

ENTERGY

**RIVER BEND STATION
STATION OPERATING MANUAL
*RADIATION PROTECTION PROCEDURE**

****OFFSITE DOSE CALCULATION MANUAL
(ODCM) PROCEDURE***

PROCEDURE NUMBER: *RSP-0008
REVISION NUMBER: *5A
Effective Date: *10/01/95

NOTE: SIGNATURES ON FILE

RECEIVED

OCT 01 1995

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*INDEXING INFORMATION

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1.1

INTRODUCTION

1.0

PURPOSE

This manual provides a concise description of the environmental dose models and techniques used to calculate offsite doses resulting from measured or projected releases of radioactive materials from River Bend Nuclear Station. It also provides the methodology for calculating effluent monitoring setpoints and allowable release rates to ensure compliance with the Radiological Effluent Technical Requirements of River Bend Station. This manual also contains a description of the Radiological Environmental Monitoring Program which includes sample point descriptions for both onsite and offsite locations and sampling and analysis frequencies.

The ODCM follows the methodology and models suggested by the "Guidance Manual for Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants" (NUREG-0133, dated October 1978) and "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I" (Regulatory Guide 1.109, Rev. 1, dated October 1977). Alternate calculational methods may be used from those presented as long as the overall methodology does not change or as long as the alternative methods provide results that are more limiting. Also as available, the most up-to-date revision of Regulatory Guide 1.109 dose conversion factors and site-specific environmental criteria may be used.

1.2

RERERENCES

1.2.1

NUREG 0133; Guidance Manual for Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants; October, 1978.

1.2.2

REG. GUIDE 1.109, Rev. 1, October, 1977; Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Compliance with 10 CFR Part 50, Appendix I.

1.2.1

U.S. Code of Federal Regulations; 10CFR20.

1.2.4

River Bend Environmental Report, OLS.

1.2.5

REG. GUIDE 1.111; Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water - Cooled Reactors.

- 1.2.6 River Bend Station USAR
- 1.2.7 River Bend Environmental Report, CPS.
- 1.2.8 U.S. Code Of Federal Regulations, 10CFR50.
- 1.2.9 U.S. Code of Federal Regulations, 40CFR190.
- 1.2.10 NUREG 0543, Methods for Demonstrating LWR Compliance with the EPA Uranium Fuel Cycle Standard (40CFR Part 190)
- 1.2.11 River Bend Station Radiological Environmental Operating Report for 1985
- 1.2.12 River Bend Technical Specifications
- 1.2.13 River Bend Technical Requirements Manual (TRM)

1.3 DEFINITIONS

1.3.1 MEMBER(s) OF THE PUBLIC -

MEMBER(S) OF THE PUBLIC shall include all persons who are not occupationally associated with the plant. This category does not include employees of the utility, its contractors or vendors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational, occupational or other purposes not associated with the plant.

1.3.2 OFFSITE DOSE CALCULATION MANUAL -

The OFFSITE DOSE CALCULATION MANUAL shall contain the methodology and parameters used in the calculation of offsite doses due to radioactive gaseous and liquid effluents and in the calculation of gaseous and liquid effluent monitoring alarm/trip setpoints. It shall also contain a table and figure defining current radiological environmental monitoring sample locations.

1.3.3 SITE BOUNDARY -

The SITE BOUNDARY shall be that line beyond which the land is not owned, leased, or otherwise controlled by the licensee.

1.3.4 UNRESTRICTED AREA - An UNRESTRICTED AREA shall be any area at or beyond the SITE BOUNDARY access to which is not controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, or any area within the site boundary used for residential quarters or for industrial, commercial, institutional, and/or recreational purposes.

1.3.5 VENTILATION EXHAUST TREATMENT SYSTEM -

A VENTILATION EXHAUST TREATMENT SYSTEM is any system designed and installed to reduce gaseous radioiodine and/or radioactive material in particulate form in effluents by passing ventilation or vent exhaust gases through charcoal adsorbers and HEPA filters prior to the release to the environment (such a system is not considered to have any effect on noble gas effluents). Engineered Safety Feature (ESF) atmospheric cleanup systems are not considered to be VENTILATION EXHAUST TREATMENT SYSTEM components.

1.4 RESPONSIBILITIES

1.4.1 Superintendent - Radiation Control

The Superintendent - Radiation Control or designee is responsible for the development and implementation of the "Offsite Dose Calculation Manual [ODCM] Procedure", which involves review of REMP-related ESPs and program changes, as well as coordination of revisions to the ODCM necessitated by results of the REMP and/or annual Land Use Census. The Superintendent - Radiation Control or designee, reviews the ODCM and Annual Radiological Environmental Operating Report prior to its submission for approval by the General Manager - Plant Operations. The Superintendent - Radiation Control or designee, coordinates the preparation of other reports for which the ODCM may provide input (e.g., special reports on excessive doses to members of the public in unrestricted areas attributable to RBS effluents).

1.4.2 Manager - Operations

The Manager - Operations, is responsible for the development and upkeep of the RBS Technical Requirements - Surveillance Test Procedure Cross Reference matrix which includes applicable STP's.

1.4.3 Director - Nuclear Safety

The Director - Nuclear Safety is responsible for identifying proposed changes to the Technical Requirements and other regulatory documents which would alter the Surveillance Test Program requirements.

1.4.4 Manager - Plant Maintenance

The Manager - Plant Maintenance is responsible for developing, maintaining, and adjusting a station-wide schedule for performance of Surveillance Test Procedures.

1.4.5 Superintendent - Chemistry

Superintendent - Chemistry has overall responsibility for the development and implementation of the Radiological Environment Monitoring Program (REMP) to include, as a minimum: developing ODCM related procedures, sampling, report generation, and immediate notification to the Superintendent - Radiation Control of any REMP result which indicates that a reporting level has been exceeded.

1.4.6 Supervisor - Radiation Control

Supervisor - Radiation Control has responsibility for supervising the day to day performance and documentation of Surveillance of the ODCM.

1.4.7 HP/CHEM Specialist

HP/CHEM Specialist has responsibility for the implementation of surveillances and documentation of the ODCM. This responsibility includes timely notification of the Supervisor - Radiation Control of any problem which impacts, or might impact, fulfillment of the Radiological Effluent Technical Requirements and the ODCM.

1.5 PRECAUTIONS AND LIMITATIONS

1.5.1 As per Reference 1.2.12, Licensee-initiated changes to the ODCM/Procedure shall be submitted to the Commission in the Annual Radioactive Effluent Release Report for the period in which the change(s) was made effective.

1.5.2 No changes(s) shall be made to the ODCM/Procedure that will reduce the accuracy or reliability of dose calculations or setpoint determinations.

- 1.5.3 Any change(s) shall be made in accordance with Reference 1.2.12. The change(s) should be recorded on the ODCM/Procedure Revision Sheet (Attachment 1). Major rewrite procedure revisions do not require the use of the ODCM/Procedure Revision Sheet.
- 1.5.4 A change to the ODCM may cause a deviation from methodologies used in the implementing procedures. Any change to RSP-0008 shall have an independent Review from Chemistry, as a minimum, and also requires Chemistry and Radiation Control to meet and discuss changes to RSP-0008 prior to approval to ensure ODCM methodology compliance.

1.6 PREREQUISITES

- 1.6.1 None

2.0 LIQUID EFFLUENT METHODOLOGY

2.1 River Bend Site Description

The River Bend Station Updated Safety Analysis Report (USAR) contains the official description of the site characteristics. The description that follows is a brief summary for dose calculation purposes:

The River Bend Station (RBS) is on a site in West Feliciana Parish, Louisiana, located approximately 24 miles north-northwest of Baton Rouge, Louisiana. This site is just east of the Mississippi River which is used as the source of the RBS major water requirements and which receives the RBS liquid effluents.

The reactor is a General Electric boiling water reactor of the BWR-6 or 1972 product line. Containment is of the Mark 3 design, a free-standing cylindrical steel structure surrounded by a reinforced concrete shield building

2.2 Compliance with 10CFR20 (Liquids)

- 2.2.1 Requirements

In accordance with Technical Requirements 3.11.1.1, the concentration of radioactive material released in liquid effluents to Unrestricted Areas (Figure 1) shall be limited to the concentrations specified in 10CFR20, Appendix B, Table 2, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} uCi/ml total activity. The concentration of radionuclides in liquid waste is determined by sampling and analysis in accordance with Technical Requirements.

2.2.2 Methodology

This section describes the calculational method to be used to determine F_L , the fraction of 10CFR20 limits of release concentrations of liquid radioactive effluents.

2.2.2.1 General Approach

Liquid effluent releases from River Bend Station are discharged through the cooling tower water blowdown which is directed to the Mississippi River. Principal sources of radwaste are from floor drains, phase separators/backwash tank subsystem, recovery sample tanks, and reactor water cleanup (as shown in Figure 4). The liquid radwaste system is operated as a batch system. Only one tank of liquid radwaste is released at a time and is considered a batch.

The radioactive content of each batch release will be determined prior to release in accordance with Table 3.11.1.1.-1 of the RBS Technical Requirements. Compliance with 10CFR20 limits will be determined with the following equation:

NOTE

f_1 shall be administratively controlled to maintain F_L to ≤ 0.3 for most discharges, as identified. If $\sum \frac{C_i}{ECL_i} \leq 0.3$ or if the calculated $f_1 > 75$ GPM, $f_1 = 75$ GPM. For $F_L > 0.3$, other administrative controls should be implemented to ensure discharges shall not exceed 10CFR20 limits

$$F_L = \frac{f_1}{f_1 + f_2} \sum_{i=1}^n \frac{C_i}{(ECL)_i} \quad 2.2.2.1-1$$

$$\text{Where: } f_1 \leq \frac{660}{\sum \frac{C_i}{ECL_i}} - 0.3$$

- F_L = The fraction of 10CFR20 ECL limits resulting from the release source being discharged
- f_1 = The undiluted release rate at monitor location, in gpm
- f_2 = The cooling tower blowdown release rate, in gpm
- C_i = The undiluted concentration of nuclide (i), in uCi/ml from sample assay.
- $(ECL)_i$ = Effluent Concentration Limit of nuclide (i) from Appendix A, in uCi/ml

As long as F_L is less than 1.0, the concentration of the tank is within compliance with 10CFR20 limits.

2.2.2.2. Simplified Approach

For purposes of simplifying the calculations, the value of 1×10^{-8} uCi/ml (unidentified 10CFR20 ECL value) could be substituted for $(ECL)_i$ and the cumulative concentration (C-Total = sum of all identified radionuclide concentrations) or the gross beta-gamma concentration should be substituted for C_i . As long as the diluted concentration ($C\text{-Total} \times f_1 / (f_1 + f_2)$) is less than 1×10^{-8} uCi/ml, the nuclide by nuclide calculation is not required to demonstrate compliance with 10CFR20 ECL limits.

2.3 Determination of Setpoints for Radioactive Liquid Effluent Monitors.

2.3.1 Requirements

Technical Requirements 3.3.11.2 requires the radioactive liquid effluent monitor be operable with their high alarm/trip setpoints set to ensure that limits of Technical Requirements 3.11.1.1 are not exceeded. The high alarm/trip setpoints shall be determined and adjusted by the methodology which follows:

The high alarm setpoint for the liquid effluent radiation monitor is derived from the concentration limit provided in 10CFR20, Appendix B, Table 2, Column 2 applied at the restricted area boundary where the discharge flows into the Mississippi River.

Liquid Monitor Setpoints calculated in accordance with the Methodology presented in this section will be regarded as upper bounds for the actual high alarm setpoints. That is, a lower high alarm setpoint may be established on the monitor, if desired. Alert level setpoints should be established at an appropriate level to give sufficient warning prior to reaching the high alarm setpoint.

2.3.1.2 Liquid Effluent Monitors

Two General Atomics RD-53 monitors are provided to ensure compliance with Technical Requirements limits for liquid releases. The RD-53 is an offline gamma scintillation (NaI) monitor designed for detecting radioactivity in liquids. Each Monitor consists of a removable sample canister surrounded by Pb shielding. A well inside the canister holds the detector within the sample fluid. The two monitors are as follows:

1. Cooling Tower Blowdown Line Monitor (1RMS-RE108)
 - a. Range: 10^1 to 10^7 cpm
2. Liquid Radwaste Effluent Monitor (1RMS-RE107)
 - a. Range: 10^1 to 10^7 cpm

2.3.2 Methodology

The high alarm setpoint does not consider dilution, dispersion, or decay of radioactive material beyond the site boundary. That is, the alarm setpoint is based on a concentration limit at the end of the blowdown line discharge.

2.3.2.1. Liquid Radwaste Effluent Monitor (1RMS-RE107)

A sample of each batch of liquid radwaste is analyzed for I-131 and other principal gamma emitters as specified in Table 3.11.1.1-1 of Technical Requirements 3.11.1.1, for total activity concentration prior to release. The fraction, F_L , of the 10CFR20 ECL limits for unrestricted areas is determined in accordance with the preceding section for the activity concentration released.

NOTE:

A change to the ODCM may cause a deviation from methodologies used in implementing procedures (ie, CSP-0110). Any change to RSP-0008 shall have an independent Review from Chemistry, as a minimum, to ensure ODCM methodology compliance.

The liquid radwaste effluent monitor will terminate a liquid radwaste discharge if activity levels exceed the Technical Requirements limits. The automatic actions associated with a trip of the monitor are:

1. 1LWS-FV197 closes
2. 1LWS-AOV258 opens

An alarm will also be annunciated in the main control room.

The liquid radwaste effluent line radiation monitor alarm setpoint is determined with the equation:

$$S = \frac{A}{F_L} \times g \times M \quad 2.3.2-1$$

where:

- S = the radiation monitor setpoint (cpm or uCi/ml)
- A = the sum of concentrations of gamma-emitting radio-nuclides in the sample, as measured in the laboratory.
- F_L = the fraction of 10CFR20 ECL limits resulting from the release source being discharged.
- g = "Instrument Correction Factor"; the ratio of effluent radiation monitor counting rate to laboratory counting rate or activity concentration in a given batch of liquid (cpm per cpm/ml, cpm per uCi/ml, or uCi/ml per uCi/ml)
- M = "Setpoint Adjustment Factor", error associated with monitor accuracy

NOTE:

A/F_L represents the counting rate of a liquid waste stream that would have the same radionuclide distribution as the given batch, but that would produce a concentration of 1.0 ECL at the point of discharge into the Unrestricted Area.

NOTE

A background determination should be performed prior to each release. Background subtraction may be performed in accordance with the applicable Chemistry procedures.

2.3.2.2. Cooling Tower Blowdown Line Monitor (1RMS-RE108)

The cooling tower monitor alarms at high levels of radioactivity in the normal plant service water / circulating water effluent to the Mississippi River. An alarm will be annunciated in the main control room if predetermined setpoints are exceeded.

The cooling tower monitor alarm setpoint is determined by the equation:

$$\underline{S = 2 \times BKG}$$

2.3.2.2-1

where:

S = the radiation monitor setpoint (cpm or uCi/ml)

BKG = monitor background value (cpm or uCi/ml)

The cooling tower blowdown line is not expected to be a contaminated stream and normally would serve as a dilution source for the final radwaste system effluent discharge. Any significant upward fluctuation in the background level is indicative of a release which could approach 10CFR50 Appendix I limits or 10CFR20 limits when combined with the liquid radwaste effluent.

2.4 Determining the Dose for Radioactive Liquid Effluents

2.4.1 Requirements

Technical Requirements 3.11.1.2 requires the dose or dose commitment to a person offsite due to radioactive material released in liquid effluents be calculated on a cumulative basis at least every 31 days. Dose or dose commitment shall be limited to:

- a) Less than or equal to 1.5 mrem to the total body and to less than or equal to 5 mrem to any organ, during any calendar quarter; and
- b) Less than or equal to 3 mrem to the total body and less than or equal to 10 mrem to any organ during any calendar year.

2.4.2 Methodology

This section provides the methodology to calculate dose to all age groups and organs from all radionuclides identified in the liquid effluents.

The method is based on the methodology suggested by Sections 4.3 and 4.3.1 of NUREG-0133, Rev. 1, November 1978. The dose factors A_{ir} for all viable pathways are listed in Appendix B.

The following equation provides a dose calculation to the total body or any organ for a given age group based on actual release conditions.

$$D_{ir} = \frac{A_{ir} * \Delta t * Q}{DF * D_w} \quad 2.4.2-1$$

$$D_{TOTAL \ r} = \sum_{i=1}^n D_{ir} \quad 2.4.2-2$$

where:

- D_{TOTAL} = The total dose commitment to the organ (τ) due to all releases during the desired time period in mrem.
- $D_{i\tau}$ = Dose commitment from radionuclide (i) received by organ (τ) of the adult age group during the time period (mrem).
- $A_{i\tau}$ = Site related dose commitment factor to the total body or any organ (τ) for each identified radionuclide (i). The $A_{i\tau}$ values listed in Appendix B are site-related to RBS (mrem/hr per uCi/ml).
- Δt = The total time for all batch releases that occurred in the period (hrs).
- Q_i = The total quantity of nuclide (i) released during the interval Δt (uCi).
- D_w = The near field dilution factor. Site specific value is 77.4.
- DF = The total volume of dilution that occurred during the time period (ml).

The doses associated with each isotope may then be summed to provide the cumulative dose over a desired time period (e.g., sum all doses during a 31 day period, calendar quarter, or a year).

2.5 Projecting Dose for Radioactive Liquid Effluents

2.5.1 Requirements

Technical Requirements 3.11.1.3 requires the liquid radwaste treatment system be used to reduce the radioactive materials in liquid wastes prior to their discharge when projected doses due to liquid effluents, to unrestricted areas (Figure 1) would exceed 0.06 mrem to the total body or 0.2 mrem to any organ in a 31 day period.

2.5.2 Methodology

The following calculational methodology shall be performed at least once per 31 day period:

$$LPD = \frac{D_{TOTAL\tau} * 31 + D_{PA}}{X_D} \quad 2.5.2-1$$

$D_{TOTAL\tau}$ = The total dose commitment to the organ (τ) due to all releases during the desired time period.

LPD = Projected dose commitment (mrem) to organ (τ) during the 31 day period from liquid effluents.

X_D = Number of days to date in the current quarter

D_{PA} = The anticipated dose contribution to the total body or any organ τ , due to planned activities during the next 31 day period, if those activities will result in liquid releases that are in addition to routine liquid effluents. If only routine liquid effluents are anticipated, $D_{PA} = 0$.

3.0 GASEOUS EFFLUENT METHODOLOGY

3.1 Introduction

The River Bend Station discharges gaseous effluents through the Main Plant Exhaust Duct, Fuel Building Exhaust Duct, and Radwaste Building Exhaust Duct. The location of these release points in relation to the River Bend site is found in Figure 3. The gaseous effluent streams, radioactivity monitoring points, and effluent discharge points are shown schematically in Figure 2. All gaseous effluent releases from the Radwaste Building Exhaust Duct and Fuel Building Exhaust Duct are assumed to be ground level releases. The Main Plant Exhaust Duct routine releases are treated as a wake split (conditionally elevated) release.

3.2 Data Requirements for Gaseous Effluents

For the purpose of estimating offsite radionuclide concentrations and radiation doses, measured radionuclide concentrations in gaseous effluents and in ventilation air exhausted from the station are relied upon. Table 3.11.2.1-1 in the Technical Requirements identifies the radionuclides in gaseous discharges for which sampling and analysis is done.

When a nuclide concentration is below the LLD for the analysis, it is not reported as being present in the sample.

Historical annual average meteorological information will be used to calculate off-site dose and monitor set points. Modelling will be performed in accordance with the methodologies described in Reg. Guide 1.111 . Rev. 1.

3.3 Instantaneous Release Rate and Setpoint Determination

3.3.1 Instantaneous Release Rate Determination

The instantaneous release rate determination is performed to show compliance with the limits set forth in the TRM.

3.3.1.1. Requirements

Technical Requirements 3.11.2.1 states that the dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary (see Figure 1) shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/year to the total body and less than or equal to 3,000 mrem/year to the skin; and
- b. For I-131, I-133, tritium, and for all radionuclides in particulate form with half-lives greater than 8 days: less than or equal to 1,500 mrem/year to any organ.

3.3.1.2. Methodology

3.3.1.2.1 Total Body and Skin Instantaneous Dose Rate Calculations

To determine the dose rate from noble gases in unrestricted areas, the following formulae are used:

$$DR_{TB} = \sum_{i=1}^n (K_i) \overline{(X/Q)} (\dot{Q}_i) \quad 3.3.1.2.1-1$$

$$DR_{SKIN} = \sum_{i=1}^n (L_i + 11M_i) \overline{(X/Q)} (\dot{Q}_i) \quad 3.3.1.2.1-2$$

where:

- DR_{SKIN} = Dose rate to the skin in mrem/year.
- DR_{TB} = Dose rate to the total body in mrem/year.
- K_i = The total body dose factor due to gamma emissions for each identified noble gas radionuclide (i) in mrem/yr per uCi/m³. Appendix C.
- L_i = Skin dose factor due to beta emissions for each identified noble gas radionuclide (i) in mrem/yr per uCi/m³.
- M_i = The air dose factor due to gamma emissions for each identified noble gas radionuclide (i) in mrad/yr per uCi/m³.
- (X/Q) = The highest calculated annual average relative dispersion factor for any area at or beyond the unrestricted area boundary for all Sectors (sec/m³). Appendix F.
- Q_i = The release rate of radionuclide (i) in gaseous effluents from all releases in uCi/sec.

1.1 = Conversion factor for M_1 from mrad to mrem.

In order to comply with the limits of the TRM, $DR_{TB} \leq 500$ mrem/year and $DR_{skin} \leq 3,000$ mrem/year must be met at the most limiting location, at or beyond the site boundary.

The $\overline{(X/Q)}$ values utilized in equations 3.3.1.2.1-1 and 3.3.1.2.1-2 are based upon maximum long-term annual average $\overline{(X/Q)}$ in the unrestricted area. Appendix F lists the maximum $\overline{(X/Q)}$ values for the RBS release points at the appropriate receptor locations.

To select the most limiting location, the highest $\overline{(X/Q)}$ for each release point is used (from Appendix F):

$$\overline{(X/Q)}_{MM} = 3.31 \times 10^{-6} \text{ sec/m}^3$$

$$\overline{(X/Q)}_{GRD} = 4.21 \times 10^{-5} \text{ sec/m}^3$$

where:

$\overline{(X/Q)}_{MM}$ = Chi/Q for Main Plant exhaust duct (mixed mode)

$\overline{(X/Q)}_{GRD}$ = Chi/Q for Radwaste Building exhaust duct (ground level) and for Fuel Building exhaust duct (ground level)

Appendix F contains the maximum $\overline{(X/Q)}$ and $\overline{D/Q}$ values used in calculating individual doses.

Release rates for all release points must be considered at the same time. If releases are occurring at the same time, the total instantaneous dose for all releases must be less than the limits of Technical Requirements 3.11.2.1. An administrative control limits the release rates for each of the three release points to 1/3 the total Technical Requirements doses.

3.3.1.2.2 Radioiodine, Tritium, and 8-day Particulate Dose Rate Calculations

The following calculational method is provided for determining the dose rate from radioiodine (I-131, I-133), Tritium and particulates with half-lives greater than 8 days and to determine if they are within the limits listed in Section 3.3.1.1.b.

In the calculation to show compliance with the TRM, only the inhalation pathway is considered, since it is the most limiting pathway.

Inhalation Pathway:

$$\underline{DR_{i\&8DPt} = \sum_{i=1}^n (P_i) \overline{(X/Q)} (\dot{Q}_i)} \quad 3.3.1.2.2-1$$

where:

$DR_{i\&8DPt}$ = Dose rate to the organ t for the age group of interest from radioiodines (I-131 and I-133), tritium and 8 day particulates via the inhalation pathway (mrem/yr).

\dot{Q}_i = Release rate of nuclide (i), (uCi/sec).

$\overline{(X/Q)}$ = The highest calculated annual average relative dispersion factor for any area at or beyond the unrestricted area boundary for all Sectors (sec/m³). Appendix F.

P_i = The dose factor for applicable environmental pathway (mrem/yr per uCi/m³). Appendix I.

Values for P_i were calculated for all age groups using the inhalation pathway methodology of NUREG-0133. The P_i values are presented in Appendix I.

3.3.2 Setpoint Determination

3.3.2.1. Requirements

Instrumentation is provided to monitor beta-gamma radiation from radioactive materials released from the River Bend Station in gaseous effluents. Each release point process monitor listed in the TRM includes an alarm (HIGH ALARM) that is set to report when the radioactive noble gas in gaseous effluents (Main Plant exhaust duct, Fuel Building exhaust duct and/or Radwaste Building exhaust duct) is expected to cause a noble gas concentration at ground level offsite resulting in a dose rate equal to or greater than 500 mrem/yr to the total body and/or 3000 mrem/yr to the skin.

The ALERT alarm is set to report when the radioactive noble gas in gaseous effluents (Main Plant exhaust duct, Fuel Building exhaust duct and/or Radwaste Building exhaust duct) is expected to cause a noble gas concentration at ground level offsite that would result in meeting or exceeding either the 5 mrad per quarter gamma air dose or 10 mrad per quarter beta air dose limit (Technical Requirements 3.11.2.2). It is permissible to set the ALERT alarm at twice (2.0) normal (approximately 100 % unit power) detector background if nuisance alarms would result from setpoints based on gamma and beta air dose.

The distribution of radioactive noble gases in a gaseous effluent stream is determined by gamma spectrum analysis of identifiable radionuclides in effluent gas sample(s). Results of one or more previous analyses may be averaged to obtain a representative sample. In the event the distribution is unobtainable from measured data, the distribution of radioactive noble gases based on past data or calculated by the BWR-GALE code may be used.

To allow for multiple sources of releases from the three different release points, the allowable operating setpoints will be administratively controlled to allocate one-third (1/3) of the total allowable release to each of the release sources.

3.3.2.2 Methodology

a. HIGH ALARM Setpoint Determination

This section describes the methodology for determining HIGH ALARM setpoints for the three release points:

1. Wide Range Gas Monitor (WRGM)

Step 1

Determine Q_{TB} as follows:

$$Q_{TB} = \frac{(500)}{n \overline{(X/Q)} \sum_{i=1} (K_i)(f_i)} \quad 3.3.2.2-1$$

where:

- Q_{TB} = maximum acceptable total release rate of all noble gas radionuclides in the gaseous effluent (uCi/sec).
- $\overline{(X/Q)}$ = The highest calculated annual average relative dispersion factor for any area at or beyond the unrestricted area boundary for all Sectors (sec/m³). Appendix F.
- K_i = The total whole body dose factor due to gamma emissions from noble gas radionuclide (i) mrem/yr per uCi/m³ from Appendix C, Table C-1.
- f_i = Fraction of noble gas radionuclide (i) to total noble gas concentration.
- 500 = Whole body exposure limits of 500 mrem/year.

Step 2

Determine Q_s as follows:

$$Q_s = \frac{(3,000)}{n \overline{(X/Q)} \sum_{i=1} [(L_i + 1.1M_i) f_i]} \quad 3.3.2.2-2$$

- Q_s = the maximum acceptable release rate of all gas radionuclides in the gaseous effluent [uCi/sec]
- $L_i + 1.1M_i$ = Calculated total skin dose factor due to emission from noble gas radionuclide (i) mrem/yr/uCi/m³ from Appendix C.

(X/Q) = The highest calculated annual average relative dispersion factor for any area at or beyond the unrestricted area boundary for all Sectors (sec/m^3). Appendix F.

3000 = Skin exposure limit of 3000 mrem/year

Step 3

Select the lower of the Q values (Q_{TB} or Q_S) obtained in Step 1 and Step 2.

NOTE

Actual alarm setpoint in the data-base may be modified to account for loop accuracy.

Step 4

Multiply the Q value selected in Step 3 by 0.33. By multiplying the Q value by a factor of 0.33, the allowable operating setpoints will be administratively controlled to allocate one-third (1/3) of the total allowable release rate to each of the release points. The resultant product will be the actual ODCM release rate HIGH ALARM setpoint for the appropriate WRGM Monitor.

- ii. Particulate and Gas Monitor (P&G) (gas channel only).

Step 1

Perform Steps 1 through 3 of Section 3.3.2.2a.1 above

Step 2

Determine C_m (the maximum acceptable total radioactivity concentration of all noble gas radionuclides for all release points in the gaseous effluent [uCi/cc]):

$$C_m = \frac{(2.12 \times 10^{-3}) Q}{F} \quad 3.3.2.2-3$$

where:

- 2.12×10^{-3} = Unit conversion factor to convert uCi/sec/cfm to uCi/cc.
- Q = Lower of the two Q values, Q_{TB} or Q_S .
- F = The maximum acceptable effluent flow rate at the point of release based on design flow rates (cfm)

NOTE

Actual alarm setpoint in the data-base may be modified to account for loop accuracy.

Step 3

Multiply the C_m value determined in Step 2 by 0.33. By multiplying the C_m value by a factor of 0.33, the allowable operating setpoints will be administratively controlled to allocate one-third (1/3) of the total allowable release to each of the release points. The resultant product will be the actual ODCM activity concentration HIGH ALARM setpoint for the appropriate P&G monitor gas channel.

- b. ALERT Setpoint Determination (Reference 1.2.12)
- i. Wide Range Gas Monitor (WRGM)

Step 1

Determine Q_{G-A} utilizing one of the following methods:

$$Q_{G-A} = \frac{(4)(5)}{n} \quad 3.3.2.2-4$$
$$\frac{(X/Q) \sum_{i=1} M_i f_i}{i=1}$$

Where:

- Q_{G-A} = maximum acceptable total release rate of all noble gas radionuclides in the gaseous effluent [uCi/sec]
- $\overline{(X/Q)}$ = The highest calculated annual average relative dispersion factor for any area at or beyond the unrestricted area boundary for all Sectors (sec/m³). Appendix F.
- 5 = 5 mrads/quarter gamma air dose limit at the unrestricted area boundary.
- M_i = The gamma air dose factor for radioactive noble gas nuclide (i) in mrad-m³/uCi-yr (Appendix C).
- f_i = The fractional abundance of noble gas radionuclide i
- 4 = Number of Quarters Per Year

Step 2

Determine Q_{B-A} utilizing one of following methods:

$$Q_{B-A} = \frac{(4)(10)}{\overline{(X/Q)} \sum_{i=1}^n (N_i) (f_i)} \quad 3.3.2.2-5$$

Where:

- Q_{B-A} = maximum acceptable total release rate of all noble gas radionuclides in the gaseous effluents (uCi/sec).
- (X/Q) = The highest calculated annual average relative dispersion factor for an area at or beyond the unrestricted area boundary for all sectors (sec/m^3) (Appendix F).
- 10 = 10 mrad/quarter (92 days) beta air dose limit at the unrestricted area boundary.
- N_i = The air dose factor due to beta emissions from each noble gas radionuclide (I) in Appendix C.
- f_i = The fractional abundance of noble gas radionuclide i.
- 4 = Number of Quarters Per Year

Step 3

Select the lower of the Q values obtained in Steps 1 and 2, either Q_{G-A} or Q_{B-A} .

Step 4

Multiply the Q value selected in Step 3 by 0.33. By multiplying the Q value by this factor, the allowable operating setpoints will be administratively controlled to allocate one-third (1/3) of the total allowable release rate to each of the release points. The resultant product will be the actual ODCM ALERT setpoint to be entered into the applicable WRGM's RM-80.

Step 5

If the actual ODCM ALERT setpoint determined in Step 4 is less than two times (2.0) the detector background, it is permissible to enter an ALERT setpoint equal to two times (2.0) the normal (approximately 100% unit power) detector background to reduce the possibility of nuisance alarms. The twice background setpoint should provide sufficient indication that an offsite dose limit could possibly be exceeded.

ii.

Particulate and Gas Monitor (P&G) (gas channel only)

Step 1

Perform Steps 1 through 3 of Section 3.3.2.2.b.1 above.

Step 2

Determine C_m (the maximum acceptable total radioactivity concentration of all noble gas radionuclides for all release points in gaseous effluent [uCi/cc]):

$$C_m = \frac{(2.12 \times 10^{-3})Q}{F} \qquad 3.3.2.2-6$$

Where:

- 2.12×10^{-3} = Unit conversion factor to convert uCi/sec/cfm to uCi/cc.
- Q = Lower of the two Q values, Q_{G-A} or Q_{B-A}
- F = The maximum acceptable effluent flow rate at the point of release based on design flow rates (cfm).

Step 3

Multiply the C_m value determined in Step 2 by 0.33. By multiplying the C_m value by this factor, the allowable operating setpoints will be administratively controlled to allocate (1/3) of the total allowable release to each of the release points. The resultant product will be the actual ODCM activity concentration ALERT setpoint. This value is the setpoint to be entered into the applicable P&G monitor's RM-80.

Step 4

If the actual ODCM ALERT setpoint determined in Step 3 is less than two times (2.0) the gas detector background, it is permissible to enter an ALERT setpoint equal to two times (2.0) the normal (approximately 100% unit power) gas detector background to reduce the possibility of nuisance alarms. The twice background setpoint should provide sufficient indication that an offsite dose limit could possibly be exceeded.

3.4 Cumulative Dose Determination for Radioactive Gaseous Effluents

3.4.1 Noble Gases

3.4.1.1 Air Dose

A. Requirements

1. Technical Requirements 3.11.2.2 states that the air dose due to noble gases released in gaseous effluents from each reactor unit to areas at and beyond the site boundary (see Figure 1) shall be limited to the following:
 - i. During any calendar quarter: less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation; and
 - ii. During any calendar year: less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

B. Methodology

This section provides the methodology to calculate the gamma and beta air doses to a maximum receptor location at the site boundary from all noble gas radionuclides identified in the gaseous effluents.

The method is based on the methodology suggested by sections 5.3 and 5.3.1 of NUREG-0133, Rev. 1, November, 1978. The dose factors for beta and gamma air dose are listed in Appendix C and are obtained from Table B-1 of RG 1.109, Revision 1, October 1977.

The following equations provide for air dose calculations based on actual noble gas releases during a specific time interval for radioactive gaseous release sources at the site boundary:

$$D_{\text{Gamma-Air}} = 3.17E-8 \sum_{i=1}^n (M_i) \overline{(X/Q)} (Q_i) \quad 3.4.1.1b-1$$

$$D_{\text{Beta-Air}} = 3.17E-8 \sum_{i=1}^n (N_i) \overline{(X/Q)} (Q_i) \quad 3.4.1.1b-2$$

where:

$D_{\text{Gamma-Air}}$	=	The gamma air dose from radioactive noble gases in mrad.
M_i	=	The gamma air dose factor for radioactive noble gas nuclide (i) in mrad-m ³ /uCi-yr (Appendix C).
3.17E-8	=	Inverse of number of Seconds Per Year in Year/Sec.
$\overline{(X/Q)}$	=	The highest calculated annual average relative dispersion factor (sec/m ³) (Appendix F).
Q_i	=	The quantity of uCi of nuclide (i) released during the period of interest.
$D_{\text{Beta-Air}}$	=	Beta air dose from radioactive noble gases in mrad.
N_i	=	The beta air dose factor for radioactive noble gas nuclide (i) in mrad-m ³ /uCi-yr (Appendix C), Table C-1.

3.4.1.2. Total Body and Skin Dose

A. Requirements

1. Technical Requirements 3.11.4 states that the annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC, due to releases of radioactivity and to radiation from uranium fuel cycle sources, shall be limited to less than or equal to 25 mrems to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.
2. Technical Specification 5.5.4.j requires the limitations on the annual dose or dose commitment to any member of the public due to releases of radioactivity and to radiation from uranium fuel cycle sources, conforming to 40 CFR 190.

Cumulative doses from liquid effluents and gaseous pathways (radioiodines (I-131, I-133), Tritium and particulates with T 1/2 > 8 days) are determined in accordance with Sections 2.4.2 and 3.4.2.5. Cumulative total body and skin doses from noble gas releases are determined in accordance with Section 3.4.1.2b.

B. Methodology

This section provides the methodology to calculate the total body and skin doses to the likely most-exposed MEMBER OF THE PUBLIC from all noble gas radionuclides identified in the gaseous effluents.

The method is based on the methodology suggested in NUREG-0133 is used to calculate the doses in this section. The dose transfer factors required for the calculations are listed in Appendix C of this document and are obtained from Table B-1 of RG 1.109, Revision 1, October, 1977.

Doses to the total body and to the skin, due to actual noble gas releases during a specific time interval, at the location of the likely most exposed MEMBER OF THE PUBLIC, are calculated as follows:

$$D_{\text{Total Body}} = \frac{(S_F)(F_O) \sum (K_i) (\overline{X/Q})(Q_i)(T)}{(5.256E+5)} \text{ which Reduces to}$$

$$D_{\text{Total Body}} = (S_F)(F_O)(3.17E-8) \sum_{i=1}^n (K_i) (\overline{X/Q})(Q_i)$$

3.4.1.2b.-1

$$D_{\text{Skin}} = \frac{(S_F)(F_O) \sum (L+1.1M) (\overline{X/Q})(Q_i)(T)}{(5.256E+5)} \text{ Which Reduces To}$$

$$D_{\text{skin}} = (S_F)(F_O)(3.17E-8) \sum_{i=1}^n (L+1.1M) (\overline{X/Q})(Q_i)$$

3.4.1.2b.-2

Where:

$D_{\text{Total Body}}$ = The total body dose from radioactive noble gases in mrem.

K_i = The total whole body dose factor due to gamma emissions from noble gas radionuclide (i) (mrem/sec per uCi/m³) from Appendix C, Table C-1.

$\overline{(X/Q)}$ = The highest calculated annual average relative dispersion factor for an area at or beyond the unrestricted area boundary for all sectors (sec/m³) (Appendix F).

NOTE

When calculating $D_{\text{Total Body}}$ and D_{skin} for determining 40CFR190 compliance as reported in the Annual Radioactive Effluent Release Report, $\overline{(X/Q)}$ values based on either historical annual-average meteorological data, or on data for the actual period of release, may be used.

Q_i = Release rate of nuclide(i), (μCi/sec)

Q_i = The number of μCi of noble gas nuclide (i) released during the period of interest.

T = Time period of Interest in Minutes

D_{skin} = The skin dose from radioactive noble gases in mrem.

M_i = The gamma air dose factor due to gamma emissions from each noble gas radionuclide (i) released.

F_o = Occupancy Factor defined for the receptor at the given location

3.17E-8 = Inverse of the number of seconds per year in yr/sec

L_i = The skin dose factor due to beta emissions from noble gas radionuclide (i) (mrem/sec per $\mu\text{Ci}/\text{m}^3$) from Appendix C, Table C-1.

1.1 = Average ratio of tissue to air energy absorption coefficients.

S_F = 0.7, attenuation factor accounting for shielding provided by residential structures for maximally exposed individual.

$5.256\text{E}+5$ = minutes per year

3.4.1.3 Radioiodine, Tritium, and 8 Day Particulate Dose to Any Organ from Cumulative Releases

A. Requirements

1. Technical Requirements 3.11.2.3 states that the dose to a Member of the Public from Radioiodines (I-131, I-133), Tritium, and Particulates with $T_{1/2} > 8$ days in gaseous effluents released, from each reactor unit, to areas at and beyond the site boundary shall be limited to the following:

- i. During any calendar quarter: less than or equal to 7.5 mrem to any organ; and
- ii. During any calendar year: less than or equal to 15 mrem to any organ.

The dose to a member of the Public shall be determine at least once per 31 days for the current calendar quarter and current calendar year.

2. Technical Requirement 3.11.4 states that the Annual (Calendar year) dose or dose commitment to any Member of the Public, due to releases of radioactivity and to radiation from Uranium Fuel Cycle sources, shall be limited to less than OR equal to 25 mrem to the total body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrem.

B. Methodology

1. The following calculational method is provided for determining the organ dose due to releases of radioiodines (I131, I133), tritium and particulates. It is based on Section 5.3.1 of NUREG-0133, Rev. 1, November 1978. The equation can be used for any age group provided that the appropriate dose factors are used and the total dose reflects only those pathways that are applicable to the age group. The total dose to an organ can then be determined by summing the pathways that apply to the receptor. The equations are:

Inhalation Pathways:

$$D_{I\&SDP_r} = (3.17 \times 10^{-8})(F_0) \sum_{i=1}^n (P_{ir})(\overline{X/Q})(Q_i) \quad 3.4.1.3-1$$

Ground Plane Pathway:

$$D_{I\&SDP_r} = (3.17 \times 10^{-8})(F_0) \sum_{i=1}^n (R_{ir})(\overline{D/Q})(Q_i) \quad 3.4.1.3-2$$

Contaminated Forage/Cow/Milk Pathway:

$$D_{I\&8DP\tau} = (3.17 \times 10^{-8})(F_o) \sum_{i=1}^n (R_{ir}) \overline{(D/Q)}(Q_i) \quad 3.4.1.3-3$$

Contaminated Forage/Goat/Milk Pathway:

$$D_{I\&8DP\tau} = (3.17 \times 10^{-8})(F_o) \sum_{i=1}^n (R_{ir}) \overline{(D/Q)}(Q_i) \quad 3.4.1.3-4$$

Contaminated Forage/Meats:

$$D_{I\&8DP\tau} = (3.17 \times 10^{-8})(F_o) \sum_{i=1}^n (R_{ir}) \overline{(D/Q)}(Q_i) \quad 3.4.1.3-5$$

Fresh Fruits and Vegetables:

$$D_{I\&8DP\tau} = (3.17 \times 10^{-8})(F_o) \sum_{i=1}^n (R_{ir}) \overline{(D/Q)}(Q_i) \quad 3.4.1.3-6$$

Total Dose:

$$D_{\tau} = \sum_{z=1}^n D_{I\&8DP\tau} \quad 3.4.1.3-7$$

Where:

$D_{I\&8DP\tau}$ = Dose to the organ (τ) for the age group of interest from radioiodines (I-131, I-133), tritium and 8-day particulates via the pathway of interest.

F_o = Occupancy factor defined for the receptor at the given location

D_{τ} = Total dose in mrem to the organ (τ) of a specified age group summed over all applicable pathways (Z).

- Z = All the applicable pathways for the age group of interest.
- P_{it} = Inhalation dose conversion factor mrem/yr per uCi/m³
- Q_i = The number of uCi of nuclide (i) released during the year of interest.
- R_{it} = The dose factor for nuclide (i) for pathway (Z) to organ (τ) of the specified age group. For tritium, a site-specific absolute humidity (H) value of 12.9 gm/m³ was used for calculation. (See Appendix I.) The units are:

$\frac{\text{mrem-m}^3}{\text{yr-uCi}}$ for pathways using $\overline{(X/Q)}$

or

$\frac{\text{mrem-m}^2\text{-sec}}{\text{yr-uCi}}$ for pathways using $\overline{(D/Q)}$

$\overline{(D/Q)}$ = A long-term relative deposition value for elevated and ground level releases m⁻².

$\overline{(X/Q)}$ = The $\overline{(X/Q)}$ value for a specific location where the receptor is located (Sec/m³)

3.17×10^{-8} = The inverse of the number of seconds per year (years/sec).

NOTE

When calculating organ doses due to the release of C-14 and/or tritium (H-3), $\overline{(X/Q)}$ values (not $\overline{(D/Q)}$ values) must be used for cow milk, goat milk, meat and vegetation pathway calculations.

3.5 Dose Projection - Determination of Need to Operate Ventilation Exhaust Treatment System

3.5.1 Requirement

Technical Requirements 3.11.2.5 requires that the ventilation exhaust treatment system be used to reduce radioactive material in waste prior to discharge when the projected dose due to gaseous effluents (radioiodines (I-131, I-133), particulates $T_{1/2} > 8$ days and H-3) would exceed 0.3 mrem to any organ in a 31 day period.

NOTE

The ventilation exhaust treatment system does not reduce the noble gas concentration in plant effluents (See Definition 1.3.5).

3.5.2 Methodology

The following calculation method is provided for determining the projected doses:

$$G_{PD} = \frac{D_t}{X_D} * 31 + D_{PA} \quad 3.5.2-1$$

where:

- G_{PD} = Projected dose due to radioiodines (I-131, I-133), particulates with $T_{1/2} > 8$ days and H-3 during the current 31 day period (mrem).
- X_D = The number of days to date in the current quarter
- D_t = Cumulative total dose due to radioiodines (I-131, I-133), particulates with $T_{1/2} > 8$ days and H-3 during the current quarter (mrem).
- D_{PA} = The anticipated dose contribution to the total body or any organ τ due to planned activities during the next 31 day period, if those activities will result in gaseous releases that are in addition to routine gaseous effluents. If only routine effluents are anticipated, $D_{PA} = 0$. This value may be adjusted to account for any changes in operating conditions that could significantly alter actual releases, such as failed fuel or changes in ventilation flow rate.

A dose projection would be based on the latest results of the monthly calculations of the dose due to radioiodines (I-131, I-133), particulates with T 1/2 > 8 days, and H-3 (Section 3.4.1.3).

4.0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Table 4.1 contains the sample point description, sampling and collection frequency, analysis, and analysis frequency for various exposure pathways in the vicinity of RBS for the radiological monitoring program. Figures 1 and 5 indicate the locations of the various onsite and offsite sampling points and TLD locations.

This section describes only those elements of the radiological environmental monitoring program required by the RBS Technical Requirements. Additional exposure pathways, sample points, analyses, and/or frequencies are performed as described in ER-OLS Section 6.2.

Samples of groundwater are taken from onsite wells located to intercept any potential contamination of the Upland Terrace Aquifer so that any such contamination would be detected before migrating beyond RBS site boundaries.

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
1. Airborne Particulates and I- 131	Samples from 5 locations:		
	AA1. River Bend Training Center; 1.7 km N.	Continuous air sampler with filter collection weekly or as required by dust loading, whichever is more frequent.	Charcoal cartridge: analysis weekly for I-131. Particulate sampler: gross beta activity following filter changes; composite for gamma isotopic quarterly.
	AR1. River Bend Station North Access Road at Gate #3; 0.8 km NNW.		
	AP1. Near River Bend Station Onsite Garden #1; 0.9 km WNW.		
	AQS2. St. Francis Substation on US Hwy. (Bus.) 61 in St. Francisville; 5.8 km NW (Community Location).		
	ALC. Parlange Power Center in Oscar; 20 km SW (Control).		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 2)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
2. Direct Radiation	Measurements from 40 locations:		
	INDICATOR STATIONS		
	TA1. River Bend Training Center; 1.7 km N.	Thermoluminescence dosimeters (TLDs); deployment/retrieval quarterly.	Gamma dose quarterly.
	TA2. Siren pole 100 m west of LA Hwy. 10 and WF2 in Elm Park; 8 km N.		
	TB1. River Bend Station iron yard area; 0.5 km NNE.		
	TB2. Stub pole at Jct. LA Hwy. 965 and Audubon Lane (WF17); 5 km NNE.		
	TC1. Stub pole at Jct. US Hwy. 61 and Old Highway 61; 1.7 km NE.		
	TC2. Stub pole along LA Hwy. 966, 0.6 km S of Jct. LA Hwys. 966 and 965; 7 km NE.		
	TD1. Stub pole along WF7, 150m S of Jct. WF7 and US Hwy. 61; 1.6 km ENE.		
	TD2. Stub pole along LA Hwy. 966, 4 km S of Jct. LA Hwys. 966 and 965; 6.3 km ENE.		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 3)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
	TE1. Stub pole along WF7, 1 km S of Jct. WF7 and USHwy. 61; 1.3 km E.		
	TE2. Gravel Power Center on LA Hwy. 68, 2 km N of Jct. LA Hwys. 68 and 964; 10 km E.		
	TF1. Stub pole along WF7, 1.6 km S of Jct. WF7 and US Hwy. 61; 1.3 km ESE.		
	TF2. on LA Hwy. 954, 0.6 km N of Jct. LA Hwy. 954 and US Hwy. 61; 6 km ESE.		
	TG1. Stub pole along WF7, 2 km S of Jct. WF7 and US Hwy. 61; 1.6 km SE.		
	TG2. Telephone pole at gate to Marathon Tank Farm on US Hwy. 61, near Delombre, 7.5 km SE.		
	TH1. Stub pole at power line crossing of WF7 (near Grants Bayou); 1.7 km SSE.		
	TH2. First telephone pole on LA Hwy. 964 N of entrance to papermill; 5.5 km SSE.		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 4)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
	TJ1. Stub pole near River Bend Station Gate #23 on Powell Station Road (LA Hwy. 965); 1.5 km S.		
	TJ2. Large tree along River Road, 100 m N of papermill intake structure; 5.8 km S.		
	TK1. GSU utility pole #L10178 on Powell Station Road (LA Hwy. 965), 20 m S of River Bend Station River Access Road; 0.9 km SSW.		
	TK2. Stub pole at Jct. LA Hwys. 414 and 415; 8 km SSW.		
	TL1. First utility pole on Powell Station Road (LA Hwy. 965) S of former Illinois Central Gulf RR crossing; 1.0 km SW.		
	TL2. Second utility pole along LA Hwy. 415 E of Louisiana and Arkansas RR crossing (near Patin's Dike); 9.5 km SW.		
	TM1. Third utility pole on Powell Station Road (LA Hwy. 965) N of former Illinois Central Gulf RR crossing; 0.9 km WSW.		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 5)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
	TM2. Utility pole along LA Hwy. 981, about 3 km S of Jct. LA Hwys. 981 and 10 (west bank ferry landing); 4.2 km WSW.		
	TN1. Utility pole along Powell Station Road (LA Hwy. 965), between River Bend Station Gates #13 and 14; 0.9 km W.		
	TN2. Utility pole with electrical meter near west bank ferry landing (LA Hwy. 10); 6.0 km W.		
	TP1. Near River Bend Station Onsite Garden #1; 0.9 km WNW.		
	TP2. Stub pole about 1.5 km N of Illinois Central Gulf RR trestle on Tunica Street, western outskirts of St. Francisville, 7.3 km WNW.		
	TQ1. GSU property sign pole along Powell Station Road (LA Hwy. 965), about 1 km N of River Bend Station North Access Road; 1.4 km NW.		
	TQ2. GSU pole with street lights at Jct. North Commerce and American Beauty Streets, St. Francisville; 6.9 km NW.		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 6)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
	TR1. River Bend Station North Access Road across from Main Plant entrance; 0.8 km NNW.		
	TR2. Tree on north side of WF2 past gravel road to the south, about 1.8 km E of Jct. WF2 and US Hwy 61; 8 km NNW.		
	CONTROL/SPECIAL STATIONS		
	TAC. Telephone pole along US Hwy. 61 about 200 m N of Hamilton Station Water Tower, near Wakefield; 18 km N (Control).		
	TLC. Parlange Power Center in Oscar; 20 km SW (Control).		
	TQS1. Utility pole front of Pentecostal church (opposite West Feliciana West Feliciana Hospital) near Jct. US Hwy. 61 and Ferdinand Street; 4 km NW (Special).		
	TQS2. St. Francis Substation on US Hwy. 61 in St. Francisville/ 5.8 km NW (Special).		
	TLS. Utility pole near False River academy sign at edge of New Roads; 9.9 km SW (Special).		

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 7)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
	TGS. GSU Service Center compound in Zachary; 17 km SE (Special).		
	THS. Roof of GSU Service Office Building, North Blvd., Baton Rouge; 40 km SSE (Special).		
	SURFACE WATER (1)		
3. Waterborne	SWU. Mississippi River about 4 km upstream from the plant liquid discharge outfall, near LA Hwy. 10 ferry crossing.	Weekly grabs composited over monthly and quarterly periods.	Monthly composite: gamma isotopic analysis; Quarterly composite: tritium analysis.
	SWD. Mississippi River about 4 km downstream from plant liquid discharge outfall, near papermill.		
	Discharge Line. At blowdown line along River Access Road.	Hourly grabs composited over monthly and quarterly periods.	
	GROUNDWATER		
	WU. Upland Terrace Aquifer well upgradient from plant, about 470 m NNE.	Quarterly grab.	Gamma isotopic and tritium analysis quarterly.
	WD. Upland Terrace Aquifer well downgradient from plant, about 470 m SW.		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 8)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
	SHORELINE SEDIMENT		
	SED. Mississippi River about 4 km downstream from plant liquid discharge outfall, near papermill.	semianual grab	Gamma isotopic analysis semiannually.
4. Ingestion	FISH AND INVERTEBRATES		
	FU. One sample of each of three commercially and/or recreationally important species from upstream area not influenced by plant discharge.	Seasonally when available or semiannually.	Gamma isotopic analysis on edible portions.
	FD. One sample of each of three commercially and/or recreationally important species from downstream area influenced by plant discharge.		

TABLE 4.1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Page 9)

Exposure Pathway and/or Sample	Sample Point, Description, Distance, and Direction	Sampling and Collection Frequency	Type and Frequency of Analysis
PRODUCE			
	G1/G2. Two samples of each of three different kinds of leafy vegetables from onsite gardens near the site boundary of highest calculated annual average ground-level D/Q if three milk sampling areas not available (2).	Monthly during growing season.	Gamma isotopic and I-131 analyses monthly.
	GQC. One sample of each of three similar vegetables from LA State Penitentiary at Angola, 35 km NW (Control).		

NOTES:

1. *The upstream sample will be taken at a distance beyond influence of the plant discharge. The downstream sample will be taken in an area beyond but near the mixing zone.*
2. *If milk-producing animals become available within a 5-km radius of the plant, up to 3 samples from these animals will be analyzed in lieu of the leafy vegetable samples from onsite gardens in high dose-potential areas.*

5.0 40CFR190 CONSIDERATIONS

5.1 Compliance with 40CFR190

Compliance with 40CFR190 as prescribed by Technical Requirements 3.11.4 is to be demonstrated only when one or more of Technical Requirement(s) 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3a, and 3.11.2.3.b, including direct radiation are exceeded by a factor of 2. Once this occurs, EOI has 30 days to submit a report in accordance with Requirement 3.11.4.

5.2 Calculations Evaluating Conformance with 40CFR190

To perform the calculations to evaluate conformance with 40CFR190, an effort is made to develop doses that are realistic by removing assumptions that lead to overestimates of dose to a Member of the Public (i.e., calculations for compliance with 10CFR50 Appendix I). To accomplish this, the following calculational rules are used:

- 5.2.1 Doses to Members of the Public via the liquid release pathway are considered to be < 1 mrem/yr (Ref NUREG-0543).
- 5.2.2 Doses to a member of the Public due to a milk pathway will be evaluated only as can be shown to exist. Otherwise, doses via this pathway will be estimated as < 1 mrem/yr.
- 5.2.3 Environmental sampling data which demonstrate that no pathway exists may be used to delete a pathway to man from a calculation.
- 5.2.4 To sum numbers represented as "less than" (<), use the value of the largest number in the group.
- e.g., <5 + <1 + <1 + <3 = <5
- 5.2.5 When doses via direct radiation are added to doses via inhalation pathway, they will be calculated for the same distance in the same sector.
- 5.2.6 The calculational locations for a Member of the Public will only be at residences or places of employment.

NOTE

Additional assumptions may be used to provide situation specific parameters, provided they are documented along with their concomitant bases.

5.3 Calculations of Total Body Dose

Estimates will be made for each of the following exposure pathways to the same location by age class. Only those age classes known to exist at a location are considered.

5.3.1 Direct Radiation (from storage tanks, N-16 sources, etc.)

The component of dose to a Member of the Public due to direct radiation will be determined by thermoluminescent dosimeters (TLDs).

5.3.2 Inhalation Dose

The inhalation dose will be determined at the calculational locations for each age group according to the methods outlined in Section 3.0 of this manual.

5.3.3 Ingestion Pathway (cow milk, goat milk, meat, vegetation)

The dose via the ingestion pathway will be calculated at the consumer locations for the consumers at risk. If no milk pathway exists in a sector, the dose via this pathway will be treated as < 1 mrem/yr.

5.3.4 Total Body Noble Gas Immersion Dose

This dose will be calculated in accordance with Section 3.4.1.2b. for the maximally exposed MEMBER OF THE PUBLIC in the limiting sector.

5.3.5 Ground Plane Deposition

5.3.6 Other Uranium Fuel Cycle Sources

The dose from other fuel sources will be treated as < 1 mrem/yr.

5.4 Thyroid Dose

The dose to the thyroid will be calculated for the limiting sector as the sum of:

5.4.1 Direct Radiation (from storage tanks, N-16 sources, etc.)

The component of dose to the thyroid due to direct radiation will be determined by thermoluminescent dosimeters (TLDs).

5.4.2 Inhalation Dose

The inhalation dose to the thyroid will be determined at the calculational locations for each age group according to the methods outlined in Section 3.0 of this manual.

5.4.3 Ingestion Pathway (cow milk, goat milk, meat, vegetation)

The dose to the thyroid via the ingestion pathway will be calculated at the consumer locations for the consumers at risk. If no milk pathway exists in a sector, the dose via this pathway will be treated as < 1 mrem/yr.

5.4.4 Noble Gas Immersion Dose

It is assumed that an external total body dose from noble gases irradiates internal body organs at the same numerical rate (Reference 1.2.11). This dose for the thyroid will therefore be equal to the dose calculated in Step 5.3.4 above.

5.4.5 Ground Plane Deposition

5.4.6 Other Uranium Fuel Cycle Sources

The dose from other fuel cycle sources will be treated as <1 mrem/yr.

5.5 Organ Dose (other than thyroid and skin)

The dose to any organ will be calculated for the limiting sector as the sum of:

5.5.1 Direct Radiation (from storage tanks, N-16 sources, etc.)

The component of dose to an organ due to direct radiation will be determined by thermoluminescent dosimeters (TLDs).

5.5.2 Inhalation Dose

The inhalation dose to an organ will be determined at the calculational locations for each age group according to the methods outlined in Section 3.0 of this manual.

5.5.3 Ingestion Pathway (cow milk, goat milk, meat, vegetation)

The dose to an organ via the ingestion pathway will be calculated at the consumer locations for the consumers at risk. If no milk pathway exists in a sector, the dose via this pathway will be treated as < 1 mrem/yr.

5.5.4 Noble Gas Immersion Dose

It is assumed that an external total body dose from noble gases irradiates internal body organs at the same numerical rate (Reference 1.2.11). This dose for an organ will therefore be equal to the dose calculated in Step 5.3.4 above.

5.5.5 Ground Plane Deposition

5.5.6 Other Uranium Fuel Cycle Sources

The dose from other fuel cycle sources will be treated as < 1 mrem/yr.

5.6 Skin Dose

The dose to the skin will be calculated for the limiting sector as the sum of:

5.6.1 Direct Radiation (from storage tanks, N-16 sources, etc.)

The component of dose to the skin due to direct radiation will be determined by thermoluminescent dosimeters (TLDs).

5.6.2 Inhalation Dose

The inhalation dose to the skin (only tritium is considered) will be determined at the calculational locations for each age group according to the methods outlined in Section 3.0 of this manual.

5.6.3 Ingestion Pathway (cow milk, goat milk, meat, vegetation)

The dose to the skin via the ingestion pathway (only tritium and C-14 considered) will be calculated at the consumer locations for the consumers at risk. If no milk pathway exists in a sector, the dose via this pathway will be treated as < 1 mrem/yr.

5.6.4 Skin Noble Gas Immersion Dose

This dose will be calculated in accordance with Section 3.4.1.2b for the maximally exposed MEMBER OF THE PUBLIC in the limiting sector(s).

- 5.6.5 Ground Plane Deposition
- 5.6.6 Other Uranium Fuel Cycle Sources

This dose from other fuel cycle sources will be treated as < 1 mrem/yr.

6.0 INTERLABORATORY COMPARISON STUDIES

6.1 Requirement

Technical Requirements 3.12.3 states "Analyses shall be performed on radioactive materials supplied as part of an Interlaboratory Comparison Program that has been approved by the Commission."

6.2 Program

6.2.1 Environmental Sample Analyses Comparison Program

Environmental samples from the River Bend Station are to be analyzed by the River Bend Station Environmental Services Group or by a qualified contracting laboratory. These laboratories will participate in the U.S. Environmental Protection Agency's Environmental Radioactivity Laboratory Intercomparison Studies (Crosscheck) Program or an equivalent program. This participation will include all of the determinations (sample-radionuclide combinations) that are offered by EPA and that are also included in the licensee's environmental monitoring program. Results of the Interlaboratory Program will be included in the Annual Radiological Environmental Operating Report.

6.2.2 Effluent Release Analyses Program

RBS Chemistry Group will perform sample analyses for gamma-emitting radionuclides in effluent releases. The radiochemistry laboratory will participate annually in a corporate interlaboratory comparison study or an equivalent study. The results of these studies will be provided to the NRC upon request.

6.2.3 Abnormal Results

If the RBS laboratory or vendor laboratory results lie at greater than three (3) standard deviations from the "recognized value," an evaluation will be performed to identify any recommended remedial actions to reduce anomalous errors. Complete documentation on the evaluation will be available to RBS Environmental Services Group and will be provided to the NRC upon request.

APPENDIX A

ECL VALUES

EFFLUENT CONCENTRATION LIMIT (uCi/ml)

NUCLIDE	AIR	WATER
H-3	1E-07	1E-03
BE-7	3E-08	6E-04
C-14	3E-09	3E-05
NA-24	7E-09	5E-05
P-32	5E-10	9E-06
CR-51	3E-08	5E-04
MN-54	1E-09	3E-05
MN-56	2E-08	7E-05
FE-55	3E-09	1E-04
FE-59	5E-10	1E-05
CO-56	3E-10	6E-06
CO-57	9E-10	6E-05
CO-58	1E-09	2E-05
CO-60	5E-11	3E-06
NI-63	1E-09	1E-04
NI-65	2E-08	1E-04
CU-64	3E-08	2E-04
ZN-65	4E-10	5E-06
ZN-69	2E-07	8E-04
ZN-69M	1E-08	6E-05
SE-75	8E-10	7E-06
BR-82	5E-09	4E-05
BR-83	9E-08	9E-04
BR-84	8E-08	4E-04
RB-86	1E-09	7E-06
RB-88	9E-08	4E-04
RB-89	2E-07	9E-04
SR-85	2E-09	4E-05
SR-89	2E-10	8E-06
SR-90	6E-12	5E-07
SR-91	5E-09	2E-05
SR-92	9E-09	4E-05
Y-88	3E-10	1E-05
Y-90	9E-10	7E-06
Y-91M	2E-07	2E-03
Y-91	2E-10	8E-06
Y-92	1E-08	4E-05
Y-93	3E-09	2E-05
ZR-95	4E-10	2E-05
ZR-97	2E-09	9E-06
NB-94	2E-11	1E-05
NB-95	2E-09	3E-05
NB-97	1E-07	3E-04
MO-90	6E-09	3E-05
MO-99	2E-09	2E-05
TC-99M	2E-07	1E-03
TC-101	5E-07	2E-03
RU-103	9E-10	3E-05
RU-105	2E-08	7E-05
RU-106	2E-11	3E-06
AG-110M	1E-10	6E-06
CD-109	7E-11	6E-06
CD-113M	5E-12	5E-07
SN-113	8E-10	3E-05
SN-117M	2E-09	3E-05
SB-122	2E-09	1E-05
SB-124	3E-10	7E-06

EFFLUENT CONCENTRATION LIMIT (uCi/ml)

NUCLIDE	AIR	WATER
SB-125	7E-10	3E-05
SB-126	7E-10	7E-06
SB-127	1E-09	1E-05
TE-127M	4E-10	9E-06
TE-127	2E-08	1E-04
TE-129M	3E-10	7E-06
TE-129	9E-08	4E-04
TE-131M	1E-09	8E-06
TE-131	2E-08	8E-05
TE-132	9E-10	9E-06
I-130	3E-09	2E-05
I-131	2E-10	1E-06
I-132	2E-08	1E-04
I-133	1E-09	7E-06
I-134	6E-08	4E-04
I-135	6E-09	3E-05
CS-134	2E-10	9E-07
CS-135	2E-09	1E-05
CS-136	9E-10	6E-06
CS-137	2E-10	1E-06
CS-138	8E-08	4E-04
BA-133	9E-10	2E-05
BA-139	4E-08	2E-04
BA-140	2E-09	8E-06
BA-141	1E-07	3E-04
BA-142	2E-07	7E-04
LA-140	2E-09	9E-06
LA-142	3E-08	1E-04
CE-139	9E-10	7E-05
CE-141	8E-10	3E-05
CE-143	2E-09	2E-05
CE-144	2E-11	3E-06
PR-143	9E-10	2E-05
PR-144	2E-07	6E-04
ND-147	1E-09	2E-05
EU-152	3E-11	1E-05
W-187	1E-08	3E-05
NP-239	3E-09	2E-05
AR-41	1E-08	0E+00
KR-83M	5E-05	0E+00
KR-85M	1E-07	0E+00
KR-85	7E-07	0E+00
KR-87	2E-08	0E+00
KR-88	9E-09	0E+00
KR-89	1E-09	0E+00
KR-90	1E-09	0E+00
XE-131M	2E-06	0E+00
XE-133M	6E-07	0E+00
XE-133	5E-07	0E+00
XE-135M	4E-08	0E+00
XE-135	7E-08	0E+00
XE-137	1E-09	0E+00
XE-138	2E-08	0E+00
G-APLHA	1E-15	2E-09
G-BETA	1E-12	1E-08
OTHER	0E+00	0E+00
RH-105	8E-09	5E-05
SC-46	3E-10	1E-05
AR-76	2E-09	1E-05

APPENDIX B

LIQUID ENVIRONMENTAL DOSE TRANSFER FACTORS

A, TABLE B-1

DOSE FACTOR TABLE : A (1,3) - Adult, liquid
Units are mrem/hr per uCi/ml

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gittract	Skin
H-3	0.00E+00	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	2.81E-01	0.00E+00
C-14	4.61E+04	9.22E+03	9.22E+03	9.22E+03	9.22E+03	9.22E+03	9.22E+03	0.00E+00
NA-24	6.02E+02	6.02E+02	6.02E+02	6.02E+02	6.02E+02	6.02E+02	6.02E+02	0.00E+00
P-32	4.85E+07	3.01E+06	1.87E+06	0.00E+00	0.00E+00	5.45E+06	5.45E+06	0.00E+00
CR-51	0.00E+00	0.00E+00	4.31E+00	2.58E+00	9.50E-01	5.72E+00	1.08E+03	0.00E+00
MN-54	0.00E+00	2.39E+05	4.56E+04	0.00E+00	7.12E+04	0.00E+00	7.33E+05	0.00E+00
MN-56	0.00E+00	6.02E+03	1.07E+03	0.00E+00	7.64E+03	0.00E+00	1.92E+05	0.00E+00
FE-55	5.68E+03	3.93E+03	9.16E+02	0.00E+00	0.00E+00	2.19E+03	2.25E+03	0.00E+00
FE-59	8.97E+03	2.11E+04	8.08E+03	0.00E+00	0.00E+00	5.89E+03	7.03E+04	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.74E+02	3.91E+02	0.00E+00	0.00E+00	0.00E+00	3.54E+03	0.00E+00
CO-60	0.00E+00	5.01E+02	1.11E+03	0.00E+00	0.00E+00	0.00E+00	9.41E+03	0.00E+00
NI-63	3.86E+04	2.68E+03	1.29E+03	0.00E+00	0.00E+00	0.00E+00	5.58E+02	0.00E+00
NI-65	1.57E+02	2.04E+01	9.29E+00	0.00E+00	0.00E+00	0.00E+00	5.17E+02	0.00E+00
CU-64	0.00E+00	2.90E+01	1.36E+01	0.00E+00	7.31E+01	0.00E+00	2.47E+03	0.00E+00
ZN-65	5.09E+04	1.62E+05	7.31E+04	0.00E+00	1.08E+05	0.00E+00	1.02E+05	0.00E+00
ZN-69	1.08E+02	2.07E+02	1.44E+01	0.00E+00	1.34E+02	0.00E+00	3.11E+01	0.00E+00
ZN-69N	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	4.81E+01	0.00E+00	0.00E+00	0.00E+00	6.92E+01	0.00E+00
BR-84	0.00E+00	0.00E+00	6.23E+01	0.00E+00	0.00E+00	0.00E+00	4.89E-04	0.00E+00
BR-85	0.00E+00	0.00E+00	2.56E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	1.13E+05	5.28E+04	0.00E+00	0.00E+00	0.00E+00	2.23E+04	0.00E+00
RB-88	0.00E+00	3.25E+02	1.72E+02	0.00E+00	0.00E+00	0.00E+00	4.49E-09	0.00E+00
RB-89	0.00E+00	2.15E+02	1.51E+02	0.00E+00	0.00E+00	0.00E+00	1.25E-11	0.00E+00
SR-89	3.97E+04	0.00E+00	1.14E+03	0.00E+00	0.00E+00	0.00E+00	6.38E+03	0.00E+00
SR-90	9.78E+05	0.00E+00	2.40E+05	0.00E+00	0.00E+00	0.00E+00	2.83E+04	0.00E+00
SR-91	7.32E+02	0.00E+00	2.96E+01	0.00E+00	0.00E+00	0.00E+00	3.48E+03	0.00E+00
SR-92	2.77E+02	0.00E+00	1.20E+01	0.00E+00	0.00E+00	0.00E+00	5.50E+03	0.00E+00
Y-90	6.07E+00	0.00E+00	1.63E-01	0.00E+00	0.00E+00	0.00E+00	6.44E+04	0.00E+00
Y-91M	5.74E-02	0.00E+00	2.22E-03	0.00E+00	0.00E+00	0.00E+00	1.68E-01	0.00E+00
Y-91	8.90E+01	0.00E+00	2.38E+00	0.00E+00	0.00E+00	0.00E+00	4.90E+04	0.00E+00
Y-92	5.33E-03	0.00E+00	1.56E-02	0.00E+00	0.00E+00	0.00E+00	9.34E+03	0.00E+00
Y-93	1.69E+00	0.00E+00	4.67E-02	0.00E+00	0.00E+00	0.00E+00	5.36E+04	0.00E+00
ZR-95	3.57E-01	1.14E-01	7.75E-02	0.00E+00	1.80E-01	0.00E+00	3.63E+00	0.00E+00
ZR-97	1.97E-02	3.98E-03	1.82E-03	0.00E+00	6.01E-03	0.00E+00	1.23E+03	0.00E+00
NB-95	4.48E+02	2.49E+02	1.34E+02	0.00E+00	2.46E+02	0.00E+00	1.51E+06	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.28E+02	2.44E+01	0.00E+00	2.90E+02	0.00E+00	2.97E+02	0.00E+00
TC-99M	9.59E-03	2.71E-02	3.45E-01	0.00E+00	4.12E-01	1.33E-02	1.60E+01	0.00E+00
TC-101	9.86E-03	1.42E-02	1.39E-01	0.00E+00	2.56E-01	7.26E-03	4.27E-14	0.00E+00
RU-103	3.61E+01	0.00E+00	1.56E+01	0.00E+00	1.38E+02	0.00E+00	4.22E+03	0.00E+00
RU-105	3.01E+00	0.00E+00	1.19E+00	0.00E+00	3.89E+01	0.00E+00	1.84E+03	0.00E+00
RU-106	5.37E+02	0.00E+00	6.80E+01	0.00E+00	1.04E+03	0.00E+00	3.48E+04	0.00E+00
AG-110M	5.38E-04	4.98E-04	2.95E-04	0.00E+00	9.78E-04	0.00E+00	2.03E-01	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125E	1.19E+04	4.31E+03	1.59E+03	3.58E+03	4.84E+04	0.00E+00	4.75E+04	0.00E+00
TE-127M	3.01E+04	1.08E+04	3.66E+03	7.69E+03	1.22E+05	0.00E+00	1.01E+05	0.00E+00
TE-127	4.89E+02	1.75E+02	1.06E+02	3.62E+02	1.99E+03	0.00E+00	3.86E+04	0.00E+00
TE-129M	5.11E+04	1.91E+04	8.09E+03	1.75E+04	2.13E+05	0.00E+00	2.57E+05	0.00E+00
TE-129	1.39E+02	5.24E+01	3.40E+01	1.07E+02	5.86E+02	0.00E+00	1.05E+02	0.00E+00
TE131M	7.69E+03	3.76E+03	3.13E+03	5.95E+03	3.81E+04	0.00E+00	3.73E+05	0.00E+00
TE-131	8.75E+01	3.66E+01	2.76E+01	7.20E+01	3.83E+02	0.00E+00	1.24E+01	0.00E+00
TE-132	1.12E+04	7.24E+03	6.80E+03	8.00E+03	6.97E+04	0.00E+00	3.43E+05	0.00E+00
I-130	2.94E+01	8.66E+01	3.42E+01	7.34E+03	1.35E+02	0.00E+00	7.46E+01	0.00E+00
I-131	1.62E+02	2.31E+02	1.32E+02	7.57E+04	3.96E+02	0.00E+00	6.10E+01	0.00E+00

I-132	7.88E+00	2.11E+01	7.38E+00	7.38E+02	3.36E+01	0.00E+00	3.96E+00	0.00E+00
I-133	5.51E+01	9.59E+01	2.92E+01	1.41E+01	1.67E+02	0.00E+00	8.62E+01	0.00E+00

TABLE B-1

DOSE FACTOR TABLE : A (1,3) - Adult, liquid
 .Units are mrem/hr per uCi/ml

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	LUNG	GITRACT	SKIN
I-134	4.12E+00	1.12E+01	4.00E+00	1.94E+02	1.78E+01	0.00E+00	9.75E-03	0.00E+00
I-135	1.72E+01	4.50E+01	1.66E+01	2.97E+03	7.22E+01	0.00E+00	5.09E+01	0.00E+00
CS-134	3.34E+05	7.94E+05	6.49E+05	0.00E+00	2.57E+05	8.53E+04	1.39E+04	0.00E+00
CS-136	3.49E+04	1.38E+05	9.93E+04	0.00E+00	7.68E+04	1.05E+04	1.57E+04	0.00E+00
CS-137	4.28E+05	5.85E+05	3.83E+05	0.00E+00	1.99E+05	6.60E+04	1.13E+04	0.00E+00
CS-138	2.96E+02	5.85E+02	2.90E+02	0.00E+00	4.30E+02	4.25E+01	2.50E-03	0.00E+00
BA-139	1.20E+01	8.55E-03	3.52E-01	0.00E+00	8.00E-03	4.85E-03	2.13E+01	0.00E+00
BA-140	2.51E+03	3.16E+00	1.65E+02	0.00E+00	1.07E+00	1.81E+00	5.17E+03	0.00E+00
BA-141	5.83E+00	4.41E-03	1.97E-01	0.00E+00	4.10E-03	2.50E-03	2.75E-09	0.00E+00
BA-142	2.64E+00	2.71E-03	1.66E-01	0.00E+00	2.29E-03	1.54E-03	3.71E-18	0.00E+00
LA-140	1.58E+00	7.95E-01	2.10E-01	0.00E+00	0.00E+00	0.00E+00	5.84E+04	0.00E+00
LA-142	8.08E-02	3.67E-02	9.15E-03	0.00E+00	0.00E+00	0.00E+00	2.68E+02	0.00E+00
CE-141	5.37E+00	3.63E+00	4.12E-01	0.00E+00	1.69E+00	0.00E+00	1.39E+04	0.00E+00
CE-143	9.46E-01	7.00E+02	7.74E-02	0.00E+00	3.08E-01	0.00E+00	2.61E+04	0.00E+00
CE-144	2.80E+02	1.17E+02	1.50E+01	0.00E+00	6.94E+01	0.00E+00	9.46E+04	0.00E+00
PR-143	5.80E+00	2.33E+00	2.88E-01	0.00E+00	1.34E+00	0.00E+00	2.54E+04	0.00E+00
PR-144	1.90E-02	7.89E-03	9.65E-04	0.00E+00	4.45E-03	0.00E+00	2.73E-09	0.00E+00
ND-147	3.97E+00	4.59E+00	2.74E-01	0.00E+00	2.68E+00	0.00E+00	2.20E+04	0.00E+00
W-187	2.97E+02	2.48E+02	8.68E+02	0.00E+00	0.00E+00	0.00E+00	8.13E+04	0.00E+00
NP-239	3.00E-01	2.95E-02	1.63E-02	0.00E+00	9.21E-02	0.00E+00	6.06E+03	0.00E+00

APPENDIX C

NOBLE GAS DOSE TRANSFER FACTORS

TABLE C-1

FACTOR FOR EXPOSURE TO A SEMI-INFINITE CLOUD

Nuclide	DOSE TO PEOPLE +		DOSE OF AIR #	
	Gamma-Body K (i)	Beta-Skin L (i)	Gamma M (i)	Beta N (i)
AR-41	8.840E+03	2.690E+03	9.300E+03	3.280E+03
KR-83M	7.560E-02	0.000E+00	1.930E+01	2.880E+02
KR-85	1.610E+01	1.340E+03	1.720E+01	1.950E+03
KR-85M	1.170E+03	1.460E+03	1.230E+03	1.970E+03
KR-87	5.920E+03	9.730E+03	6.170E+03	1.030E+04
KR-88	1.470E+04	2.370E+03	1.520E+04	2.930E+03
KR-89	1.660E+04	1.010E+04	1.730E+04	1.060E+04
KR-90	1.560E+04	7.290E+03	1.630E+04	7.830E+03
XE-131M	9.150E+01	4.760E+02	1.560E+02	1.110E+03
XE-133	2.940E+02	3.060E+02	3.530E+02	1.050E+03
XE-133M	2.510E+02	9.940E+02	3.270E+02	1.480E+03
XE-135	1.810E+03	1.860E+03	1.920E+03	2.460E+03
XE-135M	3.120E+03	7.110E+02	3.360E+03	7.390E+02
XE-137	1.420E+03	1.220E+04	1.510E+03	1.270E+04
XE-138	8.830E+03	4.130E+03	9.210E+03	4.750E+03

+ -- mrem/yr per uCi/cu.m

-- mrad/yr per uCi/cu.m

APPENDIX D

(RESERVED)

APPENDIX E

$\overline{X/Q}$ AND $\overline{D/Q}$ VALUES FOR RESTRICTED AREA BOUNDARY

Long Term Diffusion Estimates

E.1 Objective

Annual average CHI/Q and D/Q estimates for continuous and intermittent releases were calculated for each of the sixteen 22.5-deg sectors at receptor locations used to determine the maximum individual and population dose receptors.

The methodology described in Regulatory Guide 1.111, Rev. 1 provided guidance for the aforementioned analysis. The resultant CHI/Q and D/Q values for the maximum individual dose receptors are displayed in Appendix F.

E.2 Calculation Techniques

Nomenclature

2.032	=	$(2/\pi)^{1/2}(2\pi/16)^{-1}$	(dimensionless)
π	=	3.14159...	(dimensionless)
exp	=	2.71828	(dimensionless)
E_T	=	Entrainment coefficient	(dimensionless)
Ω_T	=	Terrain recirculation factor	(dimensionless)
x	=	Downwind receptor distance	(m)
σ_z	=	Vertical dispersion (plum spread) coefficient	(m)
\overline{u}_{30}	=	30-ft average wind speed corresponding to a given hour of onsite meteorological data	(m sec ⁻¹)
\overline{u}_{150}	=	150-ft average wind speed corresponding to a given hour of on-site meteorological data	
(CHI/Q)	=	Average concentration normal- ized by source strength	(sec m ⁻³)
(CHI/Q _D)	=	Depleted CHI/Q	(sec m ⁻³)
F_M	=	Momentum flux	(m ⁴ sec ⁻³)
h_b	=	Maximum adjacent building height	(m)
h_r	=	Release height	(m)

h_e	= Effective release height	(m)
h_{pr}	= Nonbuoyant plume rise	(m)
h_t	= Topographic height of receptor above plant grade	(m)
d	= Stack or vent diameter	(m)
u_e	= Efflux velocity	(m sec ⁻¹)
N	= Total number of valid hours of onsite wind data in all sectors for applicable averaging period	(dimensionless)
δ/Q	= Relative deposition rate normalized by source strength	(m ⁻¹)
D/Q	= Relative deposition per unit area normalized by source strength	(m ⁻²)
G	= Ground release (subscript)	(dimensionless)
i	= Index for atmospheric stability group (Classes A through G)	(dimensionless)
j	= Index for number of hours	(dimensionless)
k	= Index for a particular receptor distance	(dimensionless)
l	= Index for a particular 22.5-deg sector	(dimensionless)
n	= Number of hours onsite wind data in a particular 22.5-deg sector	(dimensionless)
S	= Stability parameter	(sec ⁻²)

E.3 CHI/Q Modeling Technique

Annual average values of relative concentration were calculated for continuous gaseous releases of activity from the containment building vent and the radwaste building vent according to the straight-line airflow (Gaussian) model described in Regulatory Guide 1.111, Rev. 1. An adjustment was made to the model to characterize the regional airflow pattern. The equation of this model is as follows:

$$\left(\frac{\text{CHI}}{Q}\right)_{\text{A}} = \frac{2.032}{N} \sum_{i=1}^n \left(\frac{\Omega}{x}\right)_{\text{A}} \left[\frac{E_T}{\bar{u}_{30} \left(\sigma_{z_i}^2 + \sigma_{x_i}^2\right)^{1/2}} + \frac{(1-E_T) \exp\left[-\left(\frac{h_e}{\sigma_{z_i}}\right)^2\right]}{\bar{u}_{150} \sigma_{z_i}} \right] \quad \text{E.3-1}$$

Since the River Bend Station site is located in relatively open terrain, the terrain recirculation factor (Ω_k (presented in Figure 2 of Regulatory Guide 1.111) was applied.

The entrainment coefficient (E_T) is a function of the ratio of efflux velocity (u_e) to elevated wind speed (\bar{u}_{150}) for the conditionally elevated release points.

For vent releases occurring below the level of a nearby structure, 100 percent downwash (total entrainment) is conservatively assumed ($E_T = 1$). For vent releases occurring between 1 and 2 times the height of a nearby structure, a conditionally elevated release is assumed, and the entrainment coefficient is defined as follows:

$$E_T = 0.0 \text{ when } u_e/\bar{u}_{150} \geq 5.0 \quad (\text{totally elevated})$$

$$E_T = 0.30 - 0.06 (u_e/\bar{u}_{150})$$

when $1.5 < u_e/\bar{u}_{150} \leq 5.0$ (partially entrained)

$$E_T = 2.58 - 1.58 (u_e/\bar{u}_{150})$$

$$E_T$$

when $1.0 \leq u_e/\bar{u}_{150} \leq 1.5$ (partially entrained)

$$E_T = 1.0 \text{ when } u_e/\bar{u}_{150} \leq 1.0 \quad (\text{totally entrained})$$

Within 5 km in each downwind sector, Equation E.3-1 was evaluated by sector at the property and restricted area boundaries and nearest resident, vegetable garden, milk cow, and meat animal. There were no goats whose milk is consumed in the area of interest. This evaluation was performed for each continuously emitting release point and the intermittent release from the mechanical vacuum pump with onsite data collected during the period of March 17, 1977 through March 16, 1979.

The effective release height was computed from the following equation:

$$h_e = h_r - (h_r)_k + h_{pr} \quad \text{E.3-2}$$

Where the downwash correction factor (as defined by Equation (5) in Regulatory Guide 1.111, Rev. 1) is included in the equation for h_{pr} (see Equation E.3-4)

Values of topographic heights were conservatively assessed as the maximum height within a particular annulus-sector (annsect). An annsect is an area bounded by a 22.5-deg sector and any two radial distances from the release point.

For A-D stability conditions, plume rise for nonbuoyant sources was calculated by the following algorithm:

when:

$$u_e / \bar{u}_{150} > 1.5$$

$$h_{pr} = 1.44(u_e / \bar{u}_{150})^{2/3} (x/d)^{1/3} d \quad \text{E.3-3}$$

when:

$$u_e / \bar{u}_{150} < 1.5$$

$$h_{pr} = 1.44(u_e / \bar{u}_{150})^{2/3} (x/d)^{1/3} (d-3) [1.5 - (u_e / \bar{u}_{150})d] \quad \text{E.3-4}$$

and,

$$h_{pr} \leq 3(u_e / \bar{u}_{150}) \quad \text{E.3-5}$$

The result from Equation E.3-3 or E.3-4 (whichever condition exists) is then compared to Equation E.3-5 and the smaller value of h_{pr} is used.

For E-G stability conditions, Equations E.3-3, E.3-4, and E.3-5 are compared with:

$$h_{pr} = 4(F_m / s)^{1/4}$$

and

$$h_{pr} = 1.5(F_m / \bar{u}_{150})^{1/3} S^{-1/6}$$

where:

$$F_m = \frac{(u_z)^2 d^2}{4}$$

and the smallest value was chosen.

In the ground level portion of Equation E.3-1, the vertical dispersion term:

$$(\sigma_{z,i,k}^2 + 0.5h_b / \pi)^{1/2}$$

was constrained to be less than or equal to $1.732\sigma_{z,i,k}$

E.4 (CHI/Q) and D/Q Modeling Techniques

Annual average depleted relative concentration values were conservatively assumed to be equal to annual average relative concentration values ($CHI/Q = (CHI/Q)_D$). Therefore, no credit was taken for attendant plume depletion of radioiodines and particulates.

Annual average relative deposition values were calculated using Regulatory Guide 1.111, Rev. 1 with the following equation:

$$\left(\frac{D}{Q}\right)_{\bullet} = \left(\frac{\Omega}{X}\right)_x \left(\frac{2-N}{16}\right)^{-1} \left\{ \sum_{j=1}^{n_{\bullet}} \left[n_{\bullet} \left\{ \left(\frac{\sigma}{Q}\right)_{Gx} E_T + \left(\frac{1}{n_{\bullet}} \sum_{n=1}^3 [1 - (E_T)_i] n_{\bullet} \left(\frac{\delta}{Q}\right)\right\} \right] \right\} \quad E.4-1$$

For the conditionally elevated release points, Figures 6 through 9 of Regulatory Guide 1.111, Rev. 1 were used to calculate the $(\delta/Q)_G$ and $(\delta/Q)_i$ values, while for the ground level release points, Figure 6 was utilized to calculate the $(\delta/Q)_G$ value.

E.5 Methodology Employed for Intermittent Release

The methodology employed in the calculation of intermittent release CHI/Qs and D/Qs was as follows:

1. Two-hour sector-averaged CHI/Q values were calculated without terrain recirculation factors.
2. The 15 percent, 1 hour value was plotted at 2 hours on log-log coordinates, while the annual average value was plotted at 8,760 hr. A straight line connecting the two points was drawn.
3. Log-log interpolation based on total ground intermittent release hours versus annual hours yielded a CHI/Q multiplier.

4. The multiplier was applied to annual average CHI/Q and D/Q values to obtain intermittent CHI/Q and D/Q values.

For River Bend Station, a 320 hr/yr intermittent release through the containment building vent from the mechanical vacuum pump was evaluated.

TABLE E-1

ANNUAL AVERAGE CHI/Q VALUES X 10^{-7} (SEC/M³)
 FOR RESTRICTED AREA BOUNDARY

<u>Sector</u>	Mixed Mode Releases (Continuous)	Ground Level Releases Exhaust (Continuous)
S	11.4	105
SSW	19.7	186
SW	16.4	215
WSW	19.5	326
W	23.6	654
WNW	33.1	421
NW	15.7	262
NNW	14.8	138
N	18.8	180
NNE	24.9	211
NE	16.6	150
ENE	12.2	146
E	9.07	168
ESE	10.4	154
SE	8.19	93.1
SSE	7.69	45.6

TABLE E-2

ANNUAL AVERAGE D/Q VALUES X 10^{-9} (M^{-2})

FOR RESTRICTED AREA BOUNDARY

<u>Sector</u>	<u>Mixed Mode Releases</u> <u>(Continuous)</u>	<u>Ground Level Releases</u> <u>(Continuous)</u>
S	7.61	21.4
SSW	11.3	39.6
SW	10.4	36.1
WSW	9.79	38.5
W	13.8	68.8
WNW	18.0	50.3
NW	8.68	40.8
NNW	10.5	24.7
N	11.8	28.6
NNF	11.2	27.1
NE	8.26	22.3
ENE	9.73	22.7
E	7.75	23.0
ESE	7.76	24.6
SE	6.60	17.2
SSE	5.34	11.8

APPENDIX F

MAXIMUM X/Q AND D/Q VALUES FOR INDIVIDUAL LOCATIONS

TABLE F-1

ATMOSPHERIC DISPERSION AND DEPOSITION RATES FOR
THE MAXIMUM INDIVIDUAL DOSE CALCULATIONS

Analysis	Location (meters)	Ground level Releases	Mixed Mode Releases
Gamma air dose (3) and Beta Air Dose	994 m WNW (Containment)	CHI/Q - 421.0	CHI/Q - 33.1
Maximum Receptor (4)	994 m WNW	CHI/Q - 421.0	CHI/Q - 33.1
Resident		D/Q - 50.3	D/Q - 18.1
Garden			
Meat animal			
Immersion			
Milk animal (5)	7,000 m WNW	CHI/Q - 3.58	CHI/Q - .870
		D/Q - 0.38	D/Q - .223
Other on-site Receptors (6)	115 m ENE	CHI/Q - 5977.0	CHI/Q - 407.5
		D/Q - 529.7	D/Q - 46.9
	275 m N	CHI/Q - 1644.0	CHI/Q - 169.1
		D/Q - 345.6	D/Q - 68.4
	500 WNW	CHI/Q - 916.7	CHI/Q - 105.4
		D/Q - 148.1	D/Q - 45.6
	2500 SW	CHI/Q - 34.45	CHI/Q - 4.65
		D/Q - 3.35	D/Q - 1.40

* Reference 1.2.11 and 1.2.12

Notes:

- (1) All CHI/Q = 10^{-7} sec/m³
- (2) All D/Q = 10^{-9} m⁻²
- (3) Maximum offsite location (property boundary) with highest CHI/Q (unoccupied).
- (4) Maximum hypothetical occupied offsite location with highest CHI/Q and D/Q.
- (5) No milk animal within 5 miles radius, hypothetical location in worst sector.
- (6) Other on-site receptors.

APPENDIX G
CALCULATIONAL PARAMETERS

TABLE G-1

DOSE FACTOR CALCULATION PARAMETERS

CODE	DESCRIPTION	VALUE	UNITS	
csf	Harvest stored feed to cow	7.776E+06	seconds	(cfs)
dw	Drinking Water Dilution Factor	2.480E+04	none	(dw)
esf	Stored feed exp. to deposition	5.184E+06	seconds	(esf)
fg	Fraction Stored Veg. Intake	7.600E-01	none	(fg)
fi	Fraction Vegetation Irrigated	1.000E-01	none	(fi)
fl	Fraction Leafy Veg. Intake	1.000E+00	none	(fl)
fpc	Fraction Year Cow On Pasture	1.000E+00	none	(fpc)
fpg	Fraction Year Goat On Pasture	1.000E+00	none	(fpg)
fsc	Fraction Cow Feed-Pasture Grass	1.000E+00	none	(fsc)
fsg	Fraction Goat Feed-Pasture Grass	1.000E+00	none	(fsg)
gsf	Harvest stored feed to goat	7.776E+06	seconds	(gsf)
h	Absolute Humidity	1.290E+01	gm/m3	(h)
kc	Water to sediment xfer coeff.	7.220E-02	L/kg hr	(kc)
ksf	Liq conv fact pCi*ml*yr/uCi*1*hr	1.142E+05		(ksf)
lv	Water content of Leafy Veg	9.200E-01	L/kg	(lv)
lw	Surface Weather Decay Constant	5.730E-07	1/seconds	(lw)
lwr	Iodine Surface Wx Decay Constant	5.730E-07	1/seconds	(lwr)
mtv	Mass density of sediment	4.000E+01	kg/m2	(mtv)
p	Effective surface density, soil	2.400E+02	kg/m2	(p)
pl4	Fractional equilibrium ratio	1.000E+00	none	(pl4)
qfc	Cow's Feed Consumption Rate	5.000E+01	kg/day	(qfc)
qfg	Goat's Feed Consumption Rate	6.000E+00	kg/day	(qfg)
rl	Fraction Deposited Liquid	2.500E-01	none	(rl)
rp	Fraction Deposited Particulate	2.000E-01	none	(rp)
rr	Fraction Deposited Radioiodine	1.000E+00	none	(rr)
sf	Shielding Factor	7.000E-01	none	(sf)
*tb	Long term sediment exposure	0.000E+00	seconds	(tb)
tbl	Long term sediment exp. liquid	4.716E+08	seconds	(tbl)
tei	Veg. Exposure in Growing Season	5.184E+06	seconds	(tei)
tem	Seasonal forage exposure (milk)	2.592E+06	seconds	(tem)
tev	Seasonal crop exposure (veg)	8.000E+06	seconds	(tev)
tfh	Fresh Fish Transit Time	0.000E+00	seconds	(tfh)
tgm	Time, goat milking to receptor	1.728E+05	seconds	(tgm)
thi	Transit Time-Harvest Irrig. Veg	8.640E+04	seconds	(thi)
thv	Transit Time-Harvest-Stored Veg	5.184E+06	seconds	(thv)
ti	Fresh Non-Fish Transit Time	0.000E+00	seconds	(ti)
tl	Transit Time-Harvest-Leafy Veg	8.640E+04	seconds	(tl)
tmc	Time, cow miling to receptor	1.728E+05	seconds	(tmc)
ts	Time, slaughter to consumer	1.728E+06	seconds	(ts)
tw	Drinking Water Transit Time	0.000E+00	seconds	(tw)
yiv	Irrigated Veg. Areal Density	2.000E+00	kg/m2	(yiv)
yp	Pasture Grass Areal Density	7.000E-01	kg/m2	(yp)
ys	Stored Feed Areal Density	2.000E+00	kg/m2	(ys)
ysv	Stored Vegetable Areal Density	2.000E+00	kg/m2	(ysv)
yv	Vegetation Areal Density	2.000E+00	kg/m2	(yv)

* tb-needs to be 4.716E+08 when calculating Ground Plane Dose Factors

TABLE G-2

STABLE ELEMENT TRANSFER FACTORS

Nuclide	Milk Cow	Milk Goat	Meat	Veg./Soil
H-3	1.000E-02	1.700E-01	1.200E-02	4.800E+00
C-14	1.200E-02	1.000E-01	3.100E-02	5.500E+00
NA-24	4.000E-02	4.000E-02	3.000E-02	5.200E-02
P-32	2.500E-02	2.500E-01	4.600E-02	1.100E+00
CR-51	2.200E-03	2.200E-03	2.400E-03	2.500E-04
MN-54	2.500E-04	2.500E-04	8.000E-04	2.900E-02
MN-56	2.500E-04	2.500E-04	8.000E-04	2.900E-02
FE-55	1.200E-03	1.300E-04	4.000E-02	6.600E-04
FE-59	1.200E-03	1.300E-04	4.000E-02	6.600E-04
CO-57	1.000E-03	1.000E-03	1.300E-02	9.400E-03
CO-58	1.000E-03	1.000E-03	1.300E-02	9.400E-03
CO-60	1.000E-03	1.000E-03	1.300E-02	9.400E-03
NI-63	6.700E-03	6.700E-03	5.300E-02	1.900E-02
NI-65	6.700E-03	6.700E-03	5.300E-02	1.900E-02
CU-64	1.400E-02	1.300E-02	8.000E-03	1.200E-01
ZN-65	3.900E-02	3.900E-02	3.000E-02	4.000E-01
ZN-69	3.900E-02	3.900E-02	3.000E-02	4.000E-01
ZN-69M	3.900E-02	3.900E-02	3.000E-02	4.000E-01
BR-82	5.000E-02	5.000E-02	2.600E-02	7.600E-01
BR-83	5.000E-02	5.000E-02	2.600E-02	7.600E-01
BR-84	5.000E-02	5.000E-02	2.600E-02	7.600E-01
BR-85	5.000E-02	5.000E-02	2.600E-02	7.600E-01
RB-86	3.000E-02	3.000E-02	3.100E-02	1.300E-01
RB-88	3.000E-02	3.000E-02	3.100E-02	1.300E-01
RB-89	3.000E-02	3.000E-02	3.100E-02	1.300E-01
SR-89	8.000E-04	1.400E-02	6.000E-04	1.700E-02
SR-90	8.000E-04	1.400E-02	6.000E-04	1.700E-02
SR-91	8.000E-04	1.400E-02	6.000E-04	1.700E-02
SR-92	8.000E-04	1.400E-02	6.000E-04	1.700E-02
Y-90	1.000E-05	1.000E-05	4.600E-03	2.600E-03
Y-91M	1.000E-05	1.000E-05	4.600E-03	2.600E-03
Y-91	1.000E-05	1.000E-05	4.600E-03	2.600E-03
Y-92	1.000E-05	1.000E-05	4.600E-03	2.600E-03
Y-93	1.000E-05	1.000E-05	4.600E-03	2.600E-03
ZR-95	5.000E-06	5.000E-06	3.400E-02	1.700E-04
ZR-97	5.000E-06	5.000E-06	3.400E-02	1.700E-04
NB-95	2.500E-03	2.500E-03	2.800E-01	9.400E-03
NB-97	2.500E-03	2.500E-03	2.800E-01	9.400E-03
MO-99	7.500E-03	7.500E-03	8.000E-03	1.200E-01
TC-99M	2.500E-02	2.500E-02	4.000E-01	2.500E-01
TC-101	2.500E-02	2.500E-02	4.000E-01	2.500E-01
RU-103	1.000E-06	1.000E-06	4.000E-01	5.000E-02
RU-105	1.000E-06	1.000E-06	4.000E-01	5.000E-02
RU-106	1.000E-06	1.000E-06	4.000E-01	5.000E-02
AG-110M	5.000E-02	5.000E-02	1.700E-02	1.500E-01
SB-124	1.500E-03	1.500E-03	0.000E+00	0.000E+00
SB-125	1.500E-03	1.500E-03	0.000E+00	0.000E+00
TE-125M	1.000E-03	1.000E-03	7.700E-02	1.300E+00
TE-127M	1.000E-03	1.000E-03	7.700E-02	1.300E+00
TE-127	1.000E-03	1.000E-03	7.700E-02	1.300E+00
TE-129M	1.000E-03	1.000E-03	7.700E-02	1.300E+00

TABLE G-2

STABLE ELEMENT TRANSFER FACTORS

Nuclide	Milk Cow	Milk Goat	Meat	Veg./Soil
TE-129	1.000E-03	1.000E-03	7.700E-02	1.300E+00
TE-131M	1.000E-03	1.000E-03	7.700E-02	1.300E+00
TE-131	1.000E-03	1.000E-03	7.700E-02	1.300E+00
TE-132	1.000E-03	1.000E-03	7.700E-02	1.300E+00
I-130	6.000E-03	6.000E-02	2.900E-03	2.000E-02
I-131	6.000E-03	6.000E-02	2.900E-03	2.000E-02
I-132	6.000E-03	6.000E-02	2.900E-03	2.000E-02
I-133	6.000E-03	6.000E-02	2.900E-03	2.000E-02
I-134	6.000E-03	6.000E-02	2.900E-03	2.000E-02
I-135	6.000E-03	6.000E-02	2.900E-03	2.000E-02
CS-134	1.200E-02	3.000E-01	4.000E-03	1.000E-02
CS-136	1.200E-02	3.000E-01	4.000E-03	1.000E-02
CS-137	1.200E-02	3.000E-01	4.000E-03	1.000E-02
CS-138	1.200E-02	3.000E-01	4.000E-03	1.000E-02
BA-139	4.000E-04	4.000E-04	3.200E-03	5.000E-03
BA-140	4.000E-04	4.000E-04	3.200E-03	5.000E-03
BA-141	4.000E-04	4.000E-04	3.200E-03	5.000E-03
LA-140	5.000E-06	5.000E-06	2.000E-04	2.500E-03
LA-142	5.000E-06	5.000E-06	2.000E-04	2.500E-03
CE-141	1.000E-04	1.000E-04	1.200E-03	2.500E-03
CE-143	1.000E-04	1.000E-04	1.200E-03	2.500E-03
CE-144	1.000E-04	1.000E-04	1.200E-03	2.500E-03
PR-143	5.000E-06	5.000E-06	4.700E-03	2.500E-03
PR-144	5.000E-06	5.000E-06	4.700E-03	2.500E-03
ND-147	5.000E-06	5.000E-06	3.300E-03	2.400E-03
W-187	5.000E-04	5.000E-04	1.300E-03	1.800E-02
NP-239	5.000E-06	5.000E-06	2.000E-04	2.500E-03

Units --> Milk - days/liter

Meat - days/kg

Soil - unitless

TABLE G-3

BIOACCUMULATION FACTORS

Nuclide	Freshwater Fish	Freshwater Non-Fish	Saltwater Fish	Saltwater Non-Fish
H-3	9.000E-01	9.000E-01	9.000E-01	9.300E-01
C-14	4.600E+03	9.100E+03	1.800E+03	1.400E+03
NA-24	1.000E+02	2.000E+02	6.700E-02	1.900E-01
P-32	1.000E+05	2.000E+04	2.900E+04	3.000E+04
CR-51	2.000E+02	2.000E+03	4.000E+02	2.000E+03
MN-54	4.000E+02	9.000E+04	5.500E+02	4.000E+02
MN-56	4.000E+02	9.000E+04	5.500E+02	4.000E+02
FE-55	1.000E+03	3.200E+03	3.000E+03	2.000E+04
FE-59	1.000E+02	3.200E+03	3.000E+03	2.000E+04
CO-57	5.000E+01	2.000E+02	1.000E+02	1.000E+03
CO-58	5.000E+01	2.000E+02	1.000E+02	1.000E+03
CO-60	5.000E+01	2.000E+02	1.000E+02	1.000E+03
NI-63	1.000E+02	1.000E+02	1.000E+02	2.500E+02
NI-65	1.000E+02	1.000E+02	1.000E+02	2.500E+02
CU-64	5.000E+01	4.000E+02	6.700E+02	1.700E+03
ZN-65	2.000E+03	1.000E+04	2.000E+03	5.000E+04
ZN-69	2.000E+03	1.000E+04	2.000E+03	5.000E+04
ZN-69M	2.000E+03	1.000E+04	2.000E+03	5.000E+04
BR-82	4.200E+02	3.300E+02	1.500E-02	3.100E+00
BR-83	4.200E+02	3.300E+02	1.500E-02	3.100E+00
BR-84	4.200E+02	3.300E+02	1.500E-02	3.100E+00
BR-85	4.200E+02	3.300E+02	1.500E-02	3.100E+00
RB-86	2.000E+03	1.000E+03	8.300E+00	1.700E+01
RB-88	2.000E+03	1.000E+03	8.300E+00	1.700E+01
RB-89	2.000E+03	1.000E+03	8.300E+00	1.700E+01
SR-89	3.000E+01	1.000E+02	2.000E+00	2.000E+01
SR-90	3.000E+01	1.000E+02	2.000E+00	2.000E+01
SR-91	3.000E+01	1.000E+02	2.000E+00	2.000E+01
SR-92	3.000E+01	1.000E+02	2.000E+00	2.000E+01
Y-90	2.500E+01	1.000E+03	2.500E+01	1.000E+03
Y-91M	2.500E+01	1.000E+03	2.500E+01	1.000E+03
Y-91	2.500E+01	1.000E+03	2.500E+01	1.000E+03
Y-92	2.500E+01	1.000E+03	2.500E+01	1.000E+03
Y-93	2.500E+01	1.000E+03	2.500E+01	1.000E+03
ZR-95	3.300E+00	6.700E+00	2.000E+02	8.000E+01
ZR-97	3.300E+00	6.700E+00	2.000E+02	8.000E+01
NB-95	3.000E+04	1.000E+02	3.000E+04	1.000E+02
NB-97	3.000E+04	1.000E+02	3.000E+04	1.000E+02
MO-99	1.000E+01	1.000E+01	1.000E+01	1.000E+01
TC-99M	1.500E+01	5.000E+00	1.000E+01	5.000E+01
TC-101	1.500E+01	5.000E+00	1.000E+01	5.000E+01
RU-103	1.000E+01	3.000E+02	3.000E+00	1.000E+03
RU-105	1.000E+01	3.000E+02	3.000E+00	1.000E+03
RU-106	1.000E+01	3.000E+02	3.000E+00	1.000E+03
AG-110M	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB-124	0.000E+00	0.000E+00	0.000E+00	0.000E+00
SB-125	0.000E+00	0.000E+00	0.000E+00	0.000E+00

TABLE G-3

BIOACCUMULATION FACTORS

Nuclide	Freshwater Fish	Freshwater Non-Fish	Saltwater Fish	Saltwater Non-Fish
TE-125M	4.000E+02	6.100E+03	1.000E+03	1.000E+02
TE-127M	4.000E+02	6.100E+03	1.000E+01	1.000E+02
TE-127	4.000E+02	6.100E+03	1.000E+01	1.000E+02
TE-129M	4.000E+02	6.100E+03	1.000E+01	1.000E+02
TE-129	4.000E+02	6.100E+03	1.000E+01	1.000E+02
TE-131M	4.000E+02	6.100E+03	1.000E+01	1.000E+02
TE-131	4.000E+02	6.100E+03	1.000E+01	1.000E+02
TE-132	4.000E+02	6.100E+03	1.000E+01	1.000E+02
I-130	1.500E+01	5.000E+00	1.000E+01	5.000E+01
I-131	1.500E+01	5.000E+00	1.000E+01	5.000E+01
I-132	1.500E+01	5.000E+00	1.000E+01	5.000E+01
I-133	1.500E+01	5.000E+00	1.000E+01	5.000E+01
I-134	1.500E+01	5.000E+00	1.000E+01	5.000E+01
I-135	1.500E+01	5.000E+00	1.000E+01	5.000E+01
CS-134	2.000E+03	1.000E+03	4.000E+01	2.500E+01
CS-136	2.000E+03	1.000E+03	4.000E+01	2.500E+01
CS-137	2.000E+03	1.000E+03	4.000E+01	2.500E+01
CS-138	2.000E+03	1.000E+03	4.000E+01	2.500E+01
BA-139	4.000E+00	2.000E+02	1.000E+01	1.000E+02
BA-140	4.000E+00	2.000E+02	1.000E+01	1.000E+02
BA-141	4.000E+00	2.000E+02	1.000E+01	1.000E+02
BA-142	4.000E+00	2.000E+02	1.000E+01	1.000E+02
LA-140	2.500E+01	1.000E+03	2.500E+01	1.000E+03
LA-142	2.500E+01	1.000E+03	2.500E+01	1.000E+03
CE-141	1.000E+00	1.000E+03	1.000E+01	6.000E+02
CE-143	1.000E+00	1.000E+03	1.000E+01	6.000E+02
CE-144	1.000E+00	1.000E+03	1.000E+01	6.000E+02
PR-143	2.500E+01	1.000E+03	2.500E+01	1.000E+03
PR-144	2.500E+01	1.000E+03	2.500E+01	1.000E+03
ND-147	2.500E+01	1.000E+03	2.500E+01	1.000E+03
W-187	1.200E+03	1.000E+01	3.000E+01	3.000E+01
NP-239	1.000E+01	4.000E+02	1.000E+01	1.000E+01
RH-105	1.000E+01	3.000E+02	1.000E+01	2.000E+03

Units --> pCi/kg per pCi/liter

TABLE G-4

INDIVIDUAL USAGE FACTORS

Description	Infant	Child	Teenager	Adult	Units
Fresh Non-fish	0.000E+00	1.700E+00	3.800E+00	5.000E+00	kg/year
Drinking Water	3.300E+02	5.100E+02	5.100E+02	7.300E+02	liters/year
Milk	3.300E+02	3.300E+02	4.000E+02	3.100E+02	liters/year
Shoreline Rec.	0.000E+00	1.400E+01	6.700E+01	1.200E+01	hours/year
Fresh Fish	0.000E+00	6.900E+00	1.600E+01	2.100E+01	kg/year
Fresh Leafy Veg.	0.000E+00	2.600E+01	4.200E+01	6.400E+01	kg/year
Stored Veg.	0.000E+00	5.200E+02	6.300E+02	5.200E+02	kg/year
Irrigated Veg.	0.000E+00	2.600E+01	4.200E+01	6.400E+01	kg/year
Breathing	1.400E+03	3.700E+03	8.000E+03	8.000E+03	m3/year
Meat	0.000E+00	4.100E+01	6.500E+01	1.100E+02	kg/year

APPENDIX H
PARAMETERS FOR DOSES TO MEMBER OF
THE PUBLIC INSIDE SITE BOUNDARY

TABLE H-1

ASSUMPTIONS/PARAMETERS FOR DOSES TO A
MEMBER OF THE PUBLIC INSIDE SITE BOUNDARY

MEMBER OF THE PUBLIC	LOCATION	DISTANCE (1) METERS	SECTOR	DURATION (HR/YEAR)
Private Driver	North Parking Lot	275	N	125 ⁽³⁾
Employee	Service Building	115 ⁽²⁾	ENE	5
People Entering Site Without Consent	Alligator Bayou	2500	SW	40
Casual Drivers	Main Admin Building	500	WNW	76 ⁽⁴⁾

- (1) The approximate distance from main plant vent exhaust to location.
- (2) Midpoint of building.
- (3) An individual is assumed to be on site 0.25/hr in the morning and 0.25/hr in the evening, 5 days per week, 50 weeks per year (0.5 hr/day * 5 days/week * 50 weeks/year = 125 hours).
- (4) An individual is assumed to be on site .5 hr/day.
- (5) Liquid pathways dose is not considered due to nature of activities that individuals are engaged in.

APPENDIX I
ENVIRONMENTAL DOSE TRANSFER FACTORS
FOR GASEOUS EFFLUENTS

TABLE I-1

DOSE FACTOR TABLE: P (1) - Adult, inhalation
 Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	0.00E+00
C-14	1.82E+04	3.41E+03	3.41E+03	3.41E+03	3.41E+03	3.41E+03	3.41E+03	0.00E+00
NA-24	1.02E+04	1.02E+04	1.02E+04	1.02E+04	1.02E+04	1.02E+04	1.02E+04	0.00E+00
P-32	1.32E+06	7.71E+04	5.01E+04	0.00E+00	0.00E+00	0.00E+00	8.64E+04	0.00E+00
CR-51	0.00E+00	0.00E+00	1.00E+02	5.95E+01	2.28E+01	1.44E+04	3.32E+03	0.00E+00
MN-54	0.00E+00	3.96E+04	6.30E+03	0.00E+00	9.84E+03	1.40E+06	7.74E+04	0.00E+00
MN-56	0.00E+00	1.24E+00	1.83E-01	0.00E+00	1.30E+00	9.44E+03	2.02E+04	0.00E+00
FE-55	2.46E+04	1.70E+04	3.94E+03	0.00E+00	0.00E+00	7.21E+04	6.03E+00	0.00E+00
FE-59	1.18E+04	2.78E+04	1.06E+04	0.00E+00	0.00E+00	1.02E+06	1.88E+05	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.58E+03	2.07E+03	0.00E+00	0.00E+00	9.28E+05	1.06E+05	0.00E+00
CO-60	0.00E+00	1015E+04	1.48E+04	0.00E+00	0.00E+00	5.97E+06	2.85E+05	0.00E+00
NI-63	4.32E+05	3.14E+04	1.45E+04	0.00E+00	0.11E+00	1.78E+05	1.34E+04	0.00E+00
NI-65	1.54E+00	2.10E-01	9.12E-02	0.00E+00	0.00E+00	5.60E+03	1.23E+04	0.00E+00
CU-64	0.00E+00	1.46E+00	6.15E-01	0.00E+00	4.62E+00	6.78E+03	4.90E+04	0.00E+00
ZN-65	3.24E+04	1.03E+05	4.66E+04	0.00E+00	6.90E+04	8.64E+05	5.34E+04	0.00E+00
ZN-69	3.38E-02	6.51E-02	4.52E-03	0.00E+00	4.22E-02	9.20E+02	1.63E+01	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	2.41E+02	0.00E+00	0.00E+00	0.00E+00	2.32E+02	0.00E+00
BR-84	0.00E+00	0.00E+00	3.13E+02	0.00E+02	0.00E+00	0.00E+00	1.64E-03	0.00E+00
BR-85	0.00E+00	0.00E+00	1.28E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	1.35E+05	5.90E+04	0.00E+00	0.00E+00	0.00E+00	1.66E+04	0.00E+00
RB-88	0.00E+00	3.87E+02	1.93E+02	0.00E+00	0.00E+00	0.00E+00	3.34E-09	0.00E+00
RB-89	0.00E+00	2.56E+02	1.70E+02	0.00E+00	0.00E+00	0.00E+00	9.28E-12	0.00E+00
SR-89	3.04E+05	0.00E+00	8.72E+03	0.00E+00	0.00E+00	1.40E+06	3.50E+05	0.00E+00
SR-90	9.92E+07	0.00E+00	6.10E+06	0.00E+00	0.00E+00	9.60E+06	7.22E+05	0.00E+00
SR-91	6.19E+01	0.00E+00	2.50E+00	0.00E+00	0.00E+00	2.65E+04	1.91E+05	0.00E+00
SR-92	6.74E+00	0.00E+00	2.91E-01	0.00E+00	0.00E+00	1.65E+04	4.30E+04	0.00E+00
Y-90	2.90E+03	0.00E+00	5.61E+01	0.00E+00	0.00E+00	1.70E+05	5.06E+05	0.00E+00
Y-91M	2.61E-01	0.00E+00	1.02E-02	0.00E+00	0.00E+00	1.92E+03	1.33E+00	0.00E+00
Y-91	4.62E+05	0.00E+00	1.24E+04	0.00E+00	0.00E+00	1.70E+06	3.85E+05	0.00E+00
Y-92	1.03E+01	0.00E+00	3.02E-01	0.00E+00	0.00E+00	1.57E+04	7.35E+04	0.00E+00
Y-93	9.44E+01	0.00E+00	2.61E+00	0.00E+00	0.00E+00	4.85E+04	4.22E+05	0.00E+00
ZR-95	1.07E+05	3.44E+04	2.33E+04	0.00E+00	5.42E+04	1.77E+06	1.50E+05	0.00E+00
ZR-97	9.68E+01	1.96E+01	9.04E+00	0.00E+00	2.97E+01	7.87E+04	5.23E+05	0.00E+00
NB-95	1.41E+04	7.82E+03	4.21E+03	0.00E+00	7.74E+03	5.05E+05	1.04E+05	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.21E+02	2.30E+01	0.00E+00	2.91E+02	9.12E+04	2.48E+05	0.00E+00
TC-99M	1.03E-03	2.91E-03	3.70E-02	0.00E+00	4.42E-02	7.64E+02	4.16E+03	0.00E+00
TC-101	4.18E-05	6.12E-02	5.90E-04	0.00E+00	1.08E-03	3.99E+02	1.09E-11	0.00E+00
RU-103	1.53E+03	0.00E+00	6.58E+02	0.00E+00	5.83E+03	5.05E+05	1.10E+05	0.00E+00
RU-105	7.90E-01	0.00E+00	3.11E-01	0.00E+00	1.02E+00	1.10E+04	4.82E+04	0.00E+00
RU-106	6.91E+04	0.00E+00	8.72E+03	0.00E+00	1.34E+05	9.36E+06	9.12E+05	0.00E+00
AG-110M	0.00E+00	1.00E+04	5.94E+03	0.00E+00	1.97E+04	4.63E+06	3.02E+05	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	3.42E+03	1.58E+03	4.67E+02	1.05E+03	1.24E+04	3.14E+05	7.06E+04	0.00E+00
TE-127M	1.26E+04	5.77E+03	1.57E+03	3.29E+03	4.58E+04	9.60E+05	1.50E+05	0.00E+00
TE-127	1.40E+00	6.42E-01	3.10E-01	1.06E+00	5.10E+00	6.15E+03	5.74E+04	0.00E+00
TE-129M	9.76E+03	4.67E+03	1.58E+03	3.44E+03	3.66E+04	1.16E+06	3.83E+05	0.00E+00
TE-129	4.98E-02	2.39E-02	1.24E-02	3.90E-02	1.87E-01	1.94E+03	1.57E+02	0.00E+00
TE-131M	6.99E+01	4.36E+01	2.90E+01	5.50E+01	3.09E+02	1.46E+05	5.56E+05	0.00E+00
TE-131	1.11E-02	5.95E-03	3.59E-03	9.36E-03	4.37E-02	1.39E+03	1.84E+01	0.00E+00
TE-132	2.60E+02	2.15E+02	1.62E+02	1.90E+02	1.46E+03	2.88E+05	5.10E+05	0.00E+00
I-130	4.58E+03	1.34E+04	5.28E+03	1.14E+06	2.09E+04	0.00E+00	7.69E+03	0.00E+00
I-131	2.52E+04	3.58E+04	2.05E+04	1.19E+07	6.13E+04	0.00E+00	6.28E+03	0.00E+00
I-132	1.16E+03	3.26E+03	1.16E+03	1.14E+05	5.18E+03	0.00E+00	4.06E+02	0.00E+00
I-133	8.64E+03	1.48E+04	4.52E+03	2.15E+06	2.58E+04	0.00E+00	8.88E+03	0.00E+00

TABLE I-1

DOSE FACTOR TABLE: P (i) - Adult, inhalation
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-134	6.44E+02	1.73E+03	6.15E+02	2.98E+04	2.75E+03	0.00E+00	1.01E+00	0.00E+00
I-135	2.68E+03	6.98E+03	2.57E+03	4.48E+05	1.11E+04	0.00E+00	5.25E+03	0.00E+00
CS-134	3.73E+05	8.48E+05	7.28E+05	0.00E+00	2.87E+05	9.76E+04	1.04E+04	0.00E+00
CS-136	3.90E+04	1.46E+05	1.10E+05	0.00E+00	8.56E+04	1.20E+04	1.17E+04	0.00E+00
CS-137	4.78E+05	6.21E+05	4.28E+05	0.00E+00	2.22E+05	7.52E+04	8.40E+03	0.00E+00
CS-138	3.31E+02	6.21E+02	3.24E+02	0.00E+00	4.80E+02	4.86E+01	1.86E-03	0.00E+00
BA-139	9.36E-01	0.00E+00	2.74E-02	0.00E+00	6.22E-04	3.76E+03	8.96E+02	0.00E+00
BA-140	3.90E+04	4.90E+01	0.00E+00	0.00E+00	1.67E+01	1.27E+06	2.18E+05	0.00E+00
BA-141	1.00E-01	7.53E-05	3.36E-03	0.00E+00	7.00E-05	1.94E+03	1.16E-07	0.00E+00
BA-142	2.63E-02	2.70E-05	1.66E-03	0.00E+00	0.00E+00	1.19E+03	1.57E-16	0.00E+00
LA-140	3.44E+02	1.74E+02	4.58E+01	0.00E+00	0.00E+00	1.36E+05	4.58E+05	0.00E+00
LA-142	6.83E-01	3.10E-01	7.72E-02	0.00E+00	0.00E+00	6.33E+03	2.11E+03	0.00E+00
CE-141	1.99E+04	1.35E+04	1.53E+03	0.00E+00	6.26E+03	3.62E+05	1.20E+05	0.00E+00
CE-143	1.86E+02	1.38E+02	1.53E+01	0.00E+00	6.08E+01	7.98E+04	2.26E+05	0.00E+00
CE-144	3.43E+06	1.43E+06	1.84E+05	0.00E+00	8.48E+05	7.78E+06	8.16E+05	0.00E+00
PR-143	9.36E+03	3.75E+03	4.64E+02	0.00E+00	2.16E+03	2.81E+05	2.00E+05	0.00E+00
PR-144	3.01E-02	1.25E-02	1.53E-03	0.00E+00	7.05E-03	1.02E+03	2.15E-08	0.00E+00
ND-147	5.27E+03	6.10E+03	3.65E+02	0.00E+00	3.56E+03	2.21E+05	1.73E+05	0.00E+00
W-187	8.48E+00	7.08E+00	2.48E+00	0.00E+00	0.00E+00	2.90E+04	1.50E+05	0.00E+00
NP-239	2.30E+02	2.26E+01	1.24E+01	0.00E+00	7.00E+01	3.76E+04	1.19E+05	0.00E+00

TABLE I-2

DOSE FACTOR TABLE: P (1) - Teen, inhalation,
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.27E+03	1.27E+03	1.27E+03	1.27E+03	1.27E+03	1.27E+03	0.00E+00
C-14	2.60E+04	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	0.00E+00
NA-24	1.38E+04	1.38E+04	1.38E+04	1.38E+04	1.38E+04	1.38E+04	1.38E+04	0.00E+00
P-32	1.89E+06	1.10E+05	7.16E+04	0.00E+00	0.00E+00	0.00E+00	9.28E+04	0.00E+00
CR-51	0.00E+00	0.00E+00	1.35E+02	7.50E+01	3.07E+01	2.10E+04	3.00E+03	0.00E+00
MN-54	0.00E+00	5.11E+04	8.40E+03	0.00E+00	1.27E+04	1.98E+06	6.68E+04	0.00E+00
MN-56	0.00E+00	1.70E+00	2.52E-01	0.00E+00	1.79E+00	1.52E+04	5.74E+04	0.00E+00
FE-55	3.34E+04	2.38E+04	5.54E+03	0.00E+00	0.00E+00	1.24E+05	6.39E+03	0.00E+00
FE-59	1.59E+04	3.70E+04	1.43E+04	0.00E+00	0.00E+00	1.53E+06	1.78E+05	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	2.07E+03	2.78E+03	0.00E+00	0.00E+00	1.34E+06	9.52E+04	0.00E+00
CO-60	0.00E+00	1.51E+04	1.98E+04	0.00E+00	0.00E+00	8.72E+06	2.59E+05	0.00E+00
NI-63	5.80E+05	4.34E+04	1.98E+04	0.00E+00	0.00E+00	3.07E+05	1.42E+04	0.00E+00
NI-65	2.18E+00	2.93E-01	1.27E-01	0.00E+00	0.00E+00	9.36E+03	3.67E+03	0.00E+00
CU-64	0.00E+00	2.03E+00	8.48E-01	0.00E+00	6.41E+00	1.11E+04	6.14E+04	0.00E+00
ZN-65	3.86E+04	1.34E+05	6.24E+04	0.00E+00	8.64E+04	1.24E+06	4.66E+04	0.00E+00
ZN-69	4.83E-02	9.20E-02	6.46E-03	0.00E+00	6.02E-02	1.58E+03	2.85E+02	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	3.44E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	4.33E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	1.83E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	1.90E+05	8.40E+04	0.00E+00	0.00E+00	0.00E+00	1.77E+04	0.00E+00
RB-88	0.00E+00	5.46E+02	2.72E+02	0.00E+00	0.00E+00	0.00E+00	2.92E-05	0.00E+00
RB-89	0.00E+00	3.52E+02	2.33E+02	0.00E+00	0.00E+00	0.00E+00	3.38E-07	0.00E+00
SR-89	4.34E+05	0.00E+00	1.25E+04	0.00E+00	0.00E+00	2.42E+06	3.71E+05	0.00E+00
SR-90	1.08E+08	0.00E+00	6.68E+06	0.00E+00	0.00E+00	1.65E+07	7.65E+05	0.00E+00
SR-91	8.80E+01	0.00E+00	3.51E+00	0.00E+00	0.00E+00	6.07E+04	2.59E+05	0.00E+00
SR-92	9.52E+00	0.00E+00	4.06E-01	0.00E+00	0.00E+00	2.74E+04	1.19E+05	0.00E+00
Y-90	2.98E+03	0.00E+00	8.00E+01	0.00E+00	0.00E+00	2.93E+05	5.59E+05	0.00E+00
Y-91M	3.70E-01	0.00E+00	1.42E-02	0.00E+00	0.00E+00	3.20E+03	3.02E+01	0.00E+00
Y-91	6.61E+05	0.00E+00	1.77E+04	0.00E+00	0.00E+00	2.94E+06	4.09E+05	0.00E+00
Y-92	1.47E+01	0.00E+00	4.29E-01	0.00E+00	0.00E+00	2.68E+04	1.65E+05	0.00E+00
Y-93	1.35E+02	0.00E+00	3.72E+00	0.00E+00	0.00E+00	8.32E+04	5.79E+05	0.00E+00
ZR-95	1.46E+05	4.58E+04	3.15E+04	0.00E+00	6.74E+04	2.69E+06	1.49E+05	0.00E+00
ZR-97	1.38E+02	2.72E+01	1.26E+01	0.00E+00	4.12E+01	1.30E+05	6.30E+05	0.00E+00
NB-95	1.86E+04	1.03E+04	5.66E+03	0.00E+00	1.00E+04	7.51E+05	9.68E+04	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.69E+02	3.22E+01	0.00E+00	4.11E+02	1.54E+05	2.69E+05	0.00E+00
TC-99M	1.38E-03	3.86E-03	4.99E-02	0.00E+00	5.76E-02	1.15E+03	6.13E+03	0.00E+00
TC-101	5.92E-05	8.40E-05	8.24E-04	0.00E+00	1.52E-03	6.67E+02	8.72E-07	0.00E+00
RU-103	2.10E+03	0.00E+00	8.96E+02	0.00E+00	7.43E+03	7.83E+05	1.09E+05	0.00E+00
RU-105	1.12E+00	0.00E+00	4.34E-01	0.00E+00	1.41E+00	1.82E+04	9.04E+04	0.00E+00
RU-106	9.84E+04	0.00E+00	1.24E+04	0.00E+00	1.90E+05	1.61E+07	9.60E+05	0.00E+00
AG-110M	1.38E+04	1.31E+04	7.99E+03	0.00E+00	2.50E+04	6.75E+06	2.73E+05	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	4.88E+03	2.24E+03	6.67E+02	1.40E+03	0.00E+00	5.36E+05	7.50E+04	0.00E+00
TE-127M	1.80E+04	8.16E+03	2.18E+03	4.38E+03	6.54E+04	1.66E+06	1.59E+05	0.00E+00
TE-127	2.01E+00	9.12E-01	4.42E-01	1.42E+00	7.28E+00	1.12E+04	8.08E+04	0.00E+00
TE-129M	1.39E+04	6.58E+03	2.25E+03	4.58E+03	5.19E+04	1.98E+06	4.05E+05	0.00E+00
TE-129	7.10E-02	3.38E-02	1.76E-02	5.18E-02	2.66E-01	3.30E+03	1.62E+03	0.00E+00
TE-131M	9.84E+01	6.01E+01	4.02E+01	7.25E+01	4.39E+02	2.38E+05	6.21E+05	0.00E+00
TE-131	1.58E-02	8.32E-03	5.04E-03	1.24E-02	6.18E-02	2.34E+03	1.51E+01	0.00E+00
TE-132	3.60E+02	2.90E+02	2.19E+02	2.46E+02	1.95E+03	4.49E+05	4.63E+05	0.00E+00
I-130	6.24E+03	1.79E+04	7.17E+03	1.49E+06	2.75E+04	0.00E+00	9.12E+03	0.00E+00
I-131	3.54E+04	4.91E+04	2.64E+04	1.46E+07	8.40E+04	0.00E+00	6.49E+03	0.00E+00
I-132	1.59E+03	4.38E+03	1.58E+03	1.51E+05	6.92E+03	0.00E+00	1.27E+03	0.00E+00
I-133	1.22E+04	2.05E+04	6.22E+03	2.92E+06	3.59E+04	0.00E+00	1.03E+04	0.00E+00
I-134	8.88E+02	2.32E+03	8.40E+02	3.95E+04	3.66E+03	0.00E+00	2.04E+01	0.00E+00
I-135	3.70E+03	9.44E+03	3.49E+03	6.21E+05	1.49E+04	0.00E+00	6.95E+03	0.00E+00
CS-134	5.02E+05	1.13E+06	5.49E+05	0.00E+00	3.75E+05	1.46E+05	9.76E+03	0.00E+00

TABLE I-2

DOSE FACTOR TABLE: P (i) - Teen, inhalation,
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
CS-136	5.15E+04	1.94E+05	1.37E+05	0.00E+00	1.10E+05	1.78E+04	1.09E+04	0.00E+00
CS-137	6.70E+05	8.48E+05	3.11E+05	0.00E+00	3.04E+05	1.21E+05	8.48E+03	0.00E+00
CS-138	4.66E+02	8.56E+02	4.46E+02	0.00E+00	6.62E+02	7.87E+01	2.70E-01	0.00E+00
BA-139	1.34E+00	9.44E-04	3.90E-02	0.00E+00	8.88E-04	6.46E+03	6.45E+03	0.00E+00
BA-140	5.47E+04	6.70E+01	3.52E+03	0.00E+00	2.28E+01	2.03E+06	2.29E+05	0.00E+00
BA-141	1.42E-01	1.06E-04	4.74E-03	0.00E+00	9.84E-05	3.29E+03	7.46E-04	0.00E+00
BA-142	3.70E-02	3.70E-05	2.27E-03	0.00E+00	3.14E-05	1.91E+03	4.79E-10	0.00E+00
LA-140	4.79E+02	2.36E+02	6.26E+01	0.00E+00	0.00E+00	2.14E+05	4.87E+05	0.00E+00
LA-142	9.60E-01	4.25E-01	1.06E-01	0.00E+00	0.00E+00	1.02E+04	1.20E+04	0.00E+00
CE-141	2.84E+04	1.90E+04	2.17E+03	0.00E+00	8.88E+03	6.14E+05	1.26E+05	0.00E+00
CE-143	2.66E+02	1.94E+02	2.16E+01	0.00E+00	8.64E+01	1.30E+05	2.55E+05	0.00E+00
CE-144	4.89E+06	2.02E+06	2.62E+05	0.00E+00	1.21E+06	1.34E+07	8.64E+05	0.00E+00
PR-143	1.34E+04	5.31E+03	6.62E+02	0.00E+00	3.09E+03	4.83E+05	2.14E+05	0.00E+00
PR-144	4.30E-02	1.76E-02	2.18E-03	0.00E+00	1.01E-02	1.75E+03	2.35E-04	0.00E+00
ND-147	7.86E+03	8.56E+03	5.13E+02	0.00E+00	5.02E+03	3.72E+05	1.82E+05	0.00E+00
W-187	1.20E+01	9.76E+00	3.43E+00	0.00E+00	0.00E+00	4.74E+04	1.77E+05	0.00E+00
NP-239	3.38E+02	3.19E+01	1.77E+01	0.00E+00	1.00E+02	6.49E+04	1.32E+05	0.00E+00

TABLE I-3

DOSE FACTOR TABLE: P (i) - CHILD, inhalation,
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.12E+03	1.12E+03	1.12E+03	1.12E+03	1.12E+03	1.12E+03	0.00E+00
C-14	3.59E+04	6.73E+03	6.73E+03	6.73E+03	6.73E+03	6.73E+03	6.73E+03	0.00E+00
NA-24	1.61E+04	1.61E+04	1.61E+04	1.61E+04	1.61E+04	1.61E+04	1.61E+04	0.00E+00
P-32	2.60E+06	1.14E+05	9.88E+04	0.00E+00	0.00E+00	0.00E+00	4.22E+04	0.00E+00
CR-51	0.00E+00	0.00E+00	1.54E+02	8.55E+01	2.43E+01	1.70E+04	1.08E+03	0.00E+00
MN-54	0.00E+00	4.29E+04	9.51E+03	0.00E+00	1.00E+04	1.58E+06	2.29E+04	0.00E+00
MN-56	0.00E+00	1.66E+00	3.12E-01	0.00E+00	1.67E+00	1.31E+04	1.23E+05	0.00E+00
FE-55	4.74E+04	2.52E+04	7.77E+03	0.00E+00	0.00E+00	1.11E+05	2.87E+03	0.00E+00
FE-59	2.07E+04	3.34E+04	1.67E+04	0.00E+00	0.00E+00	1.27E+06	7.07E+04	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.77E+03	3.16E+03	0.00E+00	0.00E+00	1.11E+06	3.44E+04	0.00E+00
CO-60	0.00E+00	1.31E+04	2.26E+04	0.00E+00	0.00E+00	7.07E+06	9.62E+04	0.00E+00
NI-63	8.21E+05	4.63E+04	2.80E+04	0.00E+00	0.00E+00	2.75E+05	6.33E+03	0.00E+00
NI-65	2.99E+00	2.96E-01	1.64E-01	0.00E+00	0.00E+00	8.18E+03	8.40E+04	0.00E+00
CU-64	0.00E+00	1.99E+00	1.07E+00	0.00E+00	6.03E+00	9.58E+03	3.67E+04	0.00E+00
ZN-65	4.26E+04	1.13E+05	7.03E+04	0.00E+00	7.14E+04	9.95E+05	1.63E+04	0.00E+00
ZN-69	6.70E-02	9.66E-02	8.92E-03	0.00E+00	5.85E-02	1.42E+03	1.02E-04	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	4.74E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	5.48E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	2.53E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	1.98E+05	1.14E+05	0.00E+00	0.00E+00	0.00E+00	7.99E+03	0.00E+00
RB-88	0.00E+00	5.62E+02	3.66E+02	0.00E+00	0.00E+00	0.00E+00	1.72E+01	0.00E+00
RB-89	0.00E+00	3.45E+02	2.90E+02	0.00E+00	0.00E+00	0.00E+00	1.89E+00	0.00E+00
SR-89	5.99E+05	0.00E+00	1.72E+04	0.00E+00	0.00E+00	2.16E+06	1.67E+05	0.00E+00
SR-90	1.01E+08	0.00E+00	6.44E+06	0.00E+00	0.00E+00	1.48E+07	3.43E+05	0.00E+00
SR-91	1.21E+02	0.00E+00	4.59E+00	0.00E+00	0.00E+00	5.33E+04	1.74E+05	0.00E+00
SR-92	1.31E+01	0.00E+00	5.25E-01	0.00E+00	0.00E+00	2.40E+04	2.42E+05	0.00E+00
Y-90	4.11E+03	0.00E+00	1.11E+02	0.00E+00	0.00E+00	2.62E+05	2.68E+05	0.00E+00
Y-91M	5.07E-01	0.00E+00	1.84E-02	0.00E+00	0.00E+00	2.81E+03	1.72E+03	0.00E+00
Y-91	9.14E+03	0.00E+00	2.44E+04	0.00E+00	0.00E+00	2.63E+06	1.84E+05	0.00E+00
Y-92	2.04E+01	0.00E+00	5.81E-01	0.00E+00	0.00E+00	2.39E+04	2.39E+05	0.00E+00
Y-93	1.86E+02	0.00E+00	5.11E+00	0.00E+00	0.00E+00	7.44E+04	3.89E+05	0.00E+00
ZR-95	1.90E+05	4.18E+04	3.70E+04	0.00E+00	5.96E+04	2.23E+06	6.11E+04	0.00E+00
ZR-97	1.88E+02	2.72E+01	1.60E+01	0.00E+00	3.88E+01	1.13E+05	3.51E+05	0.00E+00
NB-95	2.35E+04	9.18E+03	6.55E+03	0.00E+00	8.62E+03	6.14E+05	3.70E+04	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.72E+02	4.25E+01	0.00E+00	3.92E+02	1.35E+05	1.27E+05	0.00E+00
TC-99M	1.78E-03	3.48E-03	5.77E-02	0.00E+00	5.07E-02	9.51E+02	4.81E+03	0.00E+00
TC-101	8.10E-05	8.51E-05	1.08E-03	0.00E+00	1.45E-03	5.85E+02	1.63E+01	0.00E+00
RU-103	2.79E+03	0.00E+00	1.07E+03	0.00E+00	7.03E+03	6.62E+05	4.48E+04	0.00E+00
RU-105	1.53E+00	0.00E+00	5.55E-01	0.00E+00	1.34E-00	1.59E+04	9.95E+04	0.00E+00
RU-106	1.36E+05	0.00E+00	1.69E+04	0.00E+00	1.84E+05	1.43E+07	4.29E+05	0.00E+00
AG-110M	1.69E+04	1.14E+04	9.14E+03	0.00E+00	2.12E+04	5.48E+06	1.00E+05	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	6.73E+03	2.33E+03	9.14E+02	1.92E+03	0.00E+00	4.77E+05	3.38E+04	0.00E+00
TE-127M	2.49E+04	8.55E+03	3.02E+03	6.07E+03	6.36E+04	1.48E+06	7.14E+04	0.00E+00
TE-127	2.77E+00	9.51E-01	6.10E-01	1.96E+00	7.07E+00	1.00E+04	5.62E+04	0.00E+00
TE-129M	1.92E+04	6.85E+03	3.04E+03	6.33E+03	5.03E+04	1.76E+06	1.82E+05	0.00E+00
TE-129	9.77E-02	3.50E-02	2.38E-02	7.14E-02	2.57E-01	2.93E+03	2.55E+04	0.00E+00
TE-131M	1.34E+02	5.92E+01	5.07E+01	9.77E+01	4.00E+02	2.06E+05	3.08E+05	0.00E+00
TE-131	2.17E-02	8.44E-03	6.59E-03	1.70E-02	5.88E-02	2.05E+03	1.33E+03	0.00E+00
TE-132	4.81E+02	2.72E+02	2.63E+02	3.17E+02	1.77E+03	3.77E+05	1.38E+05	0.00E+00
I-130	8.18E+03	1.64E+04	8.44E+03	1.85E+06	2.45E+04	0.00E+00	5.11E+03	0.00E+00
I-131	4.81E+04	4.81E+04	2.73E+04	1.62E+07	7.88E+04	0.00E+00	2.84E+03	0.00E+00
I-132	2.12E+03	4.07E+03	1.88E+03	1.94E+05	6.25E+03	0.00E+00	3.20E+03	0.00E+00
I-133	1.66E+04	2.03E+04	7.70E+03	3.85E+06	3.38E+04	0.00E+00	5.48E+03	0.00E+00
I-134	1.17E+03	2.16E+03	9.95E+02	5.07E+04	3.30E+03	0.00E+00	9.55E+02	0.00E+00

TABLE I-3

DOSE FACTOR TABLE: P (i) - CHILD, inhalation,
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	4.92E+03	8.73E+03	4.14E+03	7.92E+05	1.34E+04	0.00E+00	4.44E+03	0.00E+00
CS-134	6.51E+05	1.01E+06	2.25E+05	0.00E+00	3.30E+05	1.21E+05	3.85E+03	0.00E+00
CS-136	6.51E+04	1.71E+05	1.16E+05	0.00E+00	9.55E+04	1.45E+04	4.18E+03	0.00E+00
CS-137	9.07E+05	8.25E+05	1.28E+05	0.00E+00	2.82E+05	1.04E+05	3.62E+03	0.00E+00
CS-138	6.33E+02	8.40E+02	5.55E+02	0.00E+00	6.22E+02	6.81E+01	2.70E+02	0.00E+00
BA-139	1.84E+00	9.84E-04	5.36E-02	0.00E+00	8.62E-04	5.77E+03	5.77E+04	0.00E+00
BA-140	7.40E+04	6.48E+01	4.33E+03	0.00E+00	2.11E+01	1.74E+06	1.02E+05	0.00E+00
BA-141	1.96E-01	1.09E-04	6.36E-03	0.00E+00	9.47E-05	2.92E+03	2.75E+02	0.00E+00
BA-142	4.99E-02	3.60E-05	2.79E-03	0.00E+00	2.91E-05	1.64E+03	2.74E+00	0.00E+00
LA-140	6.44E+02	2.25E+02	7.55E+01	0.00E+00	0.00E+00	1.83E+05	2.26E+05	0.00E+00
LA-142	1.29E+00	4.11E-01	1.29E-01	0.00E+00	0.00E+00	8.70E+03	7.59E+04	0.00E+00
CE-141	3.92E+04	1.95E+04	2.90E+03	0.00E+00	8.55E+03	5.44E+05	5.66E+04	0.00E+00
CE-143	3.66E+02	1.99E+02	2.87E+01	0.00E+00	8.36E+01	1.15E+05	1.27E+05	0.00E+00
CE-144	6.77E+06	2.12E+06	3.61E+05	0.00E+00	1.17E+06	1.20E+07	3.89E+05	0.00E+00
PR-143	1.85E+04	5.55E+03	9.14E+02	0.00E+00	3.00E+03	4.33E+05	9.73E+04	0.00E+00
PR-144	5.96E-02	1.85E-02	3.00E-03	0.00E+00	9.77E-03	1.57E+03	1.97E+02	0.00E+00
ND-147	1.08E+04	8.73E+03	6.81E+02	0.00E+00	4.81E+03	3.28E+05	8.21E+04	0.00E+00
W-187	1.63E+01	9.66E+00	4.33E+00	0.00E+00	0.00E+00	4.11E+04	9.10E+04	0.00E+00
NP-239	4.66E+02	3.34E+01	2.35E+01	0.00E+00	9.73E+01	5.81E+04	6.40E+04	0.00E+00

TABLE I-4

DOSE FACTOR TABLE: P (i) - Infant, inhalation,
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	6.47E+02	6.47E+02	6.47E+02	6.47E+02	6.47E+02	6.47E+02	0.00E+00
C-14	2.65E+04	5.31E+03	5.31E+03	5.31E+03	5.31E+03	5.31E+03	5.31E+03	0.00E+00
NA-24	1.06E+04	1.06E+04	1.06E+04	1.06E+04	1.06E+04	1.06E+04	1.06E+04	0.00E+00
P-32	2.03E+06	1.12E+05	7.74E+04	0.00E+00	0.00E+00	0.00E+00	1.61E+04	0.00E+00
CR-51	0.00E+00	0.00E+00	8.95E+01	5.75E+01	1.32E+01	1.28E+04	3.57E+02	0.00E+00
MN-54	0.00E+00	2.53E+04	4.98E+03	0.00E+00	4.98E+03	1.00E+06	7.06E+03	0.00E+00
MN-56	0.00E+00	1.54E+00	2.21E-01	0.00E+00	1.10E+00	1.25E+04	7.17E+04	0.00E+00
FE-55	1.97E+04	1.17E+04	3.33E+03	0.00E+00	0.00E+00	8.69E+04	1.09E+03	0.00E+00
FE-59	1.36E+04	2.35E+04	9.48E+03	0.00E+00	0.00E+00	1.02E+06	2.48E+04	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.22E+03	1.82E+03	0.00E+00	0.00E+00	7.77E+05	1.11E+04	0.00E+00
CO-60	0.00E+00	8.02E+03	1.18E+04	0.00E+00	0.00E+00	4.51E+06	3.19E+04	0.00E+00
NI-63	3.39E+05	2.04E+04	1.16E+04	0.00E+00	0.00E+00	7.19E+05	2.42E+03	0.00E+00
NI-65	2.39E+00	2.84E-01	1.23E-01	0.00E+00	0.00E+00	8.12E+03	5.01E+04	0.00E+00
CU-64	0.00E+00	1.88E+00	7.74E-01	0.00E+00	3.98E+00	9.30E+03	1.50E+04	0.00E+00
ZN-65	1.93E+04	6.26E+04	3.11E+04	0.00E+00	3.25E+04	6.47E+05	5.14E+04	0.00E+00
ZN-69	5.39E-02	9.67E-02	7.18E-03	0.00E+00	4.02E-02	1.47E+03	1.32E+04	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	3.81E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	4.00E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	2.04E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	1.90E+05	8.82E+04	0.00E+00	0.00E+00	0.00E+00	3.04E+03	0.00E+00
RB-88	0.00E+00	5.57E+02	2.67E+02	0.00E+00	0.00E+00	0.00E+00	3.39E+02	0.00E+00
RB-89	0.00E+00	3.21E+02	2.06E+02	0.00E+00	0.00E+00	0.00E+00	6.82E+01	0.00E+00
SR-89	3.98E+05	0.00E+00	1.14E+04	0.00E+00	0.00E+00	2.03E+06	6.40E+04	0.00E+00
SR-90	4.09E+07	0.00E+00	2.59E+06	0.00E+00	0.00E+00	1.12E+07	1.31E+05	0.00E+00
SR-91	9.56E+01	0.00E+00	3.46E+00	0.00E+00	0.00E+00	5.26E+04	7.34E+04	0.00E+00
SR-92	1.05E+01	0.00E+00	3.91E-01	0.00E+00	0.00E+00	2.38E+04	1.40E+05	0.00E+00
Y-90	3.29E+03	0.00E+00	8.82E+01	0.00E+00	0.00E+00	2.69E+05	1.04E+05	0.00E+00
Y-91M	4.07E-01	0.00E+00	1.39E-02	0.00E+00	0.00E+00	2.79E+03	2.35E+03	0.00E+00
Y-91	5.88E+05	0.00E+00	1.57E+04	0.00E+00	0.00E+00	2.45E+06	7.03E+04	0.00E+00
Y-92	1.64E+01	0.00E+00	4.61E-01	0.00E+00	0.00E+00	2.45E+04	1.27E+05	0.00E+00
Y-93	1.50E+02	0.00E+00	4.07E+00	0.00E+00	0.00E+00	7.64E+04	1.67E+05	0.00E+00
ZR-95	1.15E+05	2.79E+04	2.03E+04	0.00E+00	3.11E+04	1.75E+06	2.17E+04	0.00E+00
ZR-97	1.50E+02	2.56E+01	1.17E+01	0.00E+00	2.59E+01	1.10E+05	1.40E+05	0.00E+00
NB-95	1.57E+04	6.43E+03	3.78E+03	0.00E+00	4.72E+03	4.79E+05	1.27E+04	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.65E+02	3.23E+01	0.00E+00	2.65E+02	1.35E+05	4.87E+04	0.00E+00
TC-99M	1.40E-03	2.88E-03	3.72E-02	0.00E+00	3.11E-02	8.11E+02	2.03E+03	0.00E+00
TC-101	6.51E-05	8.23E-05	8.12E-04	0.00E+00	9.79E-04	5.84E+02	8.44E+02	0.00E+00
RU-103	2.02E+03	0.00E+00	6.79E+02	0.00E+00	4.24E+03	5.52E+05	1.61E+04	0.00E+00
RU-105	1.22E+00	0.00E+00	4.10E-01	0.00E+00	8.99E-01	1.57E+04	4.84E+04	0.00E+00
RU-106	8.68E+04	0.00E+00	1.09E+04	0.00E+00	1.07E+05	1.16E+07	1.64E+05	0.00E+00
AG-110M	9.98E+03	7.22E+03	5.00E+03	0.00E+00	1.09E+04	3.67E+06	3.30E+04	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	4.76E+03	1.99E+03	6.58E+02	1.62E+03	0.00E+00	4.47E+05	1.29E+04	0.00E+00
TE-127M	1.67E+04	6.90E+03	2.07E+03	4.87E+03	3.75E+04	1.31E+06	2.73E+04	0.00E+00
TE-127	2.23E+00	9.53E-01	4.89E-01	1.85E+00	4.86E+00	1.03E+04	2.44E+04	0.00E+00
TE-129M	1.41E+04	6.09E+03	2.23E+03	5.47E+03	3.18E+04	1.68E+06	6.90E+04	0.00E+00
TE-129	7.88E-02	3.47E-02	1.88E-02	6.75E-02	1.75E-01	3.00E+03	2.63E+04	0.00E+00
TE-131M	1.07E+02	5.50E+01	3.63E+01	8.93E+01	2.65E+02	1.99E+05	1.19E+05	0.00E+00
TE-131	1.74E-02	8.22E-03	5.00E-03	1.58E-02	3.99E-02	2.06E+03	8.22E+03	0.00E+00
TE-132	3.72E+02	2.37E+02	1.76E+02	2.79E+02	1.03E+03	3.40E+05	4.41E+04	0.00E+00
I-130	6.36E+03	1.39E+04	5.57E+03	1.60E+06	1.53E+04	0.00E+00	1.99E+03	0.00E+00
I-131	3.79E+04	4.44E+04	1.96E+04	1.48E+07	5.18E+04	0.00E+00	1.06E+03	0.00E+00
I-132	1.69E+03	3.54E+03	1.26E+03	1.69E+05	3.95E+03	0.00E+00	1.90E+03	0.00E+00
I-133	1.32E+04	1.92E+04	5.60E+03	3.56E+06	2.24E+04	0.00E+00	2.16E+03	0.00E+00
I-134	9.21E+02	1.88E+03	6.65E+02	4.45E+04	2.90E+03	0.00E+00	1.29E+03	0.00E+00

TABLE I-4

DOSE FACTOR TABLE: P (i) - Infant, inhalation,
Units are mrem/yr per uCi/cu.m

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	3.86E+03	7.60E+03	2.77E+03	6.96E+05	8.47E+03	0.00E+00	1.83E+03	0.00E+00
CS-134	3.96E+05	7.03E+05	7.45E+04	0.00E+00	1.90E+05	7.97E+04	1.33E+03	0.00E+00
CS-136	4.83E+04	1.35E+05	5.29E+04	0.00E+00	5.64E+04	1.18E+04	1.43E+03	0.00E+00
CS-137	5.49E+05	6.12E+05	4.55E+04	0.00E+00	1.72E+05	7.13E+04	1.33E+03	0.00E+00
CS-138	5.05E+02	7.81E+02	3.98E+02	0.00E+00	4.10E+02	6.54E+01	8.76E+02	0.00E+00
BA-139	1.48E+00	9.84E-04	4.30E-02	0.00E+00	5.92E-04	5.95E+03	5.10E+04	0.00E+00
BA-140	5.60E+04	5.60E+01	2.90E+03	0.00E+00	1.34E+01	1.60E+06	3.84E+04	0.00E+00
BA-141	1.57E-01	1.08E-04	4.97E-03	0.00E+00	6.50E-05	2.97E+03	4.75E+03	0.00E+00
BA-142	3.98E-02	3.30E-05	1.96E-03	0.00E+00	1.90E-05	1.55E+03	6.93E+02	0.00E+00
LA-140	5.05E+02	2.00E+02	5.15E+01	0.00E+00	0.00E+00	1.68E+05	8.48E+04	0.00E+00
LA-142	1.03E+00	3.77E-01	9.04E-02	0.00E+00	0.00E+00	8.22E+03	5.95E+04	0.00E+00
CE-141	2.77E+04	1.67E+04	1.99E+03	0.00E+00	5.25E+03	5.17E+05	2.16E+04	0.00E+00
CE-143	2.93E+02	1.93E+02	2.21E+01	0.00E+00	5.64E+01	1.16E+05	4.97E+04	0.00E+00
CE-144	3.19E+06	1.21E+06	1.76E+05	0.00E+00	5.38E+05	9.84E+06	1.48E+05	0.00E+00
PR-143	1.40E+04	5.24E+03	6.99E+02	0.00E+00	1.97E+03	4.33E+05	3.72E+04	0.00E+00
PR-144	4.79E-02	1.85E-02	2.41E-03	0.00E+00	6.72E-02	1.61E+03	4.28E+03	0.00E+00
ND-147	7.94E+04	8.13E+03	5.00E+02	0.00E+00	3.15E+03	3.22E+05	3.12E+04	0.00E+00
W-187	1.30E+01	9.02E+00	3.12E+00	0.00E+00	0.00E+00	3.96E+04	3.56E+04	0.00E+00
NP-239	3.71E+02	3.32E+01	1.88E+01	0.00E+00	6.62E+01	5.95E+04	2.49E+04	0.00E+00

TABLE I-5

DOSE FACTOR TABLE: R (i) -All , gr. plane,
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NA-24	1.19E+07	1.19E+07	1.19E+07	1.19E+07	1.19E+07	1.19E+07	1.19E+07	1.39E+07
P-32	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CR-51	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	5.51E+06
MN-54	1.39E+09	1.39E+09	1.39E+09	1.39E+09	1.39E+09	1.39E+09	1.39E+09	1.62E+09
MN-56	9.03E+05	9.03E+05	9.03E+05	9.03E+05	9.03E+05	9.03E+05	9.03E+05	1.07E+06
FE-55	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-59	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	3.21E+08
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	4.44E+08
CO-60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.53E+10
NI-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NI-65	2.97E+05	2.97E+05	2.97E+05	2.97E+05	2.97E+05	2.97E+05	2.97E+05	3.45E+05
CU-64	6.07E+05	6.07E+05	6.07E+05	6.07E+05	6.07E+05	6.07E+05	6.07E+05	6.88E+05
ZN-65	7.47E+08	7.47E+08	7.47E+08	7.47E+08	7.47E+08	7.47E+08	7.48E+08	8.59E+08
ZN-69	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	7.08E+03
BR-84	2.03E+05	2.03E+05	2.03E+05	2.03E+05	2.03E+05	2.03E+05	2.03E+05	2.36E+05
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	8.99E+06	8.99E+06	8.99E+06	8.99E+06	8.99E+06	8.99E+06	8.99E+06	1.03E+07
RB-88	3.31E+04	3.31E+04	3.31E+04	3.31E+04	3.31E+04	3.31E+04	3.31E+04	3.78E+04
RB-89	1.23E+05	1.23E+05	1.23E+05	1.23E+05	1.23E+05	1.23E+05	1.23E+05	1.48E+05
SR-89	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.51E+04
SR-91	2.15E+06	2.15E+06	2.15E+06	2.15E+06	2.15E+06	2.15E+06	2.15E+06	2.51E+06
SR-92	7.77E+05	7.77E+05	7.77E+05	7.77E+05	7.77E+05	7.77E+05	7.77E+05	8.63E+05
Y-90	4.49E+03	4.49E+03	4.49E+03	4.49E+03	4.49E+03	4.49E+03	4.49E+03	5.31E+03
Y-91M	1.00E+05	1.00E+05	1.00E+05	1.00E+05	1.00E+05	1.00E+05	1.00E+05	1.16E+05
Y-91	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.21E+06
Y-92	1.80E+05	1.80E+05	1.80E+05	1.80E+05	1.80E+05	1.80E+05	1.80E+05	2.14E+05
Y-93	1.83E+05	1.83E+05	1.83E+05	1.83E+05	1.83E+05	1.83E+05	1.83E+05	2.51E+05
ZR-95	2.45E+08	2.45E+08	2.45E+08	2.45E+08	2.45E+08	2.45E+08	2.45E+08	2.84E+08
ZR-97	2.96E+06	2.96E+06	2.96E+06	2.96E+06	2.96E+06	2.96E+06	2.96E+06	3.44E+06
NB-95	1.37E+08	1.37E+08	1.37E+08	1.37E+08	1.37E+08	1.37E+08	1.37E+08	1.61E+08
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	3.99E+06	3.99E+06	3.99E+06	3.99E+06	3.99E+06	3.99E+06	3.99E+06	4.63E+06
TC-99M	1.84E+05	1.84E+05	1.84E+05	1.84E+05	1.84E+05	1.84E+05	1.84E+05	2.11E+05
TC-101	2.04E+04	2.04E+04	2.04E+04	2.04E+04	2.04E+04	2.04E+04	2.04E+04	2.26E+04
RU-103	1.08E+08	1.08E+08	1.08E+08	1.08E+08	1.08E+08	1.08E+08	1.08E+08	1.26E+08
RU-105	6.36E+05	6.36E+05	6.36E+05	6.36E+05	6.36E+05	6.36E+05	6.36E+05	7.21E+05
RU-106	4.22E+08	4.22E+08	4.22E+08	4.22E+08	4.22E+08	4.22E+08	4.22E+08	5.07E+08
AG-110M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.01E+09
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	1.55E+06	2.13E+06
TE-127M	9.16E+04	9.16E+04	9.16E+04	9.16E+04	9.16E+04	9.16E+04	9.16E+04	1.08E+05
TE-127	2.98E+03	2.98E+03	2.98E+03	2.98E+03	2.98E+03	2.98E+03	2.98E+03	3.28E+03
TE-129M	1.98E+07	1.98E+07	1.98E+07	1.98E+07	1.98E+07	1.98E+07	1.98E+07	2.31E+07
TE-129	2.62E+04	2.62E+04	2.62E+04	2.62E+04	2.62E+04	2.62E+04	2.62E+04	3.10E+04
TE-131M	8.03E+06	8.03E+06	8.03E+06	8.03E+06	8.03E+06	8.03E+06	8.03E+06	9.46E+06
TE-131	2.92E+04	2.92E+04	2.92E+04	2.92E+04	2.92E+04	2.92E+04	2.92E+04	3.45E+07
TE-132	4.23E+06	4.23E+06	4.23E+06	4.23E+06	4.23E+06	4.23E+06	4.23E+06	4.98E+06
I-130	5.51E+06	5.51E+06	5.51E+06	5.51E+06	5.51E+06	5.51E+06	5.51E+06	6.69E+06
I-131	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	1.72E+07	2.09E+07
I-132	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.25E+06	1.46E+06
I-133	2.45E+06	2.45E+06	2.45E+06	2.45E+06	2.45E+06	2.45E+06	2.45E+06	2.98E+06
I-134	4.47E+05	4.47E+05	4.47E+05	4.47E+05	4.47E+05	4.47E+05	4.47E+05	5.30E+05

TABLE I-5

DOSE FACTOR TABLE: R (i) - All, gr. plane
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	2.53E+06	2.53E+06	2.53E+06	2.53E+06	2.53E+06	2.53E+06	2.53E+06	2.95E+06
CS-134	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	8.00E+09
CS-136	1.51E+08	1.51E+08	1.51E+08	1.51E+08	1.51E+08	1.51E+08	1.51E+08	1.71E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10
CS-138	3.59E+05	3.59E+05	3.59E+05	3.59E+05	3.59E+05	3.59E+05	3.59E+05	4.10E+05
BA-139	1.06E+05	1.06E+05	1.06E+05	1.06E+05	1.06E+05	1.06E+05	1.06E+05	1.19E+05
BA-140	2.05E+07	2.05E+07	2.05E+07	2.05E+07	2.05E+07	2.05E+07	2.05E+07	2.35E+07
BA-141	4.17E+04	4.17E+04	4.17E+04	4.17E+04	4.17E+04	4.17E+04	4.17E+04	4.75E+04
BA-142	4.49E+04	4.49E+04	4.49E+04	4.49E+04	4.49E+04	4.49E+04	4.49E+04	5.11E+04
LA-140	1.92E+07	1.92E+07	1.92E+07	1.92E+07	1.92E+07	1.92E+07	1.92E+07	2.18E+07
LA-142	7.60E+05	7.60E+05	7.60E+05	7.60E+05	7.60E+05	7.60E+05	7.60E+05	9.11E+05
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07
CE-143	2.31E+06	2.31E+06	2.31E+06	2.31E+06	2.31E+06	2.31E+06	2.31E+06	2.63E+06
CE-144	6.95E+07	6.95E+07	6.95E+07	6.95E+07	6.95E+07	6.95E+07	6.95E+07	8.04E+07
PR-143	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PR-144	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.83E+03	1.73E+03	2.11E+03
ND-147	8.39E+06	8.39E+06	8.39E+06	8.39E+06	8.39E+06	8.39E+06	8.39E+06	1.01E+07
W-187	2.35E+06	2.35E+06	2.35E+06	2.35E+06	2.35E+06	2.35E+06	2.35E+06	2.73E+06
NP-239	1.71E+06	1.71E+06	1.71E+06	1.71E+06	1.71E+06	1.71E+06	1.71E+06	1.98E+06

TABLE I-6

DOSE FACTOR TABLE: R (i) -Adult, cows milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	4.73E+02	4.73E+02	4.73E+02	4.73E+02	4.73E+02	4.73E+02	0.00E+00
C-14	3.53E+05	7.26E+04	7.26E+04	7.26E+04	7.26E+04	7.26E+04	7.26E+04	0.00E+00
NA-24	2.44E+06	2.44E+06	2.44E+06	2.44E+06	2.44E+06	2.44E+06	2.44E+06	0.00E+00
P-32	1.62E+10	1.01E+09	6.26E+08	0.00E+00	0.00E+00	0.00E+00	1.82E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	2.55E+04	1.53E+04	5.62E+03	3.39E+04	6.42E+06	0.00E+00
MN-54	0.00E+00	6.63E+06	1.27E+06	0.00E+00	1.97E+06	0.00E+00	2.03E+07	0.00E+00
MN-56	0.00E+00	4.21E-03	7.47E-04	0.00E+00	5.34E-03	0.00E+00	1.34E-01	0.00E+00
FE-55	1.95E+07	1.35E+07	3.15E+06	0.00E+00	0.00E+00	7.53E+06	7.75E+06	0.00E+00
FE-59	2.55E+07	5.99E+07	2.30E+07	0.00E+00	0.00E+00	1.67E+07	2.00E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	3.92E+06	8.78E+06	0.00E+00	0.00E+00	0.00E+00	7.94E+07	0.00E+00
CO-60	0.00E+00	1.27E+07	2.81E+07	0.00E+00	0.00E+00	0.00E+00	2.39E+08	0.00E+00
NI-63	5.21E+09	3.61E+08	1.75E+08	0.00E+00	0.00E+00	0.00E+00	7.53E+07	0.00E+00
NI-65	3.76E-01	4.88E-02	2.23E-02	0.00E+00	0.00E+00	0.00E+00	1.24E+00	0.00E+00
CU-64	0.00E+00	2.39E+04	1.12E+04	0.00E+00	6.03E+04	0.00E+00	2.04E+06	0.00E+00
ZN-65	1.09E+09	3.46E+09	1.56E+09	0.00E+00	2.31E+09	0.00E+00	2.18E+09	0.00E+00
ZN-69	2.18E-12	4.17E-12	2.90E-13	0.00E+00	2.71E-12	0.00E+00	6.26E-13	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	9.87E-02	0.00E+00	0.00E+00	0.00E+00	1.42E-01	0.00E+00
BR-84	0.00E+00	0.00E+00	1.73E-23	0.00E+00	0.00E+00	0.00E+00	1.36E-28	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	2.40E+09	1.12E+09	0.00E+00	0.00E+00	0.00E+00	4.74E+08	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	1.23E+09	0.00E+00	3.54E+07	0.00E+00	0.00E+00	0.00E+00	1.98E+08	0.00E+00
SR-90	3.62E+10	0.00E+00	8.89E+09	0.00E+00	0.00E+00	0.00E+00	1.05E+09	0.00E+00
SR-91	2.90E+04	0.00E+00	1.17E+03	0.00E+00	0.00E+00	0.00E+00	1.38E+05	0.00E+00
SR-92	4.95E-01	0.00E+00	2.14E-02	0.00E+00	0.00E+00	0.00E+00	9.81E+00	0.00E+00
Y-90	7.09E+01	0.00E+00	1.90E+00	0.00E+00	0.00E+00	0.00E+00	7.51E+05	0.00E+00
Y-91M	6.27E-20	0.00E+00	2.43E-21	0.00E+00	0.00E+00	0.00E+00	1.84E-19	0.00E+00
Y-91	7.22E+03	0.00E+00	1.93E+02	0.00E+00	0.00E+00	0.00E+00	3.98E+06	0.00E+00
Y-92	5.64E-05	0.00E+00	1.65E-06	0.00E+00	0.00E+00	0.00E+00	9.88E-01	0.00E+00
Y-93	2.24E-01	0.00E+00	6.19E-03	0.00E+00	0.00E+00	0.00E+00	7.11E+03	0.00E+00
ZR-95	7.89E+02	2.53E+02	1.71E+02	0.00E+00	3.97E+02	0.00E+00	8.02E+05	0.00E+00
ZP-97	4.34E-01	8.76E-02	4.01E-02	0.00E+00	1.32E-01	0.00E+00	2.71E+04	0.00E+00
NB-95	7.22E+04	4.02E+04	2.16E+04	0.00E+00	3.97E+04	0.00E+00	2.44E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	2.48E+07	4.71E+06	0.00E+00	5.61E+07	0.00E+00	5.74E+07	0.00E+00
TC-99M	3.34E+00	9.44E+00	1.20E+02	0.00E+00	1.43E+02	4.63E+00	5.59E+03	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	8.82E+02	0.00E+00	3.80E+02	0.00E+00	3.37E+03	0.00E+00	1.03E+05	0.00E+00
RU-105	8.64E-04	0.00E+00	3.41E-04	0.00E+00	1.12E-02	0.00E+00	5.29E-01	0.00E+00
RU-106	1.60E+04	0.00E+00	2.03E+03	0.00E+00	3.10E+04	0.00E+00	1.04E+06	0.00E+00
AG-110M	4.61E+07	4.26E+07	2.53E+07	0.00E+00	8.38E+07	0.00E+00	1.74E+10	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	1.37E+07	4.97E+06	1.84E+06	4.12E+06	5.58E+07	0.00E+00	5.48E+07	0.00E+00
TE-127M	3.72E+07	1.33E+07	4.53E+06	9.51E+06	1.51E+08	0.00E+00	1.25E+08	0.00E+00
TE-127	6.56E+02	2.35E+02	1.42E+02	4.86E+02	2.67E+03	0.00E+00	5.17E+04	0.00E+00
TE-129M	5.29E+07	1.97E+07	8.37E+06	1.82E+07	2.21E+08	0.00E+00	2.66E+08	0.00E+00
TE-129	2.92E-10	1.10E-10	7.11E-11	2.24E-10	1.23E-09	0.00E+00	2.20E-10	0.00E+00
TE-131M	3.62E+05	1.77E+05	1.47E+05	2.80E+05	1.79E+06	0.00E+00	1.76E+07	0.00E+00
TE-131	3.95E-33	1.65E-33	1.25E-33	3.25E-33	1.73E-32	0.00E+00	5.60E-34	0.00E+00
TE-132	2.40E+06	1.55E+06	1.46E+06	1.72E+06	1.50E+07	0.00E+00	7.35E+07	0.00E+00
I-130	4.21E+05	1.24E+06	4.90E+05	1.05E+08	1.94E+06	0.00E+00	1.07E+06	0.00E+00
I-131	2.91E+08	4.16E+08	2.38E+08	1.36E+11	7.13E+08	0.00E+00	1.10E+08	0.00E+00
I-132	1.67E-01	4.47E-01	1.56E-01	1.56E-01	7.12E-01	0.00E+00	8.39E-02	0.00E+00
I-133	3.88E+06	6.74E+02	2.06E+06	9.91E+08	1.18E+07	0.00E+00	6.06E+06	0.00E+00
I-134	2.11E-12	5.72E-12	2.05E-12	9.92E-11	9.10E-12	0.00E+00	4.99E-15	0.00E+00

TABLE I-6

DOSE FACTOR TABLE: P (i) - Adult, cows milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	1.29E+04	3.38E+04	1.25E+04	2.23E+06	5.42E+04	0.00E+00	3.82E+04	0.00E+00
CS-134	4.41E+09	1.05E+10	8.57E+09	0.00E+00	3.39E+09	1.13E+09	1.84E+08	0.00E+00
CS-136	2.51E+08	9.91E+08	7.13E+08	0.00E+00	5.51E+08	7.56E+07	1.13E+08	0.00E+00
CS-137	5.71E+09	7.81E+09	5.12E+09	0.00E+00	2.65E+09	8.82E+08	1.51E+08	0.00E+00
CS-138	9.72E-24	1.92E-23	9.50E-24	0.00E+00	1.41E-23	1.39E-24	8.18E-29	0.00E+00
BA-139	4.54E-08	3.24E-11	1.33E-09	0.00E+00	3.03E-11	1.84E-11	8.06E-08	0.00E+00
BA-140	2.57E+07	3.23E+04	1.68E+06	0.00E+00	1.10E+04	1.85E+04	5.29E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	4.52E+00	2.28E+00	6.01E-01	0.00E+00	0.00E+00	0.00E+00	1.67E+05	0.00E+00
LA-142	1.90E-11	8.66E-12	2.16E-12	0.00E+00	0.00E+00	0.00E+00	6.32E-08	0.00E+00
CE-141	4.27E+03	2.89E+03	3.27E+02	0.00E+00	1.34E+03	0.00E+00	1.10E+07	0.00E+00
CE-143	4.16E+01	3.08E+04	3.40E+00	0.00E+00	1.35E+00	0.00E+00	1.15E+06	0.00E+00
CE-144	2.82E+05	1.18E+05	1.52E+04	0.00E+00	7.00E+04	0.00E+00	9.55E+07	0.00E+00
PR-143	1.50E+02	6.02E+01	7.44E+00	0.00E+00	3.48E+01	0.00E+00	6.58E+05	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	9.10E+01	1.05E+02	6.29E+00	0.00E+00	6.15E+01	0.00E+00	5.05E+05	0.00E+00
W-187	6.52E+03	5.45E+03	1.90E+03	0.00E+00	0.00E+00	0.00E+00	1.78E+06	0.00E+00
NP-239	3.67E+00	3.61E-01	1.99E-01	0.00E+00	1.13E+00	0.00E+00	7.41E+04	0.00E+00

TABLE I-7

DOSE FACTOR TABLE: R (i) - Teen, cows milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	6.16E+02	6.16E+02	6.16E+02	6.16E+02	6.16E+02	6.16E+02	0.00E+00
C-14	6.70E+05	1.34E+05	1.34E+05	1.34E+05	1.34E+05	1.34E+05	1.34E+05	0.00E+00
NA-24	4.27E+06	4.27E+06	4.27E+06	4.27E+06	4.27E+06	4.27E+06	4.27E+06	0.00E+00
P-32	2.99E+10	1.85E+09	1.16E+09	0.00E+00	0.00E+00	0.00E+00	2.51E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	4.46E+04	2.48E+04	9.77E+03	6.36E+04	7.49E+06	0.00E+00
MN-54	0.00E+00	1.10E+07	2.19E+06	0.00E+00	3.30E+06	0.00E+00	2.27E+07	0.00E+00
MN-56	0.00E+00	7.46E-03	1.33E-03	0.00E+00	9.45E-03	0.00E+00	4.91E-01	0.00E+00
FE-55	3.47E+07	2.46E+07	5.73E+06	0.00E+00	0.00E+00	1.56E+07	1.06E+07	0.00E+00
FE-59	4.45E+07	1.04E+08	4.01E+07	0.00E+00	0.00E+00	3.27E+07	2.45E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	6.60E+06	1.52E+07	0.00E+00	0.00E+00	0.00E+00	9.09E+07	0.00E+00
CO-60	0.00E+00	2.16E+07	4.86E+07	0.00E+00	0.00E+00	0.00E+00	2.81E+08	0.00E+00
NI-63	9.15E+09	6.46E+08	3.10E+08	0.00E+00	0.00E+00	0.00E+00	1.03E+08	0.00E+00
NI-65	6.87E-01	8.78E-02	4.00E-02	0.00E+00	0.00E+00	0.00E+00	4.76E+00	0.00E+00
CU-64	0.00E+00	4.26E+04	2.00E+04	0.00E+00	1.08E+05	0.00E+00	3.30E+06	0.00E+00
ZN-65	1.67E+09	5.79E+09	2.70E+09	0.00E+00	3.71E+09	0.00E+00	2.45E+09	0.00E+00
ZN-69	4.01E-12	7.65E-12	5.35E-13	0.00E+00	5.00E-12	0.00E+00	1.41E-11	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	1.82E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	3.09E-23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	4.38E+09	2.06E+09	0.00E+00	0.00E+00	0.00E+00	6.48E+08	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	2.27E+09	0.00E+00	6.51E+07	0.00E+00	0.00E+00	0.00E+00	2.71E+08	0.00E+00
SR-90	5.12E+10	0.00E+00	1.26E+10	0.00E+00	0.00E+00	0.00E+00	1.44E+09	0.00E+00
SR-91	5.33E+04	0.00E+00	2.12E+03	0.00E+00	0.00E+00	0.00E+00	2.42E+05	0.00E+00
SR-92	9.07E-01	0.00E+00	3.86E-02	0.00E+00	0.00E+00	0.00E+00	2.31E+01	0.00E+00
Y-90	1.30E+02	0.00E+00	3.51E+00	0.00E+00	0.00E+00	0.00E+00	1.07E+06	0.00E+00
Y-91M	1.15E-19	0.00E+00	4.39E-21	0.00E+00	0.00E+00	0.00E+00	5.42E-18	0.00E+00
Y-91	1.33E+04	0.00E+00	3.56E+02	0.00E+00	0.00E+00	0.00E+00	5.45E+06	0.00E+00
Y-92	1.04E-04	0.00E+00	3.01E-06	0.00E+00	0.00E+00	0.00E+00	2.86E+00	0.00E+00
Y-93	4.13E-01	0.00E+00	1.13E-02	0.00E+00	0.00E+00	0.00E+00	1.26E+04	0.00E+00
ZR-95	1.38E+03	4.35E+02	2.99E+02	0.00E+00	6.40E+02	0.00E+00	1.00E+06	0.00E+00
ZR-97	7.90E-01	1.56E-01	7.20E-02	0.00E+00	2.37E-01	0.00E+00	4.23E+04	0.00E+00
NB-95	1.23E+05	6.83E+04	3.76E+04	0.00E+00	6.62E+04	0.00E+00	2.92E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	4.47E+07	8.53E+06	0.00E+00	1.02E+08	0.00E+00	8.01E+07	0.00E+00
TC-99M	5.80E+00	1.62E+01	2.10E+02	0.00E+00	2.41E+02	8.97E+00	1.06E+04	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	1.57E+03	0.00E+00	6.71E+02	0.00E+00	5.53E+03	0.00E+00	1.31E+05	0.00E+00
RU-105	1.58E-03	0.00E+00	6.13E-04	0.00E+00	1.99E-02	0.00E+00	1.27E+00	0.00E+00
RU-106	2.95E+04	0.00E+00	3.72E+03	0.00E+00	5.69E+04	0.00E+00	1.41E+06	0.00E+00
AG-110M	7.62E+07	7.21E+07	4.39E+07	0.00E+00	1.38E+08	0.00E+00	2.03E+10	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	2.53E+07	9.11E+06	3.38E+06	7.06E+06	0.00E+00	0.00E+00	7.46E+07	0.00E+00
TE-127M	6.86E+07	2.43E+07	8.16E+06	1.63E+07	2.78E+08	0.00E+00	1.71E+08	0.00E+00
TE-127	1.22E+03	4.31E+02	2.61E+02	8.38E+02	4.92E+03	0.00E+00	9.38E+04	0.00E+00
TE-129M	9.67E+07	3.59E+07	1.53E+07	3.12E+07	4.04E+08	0.00E+00	3.63E+08	0.00E+00
TE-129	5.37E-10	2.00E-10	1.31E-10	3.84E-10	2.25E-09	0.00E+00	2.94E-09	0.00E+00
TE-131M	6.58E+05	3.15E+05	2.63E+05	4.75E+05	3.29E+06	0.00E+00	2.53E+07	0.00E+00
TE-131	7.22E-33	2.98E-33	2.26E-33	5.57E-33	3.16E-32	0.00E+00	5.93E-34	0.00E+00
TE-132	4.29E+06	2.72E+06	2.56E+06	2.87E+06	2.61E+07	0.00E+00	8.61E+07	0.00E+00
I-130	7.41E+05	2.14E+06	8.56E+05	1.75E+08	3.30E+06	0.00E+00	1.65E+06	0.00E+00
I-131	5.28E+08	7.39E+08	3.97E+08	2.16E+11	1.27E+09	0.00E+00	1.46E+08	0.00E+00
I-132	2.96E-01	7.75E-01	2.78E-01	2.61E+01	1.22E+00	0.00E+00	3.38E-01	0.00E+00
I-133	7.08E+06	1.20E+07	3.66E+06	1.68E+09	2.11E+07	0.00E+00	9.09E+06	0.00E+00
I-134	3.74E-12	9.92E-12	3.56E-12	1.65E-10	1.56E-11	0.00E+00	1.31E-13	0.00E+00

TABLE I-7

DOSE FACTOR TABLE: R (i) - Teen, cows milk
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	2.29E+04	5.90E+04	2.19E+04	3.80E+06	9.33E+04	0.00E+00	6.54E+04	0.00E+00
CS-134	7.65E+09	1.80E+10	8.36E+09	0.00E+00	5.72E+09	2.19E+09	2.24E+08	0.00E+00
CS-136	4.27E+08	1.68E+09	1.13E+09	0.00E+00	9.15E+08	1.44E+08	1.35E+08	0.00E+00
CS-137	1.04E+10	1.38E+10	4.80E+09	0.00E+00	4.69E+09	1.82E+09	1.96E+08	0.00E+00
CS-138	1.76E-23	3.38E-23	1.69E-23	0.00E+00	2.50E-23	2.91E-24	1.54E-26	0.00E+00
BA-139	8.40E-08	5.91E-11	2.45E-09	0.00E+00	5.57E-11	4.07E-11	7.50E-07	0.00E+00
BA-140	4.64E+07	5.68E+04	2.99E+06	0.00E+00	1.93E+04	3.82E+04	7.15E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	8.11E+00	3.98E+00	1.06E+00	0.00E+00	0.00E+00	0.00E+00	2.29E+05	0.00E+00
LA-142	3.43E-11	1.53E-11	3.80E-12	0.00E+00	0.00E+00	0.00E+00	4.64E-07	0.00E+00
CE-141	7.82E+03	5.22E+03	6.00E+02	0.00E+00	2.46E+03	0.00E+00	1.49E+07	0.00E+00
CE-143	7.65E+01	5.56E+04	6.21E+00	0.00E+00	2.50E+01	0.00E+00	1.67E+06	0.00E+00
CE-144	5.20E+05	2.15E+05	2.79E+04	0.00E+00	1.28E+05	0.00E+00	1.31E+08	0.00E+00
PR-143	2.76E+02	1.10E+02	1.37E+01	0.00E+00	6.40E+01	0.00E+00	9.08E+05	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	1.75E+02	1.90E+02	1.14E+01	0.00E+00	1.12E+02	0.00E+00	6.87E+05	0.00E+00
W-187	1.19E+04	9.71E+03	3.40E+03	0.00E+00	0.00E+00	0.00E+00	2.63E+06	0.00E+00
NP-239	7.01E+00	6.61E-01	3.67E-01	0.00E+00	2.08E+00	0.00E+00	1.06E+05	0.00E+00

TABLE I-8

DOSE FACTOR TABLE: R (i) - Child, cows milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02	9.73E+02	0.00E+00
C-14	1.65E+06	3.29E+05	3.29E+05	3.2E+05	3.29E+05	3.29E+05	3.29E+05	0.00E+00
NA-24	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	8.88E+06	0.00E+00
P-32	7.37E+10	3.45E+09	2.84E+09	0.00E+00	0.00E+00	0.00E+00	2.04E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	9.09E+04	5.05E+04	1.38E+04	9.21E+04	4.82E+06	0.00E+00
MN-54	0.00E+00	1.65E+07	4.40E+06	0.00E+00	4.63E+00	0.00E+00	1.39E+07	0.00E+00
MN-56	0.00E+00	1.30E-02	2.94E-03	0.00E+00	1.57E-02	0.00E+00	1.89E+00	0.00E+00
FE-55	8.70E+07	4.61E+07	1.43E+07	0.00E+00	0.00E+00	2.61E+07	8.55E+06	0.00E+00
FE-59	1.03E+08	1.67E+08	8.31E+07	0.00E+00	0.00E+00	4.84E+07	1.74E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.01E+07	3.08E+07	0.00E+00	0.00E+00	0.00E+00	5.88E+07	0.00E+00
CO-60	0.00E+00	3.35E+07	9.88E+07	0.00E+00	0.00E+00	0.00E+00	1.86E+08	0.00E+00
NI-63	2.29E+10	1.23E+09	7.80E+08	0.00E+00	0.00E+00	0.00E+00	8.27E+07	0.00E+00
NI-65	1.68E+00	1.58E-01	9.24E-02	0.00E+00	0.00E+00	0.00E+00	1.94E+01	0.00E+00
CU-64	0.00E+00	7.48E+04	4.52E+04	0.00E+00	1.81E+05	0.00E+00	3.51E+06	0.00E+00
ZN-65	3.27E+09	8.72E+09	5.43E+09	0.00E+00	5.50E+09	0.00E+00	1.53E+09	0.00E+00
ZN-69	9.87E-12	1.43E-11	1.32E-12	0.00E+00	8.65E-12	0.00E+00	8.99E-10	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	4.47E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	7.00E-23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	8.12E+09	4.99E+09	0.00E+00	0.00E+00	0.00E+00	5.22E+08	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	5.63E+09	0.00E+00	1.61E+08	0.00E+00	0.00E+00	0.00E+00	2.18E+08	0.00E+00
SR-90	8.65E+10	0.00E+00	2.19E+10	0.00E+00	0.00E+00	0.00E+00	1.16E+09	0.00E+00
SR-91	1.31E+05	0.00E+00	4.94E+03	0.00E+00	0.00E+00	0.00E+00	2.89E+05	0.00E+00
SR-92	2.21E+00	0.00E+00	8.88E-02	0.00E+00	0.00E+00	0.00E+00	4.19E+01	0.00E+00
Y-90	3.22E+02	0.00E+00	8.63E+00	0.00E+00	0.00E+00	0.00E+00	9.18E+05	0.00E+00
Y-91M	2.80E-19	0.00E+00	1.02E-20	0.00E+00	0.00E+00	0.00E+00	5.49E-16	0.00E+00
Y-91	3.28E+04	0.00E+00	8.78E+02	0.00E+00	0.00E+00	0.00E+00	4.37E+06	0.00E+00
Y-92	2.56E-04	0.00E+00	7.32E-06	0.00E+00	0.00E+00	0.00E+00	7.39E+00	0.00E+00
Y-93	1.02E+00	0.00E+00	2.79E-02	0.00E+00	0.00E+00	0.00E+00	1.51E+01	0.00E+00
ZR-95	3.20E+03	7.04E+02	6.27E+02	0.00E+00	1.01E+03	0.00E+00	7.35E+05	0.00E+00
ZR-97	1.92E+00	2.78E-01	1.64E-01	0.00E+00	3.99E-01	0.00E+00	4.21E+04	0.00E+00
NB-95	2.78E+05	1.08E+05	7.74E+04	0.00E+00	1.02E+05	0.00E+00	2.00E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	8.14E+07	2.01E+07	0.00E+00	1.74E+08	0.00E+00	6.73E+07	0.00E+00
TC-99M	1.33E+01	2.61E+01	4.32E+02	0.00E+00	3.79E+02	1.32E+01	1.48E+04	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	3.71E+03	0.00E+00	1.43E+03	0.00E+00	9.34E+03	0.00E+00	9.59E+04	0.00E+00
RU-105	3.85E-03	0.00E+00	1.40E-03	0.00E+00	3.39E-02	0.00E+00	2.51E+00	0.00E+00
RU-106	7.26E+04	0.00E+00	9.06E+03	0.00E+00	9.81E+04	0.00E+00	1.13E+06	0.00E+00
AG-110M	1.65E+08	1.12E+08	8.92E+07	0.00E+00	2.08E+08	0.00E+00	1.33E+10	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	6.21E+07	1.68E+07	8.28E+06	1.74E+07	0.00E+00	0.00E+00	5.99E+07	0.00E+00
TE-127M	1.69E+08	4.55E+07	2.01E+07	4.04E+07	4.82E+08	0.00E+00	1.37E+08	0.00E+00
TE-127	2.99E+03	8.06E+02	6.41E+02	2.07E+03	8.50E+03	0.00E+00	1.17E+05	0.00E+00
TE-129M	2.38E+08	6.65E+07	3.70E+07	7.68E+07	7.00E+08	0.00E+00	2.91E+08	0.00E+00
TE-129	1.33E-09	3.70E-10	3.15E-10	9.46E-10	3.88E-09	0.00E+00	8.25E-08	0.00E+00
TE-131M	1.60E+06	5.54E+05	5.89E+05	1.14E+06	5.36E+06	0.00E+00	2.25E+07	0.00E+00
TE-131	1.77E-32	5.40E-33	5.27E-33	1.36E-32	5.36E-32	0.00E+00	9.31E-32	0.00E+00
TE-132	1.02E+07	4.54E+06	5.48E+06	6.61E+06	4.21E+07	0.00E+00	4.57E+07	0.00E+00
I-130	1.73E+06	3.50E+06	1.80E+06	3.86E+08	5.23E+06	0.00E+00	1.64E+06	0.00E+00
I-131	1.28E+09	1.29E+09	7.32E+08	4.26E+11	2.11E+09	0.00E+00	1.15E+08	0.00E+00
I-132	7.01E-01	1.29E+00	5.92E-01	5.97E-01	1.97E+00	0.00E+00	1.52E+00	0.00E+00
I-133	1.72E+07	2.13E+07	8.05E+06	3.95E+09	3.55E+07	0.00E+00	8.57E+06	0.00E+00
I-134	8.87E-12	1.65E-11	7.57E-12	3.79E-10	2.52E-11	0.00E+00	1.09E-11	0.00E+00

TABLE I-8

DOSE FACTOR TABLE: R (i) - Child, cows milk
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	5.43E+04	9.77E+04	4.62E+04	8.66E+06	1.50E+05	0.00E+00	7.45E+04	0.00E+00
CS-134	1.77E+10	2.90E+10	6.11E+09	0.00E+00	8.98E+09	3.22E+09	1.56E+08	0.00E+00
CS-136	9.65E+08	2.65E+09	1.72E+09	0.00E+00	1.41E+09	2.11E+08	9.32E+07	0.00E+00
CS-137	2.50E+10	2.39E+10	3.53E+09	0.00E+00	7.78E+09	2.80E+09	1.50E+08	0.00E+00
CS-138	4.27E-23	5.94E-23	3.77E-23	0.00E+00	4.18E-23	4.50E-24	2.74E-23	0.00E+00
BA-139	2.06E-07	1.10E-10	5.98E-09	0.00E+00	9.62E-11	6.48E-11	1.19E-05	0.00E+00
BA-140	1.12E+08	9.80E+04	6.53E+06	0.00E+00	3.19E+04	5.84E+04	5.67E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	1.94E+01	6.79E+00	2.29E+00	0.00E+00	0.00E+00	0.00E+00	1.89E+05	0.00E+00
LA-142	8.30E-11	2.64E-11	8.28E-12	0.00E+00	0.00E+00	0.00E+00	5.24E-06	0.00E+00
CE-141	1.93E+04	9.61E+03	1.43E+03	0.00E+00	4.21E+03	0.00E+00	1.20E+07	0.00E+00
CE-143	1.88E+02	1.02E+05	1.47E+01	0.00E+00	4.27E+01	0.00E+00	1.49E+06	0.00E+00
CE-144	1.28E+06	4.02E+05	6.84E+04	0.00E+00	2.22E+05	0.00E+00	1.05E+08	0.00E+00
PR-143	6.83E+02	2.05E+02	3.39E+01	0.00E+00	1.11E+02	0.00E+00	7.37E+05	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	4.29E+02	3.48E+02	2.69E+01	0.00E+00	1.91E+02	0.00E+00	5.51E+05	0.00E+00
W-187	2.89E+04	1.71E+04	7.68E+03	0.00E+00	0.00E+00	0.00E+00	2.40E+06	0.00E+00
NP-239	1.73E+01	1.24E+00	8.71E-01	0.00E+00	3.58E+00	0.00E+00	9.17E+04	0.00E+00

TABLE I-9

DOSE FACTOR TABLE: R (i) - Infant, cows milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.48E+03	1.48E+03	1.48E+03	1.48E+03	1.48E+03	1.48E+03	0.00E+00
C-14	3.23E+06	6.89E+05	6.89E+05	6.89E+05	6.89E+05	6.89E+05	6.89E+05	0.00E+00
NA-24	1.55E+07	1.55E+07	1.55E+07	1.55E+07	1.55E+07	1.55E+07	1.55E+07	0.00E+00
P-32	1.52E+11	8.93E+09	5.88E+09	0.00E+00	0.00E+00	0.00E+00	2.05E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	1.44E+05	9.40E+04	2.05E+04	1.83E+05	4.20E+06	0.00E+00
MN-54	0.00E+00	3.07E+07	6.97E+06	0.00E+00	6.81E+06	0.00E+00	1.13E+07	0.00E+00
MN-56	0.00E+00	3.19E-02	5.49E-03	0.00E+00	2.74E-02	0.00E+00	2.90E+00	0.00E+00
FE-55	1.05E+08	6.79E+07	1.82E+07	0.00E+00	0.00E+00	3.32E+07	8.62E+06	0.00E+00
FE-59	1.92E+08	3.36E+08	1.32E+08	0.00E+00	0.00E+00	9.94E+07	1.61E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	2.02E+07	5.03E+07	0.00E+00	0.00E+00	0.00E+00	5.02E+07	0.00E+00
CO-60	0.00E+00	6.84E+07	1.62E+08	0.00E+00	0.00E+00	0.00E+00	1.63E+08	0.00E+00
NI-63	2.72E+10	1.67E+09	9.38E+08	0.00E+00	0.00E+00	0.00E+00	8.31E+07	0.00E+00
NI-65	3.56E+00	4.03E-01	1.83E-01	0.00E+00	0.00E+00	0.00E+00	3.07E+01	0.00E+00
CU-64	0.00E+00	1.86E+05	8.61E+04	0.00E+00	3.15E+05	0.00E+00	3.82E+06	0.00E+00
ZN-65	4.40E+09	1.51E+10	6.95E+09	0.00E+00	7.31E+09	0.00E+00	1.27E+10	0.00E+00
ZN-69	2.10E-11	3.79E-11	2.82E-12	0.00E+00	1.57E-11	0.00E+00	3.09E-09	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	9.49E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	1.35E-22	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	2.06E+10	1.02E+10	0.00E+00	0.00E+00	0.00E+00	5.27E+08	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	1.07E+10	0.00E+00	3.07E+08	0.00E+00	0.00E+00	0.00E+00	2.20E+08	0.00E+00
SR-90	9.41E+10	0.00E+00	2.40E+10	0.00E+00	0.00E+00	0.00E+00	1.18E+09	0.00E+00
SR-91	2.73E+05	0.00E+00	9.87E+03	0.00E+00	0.00E+00	0.00E+00	3.23E+05	0.00E+00
SR-92	4.71E+00	0.00E+00	1.75E-01	0.00E+00	0.00E+00	0.00E+00	5.08E+01	0.00E+00
Y-90	6.82E+02	0.00E+00	1.83E+01	0.00E+00	0.00E+00	0.00E+00	9.41E+05	0.00E+00
Y-91M	5.94E-19	0.00E+00	2.03E-20	0.00E+00	0.00E+00	0.00E+00	1.98E-15	0.00E+00
Y-91	6.16E+04	0.00E+00	1.64E+03	0.00E+00	0.00E+00	0.00E+00	4.42E+06	0.00E+00
Y-92	5.44E-04	0.00E+00	1.53E-05	0.00E+00	0.00E+00	0.00E+00	1.04E+01	0.00E+00
Y- 3	2.16E+00	0.00E+00	5.90E-02	0.00E+00	0.00E+00	0.00E+00	1.71E+04	0.00E+00
ZR-95	5.69E+03	1.39E+03	9.83E+02	0.00E+00	1.49E+03	0.00E+00	6.91E+05	0.00E+00
ZR-97	4.07E+00	6.99E-01	3.19E-01	0.00E+00	7.04E-01	0.00E+00	4.46E+04	0.00E+00
NB-95	5.19E+05	2.14E+05	1.24E+05	0.00E+00	1.53E+05	0.00E+00	1.80E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	2.08E+08	4.06E+07	0.00E+00	3.11E+08	0.00E+00	6.85E+07	0.00E+00
TC-99M	2.77E+01	5.70E+01	7.35E+02	0.00E+00	6.14E+02	2.98E+01	1.66E+04	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	7.51E+03	0.00E+00	2.51E+03	0.00E+00	1.56E+04	0.00E+00	9.14E+04	0.00E+00
RU-105	8.12E-03	0.00E+00	2.74E-03	0.00E+00	5.97E-02	0.00E+00	3.23E+00	0.00E+00
RU-106	1.50E+05	0.00E+00	1.87E+04	0.00E+00	1.77E+05	0.00E+00	1.14E+06	0.00E+00
AG-110M	3.05E+08	2.23E+08	1.48E+08	0.00E+00	3.19E+08	0.00E+00	1.16E+10	0.00E+00
SP-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	1.27E+08	4.24E+07	1.72E+07	4.27E+07	0.00E+00	0.00E+00	6.05E+07	0.00E+00
TE-127M	3.42E+08	1.14E+08	4.14E+07	9.89E+07	8.43E+08	0.00E+00	1.38E+08	0.00E+00
TE-127	6.34E+03	2.13E+03	1.36E+03	5.16E+03	1.55E+04	0.00E+00	1.33E+05	0.00E+00
TE-129M	4.89E+08	1.68E+08	7.54E+07	1.88E+06	1.22E+09	0.00E+00	2.92E+08	0.00E+00
TE-129	2.81E-09	9.69E-10	6.56E-10	2.36E-09	7.00E-09	0.00E+00	2.25E-07	0.00E+00
TE-131M	3.38E+06	1.36E+06	1.12E+06	2.76E+06	9.37E+06	0.00E+00	2.29E+07	0.00E+00
TE-131	3.76E-32	1.39E-32	1.05E-32	3.35E-32	9.61E-32	0.00E+00	1.52E-30	0.00E+00
TE-132	2.11E+07	1.05E+07	9.75E+06	1.54E+07	6.53E+07	0.00E+00	3.87E+07	0.00E+00
I-130	3.56E+06	7.83E+06	3.14E+06	8.78E+08	8.60E+06	0.00E+00	1.68E+06	0.00E+00
I-131	2.67E+09	3.15E+09	1.38E+09	1.03E+12	3.68E+09	0.00E+00	1.12E+08	0.00E+00
I-132	1.45E+00	2.95E+00	1.05E+00	1.38E+02	3.29E+00	0.00E+00	2.39E+00	0.00E+00
I-133	3.63E+07	5.29E+07	1.55E+07	9.62E+09	6.22E+07	0.00E+00	8.95E+06	0.00E+00
I-134	1.84E-11	3.77E-11	1.34E-11	8.78E-10	4.21E-11	0.00E+00	3.89E-11	0.00E+00

TABLE I-9

DOSE FACTOR TABLE: R (i) - Infant, cows milk
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	1.13E+05	2.25E+05	8.19E+04	2.01E+07	2.50E+05	0.00E+00	8.13E+04	0.00E+00
CS-134	2.84E+10	5.30E+10	5.36E+09	0.00E+00	1.37E+10	5.60E+09	1.44E+08	0.00E+00
CS-136	1.88E+09	5.54E+09	2.07E+09	0.00E+00	2.21E+09	4.51E+08	8.41E+07	0.00E+00
CS-137	3.98E+10	4.66E+10	3.30E+09	0.00E+00	1.25E+10	5.07E+09	1.46E+08	0.00E+00
CS-138	9.01E-23	1.47E-22	7.10E-23	0.00E+00	7.31E-23	1.14E-23	2.34E-22	0.00E+00
BA-139	4.39E-07	2.91E-10	1.27E-08	0.00E+00	1.75E-10	1.77E-10	2.78E-05	0.00E+00
BA-140	2.30E+08	2.30E+05	1.19E+07	0.00E+00	5.47E+04	1.41E+05	5.66E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	4.06E+01	1.60E+01	4.11E+00	0.00E+00	0.00E+00	0.00E+00	1.88E+05	0.00E+00
LA-142	1.74E-10	6.40E-11	1.53E-11	0.00E+00	0.00E+00	0.00E+00	1.09E-05	0.00E+00
CE-141	3.82E+04	2.33E+04	2.74E+03	0.00E+00	7.18E+03	0.00E+00	1.20E+07	0.00E+00
CE-143	3.97E+02	2.64E+05	3.01E+01	0.00E+00	7.68E+01	0.00E+00	1.54E+06	0.00E+00
CE-144	1.84E+06	7.52E+05	1.03E+05	0.00E+00	3.04E+05	0.00E+00	1.05E+08	0.00E+00
PR-143	1.41E+03	2.28E+02	7.00E+01	0.00E+00	1.96E+02	0.00E+00	7.45E+05	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	8.51E+02	8.74E+02	5.36E+01	0.00E+00	3.37E+02	0.00E+00	5.54E+05	0.00E+00
W-187	6.08E+04	4.23E+04	1.46E+04	0.00E+00	0.00E+00	0.00E+00	2.49E+06	0.00E+00
NP-239	3.65E+01	3.26E+00	1.84E+00	0.00E+00	6.51E+00	0.00E+00	9.43E+04	0.00E+00

TABLE I-10

DOSE FACTOR TABLE: R (i) - Adult, goats milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	9.65E+02	9.65E+02	9.65E+02	9.65E+02	9.65E+02	9.65E+02	0.00E+00
C-14	3.63E+05	7.26E+04	7.26E+04	7.26E+04	7.26E+04	7.26E+04	7.26E+04	0.00E+00
NA-24	2.93E+05	2.93E+05	2.93E+05	2.93E+05	2.93E+05	2.93E+05	2.93E+05	0.00E+00
P-32	1.94E+10	1.21E+09	7.51E+08	0.00E+00	0.00E+00	0.00E+00	2.18E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	3.06E+03	1.83E+03	6.75E+02	4.06E+03	7.70E+05	0.00E+00
MN-54	0.00E+00	7.96E+05	1.52E+05	0.00E+00	2.37E+05	0.00E+00	2.44E+06	0.00E+00
MN-56	0.00E+00	5.05E-04	8.96E-05	0.00E+00	6.41E-04	0.00E+00	1.61E-02	0.00E+00
FE-55	2.54E+05	1.76E+05	4.09E+04	0.00E+00	0.00E+00	9.79E+04	1.01E+05	0.00E+00
FE-59	3.31E+05	7.79E+05	2.98E+05	0.00E+00	0.00E+00	2.18E+05	2.60E+06	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	4.70E+05	1.05E+06	0.00E+00	0.00E+00	0.00E+00	9.53E+06	0.00E+00
CO-60	0.00E+00	1.53E+06	3.37E+06	0.00E+00	0.00E+00	0.00E+00	2.87E+07	0.00E+00
NI-63	6.25E+08	4.33E+07	2.10E+07	0.00E+00	0.00E+00	0.00E+00	9.03E+06	0.00E+00
NI-65	4.51E-02	5.86E-03	2.67E-03	0.00E+00	0.00E+00	0.00E+00	1.49E-01	0.00E+00
CU-64	0.00E+00	2.66E+03	1.25E+03	0.00E+00	6.71E+03	0.00E+00	2.27E+05	0.00E+00
ZN-65	1.30E+08	4.15E+08	1.88E+08	0.00E+00	2.78E+08	0.00E+00	2.61E+08	0.00E+00
ZN-69	2.62E-13	5.00E-13	3.48E-14	0.00E+00	3.25E-13	0.00E+00	7.52E-14	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	1.18E-02	0.00E+00	0.00E+00	0.00E+00	1.71E-02	0.00E+00
BR-84	0.00E+00	0.00E+00	2.08E-24	0.00E+00	0.00E+00	0.00E+00	1.63E-29	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	2.88E+08	1.34E+08	0.00E+00	0.00E+00	0.00E+00	5.68E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	2.59E+09	0.00E+00	7.43E+07	0.00E+00	0.00E+00	0.00E+00	4.15E+08	0.00E+00
SR-90	7.61E+10	0.00E+00	1.87E+10	0.00E+00	0.00E+00	0.00E+00	2.20E+09	0.00E+00
SR-91	6.10E+04	0.00E+00	2.46E+03	0.00E+00	0.00E+00	0.00E+00	2.90E+05	0.00E+00
SR-92	1.04E+00	0.00E+00	4.50E-02	0.00E+00	0.00E+00	0.00E+00	2.06E+01	0.00E+00
Y-90	8.50E+00	0.00E+00	2.28E-01	0.00E+00	0.00E+00	0.00E+00	9.02E+04	0.00E+00
Y-91M	7.52E-21	0.00E+00	2.91E-22	0.00E+00	0.00E+00	0.00E+00	2.21E-20	0.00E+00
Y-91	8.67E+02	0.00E+00	2.32E+01	0.00E+00	0.00E+00	0.00E+00	4.77E+05	0.00E+00
Y-92	6.77E-06	0.00E+00	1.98E-07	0.00E+00	0.00E+00	0.00E+00	1.19E-01	0.00E+00
Y-93	2.69E-02	0.00E+00	7.43E-04	0.00E+00	0.00E+00	0.00E+00	8.53E+02	0.00E+00
ZR-95	9.47E+01	3.04E+01	2.06E+01	0.00E+00	4.76E+01	0.00E+00	9.62E+04	0.00E+00
ZR-97	5.21E-02	1.05E-02	4.81E-03	0.00E+00	1.59E-02	0.00E+00	3.26E+03	0.00E+00
NB-95	8.67E+03	4.82E+03	2.59E+03	0.00E+00	4.77E+03	0.00E+00	2.93E+07	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	2.97E+06	5.66E+05	0.00E+00	6.73E+06	0.00E+00	6.89E+06	0.00E+00
TC-99M	4.01E-01	1.13E+00	1.44E+01	0.00E+00	1.72E+01	5.55E-01	6.71E+02	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	1.06E+02	0.00E+00	4.56E+01	0.00E+00	4.04E+02	0.00E+00	1.24E+04	0.00E+00
RU-105	1.04E-04	0.00E+00	4.09E-05	0.00E+00	1.34E-03	0.00E+00	6.34E-02	0.00E+00
RU-106	1.92E+03	0.00E+00	2.43E+02	0.00E+00	3.71E+03	0.00E+00	1.25E+05	0.00E+00
AG-110M	5.53E+06	5.12E+06	3.04E+06	0.00E+00	1.01E+07	0.00E+00	2.09E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	1.65E+06	5.96E+05	2.20E+05	4.95E+05	6.69E+06	0.00E+00	6.57E+06	0.00E+00
TE-127M	4.47E+06	1.60E+06	5.44E+05	1.14E+06	1.81E+07	0.00E+00	1.50E+07	0.00E+00
TE-127	7.87E+01	2.82E+01	1.70E+01	5.83E+01	3.20E+02	0.00E+00	6.21E+03	0.00E+00
TE-129M	6.34E+06	2.37E+06	1.00E+06	2.18E+06	2.65E+07	0.00E+00	3.19E+07	0.00E+00
TE-129	3.50E-11	1.32E-11	6.53E-12	2.69E-11	1.47E-10	0.00E+00	2.64E-11	0.00E+00
TE-131M	4.34E+04	2.12E+04	1.77E+04	3.36E+04	2.15E+05	0.00E+00	2.11E+06	0.00E+00
TE-131	4.74E-34	1.98E-34	1.50E-34	3.90E-34	2.08E-33	0.00E+00	6.72E-35	0.00E+00
TE-132	2.88E+05	1.86E+05	1.75E+05	2.06E+05	1.80E+06	0.00E+00	8.82E+06	0.00E+00
I-130	5.06E+05	1.49E+06	5.89E+05	1.26E+08	2.33E+06	0.00E+00	1.28E+06	0.00E+00
I-131	3.49E+08	4.99E+08	2.86E+08	1.64E+11	8.56E+08	0.00E+00	1.32E+08	0.00E+00
I-132	2.00E-01	5.36E-01	1.88E-01	1.88E-01	8.54E-01	0.00E+00	1.01E-01	0.00E+00
I-133	4.65E+06	8.09E+06	2.47E+06	1.19E+09	1.41E+07	0.00E+00	7.27E+06	0.00E+00
I-134	2.53E-12	6.87E-12	2.46E-12	1.19E-10	1.09E-11	0.00E+00	5.99E-15	0.00E+00

TABLE I-10

DOSE FACTOR TABLE: R (i) - Adult, goats milk
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	1.55E+04	4.06E+04	1.50E+04	2.68E+06	6.51E+04	0.00E+00	4.58E+04	0.00E+00
CS-134	1.32E+10	3.15E+10	2.57E+10	0.00E+00	1.02E+10	3.38E+09	5.51E+08	0.00E+00
CS-136	7.53E+08	2.97E+09	2.14E+09	0.00E+00	1.65E+09	2.27E+08	3.38E+08	0.00E+00
CS-137	1.71E+10	2.34E+10	1.54E+10	0.00E+00	7.96E+09	2.65E+09	4.54E+08	0.00E+00
CS-138	2.91E-23	5.76E-23	2.85E-23	0.00E+00	4.23E-23	4.18E-24	2.46E-28	0.00E+00
BA-139	5.45E-09	3.88E-12	1.60E-10	0.00E+00	3.63E-12	2.20E-12	9.67E-09	0.00E+00
BA-140	3.08E+06	3.87E+03	2.02E+05	0.00E+00	1.32E+03	2.22E+03	6.35E+06	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	5.42E-01	2.73E-01	7.22E-02	0.00E+00	0.00E+00	0.00E+00	2.00E+04	0.00E+00
LA-142	2.28E-12	1.04E-12	2.59E-13	0.00E+00	0.00E+00	0.00E+00	7.58E-09	0.00E+00
CE-141	5.12E+02	3.46E+02	3.93E+01	0.00E+00	1.61E+02	0.00E+00	1.32E+06	0.00E+00
CE-143	4.99E+00	3.69E+03	4.09E-01	0.00E+00	1.63E+00	0.00E+00	1.38E+05	0.00E+00
CE-144	3.39E+04	1.42E+04	1.82E+03	0.00E+00	8.40E+03	0.00E+00	1.15E+07	0.00E+00
PR-143	1.80E+01	7.23E+00	8.93E-01	0.00E+00	4.17E+00	0.00E+00	7.89E+04	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	1.09E+01	1.26E+01	7.55E-01	0.00E+00	7.37E+00	0.00E+00	6.06E+04	0.00E+00
W-187	7.82E+02	6.54E+02	2.29E+02	0.00E+00	0.00E+00	0.00E+00	2.14E+05	0.00E+00
NP-239	4.41E-01	4.34E-02	2.39E-02	0.00E+00	1.35E-01	0.00E+00	8.89E+03	0.00E+00

TABLE I-11

DOSE FACTOR TABLE: R (i) - Teen, goats milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.26E+03	1.26E+03	1.26E+03	1.26E+06	1.26E+03	1.26E+03	0.00E+00
C-14	6.70E+05	1.34E+05	1.34E+05	1.34E+05	1.34E+05	1.34E+05	1.34E+05	0.00E+00
NA-24	5.12E+05	5.12E+05	5.12E+05	5.12E+05	5.12E+05	5.12E+05	5.12E+05	0.00E+00
P-32	3.58E+10	2.22E+09	1.39E+09	0.00E+00	0.00E+00	0.00E+00	3.01E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	5.35E+03	2.97E+03	1.17E+03	7.64E+03	8.99E+05	0.00E+00
MN-54	0.00E+00	1.33E+06	2.63E+05	0.00E+00	3.95E+05	0.00E+00	2.72E+06	0.00E+00
MN-56	0.00E+00	8.95E-04	1.59E-04	0.00E+00	1.13E-03	0.00E+00	5.89E-02	0.00E+00
FE-55	4.51E+05	3.19E+05	7.45E+04	0.00E+00	0.00E+00	2.03E+05	1.38E+05	0.00E+00
FE-59	5.78E+05	1.35E+06	5.21E+05	0.00E+00	0.00E+00	4.25E+05	3.19E+06	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	7.92E+05	1.82E+06	0.00E+00	0.00E+00	0.00E+00	1.09E+07	0.00E+00
CO-60	0.00E+00	2.59E+06	5.83E+06	0.00E+00	0.00E+00	0.00E+00	3.37E+07	0.00E+00
NI-63	1.10E+09	7.75E+07	3.72E+07	0.00E+00	0.00E+00	0.00E+00	1.23E+07	0.00E+00
NI-65	8.25E-02	1.05E-02	4.80E-03	0.00E+00	0.00E+00	0.00E+00	5.72E-01	0.00E+00
CU-64	0.00E+00	4.74E+03	2.23E+03	0.00E+00	1.20E+04	0.00E+00	3.68E+05	0.00E+00
ZN-65	2.00E+08	6.95E+08	3.24E+08	0.00E+00	4.45E+08	0.00E+00	2.94E+08	0.00E+00
ZN-69	4.82E-13	9.18E-13	6.42E-14	0.00E+00	6.00E-13	0.00E+00	1.69E-12	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	2.18E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	3.71E-24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	5.25E+08	2.47E+08	0.00E+00	0.00E+00	0.00E+00	7.77E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	4.77E+09	0.00E+00	1.37E+08	0.00E+00	0.00E+00	0.00E+00	5.69E+08	0.00E+00
SR-90	1.07E+11	0.00E+00	2.65E+10	0.00E+00	0.00E+00	0.00E+00	3.02E+09	0.00E+00
SR-91	1.12E+05	0.00E+00	4.46E+03	0.00E+00	0.00E+00	0.00E+00	5.08E+05	0.00E+00
SR-92	1.90E+00	0.00E+00	8.11E-02	0.00E+00	0.00E+00	0.00E+00	4.85E+01	0.00E+00
Y-90	1.56E+01	0.00E+00	4.21E-01	0.00E+00	0.00E+00	0.00E+00	1.29E+05	0.00E+00
Y-91M	1.38E-20	0.00E+00	5.26E-22	0.00E+00	0.00E+00	0.00E+00	6.50E-19	0.00E+00
Y-91	1.59E+03	0.00E+00	4.28E+01	0.00E+00	0.00E+00	0.00E+00	6.54E+05	0.00E+00
Y-92	1.25E-05	0.00E+00	3.62E-07	0.00E+00	0.00E+00	0.00E+00	3.43E-01	0.00E+00
Y-93	4.96E-02	0.00E+00	1.36E-03	0.00E+00	0.00E+00	0.00E+00	1.52E+03	0.00E+00
ZR-95	1.66E+02	5.22E+01	3.59E+01	0.00E+00	7.67E+01	0.00E+00	1.21E+05	0.00E+00
ZR-97	9.48E-02	1.88E-02	8.64E-03	0.00E+00	2.84E-02	0.00E+00	5.08E+03	0.00E+00
NB-95	1.48E+04	9.20E+03	4.51E+03	0.00E+00	7.95E+03	0.00E+00	3.51E+07	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	5.37E+06	1.02E+06	0.00E+00	1.23E+07	0.00E+00	9.61E+06	0.00E+00
TC-99M	6.96E-01	1.94E+00	2.51E+01	0.00E+00	2.89E+01	1.08E+00	1.27E+03	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	1.88E+02	0.00E+00	8.05E+01	0.00E+00	6.64E+02	0.00E+00	1.57E+04	0.00E+00
RU-105	1.89E-04	0.00E+00	7.35E-05	0.00E+00	2.39E-03	0.00E+00	1.53E-01	0.00E+00
RU-106	3.54E+03	0.00E+00	4.46E+02	0.00E+00	6.82E+03	0.00E+00	1.70E+05	0.00E+00
AG-110M	9.14E+06	8.65E+06	5.26E+06	0.00E+00	1.65E+07	0.00E+00	2.43E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	3.03E+06	1.09E+06	4.06E+05	8.48E+05	0.00E+00	0.00E+00	8.95E+06	0.00E+00
TE-127M	8.23E+06	2.92E+06	9.79E+05	1.96E+06	3.34E+07	0.00E+00	2.05E+07	0.00E+00
TE-127	1.46E+02	5.17E+01	3.14E+01	1.01E+02	5.91E+02	0.00E+00	1.13E+04	0.00E+00
TE-129M	1.16E+07	4.31E+06	1.84E+06	3.74E+06	4.85E+07	0.00E+00	4.36E+07	0.00E+00
TE-129	6.45E-11	2.40E-11	1.57E-11	4.61E-11	2.71E-10	0.00E+00	3.53E-10	0.00E+00
TE-131M	7.89E+04	3.79E+04	3.16E+04	5.69E+04	3.95E+05	0.00E+00	3.04E+06	0.00E+00
TE-131	8.67E-34	3.57E-34	2.71E-34	6.68E-34	3.79E-33	0.00E+00	7.11E-35	0.00E+00
TE-132	5.15E+05	3.26E+05	3.07E+05	3.44E+05	3.13E+06	0.00E+00	1.03E+07	0.00E+00
I-130	8.89E+05	2.57E+06	1.03E+06	2.10E+08	3.96E+06	0.00E+00	1.98E+06	0.00E+00
I-131	6.33E+08	8.87E+08	4.76E+08	2.59E+11	1.53E+09	0.00E+00	1.75E+08	0.00E+00
I-132	3.55E-01	9.30E-01	3.34E-01	3.13E+01	1.47E+00	0.00E+00	4.05E-01	0.00E+00
I-133	8.50E+06	1.44E+07	4.40E+06	2.01E+09	2.53E+07	0.00E+00	1.09E+07	0.00E+00
I-134	4.49E-12	1.19E-11	4.28E-12	1.98E-10	1.88E-11	0.00E+00	1.57E-13	0.00E+00

TABLE I-11

DOSE FACTOR TABLE: R (i) Teen, goats milk
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gittract	Skin
I-135	2.75E+04	7.09E+04	2.63E+04	4.56E+06	1.12E+05	0.00E+00	7.85E+04	0.00E+00
CS-134	2.30E+10	5.40E+10	2.51E+10	0.00E+00	1.72E+10	6.56E+09	6.72E+08	0.00E+00
CS-136	1.28E+09	5.04E+09	3.39E+09	0.00E+00	2.75E+09	4.33E+08	4.06E+08	0.00E+00
CS-137	3.11E+10	4.13E+10	1.44E+10	0.00E+00	1.41E+10	5.47E+09	5.88E+08	0.00E+00
CS-138	5.29E-23	1.02E-22	5.08E-23	0.00E+00	7.49E-23	8.72E-24	4.61E-26	0.00E+00
BA-139	1.01E-08	7.09E-12	2.94E-10	0.00E+00	6.69E-12	4.89E-12	8.49E-08	0.00E+00
BA-140	5.56E+06	6.82E+03	3.58E+05	0.00E+00	2.31E+03	4.58E+03	8.58E+06	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	9.73E-01	4.78E-01	1.27E-01	0.00E+00	0.00E+00	0.00E+00	2.75E+04	0.00E+00
LA-142	4.12E-12	1.83E-12	4.56E-13	0.00E+00	0.00E+00	0.00E+00	5.57E-08	0.00E+00
CE-141	9.39E+02	6.27E+02	7.20E+01	0.00E+00	2.95E+02	0.00E+00	1.79E+06	0.00E+00
CE-143	9.18E+00	6.68E+03	7.46E-01	0.00E+00	2.99E+00	0.00E+00	2.01E+05	0.00E+00
CE-144	6.24E+04	2.58E+04	3.35E+03	0.00E+00	1.54E+04	0.00E+00	1.57E+07	0.00E+00
PR-143	3.31E+01	1.32E+01	1.65E+00	0.00E+00	7.68E+00	0.00E+00	1.09E+05	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	2.10E+01	2.28E+01	1.37E+00	0.00E+00	1.34E+01	0.00E+00	8.24E+04	0.00E+00
W-187	1.43E+03	1.17E+03	4.08E+02	0.00E+00	0.00E+00	0.00E+00	3.15E+05	0.00E+00
NP-239	8.42E-01	7.94E-02	4.41E-02	0.00E+00	2.49E-01	0.00E+00	1.28E+04	0.00E+00

TABLE I-12

DOSE FACTOR TABLE: R (i) - Child, goats milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.99E+03	1.99E+03	1.99E+03	1.99E+03	1.99E+03	1.99E+03	0.00E+00
C-14	1.65E+06	3.29E+05	3.29E+05	3.29E+05	3.29E+05	3.29E+05	3.29E+05	0.00E+00
NA-24	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.07E+06	1.07E+06	0.00E+00
P-32	8.84E+10	4.14E+09	3.41E+09	0.00E+00	0.00E+00	0.00E+00	2.44E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	1.09E+04	6.05E+03	1.65E+03	1.11E+04	5.79E+05	0.00E+00
MN-54	0.00E+00	1.98E+06	5.28E+05	0.00E+00	5.56E+05	0.00E+00	1.66E+06	0.00E+00
MN-56	0.00E+00	1.56E-03	3.53E-04	0.00E+00	1.89E-03	0.00E+00	2.26E-01	0.00E+00
FE-55	1.13E+06	6.00E+05	1.86E+05	0.00E+00	0.00E+00	3.39E+05	1.11E+05	0.00E+00
FE-59	1.34E+06	2.17E+06	1.08E+06	0.00E+00	0.00E+00	6.29E+05	2.26E+06	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.21E+06	3.70E+06	0.00E+00	0.00E+00	0.00E+00	7.05E+06	0.00E+00
CO-60	0.00E+00	4.02E+06	1.19E+07	0.00E+00	0.00E+00	0.00E+00	2.23E+07	0.00E+00
NI-63	2.75E+09	1.47E+08	9.36E+07	0.00E+00	0.00E+00	0.00E+00	9.92E+06	0.00E+00
NI-65	2.02E-01	1.90E-02	1.11E-02	0.00E+00	0.00E+00	0.00E+00	2.33E+00	0.00E+00
CU-64	0.00E+00	8.34E+03	5.04E+03	0.00E+00	2.02E+04	0.00E+00	3.91E+05	0.00E+00
ZN-65	3.93E+08	1.05E+09	6.51E+08	0.00E+00	6.60E+08	0.00E+00	1.84E+08	0.00E+00
ZN-69	1.18E-12	1.71E-12	1.58E-13	0.00E+00	1.04E-12	0.00E+00	1.08E-10	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	5.36E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	8.40E-24	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	9.74E+08	5.99E+08	0.00E+00	0.00E+00	0.00E+00	6.27E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	1.18E+10	0.00E+00	3.37E+08	0.00E+00	0.00E+00	0.00E+00	4.57E+08	0.00E+00
SR-90	1.82E+11	0.00E+00	4.60E+10	0.00E+00	0.00E+00	0.00E+00	2.45E+09	0.00E+00
SR-91	2.75E+05	0.00E+00	1.04E+04	0.00E+00	0.00E+00	0.00E+00	6.07E+05	0.00E+00
SR-92	4.65E+00	0.00E+00	1.86E-01	0.00E+00	0.00E+00	0.00E+00	8.81E+01	0.00E+00
Y-90	3.87E+01	0.00E+00	1.04E+00	0.00E+00	0.00E+00	0.00E+00	1.10E+05	0.00E+00
Y-91M	3.36E-20	0.00E+00	1.22E-21	0.00E+00	0.00E+00	0.00E+00	6.56E-17	0.00E+00
Y-91	3.94E+03	0.00E+00	1.05E+02	0.00E+00	0.00E+00	0.00E+00	5.25E+05	0.00E+00
Y-92	3.07E-05	0.00E+00	8.78E-07	0.00E+00	0.00E+00	0.00E+00	8.87E-01	0.00E+00
Y-93	1.22E-01	0.00E+00	3.35E-03	0.00E+00	0.00E+00	0.00E+00	1.82E+03	0.00E+00
ZR-95	3.85E+02	8.45E+01	7.53E+01	0.00E+00	1.21E+02	0.00E+00	8.82E+04	0.00E+00
ZR-97	2.31E-01	3.33E-02	1.97E-02	0.00E+00	4.79E-02	0.00E+00	5.05E+03	0.00E+00
NB-95	3.34E+04	1.30E+04	9.29E+03	0.00E+00	1.22E+04	0.00E+00	2.40E+07	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	9.77E+06	2.42E+06	0.00E+00	2.09E+07	0.00E+00	8.08E+06	0.00E+00
TC-99M	1.60E+00	3.13E+00	5.19E+01	0.00E+00	4.55E+01	1.59E+00	1.78E+03	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	4.45E+02	0.00E+00	1.71E+02	0.00E+00	1.12E+03	0.00E+00	1.15E+04	0.00E+00
RU-105	4.62E-04	0.00E+00	1.68E-04	0.00E+00	4.06E-03	0.00E+00	3.02E-01	0.00E+00
RU-106	8.71E+03	0.00E+00	1.09E+03	0.00E+00	1.18E+04	0.00E+00	1.36E+05	0.00E+00
AG-110M	1.98E+07	1.34E+07	1.07E+07	0.00E+00	2.50E+07	0.00E+00	1.59E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	7.45E+06	2.02E+06	9.94E+05	2.09E+06	0.00E+00	0.00E+00	7.19E+06	0.00E+00
TE-127M	2.03E+07	5.46E+06	2.41E+06	4.85E+06	5.79E+07	0.00E+00	1.64E+07	0.00E+00
TE-127	3.59E+02	9.67E+01	7.69E+01	2.48E+02	1.02E+03	0.00E+00	1.40E+04	0.00E+00
TE-129M	2.86E+07	7.99E+06	4.44E+06	9.22E+06	8.40E+07	0.00E+00	3.49E+07	0.00E+00
TE-129	1.59E-10	4.44E-11	3.78E-11	1.14E-10	4.65E-10	0.00E+00	9.90E-09	0.00E+00
TE-131M	1.92E+05	6.65E+04	7.07E+04	1.37E+05	6.43E+05	0.00E+00	2.70E+06	0.00E+00
TE-131	2.13E-33	6.48E-34	6.33E-34	1.63E-33	6.43E-33	0.00E+00	1.12E-32	0.00E+00
TE-132	1.23E+06	5.44E+05	6.57E+05	7.93E+05	5.05E+06	0.00E+00	5.48E+06	0.00E+00
I-130	2.08E+06	4.20E+06	2.16E+06	4.63E+08	6.28E+06	0.00E+00	1.97E+06	0.00E+00
I-131	1.54E+09	1.55E+09	8.78E+08	5.11E+11	2.54E+09	0.00E+00	1.38E+08	0.00E+00
I-132	8.41E-01	1.54E+00	7.10E-01	7.17E+01	2.36E+00	0.00E+00	1.82E+00	0.00E+00
I-133	2.06E+07	2.55E+07	9.66E+06	4.74E+09	4.25E+07	0.00E+00	1.03E+07	0.00E+00
I-134	1.06E-11	1.98E-11	9.09E-12	4.54E-10	3.02E-11	0.00E+00	1.31E-11	0.00E+00

TABLE I-12

DOSE FACTOR TABLE: R (i) Child, goats milk
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	6.52E+04	1.17E+05	5.55E+04	1.04E+07	1.80E+05	0.00E+00	8.94E+04	0.00E+00
CS-134	5.30E+10	8.69E+10	1.83E+10	0.00E+00	2.69E+10	9.66E+09	4.68E+08	0.00E+00
CS-136	2.89E+09	7.59E+09	5.15E+09	0.00E+00	4.24E+09	6.32E+08	2.80E+08	0.00E+00
CS-137	7.49E+10	7.17E+10	1.06E+10	0.00E+00	2.33E+10	8.40E+09	4.49E+08	0.00E+00
CS-138	1.28E-22	1.78E-22	1.13E-22	0.00E+00	1.25E-22	1.35E-23	8.21E-23	0.00E+00
BA-139	2.48E-08	1.32E-11	7.18E-10	0.00E+00	1.15E-11	7.78E-12	1.43E-06	0.00E+00
BA-140	1.34E+07	1.18E+04	7.84E+05	0.00E+00	3.83E+03	7.01E+03	6.90E+06	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	2.33E+00	8.14E-01	2.75E-01	0.00E+00	0.00E+00	0.00E+00	2.27E+04	0.00E+00
LA-142	9.95E-12	3.17E-12	9.94E-13	0.00E+00	0.00E+00	0.00E+00	6.29E-07	0.00E+00
CE-141	2.31E+03	1.15E+03	1.71E+02	0.00E+00	5.05E+02	0.00E+00	1.44E+06	0.00E+00
CE-143	2.25E+01	1.22E+04	1.77E+00	0.00E+00	5.12E+00	0.00E+00	1.79E+05	0.00E+00
CE-144	1.54E+05	4.82E+04	8.21E+03	0.00E+00	2.67E+04	0.00E+00	1.26E+07	0.00E+00
PR-143	8.19E+01	2.46E+01	4.07E+00	0.00E+00	1.33E+01	0.00E+00	8.84E+04	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	5.15E+01	4.17E+01	3.23E+00	0.00E+00	2.29E+01	0.00E+00	6.61E+04	0.00E+00
W-187	3.47E+03	2.05E+03	9.21E+02	0.00E+00	0.00E+00	0.00E+00	2.89E+05	0.00E+00
NP-239	2.07E+00	1.49E-01	1.05E-01	0.00E+00	4.30E-01	0.00E+00	1.10E+04	0.00E+00

TABLE I-13

DOSE FACTOR TABLE: R (i) - Infant, goats milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	3.01E+03	3.01E+03	3.01E+03	3.01E+03	3.01E+03	3.01E+03	0.00E+00
C-14	3.23E+06	6.89E+05	6.89E+05	6.89E+05	6.89E+05	6.89E+05	6.89E+05	0.00E+00
NA-24	1.85E+06	1.85E+06	1.85E+06	1.85E+06	1.85E+06	1.85E+06	1.85E+06	0.00E+00
P-32	1.82E+11	1.07E+10	7.06E+09	0.00E+00	0.00E+00	0.00E+00	2.46E+09	0.00E+00
CR-51	0.00E+00	0.00E+00	1.71E+04	1.13E+04	2.46E+03	2.19E+04	5.04E+05	0.00E+00
MN-54	0.00E+00	3.69E+06	8.36E+05	0.00E+00	8.17E+05	0.00E+00	1.36E+06	0.00E+00
MN-56	0.00E+00	3.82E-03	6.59E-04	0.00E+00	3.29E-03	0.00E+00	3.47E-01	0.00E+00
FE-55	1.37E+06	8.83E+05	2.36E+05	0.00E+00	0.00E+00	4.32E+05	1.12E+05	0.00E+00
FE-59	2.50E+06	4.37E+06	1.72E+06	0.00E+00	0.00E+00	1.29E+06	2.09E+06	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	2.42E+06	6.03E+06	0.00E+00	0.00E+00	0.00E+00	6.03E+06	0.00E+00
CO-60	0.00E+00	8.21E+06	1.94E+07	0.00E+00	0.00E+00	0.00E+00	1.95E+07	0.00E+00
NI-63	3.24E+09	2.01E+08	1.13E+08	0.00E+00	0.00E+00	0.00E+00	9.98E+06	0.00E+00
NI-65	4.27E-01	4.83E-02	2.20E-02	0.00E+00	0.00E+00	0.00E+00	3.68E+00	0.00E+00
CU-64	0.00E+00	2.07E+04	9.60E+03	0.00E+00	3.51E+04	0.00E+00	4.25E+05	0.00E+00
ZN-65	5.28E+08	1.81E+09	8.35E+08	0.00E+00	8.78E+08	0.00E+00	1.53E+09	0.00E+00
ZN-69	2.52E-12	4.54E-12	3.38E-13	0.00E+00	1.89E-12	0.00E+00	3.70E-10	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	1.14E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	1.62E-23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	2.47E+09	1.22E+09	0.00E+00	0.00E+00	0.00E+00	6.33E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	2.25E+10	0.00E+00	6.44E+08	0.00E+00	0.00E+00	0.00E+00	4.62E+08	0.00E+00
SR-90	1.98E+11	0.00E+00	5.03E+10	0.00E+00	0.00E+00	0.00E+00	2.47E+09	0.00E+00
SR-91	5.73E+05	0.00E+00	2.07E+04	0.00E+00	0.00E+00	0.00E+00	6.78E+05	0.00E+00
SR-92	9.89E+00	0.00E+00	3.67E-01	0.00E+00	0.00E+00	0.00E+00	1.07E+02	0.00E+00
Y-90	8.18E+01	0.00E+00	2.19E+00	0.00E+00	0.00E+00	0.00E+00	1.13E+05	0.00E+00
Y-91M	7.13E-20	0.00E+00	2.43E-21	0.00E+00	0.00E+00	0.00E+00	2.38E-16	0.00E+00
Y-91	7.40E+03	0.00E+00	1.97E+02	0.00E+00	0.00E+00	0.00E+00	5.30E+05	0.00E+00
Y-92	6.52E-05	0.00E+00	1.83E-06	0.00E+00	0.00E+00	0.00E+00	1.24E+00	0.00E+00
Y-93	2.60E-01	0.00E+00	7.08E-03	0.00E+00	0.00E+00	0.00E+00	2.05E+03	0.00E+00
ZR-95	6.83E+02	1.66E+02	1.18E+02	0.00E+00	1.79E+02	0.00E+00	8.29E+04	0.00E+00
ZR-97	4.89E-01	8.38E-02	3.83E-02	0.00E+00	8.45E-02	0.00E+00	5.35E+03	0.00E+00
NB-95	6.23E+04	2.57E+04	1.48E+04	0.00E+00	1.84E+04	0.00E+00	2.17E+07	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	2.50E+07	4.87E+06	0.00E+00	3.73E+07	0.00E+07	8.23E+06	0.00E+00
TC-99M	3.32E+00	6.84E+00	8.82E+01	0.00E+00	7.36E+01	3.58E+00	1.99E+03	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	9.02E+02	0.00E+00	3.02E+02	0.00E+00	1.88E+03	0.00E+00	1.10E+04	0.00E+00
RU-105	9.75E-04	0.00E+00	3.28E-04	0.00E+00	7.17E-03	0.00E+00	3.88E-01	0.00E+00
RU-106	1.79E+04	0.00E+00	2.24E+03	0.00E+00	2.12E+04	0.00E+00	1.36E+05	0.00E+00
AG-110M	3.67E+07	2.68E+07	1.77E+07	0.00E+00	3.83E+07	0.00E+00	1.39E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	1.52E+07	5.09E+06	2.06E+06	5.12E+06	0.00E+00	0.00E+00	7.26E+06	0.00E+00
TE-127M	4.11E+07	1.36E+07	4.97E+06	1.19E+07	1.01E+08	0.00E+00	1.66E+07	0.00E+00
TE-127	7.61E+02	2.55E+02	1.64E+02	6.20E+02	1.86E+03	0.00E+00	1.60E+04	0.00E+00
TE-129M	5.87E+07	2.01E+07	9.04E+06	2.25E+07	1.47E+08	0.00E+00	3.51E+07	0.00E+00
TE-129	3.37E-10	1.16E-10	7.87E-11	2.83E-10	8.40E-10	0.00E+00	2.70E-08	0.00E+00
TE-131M	4.06E+05	1.63E+05	1.35E+05	3.31E+05	1.12E+06	0.00E+00	2.75E+06	0.00E+00
TE-131	4.51E-33	1.67E-33	1.27E-33	4.02E-33	1.15E-32	0.00E+00	1.82E-31	0.00E+00
TE-132	2.53E+06	1.25E+06	1.17E+06	1.85E+06	7.84E+06	0.00E+00	4.64E+06	0.00E+00
I-130	4.27E+06	9.40E+06	3.77E+06	1.05E+09	1.03E+07	0.00E+00	2.01E+06	0.00E+00
I-131	3.21E+09	3.78E+09	1.66E+09	1.24E+12	4.41E+09	0.00E+00	1.35E+08	0.00E+00
I-132	1.74E+00	3.54E+00	1.26E+00	1.66E+02	3.95E+00	0.00E+00	2.87E+00	0.00E+00
I-133	4.36E+07	6.35E+07	1.86E+07	1.15E+10	7.46E+07	0.00E+00	1.07E+07	0.00E+00
I-134	2.21E-11	4.52E-11	1.61E-11	1.05E-09	5.05E-11	0.00E+00	4.67E-11	0.00E+00

TABLE I-13

DOSE FACTOR TABLE: R (i) Infant, goats milk
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	1.36E+05	2.70E+05	9.83E+04	2.42E+07	3.00E+05	0.00E+00	9.76E+04	0.00E+00
CS-134	8.53E+10	1.59E+11	1.61E+10	0.00E+00	4.10E+10	1.68E+10	4.32E+08	0.00E+00
CS-136	5.65E+09	1.66E+10	6.21E+09	0.00E+00	6.62E+09	1.35E+09	2.52E+08	0.00E+00
CS-137	1.19E+11	1.40E+11	9.91E+09	0.00E+00	3.75E+10	1.52E+10	4.37E+08	0.00E+00
CS-138	2.70E-22	4.40E-22	2.13E-22	0.00E+00	2.19E-22	3.42E-23	7.03E-22	0.00E+00
BA-139	5.27E-08	3.49E-11	1.53E-09	0.00E+00	2.10E-11	2.12E-11	3.34E-06	0.00E+00
BA-140	2.76E+07	2.76E+04	1.42E+06	0.00E+00	6.56E+03	1.70E+04	6.79E+06	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	4.87E+00	1.92E+00	4.94E-01	0.00E+00	0.00E+00	0.00E+00	2.25E+04	0.00E+00
LA-142	2.09E-11	7.67E-12	1.84E-12	0.00E+00	0.00E+00	0.00E+00	1.30E-06	0.00E+00
CE-141	4.58E+03	2.79E+03	3.29E+02	0.00E+00	8.62E+02	0.00E+00	1.44E+06	0.00E+00
CE-143	4.77E+01	3.16E+04	3.61E+00	0.00E+00	9.21E+00	0.00E+00	1.85E+05	0.00E+00
CE-144	2.20E+05	9.02E+04	1.23E+04	0.00E+00	3.64E+04	0.00E+00	1.26E+07	0.00E+00
PR-143	1.70E+02	6.34E+01	8.40E+00	0.00E+00	2.36E+01	0.00E+00	8.95E+04	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	1.02E+02	1.05E+02	6.43E+00	0.00E+00	4.05E+01	0.00E+00	6.65E+04	0.00E+00
W-187	7.30E+03	5.08E+03	1.75E+03	0.00E+00	0.00E+00	0.00E+00	2.98E+05	0.00E+00
NP-239	4.38E+00	3.92E-01	2.21E-01	0.00E+00	7.81E-01	0.00E+00	1.13E+04	0.00E+00

TABLE I-14

DOSE FACTOR TABLE: R (i) - Adult, meat
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	2.01E+02	2.01E+02	2.01E+02	2.01E+02	2.01E+02	2.01E+02	0.00E+00
C-14	3.33E+05	6.66E+04	6.66E+04	6.66E+04	6.66E+04	6.66E+04	6.66E+04	0.00E+00
NA-24	1.39E-03	1.39E-03	1.39E-03	1.39E-03	1.39E-03	1.39E-03	1.39E-03	0.00E+00
P-32	4.41E+09	2.74E+08	1.71E+08	0.00E+00	0.00E+00	0.00E+00	4.96E+08	0.00E+00
CR-51	0.00E+00	0.00E+00	6.30E+03	3.76E+03	1.39E+03	8.36E+03	1.58E+06	0.00E+00
MN-54	0.00E+00	7.24E+06	1.38E+06	0.00E+00	2.15E+06	0.00E+00	2.22E+07	0.00E+00
MN-56	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-55	2.28E+08	1.58E+08	3.68E+07	0.00E+00	0.00E+00	8.80E+07	9.05E+07	0.00E+00
FE-59	2.28E+08	5.36E+08	2.05E+08	0.00E+00	0.00E+00	1.50E+08	1.79E+09	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.52E+07	3.40E+07	0.00E+00	0.00E+00	0.00E+00	3.07E+08	0.00E+00
CO-60	0.00E+00	5.84E+07	1.29E+08	0.00E+00	0.00E+00	0.00E+00	1.10E+09	0.00E+00
NI-63	1.46E+10	1.01E+09	4.90E+08	0.00E+00	0.00E+00	0.00E+00	2.11E+08	0.00E+00
NI-65	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CU-64	0.00E+00	2.79E-07	1.31E-07	0.00E+00	7.03E-07	0.00E+00	2.38E-05	0.00E+00
ZN-65	2.82E+08	8.97E+08	4.05E+08	0.00E+00	6.00E+08	0.00E+00	5.65E+08	0.00E+00
ZN-69	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	4.51E+08	2.10E+08	0.00E+00	0.00E+00	0.00E+00	8.90E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	2.56E+08	0.00E+00	7.36E+06	0.00E+00	0.00E+00	0.00E+00	4.11E+07	0.00E+00
SR-90	9.63E+09	0.00E+00	2.36E+09	0.00E+00	0.00E+00	0.00E+00	2.78E+08	0.00E+00
SR-91	1.58E-10	0.00E+00	6.39E-12	0.00E+00	0.00E+00	0.00E+00	7.53E-10	0.00E+00
SR-92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-90	1.08E+02	0.00E+00	2.90E+00	0.00E+00	0.00E+00	0.00E+00	1.15E+06	0.00E+00
Y-91M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-91	9.53E+05	0.00E+00	2.55E+04	0.00E+00	0.00E+00	0.00E+00	5.24E+08	0.00E+00
Y-92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-93	4.87E-12	0.00E+00	1.35E-13	0.00E+00	0.00E+00	0.00E+00	1.55E-07	0.00E+00
ZR-95	1.57E+06	5.02E+05	3.40E+05	0.00E+00	7.88E+05	0.00E+00	1.59E+09	0.00E+00
ZR-97	2.11E-05	4.27E-06	1.95E-06	0.00E+00	6.44E-06	0.00E+00	1.32E+00	0.00E+00
NB-95	2.01E+06	1.12E+06	6.01E+05	0.00E+00	1.11E+06	0.00E+00	6.79E+09	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.01E+05	1.91E+04	0.00E+00	2.28E+05	0.00E+00	2.33E+05	0.00E+00
TC-99M	4.74E-21	1.34E-20	1.71E-19	0.00E+00	2.04E-19	6.57E-21	7.93E-18	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	9.12E+07	0.00E+00	3.93E+07	0.00E+00	3.48E+08	0.00E+00	1.06E+10	0.00E+00
RU-105	6.30E-28	0.00E+00	2.49E-28	0.00E+00	8.14E-27	0.00E+00	3.85E-25	0.00E+00
RU-106	2.20E+09	0.00E+00	2.78E+08	0.00E+00	4.25E+09	0.00E+00	1.42E+11	0.00E+00
AG-110M	5.29E+06	4.89E+06	2.91E+06	0.00E+00	9.62E+06	0.00E+00	2.00E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	3.02E+08	1.09E+08	4.05E+07	9.09E+07	1.23E+09	0.00E+00	1.21E+09	0.00E+00
TE-127M	9.07E+08	3.24E+08	1.10E+08	2.32E+08	3.68E+09	0.00E+00	3.04E+09	0.00E+00
TE-127	2.21E-10	7.94E-11	4.78E-11	1.64E-10	9.01E-10	0.00E+00	1.74E-08	0.00E+00
TE-129M	9.96E+08	3.72E+08	1.58E+08	3.42E+08	4.16E+09	0.00E+00	5.02E+09	0.00E+00
TE-129	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-131M	4.57E+02	2.23E+02	1.86E+02	3.54E+02	2.26E+03	0.00E+00	2.22E+04	0.00E+00
TE-131	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-132	1.43E+06	9.22E+05	8.66E+05	1.02E+06	8.88E+06	0.00E+00	4.36E+07	0.00E+00
I-130	2.18E-06	6.42E-06	2.53E-06	5.44E-04	1.00E-05	0.00E+00	5.52E-06	0.00E+00
I-131	1.06E+07	1.51E+07	8.66E+06	4.95E+09	2.59E+07	0.00E+00	3.99E+06	0.00E+00
I-132	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	3.72E-01	6.47E-01	1.97E-01	9.51E+01	1.13E+00	0.00E+00	5.82E-01	0.00E+00
I-134	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE I-14

DOSE FACTOR TABLE: R (i) Adult, meat
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	4.69E-17	1.23E-16	4.53E-17	8.10E-15	1.97E-16	0.00E+00	1.39E-16	0.00E+00
CS-134	5.13E+08	1.22E+09	9.98E+08	0.00E+00	3.95E+08	1.31E+08	2.14E+07	0.00E+00
CS-136	1.15E+07	4.54E+07	3.27E+07	0.00E+00	2.53E+07	3.46E+06	5.16E+06	0.00E+00
CS-137	6.75E+08	9.23E+08	6.05E+08	0.00E+00	3.13E+08	1.04E+08	1.79E+07	0.00E+00
CS-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-139	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-140	2.75E+07	3.45E+04	1.80E+06	0.00E+00	1.17E+04	1.98E+04	5.66E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	3.74E-02	1.89E-02	4.98E-03	0.00E+00	0.00E+00	0.00E+00	1.38E+03	0.00E+00
LA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CE-141	1.24E+04	8.37E+03	9.49E+02	0.00E+00	3.89E+03	0.00E+00	3.20E+07	0.00E+00
CE-143	2.03E-02	1.50E+01	1.66E-03	0.00E+00	6.61E-03	0.00E+00	5.61E+02	0.00E+00
CE-144	1.15E+06	4.81E+05	6.18E+04	0.00E+00	2.85E+05	0.00E+00	3.89E+08	0.00E+00
PR-143	2.00E+04	8.00E+03	9.89E+02	0.00E+00	4.62E+03	0.00E+00	8.74E+07	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	6.84E+03	7.90E+03	4.73E+02	0.00E+00	4.62E+03	0.00E+00	3.79E+07	0.00E+00
W-187	2.08E-02	1.74E-02	6.09E-03	0.00E+00	0.00E+00	0.00E+00	5.70E+00	0.00E+00
NP-239	2.61E-01	2.56E-02	1.41E-02	0.00E+00	8.00E+02	0.00E+00	5.26E+03	0.00E+00

TABLE I-15

DOSE FACTOR TABLE: R (i) - Teen, meat
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	1.20E+02	0.00E+00
C-14	2.81E+05	5.62E+04	5.62E+04	5.62E+04	5.62E+04	5.62E+04	5.62E+04	0.00E+00
NA-24	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	1.11E-03	0.00E+00
P-32	3.73E+09	2.31E+08	1.45E+08	0.00E+00	0.00E+00	0.00E+00	3.13E+08	0.00E+00
CR-51	0.00E+00	0.00E+00	5.04E+03	2.80E+03	1.10E+03	7.10E+03	8.46E+05	0.00E+00
MN-54	0.00E+00	5.52E+06	1.09E+06	0.00E+00	1.65E+06	0.00E+00	1.13E+07	0.00E+00
MN-56	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-55	1.85E+08	1.31E+08	3.07E+07	0.00E+00	0.00E+00	8.34E+07	5.69E+07	0.00E+00
FE-59	1.82E+08	4.25E+08	1.64E+08	0.00E+00	0.00E+00	1.34E+08	1.01E+09	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.17E+07	2.69E+07	0.00E+00	0.00E+00	0.00E+00	1.61E+08	0.00E+00
CO-60	0.00E+00	4.53E+07	1.02E+08	0.00E+00	0.00E+00	0.00E+00	5.90E+08	0.00E+00
NI-63	1.18E+10	8.30E+08	3.98E+08	0.00E+00	0.00E+00	0.00E+00	1.32E+08	0.00E+00
NI-65	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CU-64	0.00E+00	2.28E-07	1.07E-07	0.00E+00	5.76E-07	0.00E+00	1.77E-05	0.00E+00
ZN-65	1.98E+08	6.88E+08	3.21E+08	0.00E+00	4.40E+08	0.00E+00	2.91E+08	0.00E+00
ZN-69	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-86	0.00E+00	3.77E+07	1.77E+08	0.00E+00	0.00E+00	0.00E+00	5.57E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	2.16E+08	0.00E+00	6.20E+06	0.00E+00	0.00E+00	0.00E+00	2.58E+07	0.00E+00
SR-90	6.23E+09	0.00E+00	1.54E+09	0.00E+00	0.00E+00	0.00E+00	1.75E+08	0.00E+00
SR-91	1.33E-10	0.00E+00	5.29E-12	0.00E+00	0.00E+00	0.00E+00	6.30E-10	0.00E+00
SR-92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-90	9.11E+01	0.00E+00	2.45E+00	0.00E+00	0.00E+00	0.00E+00	7.51E+05	0.00E+00
Y-91M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-91	8.03E+05	0.00E+00	2.15E+04	0.00E+00	0.00E+00	0.00E+00	3.29E+08	0.00E+00
Y-92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-93	4.11E-12	0.00E+00	1.13E-13	0.00E+00	0.00E+00	0.00E+00	1.26E-07	0.00E+00
ZR-95	1.25E+06	3.96E+05	2.72E+05	0.00E+00	5.82E+05	0.00E+00	9.13E+08	0.00E+00
ZR-97	1.76E-05	3.49E-06	1.61E-06	0.00E+00	5.29E-06	0.00E+00	9.44E-01	0.00E+00
NB-95	1.57E+06	8.71E+05	4.79E+05	0.00E+00	8.44E+05	0.00E+00	3.72E+09	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	8.31E+04	1.58E+04	0.00E+00	1.90E+05	0.00E+00	1.49E+05	0.00E+00
TC-99M	3.77E-21	1.05E-20	1.36E-19	0.00E+00	1.57E-19	5.83E-21	6.90E-18	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	7.43E+07	0.00E+00	3.17E+07	0.00E+00	2.62E+08	0.00E+00	6.20E+09	0.00E+00
RU-105	5.27E-28	0.00E+00	2.04E-28	0.00E+00	6.65E-27	0.00E+00	4.25E-25	0.00E+00
RU-106	1.85E+09	0.00E+00	2.34E+08	0.00E+00	3.57E+09	0.00E+00	8.89E+10	0.00E+00
AG-110M	4.00E+06	3.79E+06	2.31E+06	0.00E+00	7.23E+06	0.00E+00	1.06E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	2.55E+08	9.19E+07	3.41E+07	7.13E+07	0.00E+00	0.00E+00	7.53E+08	0.00E+00
TE-127M	7.65E+08	2.71E+08	9.10E+07	1.82E+08	3.10E+09	0.00E+00	1.91E+09	0.00E+00
TE-127	1.88E-10	6.65E-11	4.04E-11	1.29E-10	7.60E-10	0.00E+00	1.45E-08	0.00E+00
TE-129M	8.34E+08	3.10E+08	1.32E+08	2.69E+08	3.49E+09	0.00E+00	3.13E+09	0.00E+00
TE-129	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-131M	3.81E+02	1.83E+02	1.52E+02	2.75E+02	1.90E+03	0.00E+00	1.47E+04	0.00E+00
TE-131	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-132	1.17E+06	7.39E+05	6.95E+05	7.79E+05	7.09E+06	0.00E+00	2.34E+07	0.00E+00
I-130	1.75E-06	5.07E-06	2.02E-06	4.13E-04	7.80E-06	0.00E+00	3.89E-06	0.00E+00
I-131	8.78E+06	1.23E+07	6.60E+06	3.59E+09	2.12E+07	0.00E+00	2.43E+06	0.00E+00
I-132	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	3.11E-01	5.28E-01	1.61E-01	7.37E+01	9.26E-01	0.00E+00	3.99E-01	0.00E+00
I-134	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE I-15

DOSE FACTOR TABLE: R (i) Teen, meat
 Units are m²*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	3.82E-17	9.82E-17	3.64E-17	6.32E-15	1.55E-16	0.00E+00	1.09E-16	0.00E+00
CS-134	4.08E+08	9.60E+08	4.45E+08	0.00E+00	3.05E+08	1.16E+08	1.19E+07	0.00E+00
CS-136	8.97E+06	3.53E+07	2.37E+07	0.00E+00	1.92E+07	3.03E+06	2.84E+06	0.00E+00
CS-137	5.60E+08	7.46E+08	2.60E+08	0.00E+00	2.54E+08	9.86E+07	1.06E+07	0.00E+00
CS-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-139	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-140	2.27E+07	2.78E+04	1.46E+06	0.00E+00	9.44E+03	1.87E+04	3.50E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	3.08E-02	1.51E-02	4.02E-03	0.00E+00	0.00E+00	0.00E+00	8.69E+02	0.00E+00
LA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CE-141	1.04E+04	6.94E+03	7.97E+02	0.00E+00	3.27E+03	0.00E+00	0.00E+00	0.00E+00
CE-143	1.71E-02	1.24E+01	1.39E-03	0.00E+00	5.58E-03	0.00E+00	1.98E+07	0.00E+00
CE-144	9.70E+05	4.01E+05	5.21E+04	0.00E+00	2.40E+05	0.00E+00	3.74E+02	0.00E+00
PR-143	1.68E+04	6.70E+03	8.36E+02	0.00E+00	3.90E+03	0.00E+00	2.44E+08	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.52E+07	0.00E+00
ND-147	6.02E+03	6.55E+03	3.92E+02	0.00E+00	3.85E+03	0.00E+00	0.00E+00	0.00E+00
W-187	1.74E-02	1.42E-02	4.98E-03	0.00E+00	0.00E+00	0.00E+00	2.36E+07	0.00E+00
NP-239	2.28E-01	2.15E-02	1.19E-02	0.00E+00	6.75E-02	0.00E+00	3.85E+00	0.00E+00
							3.46E+03	0.00E+00

TABLE I-16

DOSE FACTOR TABLE: R (i) - Child, meat
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	1.45E+02	0.00E+00
C-14	5.29E+05	1.06E+05	1.06E+05	1.06E+05	1.06E+05	1.06E+05	1.06E+05	0.00E+00
NA-24	1.77E-03	1.77E-03	1.77E-03	1.77E-03	1.77E-03	1.77E-03	1.77E-03	0.00E+00
P-32	7.03E+09	3.29E+08	2.71E+08	0.00E+00	0.00E+00	0.00E+00	1.94E+08	0.00E+00
CR-51	0.00E+00	0.00E+00	7.85E+03	4.36E+03	1.19E+03	7.96E+03	4.16E+03	0.00E+00
MN-54	0.00E+00	6.31E+06	1.68E+06	0.00E+00	1.77E+06	0.00E+00	5.30E+06	0.00E+00
MN-56	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-55	3.56E+08	1.89E+08	5.85E+07	0.00E+00	0.00E+00	1.07E+08	3.50E+07	0.00E+00
FE-59	3.23E+08	5.23E+08	2.60E+08	0.00E+00	0.00E+00	1.51E+08	5.44E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	1.36E+07	4.18E+07	0.00E+00	0.00E+00	0.00E+00	7.96E+07	0.00E+00
CO-60	0.00E+00	5.38E+07	1.59E+08	0.00E+00	0.00E+00	0.00E+00	2.98E+08	0.00E+00
NI-63	2.25E+10	1.21E+09	7.66E+08	0.00E+00	0.00E+00	0.00E+00	8.13E+07	0.00E+00
NI-65	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CU-64	0.00E+00	3.06E-07	1.85E-07	0.00E+00	7.39E-07	0.00E+00	1.44E-05	0.00E+00
ZN-65	2.97E+08	7.92E+08	4.93E+08	0.00E+00	4.99E+08	0.00E+00	1.39E+08	0.00E+00
ZN-69	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	5.34E+08	3.28E+08	0.00E+00	0.00E+00	0.00E+00	3.44E+07	0.00E+00
RB-88	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-89	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	4.10E+08	0.00E+00	1.17E+07	0.00E+00	0.00E+00	0.00E+00	1.59E+07	0.00E+00
SR-90	8.05E+09	0.00E+00	2.04E+09	0.00E+00	0.00E+00	0.00E+00	1.08E+08	0.00E+00
SR-91	2.50E-10	0.00E+00	9.42E-12	0.00E+00	0.00E+00	0.00E+00	5.51E-10	0.00E+00
SR-92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-90	1.72E+02	0.00E+00	4.61E+00	0.00E+00	0.00E+00	0.00E+00	4.91E+05	0.00E+00
Y-91M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-91	1.52E+06	0.00E+00	4.05E+04	0.00E+00	0.00E+00	0.00E+00	2.02E+08	0.00E+00
Y-92	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Y-93	7.73E-12	0.00E+00	2.12E-13	0.00E+00	0.00E+00	0.00E+00	1.15E-07	0.00E+00
ZR-95	2.23E+06	4.90E+05	4.36E+05	0.00E+00	7.01E+05	0.00E+00	5.11E+08	0.00E+00
ZR-97	3.28E-05	4.74E-06	2.80E-06	0.00E+00	6.80E-06	0.00E+00	7.18E-01	0.00E+00
NB-95	2.71E+06	1.06E+06	7.54E+05	0.00E+00	9.92E+05	0.00E+00	1.95E+09	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	1.16E+05	2.86E+04	0.00E+00	2.47E+05	0.00E+00	9.56E+04	0.00E+00
TC-99M	6.61E-21	1.30E-20	2.15E-19	0.00E+00	1.88E-19	6.58E-21	7.37E-18	0.00E+00
TC-101	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RU-103	1.34E+08	0.00E+00	5.16E+07	0.00E+00	3.38E+08	0.00E+00	3.47E+09	0.00E+00
RU-105	9.83E-28	0.00E+00	3.57E-28	0.00E+00	8.64E-27	0.00E+00	6.42E-25	0.00E+00
RU-106	3.49E+09	0.00E+00	4.35E+08	0.00E+00	4.71E+09	0.00E+00	5.43E+10	0.00E+00
AG-110M	6.64E+06	4.49E+06	3.59E+06	0.00E+00	8.36E+06	0.00E+00	5.34E+08	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	4.79E+08	1.30E+08	6.39E+07	1.34E+08	0.00E+00	0.00E+00	4.62E+08	0.00E+00
TE-127M	1.44E+09	3.88E+08	1.71E+08	3.45E+08	4.11E+09	0.00E+00	1.17E+09	0.00E+00
TE-127	3.53E-10	9.51E-11	7.57E-11	2.44E-10	1.00E-09	0.00E+00	1.38E-08	0.00E+00
TE-129M	1.57E+09	4.39E+08	2.44E+08	5.07E+08	4.62E+09	0.00E+00	1.92E+09	0.00E+00
TE-129	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-131M	7.09E+02	2.45E+02	2.61E+02	5.04E+02	2.37E+03	0.00E+00	9.94E+03	0.00E+00
TE-131	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-132	2.13E+06	9.43E+05	1.14E+06	1.37E+06	8.75E+06	0.00E+00	9.49E+06	0.00E+00
I-130	3.13E-06	6.33E-06	3.26E-06	6.97E-04	9.46E-06	0.00E+00	2.96E-06	0.00E+00
I-131	1.63E+07	1.64E+07	9.30E+06	5.41E+09	2.69E+07	0.00E+00	1.46E+06	0.00E+00
I-132	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	5.78E-01	7.15E-01	2.70E-01	1.33E+02	1.19E+00	0.00E+00	2.88E-01	0.00E+00
I-134	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

TABLE I-16

DOSE FACTOR TABLE: R (i) Child, meat
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	6.91E-17	1.24E-16	5.88E-17	1.10E-14	1.91E-16	0.00E+00	9.47E-17	0.00E+00
CS-134	7.19E+08	1.18E+09	2.49E+08	0.00E+00	3.66E+08	1.31E+08	6.36E+06	0.00E+00
CS-136	1.55E+07	4.25E+07	2.75E+07	0.00E+00	2.27E+07	3.38E+06	1.50E+06	0.00E+00
CS-137	1.03E+09	9.88E+08	1.46E+08	0.00E+00	3.22E+08	1.16E+08	6.19E+06	0.00E+00
CS-138	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-139	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-140	4.19E+07	3.67E+04	2.45E+06	0.00E+00	1.20E+04	2.19E+04	2.12E+07	0.00E+00
BA-141	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	5.64E-02	1.97E-02	6.64E-03	0.00E+00	0.00E+00	0.00E+00	5.49E+02	0.00E+00
LA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CE-141	1.96E+04	9.76E+03	1.45E+03	0.00E+00	4.28E+03	0.00E+00	1.22E+07	0.00E+00
CE-143	3.21E-02	1.74E+01	2.52E-03	0.00E+00	7.29E-03	0.00E+00	2.55E+02	0.00E+00
CE-144	1.83E+06	5.73E+05	9.76E+04	0.00E+00	3.17E+05	0.00E+00	1.49E+08	0.00E+00
PR-143	3.18E+04	9.54E+03	1.58E+03	0.00E+00	5.17E+03	0.00E+00	3.43E+07	0.00E+00
PR-144	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
ND-147	1.13E+04	9.16E+03	7.09E+02	0.00E+00	5.02E+03	0.00E+00	1.45E+07	0.00E+00
W-187	3.23E-02	1.91E-02	8.59E-03	0.00E+00	0.00E+00	0.00E+00	2.69E+00	0.00E+00
NF-239	4.29E-01	3.08E-02	2.16E-02	0.00E+00	8.90E-02	0.00E+00	2.28E+03	0.00E+00

TABLE I-17

DOSE FACTOR TABLE: R (i) - Adult, vegetation
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.40E+03	1.40E+03	1.40E+03	1.40E+03	1.40E+03	1.40E+03	0.00E+00
C-14	8.97E+05	1.79E+05	1.79E+05	1.79E+05	1.79E+05	1.79E+05	1.79E+05	0.00E+00
NA-24	2.68E+05	2.68E+05	2.68E+05	2.68E+05	2.68E+05	2.68E+05	2.68E+05	0.00E+00
P-32	1.40E+09	8.72E+07	5.42E+07	0.00E+00	0.00E+00	0.00E+00	1.58E+08	0.00E+00
CR-51	0.00E+00	0.00E+00	4.64E+04	2.77E+04	1.02E+04	6.15E+04	1.17E+07	0.00E+00
MN-54	0.00E+00	3.10E+08	5.92E+07	0.00E+00	9.23E+07	0.00E+00	9.50E+08	0.00E+00
MN-56	0.00E+00	1.54E+01	2.74E+00	0.00E+00	1.96E+01	0.00E+00	4.92E+02	0.00E+00
FE-55	2.08E+08	1.43E+08	3.34E+07	0.00E+00	0.00E+00	8.00E+07	8.23E+07	0.00E+00
FE-59	1.26E+08	2.96E+08	1.13E+08	0.00E+00	0.00E+00	8.26E+07	9.85E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	3.06E+07	6.86E+07	0.00E+00	0.00E+00	0.00E+00	6.20E+08	0.00E+00
CO-60	0.00E+00	1.65E+08	3.65E+08	0.00E+00	0.00E+00	0.00E+00	3.11E+09	0.00E+00
NI-63	1.03E+10	7.14E+08	3.45E+08	0.00E+00	0.00E+00	0.00E+00	1.49E+08	0.00E+00
NI-65	5.96E+01	7.75E+00	3.54E+00	0.00E+00	0.00E+00	0.00E+00	1.97E+02	0.00E+00
CU-64	0.00E+00	9.14E+03	4.29E+03	0.00E+00	2.31E+04	0.00E+00	7.79E+05	0.00E+00
ZN-65	3.15E+08	1.00E+09	4.53E+08	0.00E+00	6.70E+08	0.00E+00	6.31E+08	0.00E+00
ZN-69	5.06E-06	9.67E-06	6.72E-07	0.00E+00	6.28E+06	0.00E+00	1.45E+06	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	3.01E+00	0.00E+00	0.00E+00	0.00E+00	4.33E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	2.14E-11	0.00E+00	0.00E+00	0.00E+00	1.68E-16	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	2.19E+08	1.02E+08	0.00E+00	0.00E+00	0.00E+00	4.32E+07	0.00E+00
RB-88	0.00E+00	2.64E-22	1.40E-22	0.00E+00	0.00E+00	0.00E+00	3.65E-33	0.00E+00
RB-89	0.00E+00	2.88E-26	2.03E-26	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SR-89	9.94E+09	0.00E+00	2.85E+08	0.00E+00	0.00E+00	0.00E+00	1.59E+09	0.00E+00
SR-90	5.98E+11	0.00E+00	1.47E+11	0.00E+00	0.00E+00	0.00E+00	1.73E+10	0.00E+00
SR-91	3.02E+05	0.00E+00	1.22E+04	0.00E+00	0.00E+00	0.00E+00	1.44E+06	0.00E+00
SR-92	4.15E+02	0.00E+00	1.79E+01	0.00E+00	0.00E+00	0.00E+00	8.21E+03	0.00E+00
Y-90	1.33E+04	0.00E+00	3.56E+02	0.00E+00	0.00E+00	0.00E+00	1.41E+08	0.00E+00
Y-91M	4.76M-09	0.00E+00	1.84E-10	0.00E+00	0.00E+00	0.00E+00	1.40E-08	0.00E+00
Y-91	5.09E+06	0.00E+00	1.36E+05	0.00E+00	0.00E+00	0.00E+00	2.80E+09	0.00E+00
Y-92	8.96E-01	0.00E+00	2.62E-02	0.00E+00	0.00E+00	0.00E+00	1.57E+04	0.00E+00
Y-93	1.68E+02	0.00E+00	4.65E+00	0.00E+00	0.00E+00	0.00E+00	5.34E+06	0.00E+00
ZR-95	1.17E+06	3.75E+05	2.54E+05	0.00E+00	5.89E+05	0.00E+00	1.19E+09	0.00E+00
ZR-97	3.36E+02	6.78E+01	3.10E+01	0.00E+00	1.02E+02	0.00E+00	2.10E+07	0.00E+00
NB-95	1.42E+05	7.90E+04	4.25E+04	0.00E+00	7.81E+04	0.00E+00	4.80E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	6.14E+06	1.17E+06	0.00E+00	1.39E+07	0.00E+00	1.42E+07	0.00E+00
TC-99M	3.06E+00	8.66E+00	1.10E+02	0.00E+00	1.31E+02	4.24E+00	5.12E+03	0.00E+00
TC-101	5.93E-31	8.55E-31	8.39E-30	0.00E+00	1.54E-29	4.37E-31	0.00E+00	0.00E+00
RU-103	4.76E+06	0.00E+00	2.05E+06	0.00E+00	1.82E+07	0.00E+00	5.56E+08	0.00E+00
RU-105	5.29E+01	0.00E+00	2.09E+01	0.00E+00	6.84E+02	0.00E+00	3.24E+04	0.00E+00
RU-106	1.91E+08	0.00E+00	2.42E+07	0.00E+00	3.69E+08	0.00E+00	1.24E+10	0.00E+00
AG-110M	1.05E+07	9.67E+06	5.74E+06	0.00E+00	1.90E+07	0.00E+00	3.95E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	9.62E+07	3.49E+07	1.29E+07	2.89E+07	3.91E+08	0.00E+00	3.84E+08	0.00E+00
TE-127M	3.47E+08	1.24E+08	4.23E+07	8.87E+07	1.41E+09	0.00E+00	1.16E+09	0.00E+00
TE-127	5.61E+03	2.02E+03	1.21E+03	4.16E+03	2.29E+04	0.00E+00	4.43E+05	0.00E+00
TE-129M	2.51E+08	9.36E+07	3.97E+07	8.61E+07	1.05E+09	0.00E+00	1.26E+09	0.00E+00
TE-129	7.13E-04	2.68E-04	1.74E-04	5.48E-04	3.00E-03	0.00E+00	5.38E-04	0.00E+00
TE-131M	9.10E+05	4.45E+05	3.71E+05	7.05E+05	4.51E+06	0.00E+00	4.42E+07	0.00E+00
TE-131	1.25E-15	5.21E-16	3.94E-16	1.03E-15	5.47E-15	0.00E+00	1.77E-16	0.00E+00
TE-132	4.30E+06	2.78E+06	2.61E+06	3.07E+06	2.68E+07	0.00E+00	1.31E+08	0.00E+00
I-130	3.90E+05	1.15E+06	4.54E+05	9.75E+07	1.79E+06	0.00E+00	9.90E+05	0.00E+00
I-131	8.07E+07	1.15E+08	6.61E+07	3.78E+10	1.98E+08	0.00E+00	3.04E+07	0.00E+00
I-132	5.57E+01	1.49E+02	5.21E+01	5.21E+03	2.37E+02	0.00E+00	2.80E+01	0.00E+00
I-133	2.08E+06	3.61E+06	1.10E+06	5.31E+08	6.31E+06	0.00E+00	3.25E+06	0.00E+00
I-134	8.84E-05	2.40E-04	8.59E-05	4.16E-03	3.82E-04	0.00E+00	2.09E-07	0.00E+00

TABLE I-17

DOSE FACTOR TABLE: R (i) Adult, vegetation
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	3.85E+04	1.01E+05	3.72E+04	6.65E+06	1.62E+05	0.00E+00	1.14E+05	0.00E+00
CS-134	4.62E+09	1.10E+10	8.99E+09	0.00E+00	3.56E+09	1.18E+09	1.92E+08	0.00E+00
CS-136	4.26E+07	1.68E+08	1.21E+08	0.00E+00	9.37E+07	1.28E+07	1.91E+07	0.00E+00
CS-137	6.29E+09	8.61E+09	5.64E+09	0.00E+00	2.92E+09	9.71E+08	1.67E+08	0.00E+00
CS-138	3.39E-11	6.70E-11	3.32E-11	0.00E+00	4.93E-11	4.36E-12	2.86E-16	0.00E+00
BA-139	2.70E-02	1.92E-05	7.91E-04	0.00E+00	1.80E-05	1.09E-05	4.79E-02	0.00E+00
BA-140	1.28E+08	1.61E+05	8.41E+06	0.00E+00	5.48E+04	9.23E+04	2.64E+08	0.00E+00
BA-141	8.94E-22	6.76E-25	3.02E-23	0.00E+00	6.28E-25	3.83E-25	4.21E-31	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	1.97E+03	9.95E+02	2.63E+02	0.00E+00	0.00E+00	0.00E+00	7.30E+07	0.00E+00
LA-142	1.92E-04	8.75E-05	2.18E-05	0.00E+00	0.00E+00	0.00E+00	6.39E-01	0.00E+00
CE-141	1.97E+05	1.33E+05	1.51E+04	0.00E+00	6.18E+04	0.00E+00	5.09E+08	0.00E+00
CE-143	9.95E+02	7.36E+05	8.14E+01	0.00E+00	3.24E+02	0.00E+00	2.75E+07	0.00E+00
CE-144	3.26E+07	1.36E+07	1.75E+06	0.00E+00	8.09E+06	0.00E+00	1.10E+10	0.00E+00
PR-143	6.25E+04	2.51E+04	3.10E+03	0.00E+00	1.45E+04	0.00E+00	2.74E+08	0.00E+00
PR-144	2.36E-26	9.81E-27	1.20E-27	0.00E+00	5.53E-27	0.00E+00	3.40E-33	0.00E+00
ND-147	3.33E+04	3.85E+04	2.30E+03	0.00E+00	2.25E+04	0.00E+00	1.85E+08	0.00E+00
W-187	3.79E+04	3.17E+04	1.11E+04	0.00E+00	0.00E+00	0.00E+00	1.04E+07	0.00E+00
NP-239	1.43E+03	1.40E+02	7.73E+01	0.00E+00	4.37E+02	0.00E+00	2.88E+07	0.00E+00

TABLE I-18

DOSE FACTOR TABLE: R (i) - Teen, vegetation
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	1.60E+03	1.60E+03	1.60E+03	1.60E+03	1.60E+03	1.60E+03	0.00E+00
C-14	1.45E+06	2.91E+05	2.91E+05	2.91E+05	2.91E+05	2.91E+05	2.91E+05	0.00E+00
NA-24	2.38E+05	2.38E+05	2.38E+05	2.38E+05	2.38E+05	2.38E+05	2.38E+05	0.00E+00
P-32	1.61E+09	9.95E+07	6.23E+07	0.00E+00	0.00E+00	0.00E+00	1.35E+08	0.00E+00
CR-51	0.00E+00	0.00E+00	6.16E+04	3.42E+04	1.35E+04	8.79E+04	1.03E+07	0.00E+00
MN-54	0.00E+00	4.51E+08	8.94E+07	0.00E+00	1.34E+08	0.00E+00	9.24E+08	0.00E+00
MN-56	0.00E+00	1.39E+01	2.47E+00	0.00E+00	1.76E+01	0.00E+00	9.16E+02	0.00E+00
FE-55	3.23E+08	2.29E+08	5.34E+07	0.00E+00	0.00E+00	1.45E+08	9.90E+07	0.00E+00
FE-59	1.79E+08	4.17E+08	1.61E+08	0.00E+00	0.00E+00	1.32E+08	9.87E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	4.34E+07	1.00E+08	0.00E+00	0.00E+00	0.00E+00	5.98E+08	0.00E+00
CO-60	0.00E+00	2.46E+08	5.54E+08	0.00E+00	0.00E+00	0.00E+00	3.21E+09	0.00E+00
NI-63	1.59E+10	1.12E+09	5.39E+08	0.00E+00	0.00E+00	0.00E+00	1.79E+08	0.00E+00
NI-65	5.55E+01	7.09E+00	3.23E+00	0.00E+00	0.00E+00	0.00E+00	3.85E+02	0.00E+00
CU-64	0.00E+00	8.28E+03	3.90E+03	0.00E+00	2.10E+04	0.00E+00	6.43E+05	0.00E+00
ZN-65	4.20E+08	1.46E+09	6.81E+08	0.00E+00	9.34E+08	0.00E+00	6.18E+08	0.00E+00
ZN-69	4.73E-06	9.02E-06	6.31E-07	0.00E+00	5.89E-06	0.00E+00	1.66E-05	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	2.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	1.95E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	2.73E+08	1.28E+08	0.00E+00	0.00E+00	0.00E+00	4.04E+07	0.00E+00
RB-88	0.00E+00	2.44E-22	1.30E-22	0.00E+00	0.00E+00	0.00E+00	2.09E-29	0.00E+00
RB-89	0.00E+00	2.59E-26	1.83E-26	0.00E+00	0.00E+00	0.00E+00	3.98E-05	0.00E+00
SR-89	1.51E+10	0.00E+00	4.32E+08	0.00E+00	0.00E+00	0.00E+00	1.80E+09	0.00E+00
SR-90	7.43E+11	0.00E+00	1.84E+11	0.00E+00	0.00E+00	0.00E+00	2.09E+10	0.00E+00
SR-91	2.82E+05	0.00E+00	1.12E+04	0.00E+00	0.00E+00	0.00E+00	1.28E+06	0.00E+00
SR-92	3.86E+02	0.00E+00	1.65E+01	0.00E+00	0.00E+00	0.00E+00	9.83E+03	0.00E+00
Y-90	1.24E+04	0.00E+00	3.34E+02	0.00E+00	0.00E+00	0.00E+00	1.02E+08	0.00E+00
Y-91M	4.43E-09	0.00E+00	1.69E-10	0.00E+00	0.00E+00	0.00E+00	2.09E-07	0.00E+00
Y-91	7.81E+06	0.00E+00	2.09E+05	0.00E+00	0.00E+00	0.00E+00	3.20E+09	0.00E+00
Y-92	8.42E-01	0.00E+00	2.43E-02	0.00E+00	0.00E+00	0.00E+00	2.31E+04	0.00E+00
Y-93	1.58E+02	0.00E+00	4.33E+00	0.00E+00	0.00E+00	0.00E+00	4.82E+06	0.00E+00
ZR-95	1.71E+06	5.41E+05	3.72E+05	0.00E+00	7.95E+05	0.00E+00	1.25E+09	0.00E+00
ZR-97	3.11E+02	6.15E+01	2.83E+01	0.00E+00	9.33E+01	0.00E+00	1.07E+07	0.00E+00
NB-95	1.92E+05	1.06E+05	5.86E+04	0.00E+00	1.03E+05	0.00E+00	4.55E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	5.64E+06	1.08E+06	0.00E+00	1.29E+07	0.00E+00	1.01E+07	0.00E+00
TC-99M	2.70E+00	7.54E+00	9.77E+01	0.00E+00	1.12E+02	4.18E+00	4.95E+03	0.00E+00
TC-101	5.52E-31	7.85E-31	7.71E-30	0.00E+00	1.42E-29	4.78E-31	1.34E-37	0.00E+00
RU-103	6.80E+06	0.00E+00	2.91E+06	0.00E+00	2.40E+07	0.00E+00	5.68E+08	0.00E+00
RU-105	4.92E+01	0.00E+00	1.91E+01	0.00E+00	6.20E+02	0.00E+00	3.97E+04	0.00E+00
RU-106	3.07E+08	0.00E+00	3.87E+07	0.00E+00	5.92E+08	0.00E+00	1.47E+10	0.00E+00
AG-110M	1.50E+07	1.42E+07	8.65E+06	0.00E+00	2.71E+07	0.00E+00	4.00E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	1.48E+08	5.32E+07	1.97E+07	4.13E+07	0.00E+00	0.00E+00	4.36E+08	0.00E+00
TE-127M	5.48E+08	1.94E+08	6.52E+07	1.30E+08	2.22E+09	0.00E+00	1.37E+09	0.00E+00
TE-127	6.29E+03	1.88E+03	1.14E+03	3.65E+03	2.14E+04	0.00E+00	4.09E+05	0.00E+00
TE-129M	3.61E+08	1.34E+08	5.71E+07	1.16E+08	1.51E+09	0.00E+00	1.35E+09	0.00E+00
TE-129	6.68E-04	2.49E-04	1.63E-04	4.77E-04	2.80E-03	0.00E+00	3.65E-03	0.00E+00
TE-131M	8.42E+05	4.04E+05	3.37E+05	6.07E+05	4.21E+06	0.00E+00	3.24E+07	0.00E+00
TE-131	1.16E-15	4.78E-16	3.62E-16	8.93E-16	5.07E-15	0.00E+00	9.52E-17	0.00E+00
TE-132	3.90E+06	2.47E+06	2.33E+06	2.51E+06	2.37E+07	0.00E+00	7.83E+07	0.00E+00
I-130	3.49E+05	1.01E+06	4.03E+05	8.22E+07	1.55E+06	0.00E+00	7.75E+05	0.00E+00
I-131	7.67E+07	1.07E+08	5.77E+07	3.14E+10	1.85E+08	0.00E+00	2.13E+07	0.00E+00
I-132	5.02E+01	1.31E+02	4.72E+01	4.43E+03	2.07E+02	0.00E+00	5.72E+01	0.00E+00
I-133	1.93E+06	3.27E+06	9.99E+05	4.57E+08	5.74E+06	0.00E+00	2.48E+06	0.00E+00
I-134	7.99E-05	2.12E-04	7.61E-05	3.53E-03	3.34E-04	0.00E+00	2.79E-06	0.00E+00

TABLE I-18

DOSE FACTOR TABLE: R (i) Teen, vegetation
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	3.48E+04	8.96E+04	3.32E+04	5.76E+06	1.42E+05	0.00E+00	9.93E+04	0.00E+00
CS-134	7.03E+09	1.66E+10	7.68E+09	0.00E+00	5.26E+09	2.01E+09	2.06E+08	0.00E+00
CS-136	4.37E+07	1.72E+08	1.15E+08	0.00E+00	9.36E+07	1.47E+07	1.38E+07	0.00E+00
CS-137	1.00E+10	1.33E+10	4.65E+09	0.00E+00	4.54E+09	1.76E+09	1.90E+08	0.00E+00
CS-138	3.13E-11	6.01E-11	3.00E-11	0.00E+00	4.44E-11	5.16E-12	2.73E-14	0.00E+00
LA-139	2.54E-02	1.79E-05	7.40E-04	0.00E+00	1.69E-05	1.23E-05	2.27E-01	0.00E+00
BA-140	1.38E+08	1.69E+05	8.89E+06	0.00E+00	5.73E+04	1.14E+05	2.13E+08	0.00E+00
BA-141	8.36E-22	6.24E-25	2.79E-23	0.00E+00	5.79E-25	4.27E-25	1.78E-27	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	1.80E+03	8.86E+02	2.36E+02	0.00E+00	0.00E+00	0.00E+00	5.09E+07	0.00E+00
LA-142	1.77E-04	7.84E-05	1.95E-05	0.00E+00	0.00E+00	0.00E+00	2.39E+00	0.00E+00
CE-141	2.82E+05	1.89E+05	2.17E+04	0.00E+00	8.87E+04	0.00E+00	5.39E+08	0.00E+00
CE-143	9.30E+02	6.77E+05	7.56E+01	0.00E+00	3.04E+02	0.00E+00	2.04E+07	0.00E+00
CE-144	5.23E+07	2.16E+07	2.81E+06	0.00E+00	1.29E+07	0.00E+00	1.32E+10	0.00E+00
PR-143	6.99E+04	2.79E+04	3.48E+03	0.00E+00	1.62E+04	0.00E+00	2.30E+08	0.00E+00
PR-144	2.22E-26	9.07E-27	1.12E-27	0.00E+00	5.20E-27	0.00E+00	2.44E-29	0.00E+00
ND-147	3.62E+04	3.93E+04	2.36E+03	0.00E+00	2.31E+04	0.00E+00	1.42E+08	0.00E+00
W-187	3.52E+04	2.87E+04	1.01E+04	0.00E+00	0.00E+00	0.00E+00	7.77E+06	0.00E+00
NP-239	1.38E+03	1.31E+02	7.25E+01	0.00E+00	4.10E+02	0.00E+00	2.10E+07	0.00E+00

TABLE I-19

DOSE FACTOR TABLE: R (i) - Child, vegetation
Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
H-3	0.00E+00	2.49E+03	2.49E+03	2.49E+03	2.49E+03	2.49E+03	2.49E+03	0.00E+00
C-14	3.50E+06	7.01E+05	7.01E+05	7.01E+05	7.01E+05	7.01E+05	7.01E+05	0.00E+00
NA-24	3.71E+05	3.71E+05	3.71E+05	3.71E+05	3.71E+05	3.71E+05	3.71E+05	0.00E+00
P-32	3.36E+09	1.57E+08	1.30E+08	0.00E+00	0.00E+00	0.00E+00	9.30E+07	0.00E+00
CR-51	0.00E+00	0.00E+00	1.17E+05	6.49E+04	1.77E+04	1.18E+05	6.20E+06	0.00E+00
MN-54	0.00E+00	6.59E+08	1.76E+08	0.00E+00	1.85E+08	0.00E+00	5.53E+08	0.00E+00
MN-56	0.00E+00	1.82E+01	4.11E+00	0.00E+00	2.20E+01	0.00E+00	2.64E+03	0.00E+00
FE-55	7.94E+08	4.21E+08	1.30E+08	0.00E+00	0.00E+00	2.38E+08	7.80E+07	0.00E+00
FE-59	3.96E+08	6.41E+08	3.19E+08	0.00E+00	0.00E+00	1.86E+08	6.68E+08	0.00E+00
CO-57	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CO-58	0.00E+00	6.41E+07	1.96E+08	0.00E+00	0.00E+00	0.00E+00	3.74E+08	0.00E+00
CO-60	0.00E+00	3.75E+08	1.10E+09	0.00E+00	0.00E+00	0.00E+00	2.07E+09	0.00E+00
NI-63	3.91E+10	2.09E+09	1.33E+09	0.00E+00	0.00E+00	0.00E+00	1.41E+08	0.00E+00
NI-65	1.02E+02	9.59E+00	5.60E+00	0.00E+00	0.00E+00	0.00E+00	1.17E+03	0.00E+00
CU-64	0.00E+00	1.09E+04	6.60E+03	0.00E+00	2.64E+04	0.00E+00	5.13E+05	0.00E+00
ZN-65	8.06E+08	2.15E+09	1.34E+09	0.00E+00	1.35E+09	0.00E+00	3.77E+08	0.00E+00
ZN-69	8.73E-06	1.26E-05	1.17E-06	0.00E+00	7.66E-06	0.00E+00	7.96E-04	0.00E+00
ZN-69M	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-82	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-83	0.00E+00	0.00E+00	5.20E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-84	0.00E+00	0.00E+00	3.30E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
BR-85	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RB-86	0.00E+00	4.51E+08	2.78E+08	0.00E+00	0.00E+00	0.00E+00	2.90E+07	0.00E+00
RB-88	0.00E+00	3.77E-22	2.34E-22	0.00E+00	0.00E+00	0.00E+00	1.65E-23	0.00E+00
RB-89	0.00E+00	3.42E-26	3.04E-26	0.00E+00	0.00E+00	0.00E+00	2.98E-28	0.00E+00
SR-89	3.58E+10	0.00E+00	1.02E+09	0.00E+00	0.00E+00	0.00E+00	1.39E+09	0.00E+00
SR-90	1.23E+12	0.00E+00	3.12E+11	0.00E+00	0.00E+00	0.00E+00	1.66E+10	0.00E+00
SR-91	5.20E+05	0.00E+00	1.96E+04	0.00E+00	0.00E+00	0.00E+00	1.15E+06	0.00E+00
SR-92	7.07E+02	0.00E+00	2.84E+01	0.00E+00	0.00E+00	0.00E+00	1.34E+04	0.00E+00
Y-90	2.30E+04	0.00E+00	6.17E+02	0.00E+00	0.00E+00	0.00E+00	6.56E+07	0.00E+00
Y-91M	8.12E-09	0.00E+00	2.95E-10	0.00E+00	0.00E+00	0.00E+00	1.59E-05	0.00E+00
Y-91	1.86E+07	0.00E+00	4.97E+05	0.00E+00	0.00E+00	0.00E+00	2.47E+09	0.00E+00
Y-92	1.55E+00	0.00E+00	4.43E-02	0.00E+00	0.00E+00	0.00E+00	4.48E+04	0.00E+00
Y-93	2.91E+02	0.00E+00	7.98E+00	0.00E+00	0.00E+00	0.00E+00	4.34E+06	0.00E+00
ZR-95	3.84E+06	8.44E+05	7.52E+05	0.00E+00	1.21E+06	0.00E+00	8.81E+08	0.00E+00
ZR-97	5.68E+02	8.20E+01	4.84E+01	0.00E+00	1.18E+02	0.00E+00	1.24E+07	0.00E+00
NB-95	4.09E+05	1.59E+05	1.14E+05	0.00E+00	1.50E+05	0.00E+00	2.95E+08	0.00E+00
NB-97	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MO-99	0.00E+00	7.70E+06	1.91E+06	0.00E+00	1.64E+07	0.00E+00	6.37E+06	0.00E+00
TC-99M	4.65E+00	9.12E+00	1.51E+02	0.00E+00	1.32E+02	4.63E+00	5.19E+03	0.00E+00
TC-101	1.02E-30	1.06E-30	1.35E-29	0.00E+00	1.81E-29	5.62E-31	3.38E-30	0.00E+00
RU-103	1.53E+07	0.00E+00	5.88E+06	0.00E+00	3.85E+07	0.00E+00	3.95E+08	0.00E+00
RU-105	9.01E+01	0.00E+00	3.27E+01	0.00E+00	7.92E+02	0.00E+00	5.88E+04	0.00E+00
RU-106	7.39E+08	0.00E+00	9.22E+07	0.00E+00	9.98E+08	0.00E+00	1.15E+10	0.00E+00
AG-110M	3.19E+07	2.15E+07	1.72E+07	0.00E+00	4.01E+07	0.00E+00	2.56E+09	0.00E+00
SB-124	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
SB-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TE-125M	3.49E+08	9.47E+07	4.66E+07	9.80E+07	0.00E+00	0.00E+00	3.37E+08	0.00E+00
TE-127M	1.31E+09	3.54E+08	1.56E+08	3.14E+08	3.75E+09	0.00E+00	1.06E+09	0.00E+00
TE-127	9.76E+03	2.63E+03	2.09E+03	6.76E+03	2.78E+04	0.00E+00	3.81E+05	0.00E+00
TE-129M	8.39E+08	2.34E+08	1.30E+08	2.71E+08	2.46E+09	0.00E+00	1.02E+09	0.00E+00
TE-129	1.24E-03	3.45E-04	2.94E-04	8.82E-04	3.62E-03	0.00E+00	7.70E-02	0.00E+00
TE-131M	1.54E+06	5.32E+05	5.66E+05	1.09E+06	5.15E+06	0.00E+00	2.16E+07	0.00E+00
TE-131	2.14E-15	6.51E-16	6.35E-16	1.63E-15	6.46E-15	0.00E+00	1.12E-14	0.00E+00
TE-132	6.99E+06	3.10E+06	3.74E+06	4.51E+06	2.87E+07	0.00E+00	3.12E+07	0.00E+00
I-130	6.12E+05	1.24E+06	6.37E+05	1.36E+08	1.85E+06	0.00E+00	5.78E+05	0.00E+00
I-131	1.43E+08	1.44E+08	8.16E+07	4.75E+10	2.36E+08	0.00E+00	1.28E+07	0.00E+00
I-132	8.91E+01	1.64E+02	7.53E+01	7.60E+03	2.51E+02	0.00E+00	1.93E+02	0.00E+00
I-133	3.52E+06	4.35E+06	1.65E+06	8.08E+08	7.25E+06	0.00E+00	1.75E+06	0.00E+00
I-134	1.42E-04	2.64E-04	1.21E-04	6.07E-03	4.03E-04	0.00E+00	1.75E-04	0.00E+00

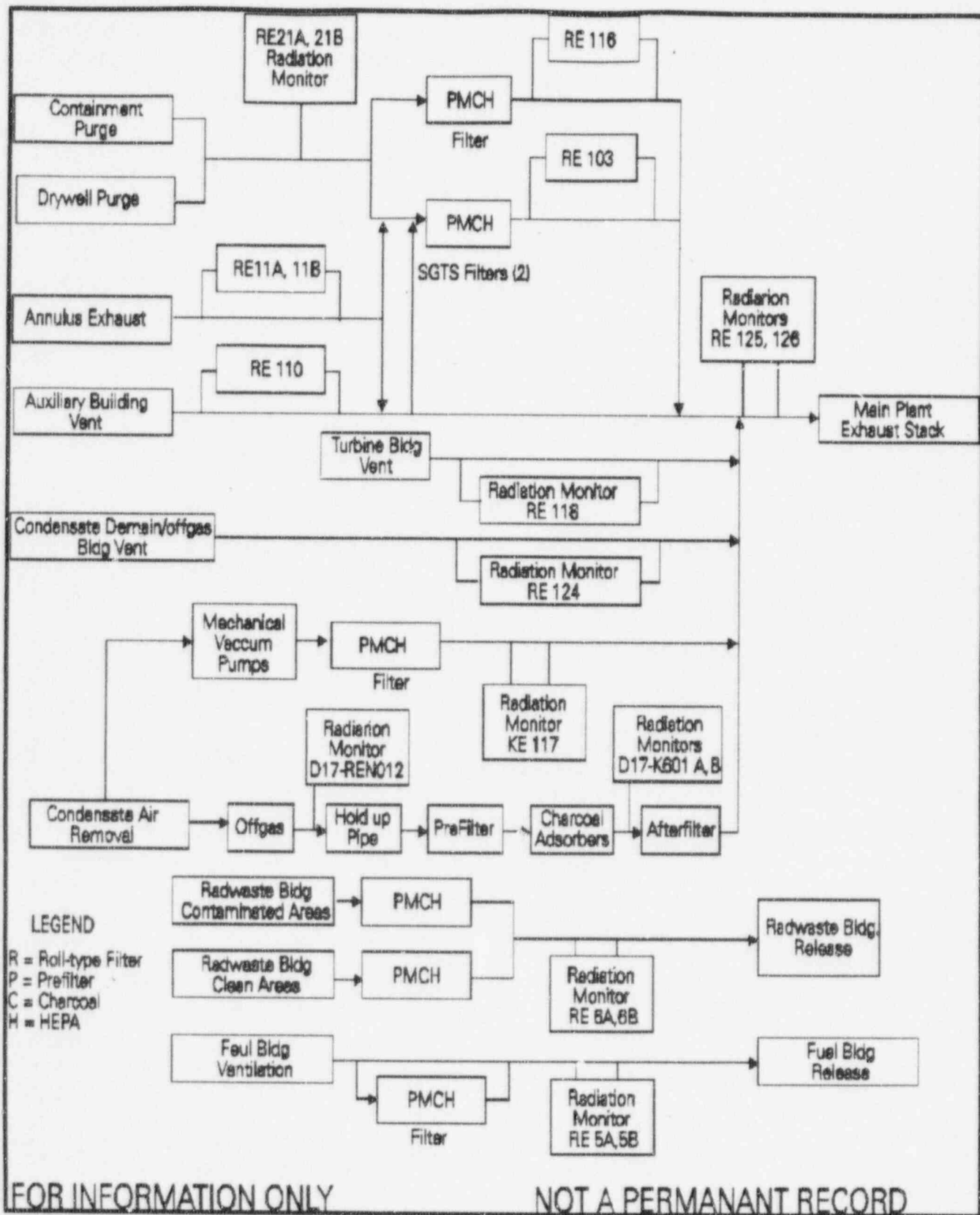
TABLE I-19

DOSE FACTOR TABLE: R (i) Child, vegetation
 Units are m2*mrem/yr per uCi/sec

Nuclide	Bone	Liver	Tbody	Thyroid	Kidney	Lung	Gitract	Skin
I-135	6.18E+04	1.11E+05	5.26E+04	9.86E+06	1.71E+05	0.00E+00	8.48E+04	0.00E+00
CS-134	1.59E+10	2.61E+10	5.50E+09	0.00E+00	8.08E+09	2.90E+09	1.41E+08	0.00E+00
CS-136	8.23E+07	2.26E+08	1.46E+08	0.00E+00	1.20E+08	1.80E+07	7.95E+06	0.00E+00
CS-137	2.37E+10	2.27E+10	3.35E+09	0.00E+00	7.39E+09	2.66E+09	1.42E+08	0.00E+00
CS-138	5.69E-11	7.91E-11	5.02E-11	0.00E+00	5.57E-11	5.99E-12	3.64E-11	0.00E+00
BA-139	4.69E-02	2.50E-05	1.36E-03	0.00E+00	2.18E-03	1.47E-05	2.70E+00	0.00E+00
BA-140	2.76E+08	2.42E+05	1.60E+07	0.00E+00	7.88E+04	1.44E+05	1.40E+08	0.00E+00
BA-141	1.54E-21	8.64E-25	5.02E-23	0.00E+00	7.47E-25	5.07E-24	8.79E-22	0.00E+00
BA-142	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
LA-140	3.24E+03	1.13E+03	3.82E+02	0.00E+00	0.00E+00	0.00E+00	3.16E+07	0.00E+00
LA-142	3.20E-04	1.02E-04	3.19E-05	0.00E+00	0.00E+00	0.00E+00	2.02E+01	0.00E+00
CE-141	6.55E+05	3.26E+05	4.85E+04	0.00E+00	1.43E+05	0.00E+00	4.07E+08	0.00E+00
CE-143	1.71E+03	9.29E+05	1.35E+02	0.00E+00	3.90E+02	0.00E+00	1.36E+07	0.00E+00
CE-144	1.26E+08	3.95E+07	6.73E+06	0.00E+00	2.19E+07	0.00E+00	1.03E+10	0.00E+00
PR-143	1.45E+05	4.36E+04	7.21E+03	0.00E+00	2.36E+04	0.00E+00	1.57E+08	0.00E+00
PR-144	4.11E-26	1.27E-26	2.07E-27	0.00E+00	6.73E-27	0.00E+00	2.74E-23	0.00E+00
ND-147	7.14E+04	5.78E+04	4.48E+03	0.00E+00	2.17E+04	0.00E+00	9.16E+07	0.00E+00
W-187	6.41E+04	3.79E+04	1.70E+04	0.00E+00	0.00E+00	0.00E+00	5.33E+06	0.00E+00
NP-239	2.56E+03	1.83E+02	1.29E+02	0.00E+00	5.31E+02	0.00E+00	1.36E+07	0.00E+00

FIGURE 2

SCHMATIC OF GASEOUS RADWASTE SYSTEM



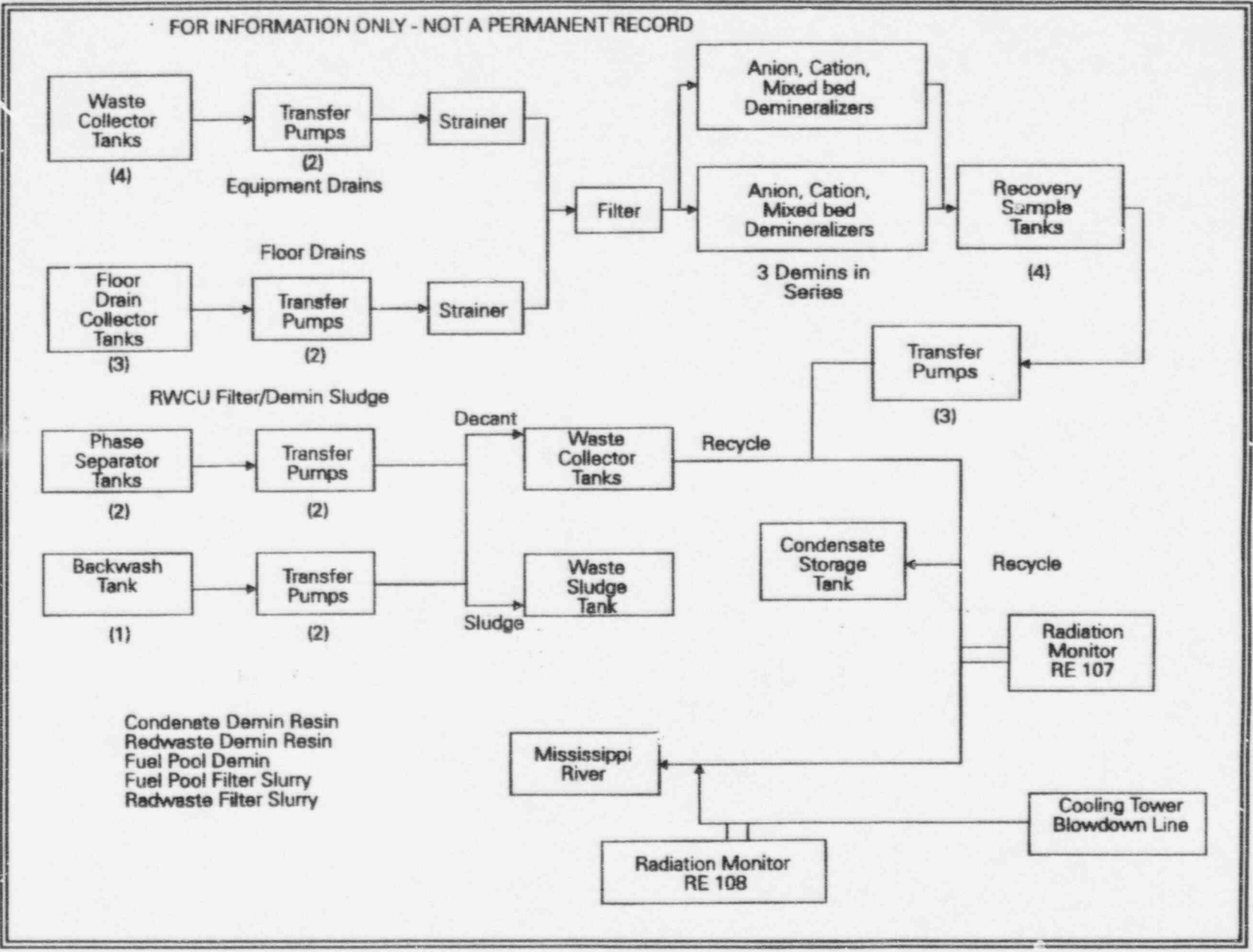


FIGURE 5

FAR-FIELD RADIOLOGICAL ENVIRONMENTAL MONITORING LOCATIONS

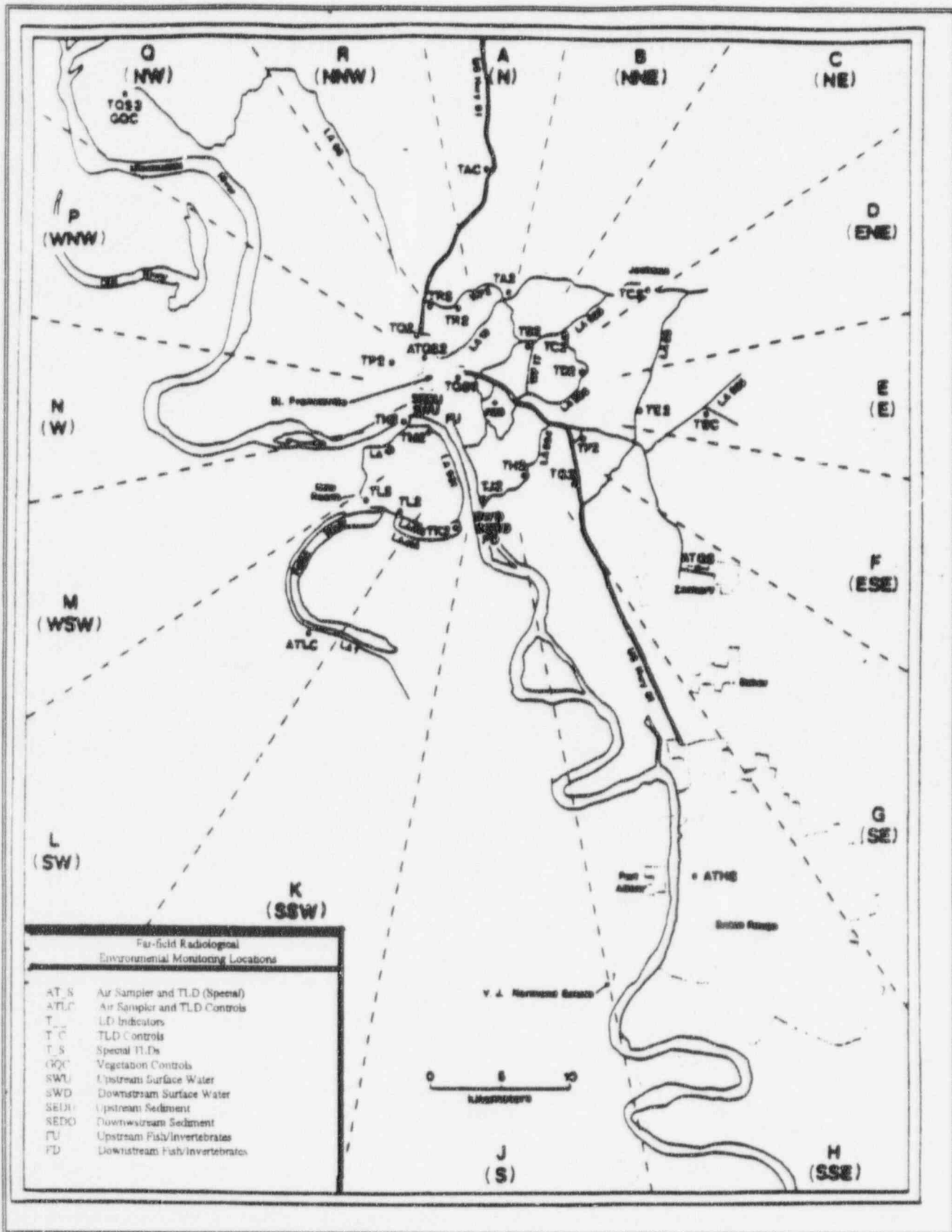
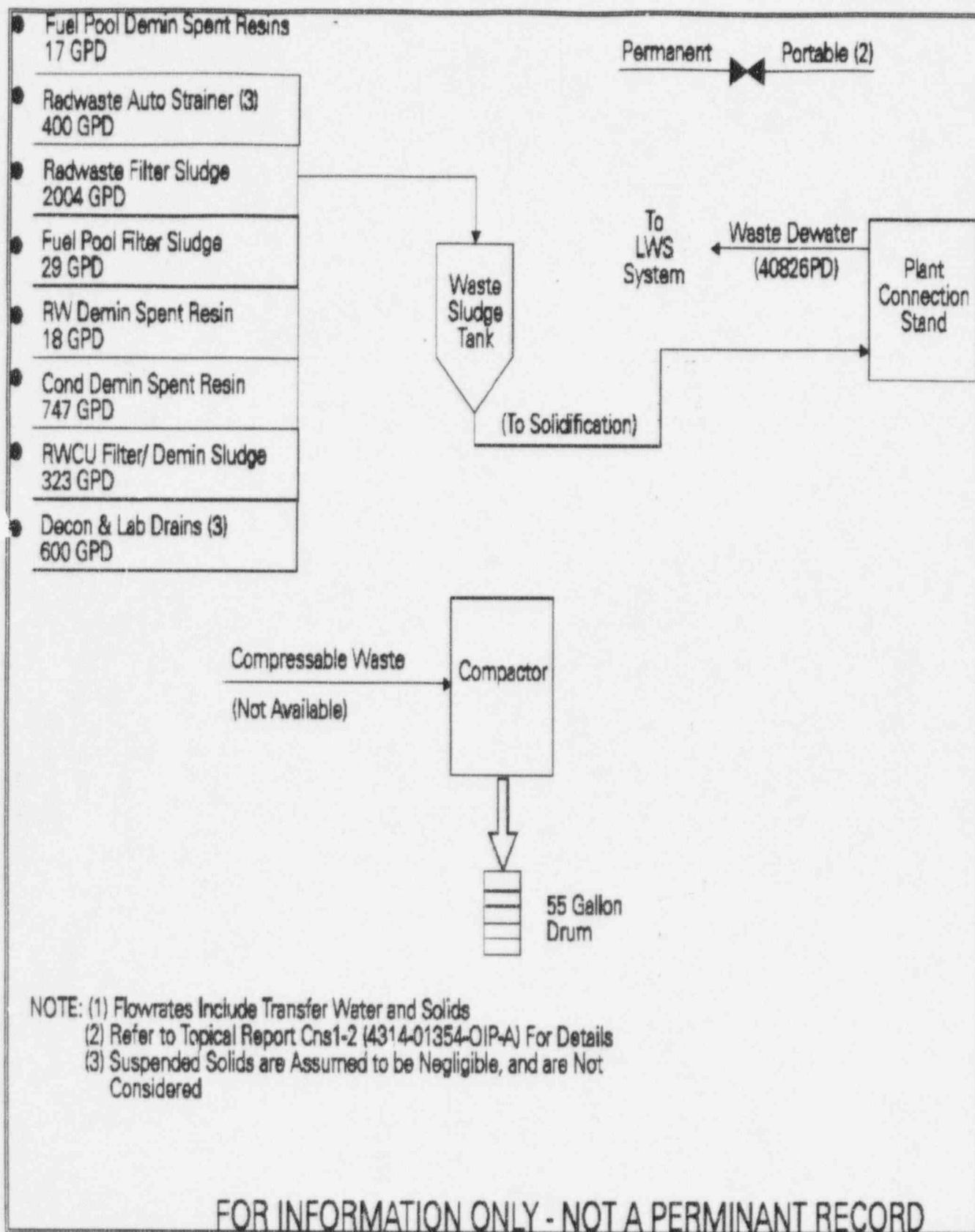


FIGURE 6

SCHMATIC OF THE SOLID WASTE TREATMENT SYSTEM



NOTE: (1) Flowrates Include Transfer Water and Solids
 (2) Refer to Topical Report Cns1-2 (4314-01354-OIP-A) For Details
 (3) Suspended Solids are Assumed to be Negligible, and are Not Considered

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