+01	5.500E+01	---	LFI6
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
C14	C-12 concentration in water (g/cm**3)	not used	2.000E-05	---	C12WTR
C14	C-12 concentration in contaminated soil (g/g)	not used	3.000E-02	---	C12CZ
C14	Fraction of vegetation carbon from soil	not used	2.000E-02	---	CSOIL
C14	Fraction of vegetation carbon from air	not used	9.800E-01	---	CAIR
C14	C-14 evasion layer thickness in soil (m)	not used	3.000E-01	---	DMC
C14	C-14 evasion flux rate from soil (1/sec)	not used	7.000E-07	---	EVSN
C14	C-12 evasion flux rate from soil (1/sec)	not used	1.000E-10	---	REVSN
C14	Fraction of grain in beef cattle feed	not used	8.000E-01	---	AVFG4
C14	Fraction of grain in milk cow feed	not used	2.000E-01	---	AVFG5
R021	Thickness of building foundation (m)	1.500E-01	1.500E-01	---	FLOOR
R021	Bulk density of building foundation (g/cm**3)	2.400E+00	2.400E+00	---	DENSFL
R021	Total porosity of the cover material	not used	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	not used	5.000E-02	---	PH2OCV
R021	Volumetric water content of the foundation	1.000E-02	3.000E-02	---	PH2OFL
R021	Diffusion coefficient for radon gas (m/sec):				
R021	in cover material	not used	2.000E-06	---	DIFCV
R021	in foundation material	2.000E-08	3.000E-07	---	DIFFL
R021	in contaminated zone soil	2.000E-06	2.000E-06	---	DIFCZ
R021	Radon vertical dimension of mixing (m)	2.000E+00	2.000E+00	---	HMIX
R021	Average annual wind speed (m/sec)	6.700E+00	2.000E+00	---	WIND
R021	Average building air exchange rate (1/hr)	1.000E+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)	1.000E+00	1.000E+00	---	DMFL
R021	Emanating power of Rn-222 gas	2.000E-01	2.500E-01	---	EMANA(1)
R021	Emanating power of Rn-220 gas	not used	1.500E-01	---	EMANA(2)

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	active
7 -- drinking water	active
8 -- soil ingestion	active
9 -- radon	active

Summary : Post-closure Pathways Analysis (No Cover) - Bert Avenue Site
File : BERT-4.DAT

Contaminated Zone Dimensions		Initial Soil Concentrations, pCi/g	
Area:	4900.00 square meters	U-235	8.700E-01
Thickness:	3.00 meters	U-238	8.700E+01
Cover Depth:	0.00 meters		

Total Dose TDOSE(t), mrem/yr
Basic Radiation Dose Limit = 15 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	3.000E+03	1.000E+04
TDOSE(t):	2.025E+01	2.024E+01	2.020E+01	2.009E+01	1.976E+01	1.866E+01	1.584E+01	8.922E+00	1.741E+00	3.171E-02
M(t):	1.350E+00	1.349E+00	1.347E+00	1.339E+00	1.317E+00	1.244E+00	1.056E+00	5.948E-01	1.161E-01	2.114E-03

Maximum TDOSE(t): 2.025E+01 mrem/yr at t = 0.000E+00 years

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.724E-01	0.0233	7.568E-02	0.0037	0.000E+00	0.0000	4.744E-02	0.0023	7.669E-04	0.0000	1.880E-03	0.0001	3.572E-03	0.0002
U-238	6.718E+00	0.3317	7.568E+00	0.3737	0.000E+00	0.0000	4.744E+00	0.2342	7.669E-02	0.0038	1.880E-01	0.0093	3.572E-01	0.0176
Total	7.190E+00	0.3550	7.644E+00	0.3774	0.000E+00	0.0000	4.791E+00	0.2366	7.746E-02	0.0038	1.898E-01	0.0094	3.608E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 0.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.017E-01	0.0297
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.965E+01	0.9703
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.025E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

Radio-	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.720E-01	0.0233	7.564E-02	0.0037	0.000E+00	0.0000	4.757E-02	0.0024	7.847E-04	0.0000	1.878E-03	0.0001	3.573E-03	0.0002
U-238	6.712E+00	0.3317	7.562E+00	0.3737	2.359E-13	0.0000	4.740E+00	0.2342	7.662E-02	0.0038	1.878E-01	0.0093	3.569E-01	0.0176
Total	7.184E+00	0.3550	7.638E+00	0.3774	2.359E-13	0.0000	4.787E+00	0.2366	7.741E-02	0.0038	1.897E-01	0.0094	3.605E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+00 years

Water Dependent Pathways

Radio-	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.015E-01	0.0297
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.964E+01	0.9703
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.024E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.712E-01	0.0233	7.556E-02	0.0037	0.000E+00	0.0000	4.785E-02	0.0024	8.202E-04	0.0000	1.875E-03	0.0001	3.574E-03	0.0002
U-238	6.701E+00	0.3317	7.549E+00	0.3737	6.361E-12	0.0000	4.732E+00	0.2342	7.650E-02	0.0038	1.875E-01	0.0093	3.563E-01	0.0176
Total	7.172E+00	0.3550	7.625E+00	0.3774	6.361E-12	0.0000	4.779E+00	0.2366	7.732E-02	0.0038	1.894E-01	0.0094	3.599E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+00 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	6.009E-01	0.0297
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.960E+01	0.9703
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.020E+01	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways Analysis (No Cover) - Bert Avenue Site
File : BERT-4.DAT

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.685E-01	0.0233	7.535E-02	0.0038	0.000E+00	0.0000	4.887E-02	0.0024	9.434E-04	0.0000	1.864E-03	0.0001	3.582E-03	0.0002
U-238	6.662E+00	0.3317	7.505E+00	0.3736	2.345E-10	0.0000	4.704E+00	0.2342	7.605E-02	0.0038	1.864E-01	0.0093	3.543E-01	0.0176
Total	7.130E+00	0.3550	7.580E+00	0.3774	2.345E-10	0.0000	4.753E+00	0.2366	7.699E-02	0.0038	1.883E-01	0.0094	3.578E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.991E-01	0.0298
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.949E+01	0.9702
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	2.009E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.610E-01	0.0233	7.523E-02	0.0038	0.000E+00	0.0000	5.202E-02	0.0026	1.288E-03	0.0001	1.834E-03	0.0001	3.627E-03	0.0002
U-238	6.551E+00	0.3315	7.380E+00	0.3735	6.245E-09	0.0000	4.626E+00	0.2341	7.478E-02	0.0038	1.833E-01	0.0093	3.484E-01	0.0176
Total	7.012E+00	0.3549	7.456E+00	0.3773	6.245E-09	0.0000	4.678E+00	0.2368	7.607E-02	0.0039	1.851E-01	0.0094	3.520E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+01 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.950E-01	0.0301
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.916E+01	0.9699
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.976E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.365E-01	0.0234	7.677E-02	0.0041	0.000E+00	0.0000	6.355E-02	0.0034	2.403E-03	0.0001	1.735E-03	0.0001	3.873E-03	0.0002
U-238	6.176E+00	0.3311	6.960E+00	0.3731	2.205E-07	0.0000	4.362E+00	0.2338	7.052E-02	0.0038	1.729E-01	0.0093	3.285E-01	0.0176
Total	6.613E+00	0.3545	7.037E+00	0.3772	2.205E-07	0.0000	4.426E+00	0.2372	7.293E-02	0.0039	1.746E-01	0.0094	3.324E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.848E-01	0.0313
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.807E+01	0.9687
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.866E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	3.739E-01	0.0236	8.080E-02	0.0051	0.000E+00	0.0000	8.987E-02	0.0057	4.894E-03	0.0003	1.482E-03	0.0001	4.459E-03	0.0003
U-238	5.220E+00	0.3297	5.886E+00	0.3717	5.201E-06	0.0000	3.689E+00	0.2330	5.964E-02	0.0038	1.462E-01	0.0092	2.778E-01	0.0175
Total	5.594E+00	0.3533	5.967E+00	0.3768	5.201E-06	0.0000	3.779E+00	0.2387	6.454E-02	0.0041	1.477E-01	0.0093	2.823E-01	0.0178

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+02 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	5.554E-01	0.0351
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.528E+01	0.9649
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.584E+01	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	2.172E-01	0.0243	7.562E-02	0.0085	0.000E+00	0.0000	1.196E-01	0.0134	8.227E-03	0.0009	8.527E-04	0.0001	4.764E-03	0.0005
U-238	2.899E+00	0.3249	3.275E+00	0.3670	1.212E-04	0.0000	2.053E+00	0.2301	3.319E-02	0.0037	8.133E-02	0.0091	1.546E-01	0.0173
Total	3.116E+00	0.3492	3.350E+00	0.3755	1.212E-04	0.0000	2.173E+00	0.2435	4.142E-02	0.0046	8.218E-02	0.0092	1.593E-01	0.0179

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+03 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	4.262E-01	0.0478
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.496E+00	0.9522
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	8.922E+00	1.0000

*Sum of all water independent and dependent pathways.

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+03 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	4.537E-02	0.0261	2.997E-02	0.0172	0.000E+00	0.0000	5.826E-02	0.0335	4.378E-03	0.0025	1.741E-04	0.0001	2.069E-03	0.0012
U-238	5.455E-01	0.3133	6.135E-01	0.3524	9.640E-04	0.0006	3.904E-01	0.2242	6.308E-03	0.0036	1.529E-02	0.0088	2.903E-02	0.0167
Total	5.908E-01	0.3393	6.435E-01	0.3696	9.640E-04	0.0006	4.487E-01	0.2577	1.069E-02	0.0061	1.547E-02	0.0089	3.110E-02	0.0179

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 3.000E+03 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.402E-01	0.0805
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.601E+00	0.9195
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	1.741E+00	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways Analysis (No Cover) - Bert Avenue Site
File : BERT-4.DAT

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+04 years

Water Independent Pathways (Inhalation excludes radon)

	Ground		Inhalation		Radon		Plant		Meat		Milk		Soil	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	1.700E-04	0.0054	2.240E-04	0.0071	0.000E+00	0.0000	4.806E-04	0.0152	3.737E-05	0.0012	6.207E-07	0.0000	1.621E-05	0.0005
U-238	1.304E-02	0.4112	2.436E-03	0.0768	1.764E-03	0.0556	1.290E-02	0.4066	2.031E-04	0.0064	1.821E-04	0.0057	2.614E-04	0.0082
Total	1.321E-02	0.4166	2.660E-03	0.0839	1.764E-03	0.0556	1.338E-02	0.4218	2.404E-04	0.0076	1.827E-04	0.0058	2.777E-04	0.0088

Total Dose Contributions TDOSE(i,p,t) for Individual Radionuclides (i) and Pathways (p)
As mrem/yr and Fraction of Total Dose At t = 1.000E+04 years

Water Dependent Pathways

	Water		Fish		Radon		Plant		Meat		Milk		All Pathways*	
Radio-														
Nuclide	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.	mrem/yr	fract.
U-235	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	9.288E-04	0.0293
U-238	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.078E-02	0.9707
Total	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	0.000E+00	0.0000	3.171E-02	1.0000

*Sum of all water independent and dependent pathways.

Summary : Post-closure Pathways Analysis (No Cover) - Bert Avenue Site
File : BERT-4.DAT

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	3.000E+03	1.000E+04
U-235	U-235	1.000E+00	6.917E-01	6.911E-01	6.899E-01	6.859E-01	6.744E-01	6.359E-01	5.375E-01	2.984E-01	5.551E-02	1.543E-04
U-235	Pa-231	1.000E+00	0.000E+00	2.500E-04	7.486E-04	2.481E-03	7.316E-03	2.298E-02	5.814E-02	1.068E-01	5.837E-02	5.030E-04
U-235	Ac-227	1.000E+00	0.000E+00	3.352E-06	2.947E-05	3.021E-04	2.193E-03	1.333E-02	4.279E-02	8.475E-02	4.729E-02	4.104E-04
U-235	ΣDSR(j)		6.917E-01	6.913E-01	6.907E-01	6.886E-01	6.839E-01	6.722E-01	6.384E-01	4.899E-01	1.612E-01	1.068E-03
U-238	U-238	1.000E+00	2.259E-01	2.257E-01	2.253E-01	2.240E-01	2.203E-01	2.077E-01	1.755E-01	9.744E-02	1.813E-02	5.038E-05
U-238	U-234	1.000E+00	0.000E+00	4.500E-07	1.348E-06	4.466E-06	1.317E-05	4.140E-05	1.049E-04	1.940E-04	1.080E-04	9.904E-07
U-238	Th-230	1.000E+00	0.000E+00	3.675E-12	3.304E-11	3.657E-10	3.254E-09	3.476E-08	2.799E-07	2.133E-06	7.340E-06	9.608E-06
U-238	Ra-226	1.000E+00	0.000E+00	2.742E-14	7.393E-13	2.725E-11	7.259E-10	2.563E-08	6.046E-07	1.410E-05	1.122E-04	2.085E-04
U-238	Pb-210	1.000E+00	0.000E+00	9.195E-17	6.931E-15	8.158E-13	5.818E-11	4.895E-09	1.841E-07	5.283E-06	4.470E-05	8.435E-05
U-238	ΣDSR(j)		2.259E-01	2.257E-01	2.253E-01	2.[illegible]E-01	2.203E-01	2.077E-01	1.756E-01	9.765E-02	1.840E-02	3.538E-04

Branch Fraction is the cumulative factor for the j'th 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 = 15 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	3.000E+03	1.000E+04
U-235	2.169E+01	2.170E+01	2.172E+01	2.178E+01	2.193E+01	2.232E+01	2.350E+01	3.062E+01	9.307E+01	1.405E+04
U-238	6.641E+01	6.646E+01	6.657E+01	6.697E+01	6.810E+01	7.222E+01	8.541E+01	1.536E+02	8.151E+02	4.239E+04

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 = 0.000E+00 years

Nuclide (i)	Initial pCi/g	tmin (years)	DSR(i,tmin)	G(i,tmin) (pCi/g)	DSR(i,tmax)	G(i,tmax) (pCi/g)
U-235	8.700E-01	0.000E+00	6.917E-01	2.169E+01	6.917E-01	2.169E+01
U-238	8.700E+01	0.000E+00	2.259E-01	6.641E+01	2.259E-01	6.641E+01