JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL

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JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

1.0 INTRODUCTION

1.1 Purpose

This manual provides the methodology to calculate radiation doses to individuals in the vicinity of the James A. Fitzpatrick Nuclear Power Plant. It also provides methodology for calculating effluent monitor setpoints and allowable release rates to ensure compliance with the Technical Specifications, Appendix B, of the New York Power Authority, James A. Fitzpatrick Nuclear Power Plant, Docket No. 50-333, and 10CFR Part 20 release criteria.

1.2 Methodologies and Parameters

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, Rev. 1, dated November, 1978) and "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR PART 50, Appendix I" (Regulatory Guide 1.109 Rev. 1 dated October, 1977). Simplifying assumptions have been made and justified where applicable to provide a more workable document for implementing the Technical Specifications, Appendix B, requirements. Alternate calculational methods to those presented here may be used provided the overall methodology does not change or the results are not less conservative. Additionally, as available, the most up-to-date revision of the Regulatory Guide 1.109 dose conversion factors and site-specific environmental transfer factors may be substitued for those currently included and used in this document.

2.0 GLOSSARY OF TERMS

BETA	A beta particle (electron).
BETA Dose	The dose component to skin dose due to beta-emitting radionuclides in air.
CC	Cubic Centimeter.
Ci	Curie. A unit of radioactivity equal to 3.7×10^{10} disintegrations per second. See also microcurie (uCi).
C_i	Activity or concentration of a nuclide in the release source. Units of μCi, μCi/cc, or μCi/ml.
CFR	Code of Federal Regulations.
Dose	A measure of the radiation energy deposited per unit mass (in mrem or mrad), that the organ or the individual receives from exposure to radioactive effluents dispersed in the environment.
Dose Commitment	The total dose delivered to the organ or total body over a 50-year period resulting from uptake of radioactive material.
Dose Factor	Normally, a factor that converts the effect of ingesting or inhaling radioactive material into the body, to dose to a specific organ. Body elimination, radioactive decay, and organ uptake are some of the factors that determine a dose factor for a given nuclide.
Dose Pathway	A specific path that radioactive material physically travels through in the environment prior to exposing an individual to its emitted radiation. The contaminated forage/cow/milk pathway is a dose pathway.
Dose Rate	The dose received per unit time.
$\overline{(D/Q)}$	A long-term relative deposition coefficient. A factor with units of $1/m^2$ which describes the deposition of particulate matter from a plume at a point downrange from the source. It can be thought of as the part of the cloud that will fall out and deposit over one square meter of ground.
GAMMA	A gamma photon.
GAMMA Dose	The dose component to skin or total body dose due to gamma-emitting radionuclides in air.

Ground Plane	Radioactive material deposited uniformly over the ground emits radiation that produces an exposure pathway when an individual is present in the area. It is assumed that an adult receives the same exposure as an infant, regardless of the physical height differences. Only the total body is considered for the purpose of the ODCM.
H-3	Hydrogen-3, or Tritium. An isotope of hydrogen that is a low-energy BETA emitter.
I&8DP	Radioiodines and particulates with half-lives greater than 8 days.
LLD	Lower limit of detection. The smallest concentration of radioactive material in a sample that will yield a net count, above systems background that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.
LCO	Limiting Condition for Operation in Technical Specifications, Appendix B.
m^3	Cubic meters.
m^2	Square meters.
MPC	Maximum Permissible Concentration.
Nuclide	For the purposes of the ODCM, a radioactive isotope. Nuclide (i) signifies a specific nuclide, the 1st, 2nd, 3rd, etc. one under consideration. If nuclide (i) is I-131, then the M_i (dose factor) under consideration should be M_{I-131}, for example.
Organ	For the purpose of the ODCM, either the bone, liver, thyroid, kidney, lung, GI-LLI, skin, or the T. Body. T. Body (Total Body) is considered an organ for consistency with the ODCM nomenclature.
$\dot{Q}_i$	$\dot{Q}_i$ (dotted) Denotes a release rate in Ci/sec for nuclide (i).
Q_i	Denotes C_i of nuclide (i) released over a specified time interval.

Receptor	The individual receiving radiation exposure from effluent releases at JAFNPP at a given location, or who ingests food products contained with trace amounts of radioactive materials. A receptor can receive doses from one or more dose pathways.
Release Source(s)	A subsystem, tank, vent or stack where radioactive material can be released independently of other radioactive release points.
Restricted Area	An area within the site boundary to which access is controlled by NYPA for purposes of protection of individuals from exposure to radiation and radioactive materials.
Technical Specifications, Appendix B	The JAFNPP Radioactive Effluent Technical Specifications.
uCi	Microcuries. 1 Ci = 10^6 μCuries. The μCi is the standard unit of radioactivity for all dose calculations in the JAFNPP ODCM.
$\overline{(X/Q)}$	A long-term relative atmospheric dispersion coefficient. It describes the physical dispersion characteristics of a semi-infinite cloud of noble gases as the cloud travels downwind from the release point.
$\overline{(X/Q)}_D$	A long-term depleted relative atmospheric dispersion coefficient. It describes the physical dispersion characteristics of a semi-infinite cloud of radioactive iodines and particulates as the cloud travels down wind. Since iodines and particulates settle (fallout of the cloud) on the ground, the $(X/Q)_D$ represents what physically remains of the cloud at a given location downrange from the release point.
Unrestricted Area	An unrestricted area shall be any area at or beyond the site boundary access to which is not controlled by NYPA 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. (Refer to Technical Specification Section 1.0, Appendix B, for expanded definition).

3.0 LIQUID EFFLUENT METHODOLOGY

3.1 Applicable Site Characteristics

The JAFNPP Final Safety Analysis Report contains the official description of the site characteristics. The description that follows is a brief summary for dose calculation purposes:

The James A. Fitzpatrick Nuclear Power Plant is located on the eastern portion of the Nine Mile Point promontory on Lake Ontario in Oswego County, NY. The site is approximately 7 miles northeast of the City of Oswego. All radioactive liquid releases enter Lake Ontario where the Circulating Water Discharge Tunnel terminates on the lake bottom approximately 1400 ft. from the shoreline.

3.2 10CFR20 MPC Limits Determination of the Fraction (F_L) of Release Limits

3.2.1 Requirements

In accordance with Technical Specification Section 2.2, Appendix B, the concentration of liquid radioactive material released to Unrestricted Areas (See Appendix G) shall not exceed the concentrations specified in 10CFR20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. The concentration of radionuclides in liquid waste is determined by sampling and analyses in accordance with Technical Specifications Section 2.2, Appendix B.

In accordance with Technical Specification Section 2.2, Appendix B, for dissolved or entrained noble gases, the concentration shall be limited to 2×10^{-4} uCi/ml.

3.2.2 Methodology

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

3.2.2.1 General Approach

This method addresses the calculation for a specific release source. Administrative controls are applied to assure that the summation of F_L values for each release source does not exceed JAFNPP's 10CFR20 limit.

Normally, all potentially radioactive liquid effluents are released to the unrestricted area through a single monitored release path as indicated in Appendix F. However, the service water system presents a potential release point for radioactive liquid effluents. To assure the combined releases do not exceed 10CFR20 limits, the alarm setpoint, as determined in Section 3.3 is normally multiplied by 0.5.

The basic equation which determines the fraction F_L of the 10CFR20 MPC limits is:

$$F_L = \left(\frac{f_1}{f_2}\right) \cdot \sum_{i=1}^{n} \frac{C_i}{(MPC)_i} \qquad 3.2.2.1\text{-}1$$

Where:

F_L = The fraction of 10CFR20 MPC limits resulting from the release source being discharged, dimensionless.

f_1 = The undiluted release rate in of the release source as measured at the liquid effluent monitor location, in gpm.

f_2 = The discharge structure exit flow in gpm. (Summation of circulating water pump and service water pump discharge flow).

C_i = The undiluted concentration of nuclide (i) in uCi/ml from sample assay. When a radionuclide concentration is below the lower limit of detection (LLD) for the analysis, it is not reported as being present in the sample.

$(MPC)_i$ = Maximum Permissible Concentration of nuclide (i) from Appendix A, in uCi/ml.

Using the general approach, the fraction of the 10 CFR 20 MPC limit may be determined by a nuclide-by-nuclide evaluation.

3.2.2.2 Simplified Approach

For purposes of simplifying the calculation, the value of 3 x 10^{-8} uCi/ml (unidentified 10CFR20 MPC value) should be substituted for $(MPC)_i$ in equation 3.2.2.1-1 and the cumulative concentration (C_{total} = sum of all identified radionuclide concentrations) or the gross beta-gamma concentration should be substituted for C_i.

3.2.2.3 Approach Selection Criteria

As long as the diluted concentration ($C_{total} \times f_1/f_2$) is equal to or less than 3 x 10^{-8} uCi/ml, the nuclide-by-nuclide calculation is not required to demonstrate compliance with the 10 CFR 20 MPC limit.

3.2.3 Calculational Process

The following section provides a procedure for determining the minimum required dilution factor (f_2/f_1) to ensure that $F_L \leq 1$ during the actual release. With $F_L = 1$, the minimum required dilution factor can be expressed as:

$$\left(\frac{f_2}{f_1}\right)_{min} = \sum_{i=1}^{n} \frac{C_i}{(MPC)_i} \qquad 3.2.3\text{-}1$$

3.2.3.1 Obtain (C_i), the undiluted assay value of nuclide (i), in uCi/ml. If a gross activity determination (simplified approach) is used, the cumulative concentration (C_{total}) is used.

3.2.3.2 From Appendix A, Table L-1, obtain the corresponding $(MPC)_i$ for nuclide (i) in uCi/ml. The value of $3x10^{-8}$ uCi/ml should be used for the gross activity method.

3.2.3.3 Divide C_i by $(MPC)_i$.

3.2.3.4 If the gross activity method is used, then $\left(\frac{f_2}{f_1}\right)_{min}$ is given by $C_{total}/3x10^{-8}$

If determining the MPC fraction by the nuclide-by-nuclide evaluation, repeat steps 3.2.3.2 and 3.2.3.3 for each nuclide and sum the totals.

3.2.3.5 Enter the total activity (C) and the minimum required dilution factor (f_2/f_1)min on the liquid release permit.

3.3 Determination of Setpoints for Radioactive Liquid Effluent Monitors

3.3.1 Requirements

Technical Specification Section 2.1.a, Appendix B, requires that the radioactive liquid effluent monitor be operable and set to initiate an alarm and/or trip in the event that the limits of Technical Specification Section 2.2, Appendix B,are approached. The alarm and/or trip setpoints shall be determined and adjusted by the methodology which follows. The setpoint values should be applied above normal background levels.

The alarm setpoint for the liquid effluent radiation monitor is derived from the concentration limit provided in 10CFR PART 20, Appendix B, Table II, Column 2 applied at the unrestricted area boundary where the discharge tunnel flows into Lake Ontario.

3.3.2 Methodology

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

A sample of each batch of liquid radwaste is analyzed for I-131 and other principal gamma emitters, or for total activity concentration prior to release. The fraction F_L of 10CFR20 MPC limits and the minimum required dilution factor to achieve F_L = 1 is determined in accordance with the preceding section for the activity to be released.

A conservative alarm and/or trip setpoint (uCi/ml) is determined in accordance with the following equation:

$$S = .5 \cdot \frac{C}{F_L} \qquad 3.3.2\text{-}1$$

Where:

S = The alarm and/or trip setpoint above background corresponding to the limiting concentration of undiluted liquid effluent (uCi/ml).

.5 = Conservatism factor to account for releases from multiple points.

C = Total gamma isotopic or gross activity concentration (uCi/ml) of sample as determined in the laboratory.

F_L = The fraction of 10CFR20 MPC limits for unrestriced areas resulting from the release source being discharged.

3.3.3 Calculational Process

The following section provides a procedure for determining a liquid effluent monitor setpoint. Typical parameter values are used for illustration.

3.3.3.1 Determine f_1, measured at the liquid effluent monitor location. A typical value is 100 gpm.

3.3.3.2 Determine f_2 from pump curves and current plant operating configuration. A typical value is 3.78×10^5 gpm.

3.3.3.3 Determine C from laboratory analysis of the liquid effluent sample. For the purpose of this example, assume a value of 3×10^{-5} uCi/ml in a gross beta-gamma activity analysis.

3.3.3.4 Determine the minimum required dilution factor in accordance with equation 3.2.3-1:

$$\left(\frac{f_2}{f_1}\right)_{min} = \sum_{i=1}^{n} \frac{C_i}{(MPC)_i}$$

For a gross activity determination, the unidentified MPC of 3×10^{-8} uCi/ml is used. Therefore

$$\left(\frac{f_2}{f_1}\right)_{min} = 3\times10^{-5} \div 3\times10^{-8} = 1000$$

3.3.2.5 A typical value of the dilution factor from current plant operating conditions is:

[3.78×10^5 gpm] ÷ 100 gpm = 3780, which is

greater than 1000. Therefore the release can be made at the current release rates and concentrations maintained within the 10CFR20 limits.

3.3.2.6 Determine F_L, the fraction of 10CFR20 MPC limits resulting from the release source being discharged at a dilution factor of 3780, in accordance with equation 3.2.2.1-1:

$$F_L = \left(\frac{f_1}{f_2}\right) \cdot \sum_{i=1}^{n} \frac{C_i}{(MPC)_i}$$

$$= (100 \div 3.78 \times 10^5) \times (3 \times 10^{-5} \div 3 \times 10^{-8})$$

$$= (2.65 \times 10^{-4}) \times 1000$$

$$= .265$$

3.3.2.7 The liquid effluent monitor setpoint, S in uCi/ml, from equation 3.3.2.1-1 is:

$$S = .5 \cdot \frac{C}{F_L}$$

$$= .5 \cdot [(3 \times 10^{-5}) \div (.265)]$$

$$= 5.66 \times 10^{-5} \text{ uCi/ml.}$$

3.3.2.8 Appropriate calibration factors are applied to this limiting concentration determined in step 3.3.2.7 to determine an effluent monitor alarm potentiometer setpoint.

3.4 Dose Determination for Radioactive Liquid Effluents

3.4.1 Annual Dose Assessment - Radioactive Effluent Release Report Submittal

3.4.1.1 Requirements

Technical Specification Section 7.3, Appendix B, requires an annual Radioactive Effluent Release Report to be submitted that includes an assessment of the radiation doses to the public due to the radioactive liquid and gaseous effluents released from the unit during the previous calendar year.

3.4.1.2 Methodology

This section provides the methodology to calculate the doses 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 site-related dose factors for all viable pathways are listed in Appendix B, Tables L-2 and L-3. Table L-3 dose factors are compiled by age groups, for all organs and radionuclides common to a BWR environment.

The following equation provides for a dose calculation to the total body or any organ for a given age group based on actual release conditions during a specific time interval for radioactive liquid releases:

$$D_{i\tau} = \frac{A_{i\tau}\Delta t_l \, Q_{il}}{(DF)_l} \qquad 3.4.1.2\text{-}1$$

where:

$D_{i\gamma}$ = Dose commitment in mrem received by organ γ of age group (to be specified) resulting from releases during time interval Δt_l.

$A_{i\tau}$ = The 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 A, Tables L-2 and L-3 are site specific, in mrem/hr per uCi/ml. Dose commitment factors are compiled by age groups, for all organs and radionuclides common to a BWR environment.

Δt_l = The number of hours of liquid effluent release during the calendar year.

Q_i = The total quantity of nuclide (i) released during the time period Δt_l, in μCi.

$(DF)_l$ = The total volume of dilution that occurred during the calendar year period Δt_l (ie, the circulating water flow multiplied by the time).

By entering the appropriate annual parameter values onto a form similar to that shown in Table 3.4.2, total body or organ doses may be calculated as outlined in Section 3.4.2.3.

In addition, more realistic assumptions may be made concerning the dilution and ingestion of fish and potable water by individuals who live and fish in the area.

3.4.2 Monthly Dose Assessment - Verification of Compliance with 10CFR50 Appendix I Limits

3.4.2.1 Requirements

Technical Specification Section 2.3, Appendix B, requires an assessment to be performed at least once every month in any quarter in which radioactive effluent is discharged, to verify that radioactive liquid effluents do not result in a cumulative dose in excess of 1.5 mrem to the total body and 5 mrem to any organ in a calendar quarter.

3.4.2.2 Methodology

This section presents the calculational method to be used for the 10CFR50 Appendix I compliance verification. The method is based on the models suggested by Sections 4.3 and 4.3.1 of NUREG-0133, Rev. 1, November, 1978.

3.4.2.2.1 General Approach

The general approach used is almost identical to that described in Section 3.4.1 for use in calculations for the annual Radioactive Effluent Release Report. The only difference is that the liquid effluent dose pathways considered are limited to the ingestion of fish and potable water. As discussed in Appendix D, these dose pathways are the only ones that need by considered for verifying compliance with the requirements specified in Section 3.4.2.1 above.

The site-specific dose factors for the fresh water fish and potable water pathways are provided in Appendix A, Table L-2.

For JAFNPP, the adult is the most limiting age group, but the dose for child, and teenager may also be calculated by this method using the appropriate dose factors from Appendix A, Table L-3.

The following equation is used to determine a dose to the total body or any organ for a given age group based on actual release conditions during a specified time interval for radioactive liquid releases. The equation is:

$$D_{i\tau} = \frac{A_{i\tau}\,\Delta t_l\,Q_{il}}{(DF)_l} \qquad 3.4.2.1\text{-}1$$

where:

$D_{i\tau}$ = Dose commitment in mrem received by organ τ of age group (to be specified) from release time interval Δt_l.

$A_{i\tau}$ = The composite dose factor for the fresh water fish pathway and potable water pathway for nuclide (i) for organ τ of age group (to be specified). The $A_{i\tau}$ values listed in Appendix A, Table L-2 in this manual have the units $\frac{\text{mrem-ml}}{\text{Ci-hr}}$.

Δt_l = The number of hours over which the release occurs.

Q_{il} = The total quantity of nuclide (i) released during the time period Δt_l in μCi.

$(DF)_l$ = The total volume of dilution that occurred during the release time period Δt_l (ie, the circulating water flow multiplied by the time).

3.4.2.2.2 Limited Analysis Approach

Based on the radionuclide distribution typical in radioactive effluents at JAFNPP, the calculated dose to individuals are dominated by the radionuclides, Cs-134, Cs-137, Zn-65, Mn-54 and Co-60. These nuclides typically contribute over 95% of the total body dose and over 95% of the liver dose, which is the critical organ. Therefore, the dose commitment due to radioactivity in liquid effluents may be reasonably evaluated by limiting the dose calculational process to these radionuclides for the adult total body and adult liver dose. To allow for any unexpected variability in the radionuclide distribution a conservatism factor of 0.9 is introduced into the equation. After calculating the dose based on these 5 nuclides, the cumulative dose should therefore be divided by 0.9. (Refer to Appendix D for a detailed evaluation and explanation of this limited analysis approach).

If the limited analysis approach is used, the calculation should be limited to the adult total body dose and adult liver dose from the fish and potable water pathways. Only the 5 previously specified nuclides need be evaluated.

3.4.2.2.3 Approach Selection Criteria

The limited analysis approach fully satisfies the requirements specified in Section 3.4.2.1 and can thus be used at all times. The more general approach may be used for more refined calculations.

3.4.2.3 Calculational Method

The methodology that follows is a step-by-step breakdown to calculate doses based on equation 3.4.2.1-1. If the limited analysis approach is used, the calculation should be limited to the adult total body dose and adult liver dose from the fish and potable water pathways. Only the 5 previous specified radionuclides need to be evaluated.

Note: Table 3.4.2 provides a convenient form for compiling the dose accounting information.

3.4.2.3.1 Determine the time interval Δt_l over which the release took place.

3.4.2.3.2 Obtain $(DF)_1$ for the time period Δt_l for the release source(s) of interest. DF_1 is the total volume of dilution, (i.e., the circulating water flow multiplied by the time.)

3.4.2.3.3 Obtain Q_{il} (uCi) for nuclide (i) for the time period $\Delta\tau_l$.

3.4.2.3.4 Obtain $A_{i\tau}$ from the appropriate Liquid Dose Factor Table: Appendix A, Table L-2 for the fish and potable water pathways; Appendix A, Table L-3 for all other pathways.

3.4.2.3.5 Solve for Dose (i)

$$D_{i\tau} = \frac{Q_{il} \cdot \Delta t_1 \cdot A_{i\tau}}{(DF)_1}$$

3.4.2.3.6 Repeat steps 3.4.2.3.3 through 3.4.2.3.5 for each nuclide reported and each organ required. If the limited analysis method is used, limit the radionuclides to Co-60, Mn-54, Zn-65, Cs-134 and Cs-137 and determine the adult total body dose and the adult liver dose.

3.4.2.3.7 Sum the $D_{i\tau}$ values to obtain the total dose to organ τ from the fish and potable water pathways. If the limited analysis method is being used, divide the cumulative dose by a conservatism factor of 0.9 to account for any unexpected variability in radionuclide distribution.

3.5 Dose Projections - Determination of Need to Operate Liquid Radwaste Treatment System

3.5.1 Requirements

Technical Specification Section 2.4, Appendix B, requires that appropriate subsystems of the liquid radwaste treatment system be used to reduce radioactive material in untreated liquid effluents when the projected monthly dose due to liquid releases to unrestricted areas, when averaged over 31 days, would exceed 0.06 mrem to the total body or 0.2 mrem to any organ. Doses are to be projected at least once per month.

3.5.2 Calculational Methodology

The method is based on total body dose and critical organ dose (liver) as calculated in Section 3.4.2. The adult is the critical age group to be used for the dose projection.

The following calculational methodology is provided for performing this dose projection.

3.5.2.1 Obtain the latest result of the monthly calculation of the adult total body and adult liver dose (Section 3.4.2).

3.5.2.2 Divide this dose by the number of batch releases from the plant during the month.

3.5.2.3 Multiply the quotient by the number of batch releases from the plant projected for the next month. The product is the projected dose for the next month. This value should be adjusted as needed to account for any changes in failed fuel or other identifiable operating conditions that could significantly alter the actual releases.

3.5.2.4 If the projected dose is greater than .06 mrem to the total body or 0.2 mrem to the liver, the appropriate subsystems of the liquid radwaste system shall be used to reduce the radioactivity levels prior to release.

TABLE 3.4.2

FISH PATHWAY

TIME/DATE START: _____ TIME/DATE STOP: ti hours

TOTAL DILUTION VOLUME: _____ mls

AGE GROUP: _____ ORGAN: _____ DOSE FACTOR TABLE # _____

Limited Analysis

Nuclide (i)	C_i (μCi)	$A_{i\tau}$	Dose (i) mrem
Mn-57			
Co-60			
Zn-65			
Cs-134			
Cs-137			
Others:			

Total Dose $_\tau$ = _____ mrem

If based on limited analysis ÷ 0.9 _____ mrem

4.0 GASEOUS EFFLUENT METHODOLOGY

4.1 Gaseous Waste Streams

James A. Fitzpatrick Nuclear Power Plant discharges gaseous effluents through a stack, and discharges ventilation air from the Reactor Building, Turbine Building, Radwaste Building, and Refuel Floor through separately monitored vent release points. Normal gaseous effluent streams, and effluent discharge points are tabulated in Table F-1. (Appendix F).

For the purpose of estimating offsite radionuclide concentrations and radiation doses, radionuclide concentrations are first measured in gaseous effluents and ventilation air exhausted from the plant. Technical Specifications Table 3.2-1, Appendix B, identifies the specific radionuclides in gaseous discharges for which sampling and analysis is done. When a radionuclide concentration is below the LLD for the analysis, it is not reported as being present in the sample.

4.2 Data Requirements for Gaseous Effluent Calculations

Dose calculations to demonstrate compliance with Technical Specification Sections 3.2.a, 3.3.a and 3.4.a Appendix B, are normally performed using historical meteorological data and receptor location(s) which yield calculated doses no lower than those received by real receptor(s). Historical meterological data for use in performing dose calculations are provided in Appendix C. Dose calculations to show conformance with Technical Specifications, Appendix B, dose limits may be performed using real meteorological data, real receptor locations, and sector wind frequency distribution if desired.

Real meteorological data factors are calculated and used in dose calculations for the annual Radioactive Effluent Release Report. Historical information and conservative receptor assumptions, are only used for ease of Technical Specifications, Appendix B, Limiting Condition of Operation (LCO) dose limit calculations. Any dose calculations performed with real data should note the source of the data in the Annual Report. Real meteorological data modelling should be performed in accordance with Regulatory Guide 1-111, Rev. 1. JAFNPP uses an elevated release model for stack discharges and ground level release model for Reactor, Turbine, Radwaste and Refuel Floor vents.

Those radionuclides that appear in the gaseous effluent dose factor tables are representative of BWR isotopes that may be considered in any dose calculations.

4.3 Instantaneous Release Rate and Setpoint Determination

4.3.1 Determining Instantaneous Noble Gas Release Rates

4.3.1.1 Requirements

Technical Specification Section 3.2.a.1, Appendix B, limits the instantaneous dose rate from noble gases in airborne releases to less than 500 mrem/yr - total body, and less than 3000 mrem/yr - skin.

The results of the sampling and analysis program of Technical Specification Table 3.2-1, Appendix B, are used to demonstrate compliance with these limits.

4.3.1.2 Methodology

The instantaneous dose rates to the total body and skin from noble gases are evaluated to determine gaseous effluent release rates and alarm and/or trip setpoints.

The following calculational method is provided for determining the instantaneous dose rates to the total body and skin from noble gases in all airborne release paths from JAFNPP. However, for ease of calculation and without unduly reducing the conservatism of the calculation, all releases may be treated as if discharged from two (2) release points; an elevated stack for condenser off-gas releases and a ground-level vent for the combined discharge of the Reactor Building, Turbine Building, Radwaste Building and Refuel Floor vents. Appendix F, Table F-1 provides a summary of gaseous effluent release sources and pathways for JAFNPP. Table E-6 provides a summary of the fraction of each isotope to the total release for the two (2) release points; elevated and ground.

The calculational methods are in accordance with Section 5.1 and 5.2 of NUREG-0133, Rev. 1, November 1978.

The equations for computing instantaneous dose rates are:

Total Body Dose Rate

$$DR_{TB} = \sum_{i=1}^{n} K_i \cdot (\overline{X/Q}) \cdot \dot{Q}_i \qquad 4.3.1.2\text{-}1$$

Skin Dose Rate

$$DR_{SKIN} = \sum_{i=1}^{n} [L_i + 1.1\, M_i] \cdot (\overline{X/Q}) \cdot \dot{Q}_i \qquad 4.3.1.2\text{-}2$$

where

DR_{TB} = Total body dose rate from noble gases in airborne releases, in mrem/sec.

DR_{SKIN} = Skin dose rate from noble gases in airborne releases in mrem/sec.

K_i = The total body dose factor due to gamma emissions for each noble gas nuclide (i) reported in the release source, in mrem-m^3/uCi-sec.

L_i = The skin dose factor due to beta emissions for each noble gas nuclide (i) reported in the assay of the release source in mrem-m^3/uCi-sec.

M_i = The air dose factor due to gamma emissions for each noble gas nuclide (i) reported in the assay of the release source. The constant 1.1 converts 'mrad' to 'mrem' since the units of M_i are in: [mrad-m^3/uCi-sec]

$(\overline{X/Q})$vent = For ground level releases, the highest calculated annual long term historic relative dispersion coefficient for any of the 16 sectors, at or beyond the unrestricted area boundary, in sec/m^3.

$\overline{(X/Q)}$stack = For elevated releases, the highest calculated annual long term historic relative dispersion coefficient for any of the 16 sectors, at or beyond the unrestricted area boundary, in sec/m^3.

$\dot{Q}_i$ = The release rate of noble gas nuclide (i) from the release source of interest, in uCi/sec.

4.3.1.2.1 Limited Analysis Approach - Instantaneous Noble Gas Release Rate

The above methodology can be simplified to provide for a rapid determination of cumulative noble gas release limits based on the requirements specified in Section 4.3.1.1. Beginning with equation 4.3.1.2-1, the simplification proceeds as follows:

From an evaluation of past releases, an effective total body dose factor (K_{eff}) can be derived. This dose factor is, in effect, a weighted average total body dose factor (i.e., weighted by the radionuclide distribution typical of past operation). See Appendix 'E' for a detailed explanation and evaluation of K_{eff}. The value of K_{eff} has been derived from the radioactive noble gas effluents for the years 1980, 1981, and 1982 for the plant. The value is:

$K_{eff} = 7.68 \times 10^{-5}$ [mrem-m^3/uCi-sec] (Ground Level Releases)

$K_{eff} = 1.41 \times 10^{-4}$ [mrem-m^3/uCi-sec] (Elevated Releases)

Either of these values, as appropriate, may be used in conjunction with the total noble gas release rate ($\Sigma \dot{Q}_i$) to verify that the instantaneous dose rate is within the allowable limits. To compensate for any unexpected variability in the radionuclide distribution a conservatism factor of 0.8 is introduced into the calculation. The simplified equation is

$$DR_{TB} = \frac{K_{eff} \cdot \overline{(X/Q)}}{0.8} \sum_{i=1}^{n} \dot{Q}_i \qquad 4.3.1.2.1\text{-}1$$

Where:

DR_{TB} = Total body dose rate from noble gases in airborne releases, in mrem/sec.

$\overline{X/Q}$ = For ground level or elevated releases, the highest calculated annual long term historic relative concentration for any of the 16 sectors, at or beyond the unrestricted area boundary, in sec/m^3.

$\dot{Q}$ = The total release rate of all noble gas nuclides from the release source of interest, in uCi/sec.

A single cumulative (or gross) noble gas release rate limit for elevated releases and ground level releases may be derived by rearranging equation 4.3.1.2.1-1 as follows:

$$\dot{Q}_i = \frac{DR_{TB} \times (.8)}{Keff \times (\overline{X/Q})} \qquad 4.3.1.2.1\text{-}2$$

These limits may be determined by taking the highest calculated annual long term historic relative concentration, for elevated and ground level releases, at any of the 16 land based sectors, at or beyond the unrestricted area. From Appendix C, Table M-1, these values are:

$$\overline{X/Q}_{stack} = 6.8 \times 10^{-10} \frac{sec}{m^3} \quad \text{(Elevated Releases)}$$

$$\overline{X/Q}_{vent} = 8.3 \times 10^{-9} \frac{sec}{m^3} \quad \text{(Ground Level Releases)}$$

Also, the dose limit of 500 mrem/yr = 1.585×10^{-5} mrem/sec may be substituted for DR_{TB} in equation 4.3.1.2.1-2.

In addition, from a review of gaseous effluent releases as reported in the JAFNPP semi-annual Effluent Release Reports for the years 1980, 1981, and 1982, it was determined that, on the average, approximately 90% of the annual total body dose from noble gases is due to elevated releases. These data are presented in Appendix E. In accordance with this, the release limit is split as follows:

90% - Elevated Release

10% - Ground Level Release

Making these substitutions in equation 4.3.1.2.1-2 yields the following cumulative (or gross) noble gas release rate limits:

Elevated Release Rate Limit = 1.34×10^8 uCi/sec

Ground Level Release Rate Limit = 2.25×10^6 uCi/sec

As long as the noble gas release rates do not exceed these values (1.34×10^8 uCi/sec for elevated releases, and 2.25×10^6 uCi/sec for ground level releases) no additional dose rate calculations are needed to verify compliance with the instantaneous release rate limits of Technical Specification Section 3.2.a.1, Appendix B.

4.3.1.2.2 General Approach - Total Body and Skin Nuclide-Specific Instantaneous Release Rate Calculations

The methods described herein need only be used if the actual releases exceed the values of:

Elevated Release = 1.34×10^8 uCi/sec

Ground Level Release = 2.25×10^6 uCi/sec

Total Body Dose Rate

$$DR_{TB} = \sum_{i=1}^{n} DR_{TBi} = \sum_{i=1}^{n} K_i \cdot \overline{(X/Q)} \cdot Q_i \qquad 4.3.1.2.2\text{-}1$$

where:

DR_{TB} = Dose rate to the total body due to gamma emissions from noble gas nuclide (i), mrem/sec.

DR_{TBi} = Dose rate to the total body due to gamma emissions from nuclide (i), mrem/sec.

K_i = The total body dose factor due to gamma emissions from noble gas radionuclide (i), in mrem-m^3/uCi-sec. (See Table G-2, Appendix B).

$\overline{X/Q}$ = Calculated annual longterm historic value of CHI/Q for the most limiting land sector at the unrestricted area boundary, in sec/m^3. (See Table M-1, Appendix C).

Elevated Release $\overline{X/Q}_{stack}$ = 6.8×10^{-10} sec/m^3

Ground Level Release $\overline{X/Q}_{vent}$ = 8.3×10^{-9} sec/m^3

$\dot{Q}_i$ = Release rate of the i^{th} nuclide, in uCi/sec.

Total Skin Dose Rate

$$DR_{SKIN} = \sum_{i=1}^{n} DR_{SKIN} = \sum_{i=1}^{n} [L_i + 1.1\, M_i]\ (\overline{X/Q})\ \dot{Q}_i \qquad 4.3.1.2.2\text{-}2$$

where:

DR_{SKIN} = Dose rate to skin due to beta and gamma radiation from noble gas nuclide (i) [mrem/sec].

L_i = The skin dose factor due to beta emissions from noble gas nuclide (i), in mrem-m^3/uCi-sec (See Table G-2, Appendix B).

M_i = The air dose factor due to gamma emissions from noble gas nuclide (i), in mrad-m^3/uCi-sec. (See Table G-3, Appendix B).

1.1 = Conversion factor for M_i from mrad to mrem.

$\overline{X/Q}$ = Calculated annual long term historic value of CHI/Q [sec/m^3] for the most limiting land sector at the unrestricted area boundary, in sec/m^3. (See Table M-1, Appendix C).

Q_i = Release rate of the i^{th} nuclide in uCi/sec.

The dose rate contribution of this release source shall be added to all other simultaneous gaseous release sources, if any, to determine overall total dose rate to the total body and skin from noble gas effluents.

4.3.1.3 Calculational Process

The following outline provides a step-by-step explanation of how the total body and skin dose rates are calculated on a nuclide-by-nuclide basis to evaluate compliance with Technical Specification Section 3.2.a.1, Appendix B. This method is only used if the actual releases exceed the value specified in ODCM Section 4.3.1.2.1.

4.3.1.3.1 The $\overline{X/Q}$ value = _____ sec/m^3 and _____ is the most limiting sector at the unrestricted area.

4.3.1.3.2 Enter the release rate in ft^3/min of the release source and convert it to cc/sec;

$$= \frac{(\quad)ft^3}{min} \cdot \frac{2.8317 \times 10^4 \text{ cc}}{ft^3} \cdot \frac{min}{60 \text{ sec}}$$

= _____ cc/sec volume release rate

4.3.1.3.3 Determine Q_i for nuclide (i) by obtaining the uCi/cc assay value of the release source and multiplying it by the release rate computed in the previous steps.

$$Q_i = \frac{(\quad)uCi}{cc} \cdot \frac{(\quad)cc}{sec}$$

$\dot{Q}_i$ = _____ uCi/sec for nuclide (i).

4.3.1.3.4 To evaluate the total body dose rate obtain the K_i value for nuclide (i) from Appendix B Table G-2.

4.3.1.3.5 Solve for DR_{TBi}:

$$DR_{TBi} = k_i \cdot (\overline{X/Q}) \cdot \dot{Q}_i = \frac{\text{mrem-m}^3}{\text{uCi-yr}} \cdot \frac{\text{sec}}{\text{m}^3} \cdot \frac{\text{uCi}}{\text{sec}}$$

DR_{TBi} = Total body dose from nuclide (i) for the specified release source in mrem/yr.

4.3.1.3.6 To evaluate the skin dose rate obtain the L_i and M_i values from Appendix B Table G-2 for nuclide (i).

4.3.1.3.7 Solve for $DR_{SKIN\ i}$:

$$DR_{SKIN\ i} = (L_i + 1.1\ M_i) \cdot (\overline{X/Q}) \cdot \dot{Q}_i$$

$DR_{SKIN\ i}$ = Skin dose from nuclide (i) for the specified release source, in mrem/yr.

4.3.1.3.8 Repeat steps 4.3.1.3.1 through 4.3.1.3.7 for each noble gas nuclide (i) reported in the assay of the release source.

4.3.1.3.9 The dose rate to the total body from radioactive noble gas gamma radiation from the specified release source is:

$$DR_{TB} = \sum_{i=1}^{n} DR_{TBi}$$

4.3 1.3.10 The dose rate to the skin due to noble gas radiation from the specified release source is:

$$DR_{SKIN} = \sum_{i=1}^{n} DR_{SKIN\ i}$$

The dose rate contribution of this release source shall be added to all other gaseous release sources that are in progress at the time of interest.

Technical Specification Section 3.2.a.1,Appendix B,requires the following:

$DR_{TB} \leq$ 500 mrem/yr (1.585×10^{-5} mrem/sec)

$DR_{SKIN} \leq$ 3000 mrem/yr (9.513×10^{-5} mrem/sec)

Where:

DR_{TB} = The sum of the total body dose rate contributions (mrem/sec) from all noble gas nuclides from all concurrent releases.

DR_{SKIN} = The sum of skin dose rate contributions (mrem/sec) from all noble gas nuclides from all concurrent releases.

4.3.2 Setpoint Determination

4.3.2.1 Requirements

To comply with Technical Specification Section 3.1, Appendix B, the alarm/trip setpoints are established to ensure that the noble gas releases do not exceed the appropriate cumulative (or gross) noble gas release rate limit specified in ODCM Section 4.3.1.2.1.

4.3.2.2 Methodology

This section describes the methodology for determing alarm/trip set points for the stack and vent gaseous release pathways. To allow for multiple sources of releases from different or common release points, the allowable operating setpoints will be administratively controlled to allocate a percentage of the total allowable release to each of the release sources. The cumulative noble gas release rate limit for a stack (elevated) release (1.34×10^{8} uCi/sec) is based on allocating 90% of the total body dose limit to the stack release point. The individual release rate limits for the four other gaseous release points (assumed to be ground level releases), are based upon an allocated percentage of the cumulative ground level release rate limit (2.25×10^{6} uCi/sec).

The method that follows establishes a procedure for determining setpoints.

4.3.2.2.1 Determine the maximum volume release rate potential for the release source under consideration.

4.3.2.2.2 Based upon that release rate [FT^3/MIN or other units of Vol/Time] determine the equivalent activity concentration in [uCi/CC] that would produce a release of:

1.34×10^8 uCi/sec - Elevated Release

2.25×10^6 uCi/sec - Ground Level Release

4.3.2.2.3 Referring to the calibration curve [uCi/CC vs. CPM] for the release source's gaseous effluent monitor, determine the CPM value (C) corresponding to the value of activity concentration determined in step 4.3.2.2.2.

4.3.2.2.4 For an elevated release the setpoint is equal to the CPM value, (or corresponding potentiometer setting), as follows:

$$SP = (C)\ CPM \qquad 4.3.2.2\text{-}1$$

4.3.2.2.5 For a ground level release, (C) corresponds to 100% of the ground level release rate limit assuming no other ground level release sources at the time. To obtain an operational setpoint value SP, take (C) in (CPM) and multiply it by the allocated fraction for the individual ground release point.

$$SP = (C)\ CPM \cdot \left(\begin{array}{c} \text{fraction} \\ \text{allocated for} \\ \text{a particular} \\ \text{ground release} \end{array} \right) \qquad 4.3.2.2\text{-}2$$

The total body dose is more limiting than the calculated skin dose. (See Appendix 'E' for a detailed evaluation.) Therefore, the skin dose rate calculations are not required if the simplified dose rate calculation is used (i.e., using K_{eff} to determine release rate limits).

The calculational processes of section (4.3.1.2) are to be used if the actual releases of noble gases exceed the predetermined limits of 1.34 x 10^8 uCi/sec for elevated releases or 2.25 x 10^6 uCi/sec for ground level releases.

Under these conditions, a nuclide-by-nuclide evaluation is required to evaluate compliance with the dose rate limits of Technical Specification Section 3.2.a.1, Appendix B.

4.3.3 Determining the Radioiodine and 8 Day Particulate Instantaneous Release Rates

4.3.3.1 Requirements

Technical Specification Section 3.2.a.2, Appendix B, limits the instantaneous dose rate from radioiodines and particulates with half-lives greater than 8 days to 1,500 mrem/yr to any organ.

4.3.3.2 Methodology

The following calculational method is provided for determining the dose rate from radioiodines and particulates. It is based on NUREG-0133, Rev. 1, November, 1978; Sections 5.2.1, and 5.2.1.1 through 5.2.1.3.

Based on an analysis of doses to all organs from all atmospheric release pathways and age groups (EDS Nuclear RG109 Computer Analysis, EDS Version 2, Rev. 0) the infant was determined to be the controlling age group for the contaminated forage/cow/milk pathway. There is no controlling age group for the ground plane deposition pathway. The child is the controlling age group for the inhalation pathway. These three pathways are the only ones that need be considered for instantaneous releases. The long-term $(\overline{X/Q})$ Depleted and $(\overline{D/Q})$ values are based on historical meteorological data. Dose factors for nuclides listed in Appendix B, Table G-4 will be used.

Inhalation Pathway

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} P_{i_\tau} \cdot (\overline{X/Q})_D \cdot \dot{Q}_i \qquad 4.3.3.2\text{-}1$$

Ground Plane Deposition Pathway

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} P_{i_\tau} \cdot (\overline{D/Q}) \cdot \dot{Q}_i \qquad 4.3.3.2\text{-}2$$

Contaminated Forage/Cow/Milk Pathway

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} P_{i_\tau} \cdot (\overline{D/Q}) \cdot \dot{Q}_i \qquad 4.3.3.2\text{-}3$$

Total Dose Rate From I&8DP

$$DR_\tau = \sum_{z} DR_{I\&8DP_\tau} \qquad 4.3.3.2\text{-}4$$

where:

τ = The organ of interest for the age group of interest.

z = All the applicable pathways.

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

$DR_{I\&8DP_\tau}$ = Dose rate to the organ τ for the age group of interest from iodines and 8 day particulates via the pathway of interest in [mrem/yr].

DR_τ = Total dose rate to organ τ from all applicable pathways for the age group of interest in [mrem/yr].

$(\overline{X/Q})_D$ = The long-term depleted and 8-Day decayed CHI/Q value based on historical meteorological data (see Table M-1, Appendix C) [in sec/m^3]

$(\overline{D/Q})$ = The long-term relative deposition value based on historical data [in m^{-2}], (see Table M-1, Appendix C).

P_i = The dose factor for applicable environmental pathway in [units vary with pathway]. (See Tables G-4 through G-6, Appendix B)

4.3.3.2.1 Limited Analysis Approach

From an evaluation of the radioactive release and environmental pathways, the contaminated forage/cow/milk pathway has been identified as the most limiting pathway with infant's thyroid being the most critical organ. This pathway contributes, on the average, greater than 85% of the total dose received by the infant's thyroid and the radioiodines contribute essentially all of this dose. Therefore, it is possible to demonstrate compliance with the release rate limit of Technical Specification Section 3.2.a.2, Appendix B, for radioiodines and particulates by only evaluating the infant's thyroid dose for the release of radioiodines via the contaminated forage/cow/milk pathway. A conservatism factor of 0.8 is applied to the equation. If this limited analysis approach is used, the dose calculations for other radioactive particulate matter and other pathways need not be performed. Only the calculation for radioiodines from the contaminated forage/cow/milk pathway need be performed to demonstrate compliance with the Technical Specification, dose rate limit. App. B,

The limiting iodine release rate is then determined by the following relationships:

$$\dot{Q}_I = \frac{DR_{Thyroid}}{\overline{(D/Q)}\ P_{i(Thyroid)}} \times 0.8 \qquad 4.3.3.2.1\text{-}1$$

Where:

$DR_{Thyroid}$ = Dose rate to the infant's thyroid from the contaminated forage/cow/milk pathway set equal to the Technical Specification Section 3.2.a.2, Appendix B, limit of 1,500 mrem/year, or 4.78×10^{-5} mrem/sec.

$P_{i\ (Thyroid)}$ = The instantaneous dose factor for nuclide i for the infant's thyroid for the contaminated forage/cow/milk pathway.

$\overline{D/Q}$ = The relative deposition value for a specific location where the receptor is located, in m^{-2}. (See Table M-1, Appendix C).

$\dot{Q}_I$ = Limiting iodine release rate, in uCi/sec.

0.8 = A conservatism factor of 0.8 for a typical radioisotope distribution and dose contribution.

4.3.3.2.2 Approach Selection Criteria

Only the limited analysis approach need be used for verifying compliance with release rate limits for radioiodines and eight day particulates.

4.4 Dose Determination for Radioactive Gaseous Effluents

4.4.1 Annual Dose Assessment - Radioactive Effluent Release Report Submittal

4.4.1.1 Requirements

Technical Specification Section 7.3, Appendix B, requires an annual Radioactive Effluent Release Report to be submitted that includes an assessment of the radiation doses to the public due to the radioactive liquid and gaseous effluents released from the unit during the previous calendar year.

4.4.1.2 Methodology

The section provides the methodology to calculate the doses to all age groups and organs from all 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 site-related dose factors for all viable pathways are listed in Appendix B, Tables G-1 through G-8. Dose factors are compiled by age groups, for all organs and radionuclides common to a BWR environment.

The following equations provide for a dose calculation to the total body or any organ for a given age group based on actual release rates during a specific time interval for radioactive gaseous release sources:

4.4.1.2.1 Annual Dose Due to Noble Gases

$$D_{Gamma-Air} = \sum_{i=1}^{n} M_i \times (\overline{X/Q}) \times Q_i \qquad 4.4.1.2.1\text{-}1$$

Where:

$D_{Gamma-Air}$ = 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-sec. (See Table G-3, Appendix B).

$(\overline{X/Q})$ = The long-term atmospheric dispersion factor for ground level or elevated releases (annual average) for the year of interest. Actual meteorological data and sector wind frequency distributions will be used to determine annual X/Q for the year of interest.

Q_i = The number of uCi of nuclide 'i' released during the year of interest.

$$D_{Beta-Air} = \sum_{i=1}^{n} N_i \times (\overline{X/Q}) \times Q_i \qquad 4.4.1.2.2\text{-}2$$

Where:

$D_{Beta-Air}$ = 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-sec. (See Table G-3, Appendix B).

$(\overline{X/Q})$ = The long-term atmospheric dispersion factor for ground level or elevated releases (annual average) for the year of interest. Actual meteorological data and sector wind frequency distributions will be used to determine annual X/Q for the year of interest.

Qi = The number of uCi of nuclide 'i' released during the year of interest.

4.4.1.2.2 Annual Dose Due to Radioiodines and 8-Day Particulates

Inhalation Pathways

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{X/Q})_D \cdot Q_i \qquad 4.4.1.2.2\text{-}1$$

Ground Plane Deposition Pathway

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{D/Q}) \cdot Q_i \qquad 4.4.1.2.2\text{-}2$$

Contaminated Forage/Cow/Milk Pathway

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{D/Q}) \cdot Q_i \qquad 4.4.1.2.2\text{-}3$$

Contaminated Forage/Goats Milk Pathway

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{D/Q}) \cdot Q_i \qquad 4.4.1.2.2\text{-}4$$

Contaminated Forage/Meats

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{D/Q}) \cdot Q_i \qquad 4.4.1.2.2\text{-}5$$

Stored Fruits and Vegetables

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{D/Q}) \cdot Q_i \qquad 4.4.1.2.2\text{-}6$$

Fresh Fruits and Vegetables

$$DR_{I\&8DP_\tau} = \sum_{i=1}^{n} R_{i_\tau} \cdot (\overline{D/Q}) \cdot Q_i \qquad 4.4.1.2.2\text{-}7$$

Total Annual Dose

$$D_\tau = \sum_{i=1}^{n} DR_{I\&8DP_\tau}$$

where:

γ = The organ of interest for the age group of interest.

z = All the applicable pathways.

$DR_{I\&8DP}$ = Dose rate to the organ γ for the age group of interest from iodines and 8 day particulates via the pathway of interest in [mrem/yr].

DR = Total dose rate to organ γ from all applicable pathways for the age group of interest in [mrem/yr].

Q = The number of uCi of nuclide 'i' released during the year of interest.

$R_{i\gamma}$ = The dose factor for nuclide (i) for organ γ for the pathway specified [units vary with pathway]. (See Table G-8, Appendix B)

$(\overline{D/Q})$ = A long-term relative deposition value for elevated and ground level releases. A factor with units of m^{-2} which describes the deposition of particulate matter from a plume at a point downrange from the source. Actual meteorological data and sector wind frequency distribution will be used to determine annual average D/Q for the year of interest.

$(\overline{X/Q})_D$ = A long-term depleted and 8-day decayed relative concentration value for elevated and ground level release. It describes the physical dispersion characteristics of a semi-infinite cloud travels downrange. Since iodines and particulates settle out (fallout of the cloud) on the ground, the $(\overline{X/Q})_D$ represents what physically remains of the cloud at a given location downrange from the release point. Actual meteorological data and sector wind frequency distributions will be used to determine annual average $(X/Q)_D$ for the year of interestd. Total body and organ doses will be calculated for pathway and age group on an annual basis using the above described methodology.

Meteorological Data ($\overline{X/Q}$, $\overline{X/Q_D}$, $\overline{D/Q}$) will be determined from actual meteorological data and sector wind frequency distributions for the year of interest. Release rates (uCi/year) will be based on total activity released through elevated and ground level (total of all vent pathways) as reported in the semi-annual effluent report.

4.4.2 Monthly Dose Assessment - Verification of Compliance with 10 CFR 50, Appendix I

4.4.2.1 Determining the Gamma Air Dose for Radioactive Noble Gas Release Source(s)

4.4.2.1.1 Requirement

Technical Specification Section 3.3.a.2, Appendix B, limits the yearly dose due to noble gases in the gaseous effluent to less than 10 mrem to the whole body from gamma. This is equivalent to a yearly air dose limit of less than 10 mrad.

4.4.2.1.2 Methodology

The following calculation method is provided for determining the noble gas gamma air dose and is based on Section 5.3.1 of NUREG-0133, Rev. 1, November 1978. The dose calculation is independent of any age group. The equation may be used for Technical Specification, Appendix B, dose calculations, the dose calculation for the annual report, or for projecting dose, provided that the appropriate value of $(\overline{X/Q})$ is used. The equation for gamma air dose is:

$$D_{Gamma\text{-}Air} = \sum_{i=1}^{n} M_i \cdot (\overline{X/Q})\ Q_i \qquad 4.4.2.1.2\text{-}1$$

where:

$D_{Gamma\text{-}Air}$ = 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-sec (See Table G-3 in Appendix 'A')

$\overline{(X/Q)}$ = The long term atmospheric dispersion factor for ground level or elevated releases (worst case) in sec/m^3. (See Appendix C, Table M-1.)

Q_i = The number of uCi of nuclide 'i' released (or projected) during the dose calculation exposure period. (e.g., month, quarter, or year).

(a) Limited Analysis Approach

The following limited analysis approach is used to establish monthly release objectives (uCi/month) that will ensure compliance with the 10 CFR 50, Appendix I, yearly whole body gamma dose limit of 10 mrem.

From an evaluation of past releases, a single effective gamma air dose factor (M_{eff}) has been derived, which is representative of the radionuclide abundances and corresponding dose contributions typical of past operation. (See Appendix C for a detailed explanation and evaluation of M_{eff}). The value of M_{eff} has been derived from the radioactive noble gas effluents for the years 1980, 1981, and 1982. The value is

$M_{eff} = 8.17 \times 10^{-5}$ mrad-m^3/uCi-sec (GROUND RELEASE)

$M_{eff} = 1.37 \times 10^{-4}$ mrad-m^3/uCi-sec (ELEVATED RELEASE)

The effective gamma air dose factor may be used in conjunction with the total noble gas release (ΣQ_i) to simplify the dose evaluation and to verify that the cumulative gamma air dose is within the equivalence of the limits of Technical Specification 3.3.a.2. To compensate for any unexpected variability in the radionuclide distribution, a conservatism factor of 0.8 is introduced into the calculation. The simplified equation is

$$D_{Gamma\text{-}Air} = \frac{(M_{eff}) \cdot \overline{(X/Q)}}{0.8} \sum_{i=1}^{n} Q_i \qquad 4.4.2.1.2\text{-}2$$

For purposes of calculations, the appropriate meteorological dispersion (X/Q) should be used.

Solving equation 4.4.2.1.2-2 for Q_i yields the following:

$$\sum_{i=1}^{n} Q_i = \frac{D_{Gamma\text{-}Air} \times (.8)}{(M_{eff}) \times (X/Q)} \qquad 4.4.2.1.2\text{-}3$$

Technical Specifications Section 3.3.a, Appendix B, states that the doses must be evaluated once per month. The yearly dose limit is 10 mrads, which corresponds to a monthly allotment of 0.83 mrads. If the .83 mRads is substituted for $D_{Gamma\text{-}Air}$ in equation 4.4.2.1.2-3, a cumulative noble gas monthly release objective can be calculated for elevated and ground level releases. As described in Section 4.3, 90% of the dose will be allocated to elevated releases and 10% to ground level releases in accordance with release source terms for the year 1980, 1981, and 1982 (Appendix E). Thus, $\overline{X/Q}$ values of 8.3×10^{-9} sec/m^3 for ground level releases and 6.8×10^{-10} sec/m^3 for elevated releases can be used, along with the corresponding Meff values, to calculate the following cumulative noble gas monthly release objectives:

Q (ground level release) = 8.8×10^{11} uCi/month

Q (elevated release) = 7.13×10^{11} uCi/month

As long as this value is not exceeded in any month, no additional calculations are needed to verify compliance with the quarterly noble gas release limits of Technical Specification Section 3.3.a.1, Appendix B.

(b) Approach Selection Criteria

The gamma air dose is more limiting than the beta air dose. Therefore, the beta air dose determined in accordance with Section 4.4.2.2 need not be calculated if the M_{eff} dose factor is used to determine the gamma air dose (i.e., the limited analysis approach). See Appendix 'E' for a detailed evaluation and explanation.

4.4.2.2 Determining the Beta Air Dose for Radioactive Noble Gas Release Sources

The beta air dose calculations of Section 4.4.2.2 need only be performed if the radionuclide specific dose analysis is performed. The radionuclide specific dose analysis is performed if the monthly release objectives of Section 4.4.2.2 are exceeded and for calculations in the annual Radiological Effluent Release Report.

4.4.2.2.1 Requirement

Technical Specification 3.3.a.2, App B, limits the yearly dose due to noble gases in the gaseous effluents to less than 20 mrads to the skin from beta.

The beta air dose need not be evaluated if the more conservative and limiting noble gas gamma air dose is evaluated by the use of the effective gamma air dose factor (M_{eff}) in accordance with Section 4.4.2.1. However, if the nuclide specific dose calculation is used to evaluate compliance with the gamma air dose limits (Section 4.4.2.1), then the beta air dose should also be evaluated on a nuclide specific basis using the methodology presented below.

4.4.2.2.2 Methodology

The following calculational method is provided for determining the beta air dose and is based on Section 5.3.1 of NUREG-0133, Rev. 1, November 1978. The dose calculation is independent of any age group. The equation may be used for dose calculations for annual Radiological Effluent Release Reports, or for projecting dose, provided that the appropriate value of $(\overline{X/Q})$ is used.

The equation for beta air dose is

$$D_{Beta\text{-}Air} = \sum_{i=1}^{n} N_i \cdot (\overline{X/Q}) \cdot Q_i \qquad 4.5\text{-}1$$

where,

$D_{Beta\text{-}Air}$ = 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-sec (See Table G-3 in Appendix A).

$\overline{(X/Q)}$ = The long term atmospheric dispersion factor for ground level or elevated releases, in sec/m^3. (See Appendix C.)

Q_i = The number of uCi of nuclide 'i' released (or projected) during the dose calculation exposure period.

4.4.2.3 Determining the Radioiodine and 8 Day Particulate Dose to any Organ from Cumulative Releases

4.4.2.3.1 Requirement

Technical Specification 3.4.a.1, App. B, limits the dose to the total body or any organ resulting from the release of radioiodines and particulates with half-lives greater than 8 days to less than 7.5 mrem/quarter.

4.4.2.3.2 Methodology

The following calculational method is provided for determining the critical organ dose due to releases of radioiodines 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 symbol $(X/Q)_D$ represents a depleted (X/Q) which is different from the Noble Gas (X/Q) in that $(X/Q)_D$ takes into account the loss of iodines, 8 day particulates and tritium from the plume as the semi-infinite cloud travels over a given distance. The dispersion factor, (D/Q), represents the rate of fallout from the cloud that affects a square meter of ground at various distances from the site. The total dose to an organ can then be determined by summing the pathways that apply to the receptor in the sector. The equations are:

Inhalation Pathway

$$(D_{I\&8DP})_{\tau} = \underset{\text{Inhalation}}{} (3.17 \times 10^{-8}) \sum_{i=1}^{n} R_{i\tau} \cdot \overline{(X/Q)}_D \cdot Q_i \qquad 4.4.2.3.2\text{-}1$$

Ground Plane Pathway

$$(D_{I\&8DP})_{\tau} = (3.17 \times 10^{-8}) \sum_{i=1}^{n} R_{i\tau} \cdot \overline{(D/Q)} \cdot Q_i \qquad 4.4.2.3.2\text{-}2$$

Contaminated Forage/Cow/Milk Pathway

$$(D_{I\&8DP})_{\tau} = (3.17 \times 10^{-8}) \sum_{i=1}^{n} R_{i\tau} \cdot \overline{(D/Q)} \cdot Q_i \qquad 4.4.2.3.2\text{-}3$$

Total Dose

$$D_{\tau} = \sum_{z}^{n} D_{I\&8DP_{\tau}} \qquad 4.4.2.3.2\text{-}4$$

where

τ = The organ of interest in a specified age group.

z = All the applicable pathways for the age group of interest.

$D_{I\&8DP_{\tau}}$ = Dose in mrem to the organ τ of a specified age group from radioiodines and 8 day particulates due to a particular pathway.

D_{τ} = Total dose in mrem to the organ τ of a specified age group from gaseous iodine and particulate effluents.

3.17×10^{-8} = The inverse of the number of seconds per year in [years/sec]

$R_{i\tau}$ = The dose factor for nuclide (i) for pathway z to organ τ of the specified age group. The units are either, $\frac{\text{mrem -m}^3}{\text{yr -uCi}}$ for pathways using $\overline{(X/Q)}_D$ or $\frac{\text{mrem -m}^2\text{ -sec}}{\text{yr -uCi}}$ for pathways using $\overline{(D/Q)}$. (See Tables G-5 thru G-8, Appendix B)

$\overline{(X/Q)}_D$ = The depleted $\overline{(X/Q)}$ value for a specific location where the receptor is located. The units are [sec/m^3]. (See Table M-2 or M-3, Appendix B)

$\overline{(D/Q)}$ = The deposition value for a specific location where the receptor is located. The units are [m^{-2}]. (See Table M-2 or M-3, Appendix B)

Q_i = The number of micro-curies of nuclide (i) released (or projected) during the dose calculation exposure period.

(a) Limited Analysis Approach

As discussed in Section 4.3.3 above, the contaminated forage/cow/milk pathway has been identified as the most limiting pathway with the infant's thyroid being the most critical organ and age group. This pathway contributes, on average, over 85% of the total dose received by infant's thyroid and the radioiodines contribute essentially all of this dose. Therefore, it is possible to demonstrate compliance with the dose limit of Technical Specification 3.4.a.1, for radioiodines and particulates by only evaluating the infant's thyroid dose due to the release of radioiodines via the contaminated forage/cow/milk pathway.

The calculational method to be used includes a conservatism factor of 0.8 which assures that the calculated dose is always greater than or equal to the actual dose despite possible atypical distributions of radionuclides in the gaseous effluent.The simplified dose equation reduces to:

$$D_\tau = [3.17 \times 10^{-8}\ \overline{(D/Q)} \sum_{\text{iodines}} R_{i_\tau} \cdot Q_i] / 0.8 \qquad 4.4.2.3.2\text{-}5$$

(b) Approach Selection Criteria

The limited analysis may be used in all cases to demonstrate compliance with the dose limit of Technical Specification 3.4.2.1, App. B, (7.5 mrem/qtr) for radioiodines and particulates.

However, for the dose assessment included in the annual Radioactive Effluent Release Report, doses will be evaluated for all designated age groups and organs via all designated pathways from radioiodines and particulates measured in the gaseous effluents according to sampling and analyses required by Technical Specification.

4.5 Dose Projection - Determination of Need to Operate Offgas Radwaste

4.5.1 Requirement

Technical Specification Section 3.6.a, Appendix B, requires that the offgas radwaste treatment system be used to reduce radioactive material in waste prior to discharge when the projected dose due to gaseous effluents would exceed 0.2 mRad for gamma radiation and 0.4 mRad for beta radiation in a 31 day period.

4.5.2 Methodology

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

$$PD_\gamma = \frac{91}{X} \cdot D\gamma \cdot X \qquad 4.5.2\text{-}1$$

$$PD_\beta = \frac{91}{X} \cdot D\beta \cdot X \qquad 4.5.2\text{-}2$$

where:

PD_γ = Projected air dose due to noble gas gamma radiation during the current quarter (mrad)

PD_β = Projected air dose due to noble gas beta radiation during the current quarter (mrad)

91 = Number of days in a quarter

X = Number of days to date during current quarter

D_γ = Air dose due to noble gas gamma radiation during the quarter to date (mrad)

D = Air dose due to noble gas beta radiation during the quarter-to-date (mrad)

A formal dose projection would be based on the latest results of the monthly calculations of the gamma air dose (Section 4.4.2.1) and the beta air dose, if performed (Section 4.4.2.2). The doses calculated would be divided by the number of days that the plant was operational during that month. The per-day doses (gamma and beta) would be multiplied by the number of days the plant is projected to be operational during the coming month. The product is the projected dose for the coming month. Its value may need to be adjusted to account for any changes in operating conditions that could significantly alter the actual releases, such as failed fuel.

4.5.2.1 Limited Analysis Approach and Selection Criteria

A simpler approach, a linear extrapolation of the most recent three-month's dose for the coming month, could be used as long as the limits of Technical Specification Section 3.6.a, Appendix B, are not reached.

5.0 40 CFR 190 DOSE EVALUATION

Technical Specification Section 5.1.a, Appendix B, requires that the annual (calendar year) dose or dose commitment to any member of the public from uranium fuel cycle sources be limited to $\leq$ 25 mrem to the total body or any organ (except the thyroid which is limited to $\leq$ 75 mrem). The following approach should be used to demonstrate compliance with these dose limits.

5.1 Evaluation Bases

Dose evaluation to demonstrate compliance with the 40 CFR 190 dose limits need only be performed if the quarterly doses calculated in Sections 3.4, 4.4 and 4.6 exceed twice the dose limits of Technical Specifications Sections 2.3.a, 3.3.a and 3.4.a Appendix B, respectively, i.e., quarterly doses exceeding 5 mrem to the total body (liquid releases), 10 mrem to any organ (liquid releases), 10 mrads equivalent gamma air dose, 20 mrads equivalent beta air dose, or 15 mrem to the thyroid or any organ from radioiodines and particulates (atmospheric releases). The dose evaluation includes dose contributions to a maximally exposed real individual from the calander quarter in which the quarterly limits were exceeded in addition to plant offsite dose contributions during the balance of the current calendar year.

For purposes of the evaluation, if required, it may be assumed that the dose commitment to the maximally exposed real individual from other uranium fuel cycle sources is negligible. However, dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 8 km must be considered.

5.2 Doses From Liquid Releases

For the evaluation of doses to real individuals from liquid releases, the same calculational method as employed in Section 3.4 will be used. However, more realistic assumptions will be any current field data or updated estimates may be used, if available, concerning the dilution and ingestion of fish and potable water by individuals who live and fish in the area. Also, the results of the Radiological Environmental Monitoring program will be included in determining more refined estimates of doses to real individuals by providing data on actual measured levels of plant-related radionuclides in the environment.

5.3 Doses From Atmospheric Releases

For the evaluation of doses to real individuals from the atmospheric releases, the same calculational methods as employed in Section 4.4 will be used. In Section 4.4, the total body dose factor (K_i) should be substituted for the gamma air dose factor (M_i) to determine the total body dose. Otherwise the same calculational sequence applies. However, any current field data or updated estimates may be used, if available, concerning the actual location of real individuals, the meteorological conditions, and the consumption of food (eg, milk, meat and vegetation). Data obtained from the latest land use census (Technical Specifications Section 6.2, Appendix B) should be used to determine locations for evaluating doses. Also, the results of the Radiological Environmental Monitoring program will be included in determining more refined dose estimates to real individuals by providing data on actual measured levels of radioactivity and radiation at locations of interest.

5.4 Doses from Direct Radiation

Because 40 CFR 190 requirements include consideration of the offsite dose contribution from direct radiation, an estimate must be provided in the evaluation. Direct radiation dose contribution from turbine shine and from outdoor facilities containing radioactive material, if applicable, may be estimated by shielding calculations or from the results of the environmental monitoring program for direct radiation.

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX A

LIQUID DOSE CALCULATION DATA

TABLE L-1

Maximum Permissible Concentrations in Water in Unrestricted Areas

Nuclide[1]	MPC(μCi/ml)	Nuclide[1]	MPC(μCi/ml)	Nuclide[1]	MPC(μCi/ml)
H-3	3 E-3	Y-90	2 E-5	Te-129	8 E-4
Na-24	3 E-5	Y-91m	3 E-3	Te-131m	4 E-5
P-32	2 E-5	Y-91	3 E-5	Te-131	None
Cr-51	2 E-3	Y-92	6 E-5	Te-132	2 E-5
Mn-54	1 E-4	Y-93	3 E-5	I-130	3 E-6
Mn-56	1 E-4	Zr-95	6 E-5	I-131	3 E-7
Fe-55	8 E-4	Zr-97	2 E-5	I-132	8 E-6
Fe-59	5 E-5	Nb-95	1 E-4	I-133	1 E-6
Co-57	4 E-4	Nb-97	9 E-4	I-134	2 E-5
Co-58	9 E-5	Mo-99	4 E-5	I-135	4 E-6
Co-60	3 E-5	TC-99m	3 E-3	Cs-134	9 E-6
Ni-65	1 E-4	Tc-101	None	Cs-136	6 E-5
Cu-64	2 E-4	Ru-103	8 E-5	Cs-137	2 E-5
Zn-65	1 E-4	Ru-105	1 E-4	Cs-138	None
Zn-69	2 E-3	Ru-106	1 E-5	Ba-139	None
Br-82	4 E-5	Ag-110m	3 E-5	Ba-140	2 E-5
Br-83	3 E-6	Sn-113	8 E-5	Ba-141	None
Br-84	None[2]	In-113m	1 E-3	Ba-142	None
Br-85	None	Sb-122	3 E-5	La-140	2 E-5
Rb-86	2 E-5	Sb-124	2 E-5	La-142	None
Rb-88	None	Sb-125	1 E-4	Ce-141	9 E-5
Rb-89	None	Te-125M	1 E-4	Ce-143	4 E-5
Sr-89	3 E-6	Te-127m	5 E-5	Ce-144	1 E-5
Sr-90	3 E-7	Te-127	2 E-4	Pr-144	None
Sr-91	5 E-5	Te-129m	2 E-5	W-187	6 E-5
Sr-92	6 E-5			Np-239	1 E-4

(1) If a nuclide is not listed, refer to 10 CFR 20, Appendix B, and use the most conservative insoluble/soluble MPC where they are given in Table II, Column 2.

(2) None-(As per 10 CFR 20, Appendix B) 'No MPC limit for any single radionuclide not listed above with decay mode other than apha emission or spontaneous fission and with radioactive half-life less than 2 hours'.

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - POTABLE WATER AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.83E-01	4.83E-01	4.83E-01	4.83E-01	4.83E-01	0.	4.83E-01
C----14	0.	0.	0.	0.	0.	0.	0.	0.
F----18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	6.18E-01	6.18E-01	6.18E-01	6.18E-01	6.18E-01	6.18E-01	0.	6.18E-01
P----32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	6.91E-03	2.55E-03	1.54E-02	2.91E+00	0.	1.16E-02
MN--54	0.	2.09E+01	0.	6.23E+00	0.	6.41E+01	0.	3.99E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.93E+01	4.53E+01	0.	0.	1.27E+01	1.51E+02	0.	1.74E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	3.35E+00	0.	0.	0.	6.80E+01	0.	7.52E+00
CO--60	0.	9.84E+00	0.	0.	0.	1.85E+02	0.	2.17E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.21E+01	7.04E+01	0.	4.71E+01	0.	4.44E+01	0.	3.18E+01
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.37E+03	0.	0.	0.	0.	2.20E+02	0.	3.94E+01
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.77E+04	0.	0.	0.	0.	1.22E+03	0.	4.74E+03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.36E-01	4.49E-02	0.	6.94E-02	0.	1.43E+02	0.	3.30E-02
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	6.11E-04	1.11E+01	0.	2.52E+01	8.46E-04	2.68E+01	0.	2.14E+00
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	7.32E-01	6.77E-01	0.	1.33E+00	0.	2.76E+02	0.	4.32E-01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.26E+01	2.37E-01	3.05E-02	0.	9.78E+00	3.57E+02	0.	4.98E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-2
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - POTABLE WATER — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.57E+21	2.25E+01	7.37E+03	3.85E+01	0.	5.93E+00	0.	1.29E+01
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.05E+00	1.84E+00	2.70E+02	3.20E+00	0.	1.65E+00	0.	5.39E-01
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	6.38E-03	1.67E-02	1.10E+00	2.68E-02	5.45E-09	1.89E-02	0.	6.16E-03
CS-134	2.86E+02	6.80E+02	0.	2.20E+02	7.31E+01	1.19E+01	0.	5.56E+02
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	3.67E+02	5.02E+02	0.	1.70E+02	5.66E+01	9.71E+00	0.	3.29E+02
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	8.25E+01	1.07E-01	0.	3.53E-02	5.94E-02	4.13E+02	0.	5.41E+00
BA-141	4.10E-02	2.79E-02	0.	1.29E-02	0.	1.06E+02	0.	3.15E-03
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	2.23E+00	9.34E-01	0.	5.54E-01	0.	7.55E+02	0.	1.20E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	3.23E-03	3.27E-04	0.	9.04E-04	0.	5.62E+01	0.	1.63E-04
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-2
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.52E-02	4.52E-02	4.52E-02	4.52E-02	4.52E-02	0.	4.52E-02
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.26E-03	1.26E-03	1.26E-03	1.26E-03	1.26E-03	1.26E-03	0.	1.26E-03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.19E-01	4.38E-02	2.64E-01	5.00E+01	0.	1.99E-01
MN--54	0.	8.57E+02	0.	2.55E+02	0.	2.63E+03	0.	1.64E+02
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.78E+02	4.19E+02	0.	0.	1.17E+02	1.40E+03	0.	1.61E+02
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.62E+01	0.	0.	0.	3.28E+02	0.	3.63E+01
CO--60	0.	5.11E+01	0.	0.	0.	9.60E+02	0.	1.13E+02
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	4.51E+03	1.44E+04	0.	9.60E+03	0.	9.04E+03	0.	6.49E+03
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	3.86E+03	0.	0.	0.	0.	6.19E+02	0.	1.11E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	5.52E+04	0.	0.	0.	0.	4.29E+03	0.	1.48E+04
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.52E+01	4.44E+00	0.	4.35E+00	0.	5.11E+04	0.	4.54E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.37E-04	1.66E+00	0.	3.78E+00	1.90E-04	4.09E+00	0.	3.21E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.72E-01	1.59E-01	0.	3.12E-01	0.	6.48E+01	0.	9.43E-02
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.20E+00	2.26E-02	2.90E-03	0.	9.32E-01	3.40E+01	0.	4.74E-01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-2
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.25E+01	1.81E+01	5.92E+03	3.10E+01	0.	4.77E+00	0.	1.04E+01
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	3.57E-03	6.21E-03	9.12E-01	1.08E-02	0.	5.58E-03	0.	1.89E-03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.12E-05	1.03E-05	6.46E-09	3.90E-06	1.17E-06	2.41E-07	0.	4.58E-06
CS-134	5.91E+04	1.41E+05	0.	4.55E+04	1.51E+04	2.46E+03	0.	1.15E+05
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	7.64E+04	1.05E+05	0.	3.55E+04	1.18E+04	2.02E+03	0.	6.84E+04
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.25E+01	3.82E-02	0.	9.67E-03	1.63E-02	7.69E+02	0.	1.48E+00
BA-141	3.63E-03	2.45E-03	0.	1.14E-03	0.	9.37E+00	0.	2.78E-04
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	2.28E-01	9.56E-02	0.	5.67E-02	0.	7.72E+01	0.	1.23E-02
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	6.07E-04	6.64E-05	0.	1.26E-04	0.	6.03E+00	0.	2.43E-05
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
-----3	0.	0.	0.	0.	0.	0.	0.	0.
---14	0.	0.	0.	0.	0.	0.	0.	0.
---18	0.	0.	0.	0.	0.	0.	0.	0.
A--24	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.93E-02	1.66E-02
---32	0.	0.	0.	0.	0.	0.	0.	0.
---51	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.30E-03	8.30E-03	9.81E-03	8.30E-03
V--54	2.48E+00	2.48E+00	2.48E+00	2.48E+00	2.48E+00	2.48E+00	2.91E+00	2.48E+00
--56	0.	0.	0.	0.	0.	0.	0.	0.
--55	0.	0.	0.	0.	0.	0.	0.	0.
--59	4.87E-01	4.87E-01	4.87E-01	4.87E-01	4.87E-01	4.87E-01	5.72E-01	4.87E-01
--57	0.	0.	0.	0.	0.	0.	0.	0.
--58	6.77E-01	6.77E-01	6.77E-01	6.77E-01	6.77E-01	6.77E-01	7.94E-01	6.77E-01
--60	3.86E+01	3.86E+01	3.86E+01	3.86E+01	3.86E+01	3.86E+01	4.54E+01	3.86E+01
--63	0.	0.	0.	0.	0.	0.	0.	0.
--65	0.	0.	0.	0.	0.	0.	0.	0.
U--64	0.	0.	0.	0.	0.	0.	0.	0.
--65	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.34E+00	1.54E+00	1.34E+00
N--69	0.	0.	0.	0.	0.	0.	0.	0.
--82	0.	0.	0.	0.	0.	0.	0.	0.
R--83	0.	0.	0.	0.	0.	0.	0.	0.
--84	0.	0.	0.	0.	0.	0.	0.	0.
--85	0.	0.	0.	0.	0.	0.	0.	0.
--86	0.	0.	0.	0.	0.	0.	0.	0.
--88	0.	0.	0.	0.	0.	0.	0.	0.
H--89	3.86E-05	3.86E-05	3.86E-05	3.86E-05	3.86E-05	3.86E-05	4.48E-05	3.86E-05
R-83M	0.	0.	0.	0.	0.	0.	0.	0.
R--89	0.	0.	0.	0.	0.	0.	1.13E-02	9.60E-03
R--90	9.60E-03	9.60E-03	9.60E-03	9.60E-03	9.60E-03	9.60E-03	0.	0.
R--91	0.	0.	0.	0.	0.	0.	0.	0.
R--92	0.	0.	0.	0.	0.	0.	0.	0.
--90	0.	0.	0.	0.	0.	0.	0.	0.
--91M	0.	0.	0.	0.	0.	0.	0.	0.
--91	0.	0.	0.	0.	0.	0.	0.	0.
--92	0.	0.	0.	0.	0.	0.	0.	0.
--93	0.	0.	0.	0.	0.	0.	0.	0.
--95	9.63E-01	9.63E-01	9.63E-01	9.63E-01	9.63E-01	9.63E-01	9.54E-01	9.63E-01
R--97	0.	0.	0.	0.	0.	0.	0.	0.
--95	0.	0.	0.	0.	0.	0.	0.	0.
--97	0.	0.	0.	0.	0.	0.	0.	0.
--99	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.11E-02	1.05E-02	1.11E-02
--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
U-103	0.	0.	0.	0.	0.	0.	0.	0.
U-105	0.	0.	0.	0.	0.	0.	0.	0.
U-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	6.21E+00	6.21E+00	6.21E+00	6.21E+00	6.21E+00	6.21E+00	7.25E+00	6.21E+00
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.07E+00	1.23E+00	1.07E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	3.02E-02	3.02E-02	3.02E-02	3.02E-02	3.02E-02	3.02E-02	3.67E-02	3.02E-02
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	3.68E-03	3.68E-03	3.68E-03	3.68E-03	3.68E-03	3.68E-03	4.47E-03	3.68E-03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	2.97E-03	2.97E-03	2.97E-03	2.97E-03	2.97E-03	2.97E-03	2.54E-03	2.97E-03
CS-134	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.23E+01	1.44E+01	1.23E+01
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	2.16E+01	1.85E+01
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	3.34E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01	3.34E-01	3.85E-01	3.34E-01
BA-141	2.44E-02	2.44E-02	2.44E-02	2.44E-02	2.44E-02	2.44E-02	2.75E-02	2.44E-02
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.02E-01	2.33E-01	2.02E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	2.86E-03	2.86E-03	2.86E-03	2.86E-03	2.86E-03	2.86E-03	3.31E-03	2.86E-03
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C----14	0.	0.	0.	0.	0.	0.	0.	0.
F----18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	0.	1.78E+01
P----32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	0.	1.19E-01
MN--54	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	0.	5.02E+00
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	0.	4.11E+00
CO--60	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	0.	1.05E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	0.	2.51E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	0.	1.05E-02
SR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	0.	1.23E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	0.	1.12E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	0.	8.22E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

AGE GROUP - ADULT

PATHWAY - SWIMMING

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	0.	1.78E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	0.	2.19E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	0.	6.62E+00
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	0.	2.28E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	0.	1.12E+00
BA-141	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	0.	2.97E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	0.	1.96E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
AT-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---19	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	0.	3.83E+01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	0.	2.55E-01
MN--54	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	0.	1.08E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	0.	8.84E+00
CO--60	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	0.	2.26E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	0.	5.40E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	0.	2.26E-02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	0.	2.65E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	0.	2.41E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	0.	1.77E+01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
-129M	0.	0.	0.	0.	0.	0.	0.	0.
-129	0.	0.	0.	0.	0.	0.	0.	0.
-131M	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	0.	3.83E+00
-131	0.	0.	0.	0.	0.	0.	0.	0.
-132	0.	0.	0.	0.	0.	0.	0.	0.
-129	0.	0.	0.	0.	0.	0.	0.	0.
-130	0.	0.	0.	0.	0.	0.	0.	0.
-131	0.	0.	0.	0.	0.	0.	0.	0.
-132	0.	0.	0.	0.	0.	0.	0.	0.
-133	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	0.	4.71E+00
-134	0.	0.	0.	0.	0.	0.	0.	0.
-135	0.	0.	0.	0.	0.	0.	0.	0.
-134	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	0.	1.42E+01
-135	0.	0.	0.	0.	0.	0.	0.	0.
135M	0.	0.	0.	0.	0.	0.	0.	0.
-135	0.	0.	0.	0.	0.	0.	0.	0.
133M	0.	0.	0.	0.	0.	0.	0.	0.
-133	0.	0.	0.	0.	0.	0.	0.	0.
131M	0.	0.	0.	0.	0.	0.	0.	0.
-136	0.	0.	0.	0.	0.	0.	0.	0.
-137	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	0.	4.91E+00
-138	0.	0.	0.	0.	0.	0.	0.	0.
137M	0.	0.	0.	0.	0.	0.	0.	0.
136M	0.	0.	0.	0.	0.	0.	0.	0.
-139	0.	0.	0.	0.	0.	0.	0.	0.
-140	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	0.	2.41E+00
-141	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	0.	6.38E-01
-142	0.	0.	0.	0.	0.	0.	0.	0.
-140	0.	0.	0.	0.	0.	0.	0.	0.
-142	0.	0.	0.	0.	0.	0.	0.	0.
-141	0.	0.	0.	0.	0.	0.	0.	0.
-143	0.	0.	0.	0.	0.	0.	0.	0.
-144	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	0.	4.22E-01
-143	0.	0.	0.	0.	0.	0.	0.	0.
-144	0.	0.	0.	0.	0.	0.	0.	0.
144M	0.	0.	0.	0.	0.	0.	0.	0.
-144	0.	0.	0.	0.	0.	0.	0.	0.
-147	0.	0.	0.	0.	0.	0.	0.	0.
-147	0.	0.	0.	0.	0.	0.	0.	0.
-239	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
-239	0.	0.	0.	0.	0.	0.	0.	0.
-235	0.	0.	0.	0.	0.	0.	0.	0.
-231	0.	0.	0.	0.	0.	0.	0.	0.
-227	0.	0.	0.	0.	0.	0.	0.	0.
-227	0.	0.	0.	0.	0.	0.	0.	0.
-223	0.	0.	0.	0.	0.	0.	0.	0.
-231	0.	0.	0.	0.	0.	0.	0.	0.
-223	0.	0.	0.	0.	0.	0.	0.	0.
-219	0.	0.	0.	0.	0.	0.	0.	0.
-219	0.	0.	0.	0.	0.	0.	0.	0.
-215	0.	0.	0.	0.	0.	0.	0.	0.
-215	0.	0.	0.	0.	0.	0.	0.	0.
-211	0.	0.	0.	0.	0.	0.	0.	0.
-211	0.	0.	0.	0.	0.	0.	0.	0.
-211	0.	0.	0.	0.	0.	0.	0.	0.
-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

AGE GROUP - TEENAGER

PATHWAY - POTABLE WATER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.43E-01	3.43E-01	3.43E-01	3.43E-01	3.43E-01	0.	3.43E-01
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	5.88E-01	5.88E-01	5.88E-01	5.88E-01	5.88E-01	5.88E-01	0.	5.88E-01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	6.11E-03	2.41E-03	1.57E-02	1.85E+00	0.	1.10E-02
MN--54	0.	1.90E+01	0.	5.67E+00	0.	3.90E+01	0.	3.77E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.83E+01	4.28E+01	0.	0.	1.35E+01	1.01E+02	0.	1.65E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	3.08E+00	0.	0.	0.	4.24E+01	0.	7.09E+00
CO--60	0.	9.08E+00	0.	0.	0.	1.18E+02	0.	2.05E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.85E+01	6.43E+01	0.	4.11E+01	0.	2.72E+01	0.	3.03E+01
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	1.64E+02	0.	3.95E+01
RB--89	1.38E+03	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	9.18E+02	0.	3.88E+03
SR--90	1.45E+04	0.	0.	0.	0.	0.	0.	0.
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	4.74E+01	0.	2.46E+02
ZR--95	1.31E-01	4.16E-02	0.	6.09E-02	0.	0.	0.	0.
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	0.	0.	0.	2.51E+01	8.94E-04	2.07E+01	0.	2.11E+03
TC--99	5.77E-04	1.10E+01	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	6.59E-01	6.24E-01	0.	1.18E+00	0.	1.75E+02	0.	3.79E-01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.22E+01	2.25E-01	2.77E-02	0.	1.07E+01	2.46E+02	0.	4.76E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - POTABLE WATER

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.55E+01	2.18E+01	6.35E+03	3.74E+01	0.	4.30E+00	0.	1.17E+01
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.05E+00	1.78E+00	2.49E+02	3.12E+00	0.	1.35E+00	0.	5.43E-01
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	6.17E-03	1.59E-02	1.02E+00	2.51E-02	6.51E-09	1.76E-02	0.	5.89E-03
CS-134	2.70E+02	6.36E+02	0.	2.02E+02	7.72E+01	7.91E+00	0.	2.95E+02
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS136M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	3.62E+02	4.82E+02	0.	1.64E+02	6.37E+01	6.96E+00	0.	1.68E+02
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	8.12E+01	1.03E-01	0.	3.37E-02	6.69E-02	3.06E+02	0.	5.23E+01
BA-141	0.10E-02	2.74E-02	0.	1.29E-02	0.	7.83E+01	0.	3.14E-03
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	2.24E+00	9.27E-01	0.	5.53E-01	0.	5.63E+02	0.	1.23E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	3.23E-03	3.12E-04	0.	8.93E-04	0.	4.39E+01	0.	1.61E-04
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
AM-235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.					

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.48E-02	3.48E-02	3.48E-02	3.48E-02	3.48E-02	0.	3.48E-02
C----14	0.	0.	0.	0.	0.	0.	0.	0.
F----18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	1.30E-03	0.	1.30E-03
P----32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.14E-01	4.49E-02	2.92E-01	3.44E+01	0.	2.05E-01
MN--54	0.	8.43E+02	0.	2.52E+02	0.	1.73E+03	0.	1.67E+02
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.84E+02	4.28E+02	0.	0.	1.35E+02	1.01E+03	0.	1.65E+02
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.61E+01	0.	0.	0.	2.22E+02	0.	3.71E+01
CO--60	0.	5.11E+01	0.	0.	0.	6.66E+02	0.	1.15E+02
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	4.09E+03	1.42E+04	0.	9.09E+03	0.	6.02E+03	0.	6.63E+03
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	4.20E+03	0.	0.	0.	0.	5.01E+02	0.	1.20E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	4.91E+04	0.	0.	0.	0.	3.51E+03	0.	1.31E+04
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.53E+01	8.47E+00	0.	8.22E+00	0.	3.62E+04	0.	4.67E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.40E-04	1.77E+00	0.	4.07E+00	2.17E-04	3.44E+00	0.	3.43E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG113M	1.68E-01	1.59E-01	0.	3.02E-01	0.	4.46E+01	0.	9.65E-02
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.25E+00	2.32E-02	2.86E-03	0.	1.10E+00	2.54E+01	0.	4.92E-01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	6.35E+01	1.93E+01	5.53E+03	3.26E+01	0.	3.75E+00	0.	1.02E+01
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	3.85E-03	6.53E-03	9.11E-01	1.15E-02	0.	4.94E-03	0.	1.99E-03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.21E-05	1.11E-05	6.50E-05	4.25E-06	1.54E-06	1.95E-07	0.	2.60E-06
CS-134	6.06E+04	1.43E+05	0.	4.53E+04	1.73E+04	1.77E+03	0.	6.62E+04
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	8.18E+04	1.09E+05	0.	3.70E+04	1.44E+04	1.55E+03	0.	3.79E+04
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.41E+01	3.98E-02	0.	1.00E-02	1.99E-02	6.21E+02	0.	1.56E+00
BA-141	3.93E-03	2.62E-03	0.	1.23E-03	0.	7.50E+00	0.	3.01E-04
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	2.48E-01	1.03E-01	0.	6.14E-02	0.	6.24E+01	0.	1.33E-02
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.84E-04	6.19E-05	0.	1.27E-04	0.	5.11E+00	0.	2.41E-05
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE B-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	3.33E-02	3.33E-02	3.33E-02	3.33E-02	3.33E-02	3.33E-02	3.86E-02	3.33E-02
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.96E-02	1.66E-02
MN--54	4.96E+00	4.96E+00	4.96E+00	4.96E+00	4.96E+00	4.96E+00	5.81E+00	4.96E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	1.15E+00	9.74E-01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.59E+00	1.36E+00
CO--60	7.72E+01	7.72E+01	7.72E+01	7.72E+01	7.72E+01	7.72E+01	9.08E+01	7.72E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.67E+00	2.67E+00	2.67E+00	2.67E+00	2.67E+00	2.67E+00	3.07E+00	2.67E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	7.72E-05	7.72E-05	7.72E-05	7.72E-05	7.72E-05	7.72E-05	8.97E-05	7.72E-05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.92E-02	1.92E-02	1.92E-02	1.92E-02	1.92E-02	1.92E-02	2.27E-02	1.92E-02
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.90E+00	1.93E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.10E-02	2.23E-02
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.45E+01	1.24E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	2.14E+00	2.14E+00	2.14E+00	2.14E+00	2.14E+00	2.14E+00	2.47E+00	2.14E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	6.05E-02	6.05E-02	6.05E-02	6.05E-02	6.05E-02	6.05E-02	7.34E-02	6.05E-02
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	7.36E-03	7.36E-03	7.36E-03	7.36E-03	7.36E-03	7.36E-03	8.95E-03	7.36E-03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.09E-03	5.93E-03
CS-134	2.46E+01	2.46E+01	2.46E+01	2.46E+01	2.46E+01	2.46E+01	2.97E+01	2.46E+01
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	3.69E+01	3.69E+01	3.69E+01	3.69E+01	3.69E+01	3.69E+01	4.31E+01	3.69E+01
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.08E-01	6.68E-01
BA-141	4.87E-02	4.87E-02	4.87E-02	4.87E-02	4.87E-02	4.87E-02	5.49E-02	4.87E-02
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	4.05E-01	4.05E-01	4.05E-01	4.05E-01	4.05E-01	4.05E-01	4.67E-01	4.05E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.72E-03	5.72E-03	5.72E-03	5.72E-03	5.72E-03	5.72E-03	6.62E-03	5.72E-03
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE B-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	0.	1.78E+01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	0.	1.19E-01
MN--54	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	0.	5.02E+00
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	0.	4.11E+00
CO--60	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	0.	1.05E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	0.	2.51E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	0.	1.05E-02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	0.	1.23E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	0.	1.12E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	0.	8.22E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

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ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	0.	1.78E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	0.	2.19E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	0.	6.62E+00
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	0.	2.28E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	0.	1.12E+00
BA-141	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	0.	2.97E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	0.	1.96E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	0.	3.83E+01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	0.	2.55E-01
MN--54	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	0.	1.08E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	0.	8.84E+00
CO--60	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	0.	2.26E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	0.	5.40E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	0.	2.26E-02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	0.	2.65E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG113M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	0.	2.41E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	0.	1.77E+01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	0.	3.83E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	0.	4.71E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	0.	1.42E+01
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	0.	4.91E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	0.	2.41E+00
BA-141	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	0.	6.38E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	0.	4.22E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
RT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
PI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - POTABLE WATER — AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.57E-01	6.57E-01	6.57E-01	6.57E-01	6.57E-01	0.	6.57E-01
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	1.48E+00	0.	1.48E+00
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.51E-02	4.12E-03	2.76E-02	1.44E+00	0.	2.72E-02
MN--54	0.	3.44E+01	0.	9.66E+00	0.	2.89E+01	0.	9.17E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	5.15E+01	8.34E+01	0.	0.	2.42E+01	8.68E+01	0.	4.15E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	5.69E+00	0.	0.	0.	3.32E+01	0.	1.74E+01
CO--60	0.	1.71E+01	0.	0.	0.	9.47E+01	0.	5.04E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	4.40E+01	1.17E+02	0.	7.39E+01	0.	2.06E+01	0.	7.30E+01
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	4.14E+03	0.	0.	0.	0.	1.60E+02	0.	1.18E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	3.66E+04	0.	0.	0.	0.	9.11E+02	0.	9.80E+03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	3.69E-01	8.17E-02	0.	1.15E-01	0.	8.63E+01	0.	7.25E-02
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.61E-03	2.42E+01	0.	5.16E+01	1.60E-03	2.18E+01	0.	6.08E+03
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.73E+00	1.17E+00	0.	2.18E+00	0.	1.39E+02	0.	9.36E-01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	3.58E+01	4.54E-01	7.72E-02	0.	1.94E+01	2.19E+02	0.	1.23E+01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

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ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

AGE GROUP - CHILD

PATHWAY - POTABLE WATER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
*E129M	0.	0.	0.	0.	0.	0.	0.	0.
*E-129	0.	0.	0.	0.	0.	0.	0.	0.
*E131M	4.57E+01	4.59E+01	1.52E+04	7.54E+01	0.	4.09E+00	0.	2.61E+01
*E-131	0.	0.	0.	0.	0.	0.	0.	0.
*E-132	0.	0.	0.	0.	0.	0.	0.	0.
*--129	0.	0.	0.	0.	0.	0.	0.	0.
*--130	0.	0.	0.	0.	0.	0.	0.	0.
*--131	0.	0.	0.	0.	0.	0.	0.	0.
*--132	0.	0.	0.	0.	0.	0.	0.	0.
*--133	3.09E+00	3.82E+00	7.10E+02	6.37E+00	0.	1.54E+00	0.	1.45E+01
*--134	0.	0.	0.	0.	0.	0.	0.	0.
*--135	1.77E-02	3.19E-02	2.82E+00	4.89E-02	1.28E-08	2.43E-02	0.	1.51E-02
S-134	7.55E+02	1.24E+03	0.	3.84E+02	1.38E+02	6.68E+00	0.	2.62E+02
S-135	0.	0.	0.	0.	0.	0.	0.	0.
*E135M	0.	0.	0.	0.	0.	0.	0.	0.
*E-135	0.	0.	0.	0.	0.	0.	0.	0.
*E133M	0.	0.	0.	0.	0.	0.	0.	0.
*E-133	0.	0.	0.	0.	0.	0.	0.	0.
*E131M	0.	0.	0.	0.	0.	0.	0.	0.
S-136	0.	0.	0.	0.	0.	0.	0.	0.
*S-137	1.06E+03	1.01E+03	0.	3.30E+02	1.19E+02	6.34E+00	0.	1.49E+02
*S-138	0.	0.	0.	0.	0.	0.	0.	0.
A137M	0.	0.	0.	0.	0.	0.	0.	0.
A136M	0.	0.	0.	0.	0.	0.	0.	0.
A-139	0.	0.	0.	0.	0.	0.	0.	0.
A-140	2.37E+02	2.15E-01	0.	6.77E-02	1.24E-01	3.01E+02	0.	1.39E+01
A-141	1.22E-01	6.10E-02	0.	2.67E-02	0.	7.61E+01	0.	9.06E-03
A-142	0.	0.	0.	0.	0.	0.	0.	0.
A-140	0.	0.	0.	0.	0.	0.	0.	0.
A-142	0.	0.	0.	0.	0.	0.	0.	0.
E-141	0.	0.	0.	0.	0.	0.	0.	0.
E-143	0.	0.	0.	0.	0.	0.	0.	0.
E-144	6.69E+00	2.10E+00	0.	1.16E+00	0.	5.47E+02	0.	3.57E-01
R-143	0.	0.	0.	0.	0.	0.	0.	0.
R-144	0.	0.	0.	0.	0.	0.	0.	0.
RH144M	0.	0.	0.	0.	0.	0.	0.	0.
RH-144	0.	0.	0.	0.	0.	0.	0.	0.
RH-147	0.	0.	0.	0.	0.	0.	0.	0.
*--147	0.	0.	0.	0.	0.	0.	0.	0.
P-239	9.19E-03	6.79E-04	0.	1.84E-03	0.	4.59E+01	0.	4.50E-04
*U-239	0.	0.	0.	0.	0.	0.	0.	0.
*--235	0.	0.	0.	0.	0.	0.	0.	0.
A-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
*H-227	0.	0.	0.	0.	0.	0.	0.	0.
A-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
A-223	0.	0.	0.	0.	0.	0.	0.	0.
T-219	0.	0.	0.	0.	0.	0.	0.	0.
N-219	0.	0.	0.	0.	0.	0.	0.	0.
I-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
B-211	0.	0.	0.	0.	0.	0.	0.	0.
I-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
*L-207	0.	0.	0.	0.	0.	0.	0.	0.

*BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE E-5
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.87E-02	2.87E-02	2.87E-02	2.87E-02	2.87E-02	0.	2.87E-02
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.42E-03	1.42E-03	1.42E-03	1.42E-03	1.42E-03	1.42E-03	0.	1.42E-03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.21E-01	3.31E-02	2.21E-01	1.15E+01	0.	2.18E-01
MN--54	0.	6.59E+02	0.	1.85E+02	0.	5.53E+02	0.	1.76E+02
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	2.23E+02	3.60E+02	0.	0.	1.04E+02	3.75E+02	0.	1.79E+02
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.29E+01	0.	0.	0.	7.50E+01	0.	3.94E+01
CO--60	0.	4.15E+01	0.	0.	0.	2.30E+02	0.	1.22E+02
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	4.20E+03	1.12E+04	0.	7.04E+03	0.	1.96E+03	0.	6.95E+03
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	5.44E+03	0.	0.	0.	0.	2.11E+02	0.	1.55E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	5.34E+04	0.	0.	0.	0.	1.51E+03	0.	1.43E+04
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.81E+01	7.02E+00	0.	6.61E+00	0.	1.30E+04	0.	5.02E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.68E-04	1.69E+00	0.	3.60E+00	1.67E-04	1.59E+00	0.	4.22E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.90E-01	1.28E-01	0.	2.39E-01	0.	1.53E+01	0.	1.03E-01
AG-111	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.56E+00	2.02E-02	3.44E-03	0.	8.65E-01	9.74E+00	0.	5.46E-01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.72E+01	1.73E+01	5.71E+03	2.83E+01	0.	1.54E+00	0.	9.81E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	4.69E-03	6.84E-03	1.12E+00	1.01E-02	0.	2.44E-03	0.	2.29E-03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.55E-05	1.99E-05	7.74E-09	3.84E-06	1.28E-06	8.16E-08	0.	1.12E-06
CS-134	7.31E+04	1.20E+05	0.	3.72E+04	1.33E+04	6.46E+02	0.	2.53E+04
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	1.03E+05	9.86E+04	0.	3.21E+04	1.16E+04	6.17E+02	0.	1.46E+04
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	3.05E+01	3.58E-02	0.	8.69E-03	1.59E-02	2.67E+00	0.	1.78E+00
BA-141	5.05E-03	2.52E-03	0.	1.11E-03	0.	3.14E+00	0.	3.74E-04
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	3.20E-01	1.00E-01	0.	5.56E-02	0.	2.64E+01	0.	1.71E-02
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	6.13E-04	5.04E-05	0.	1.07E-04	0.	2.36E+00	0.	2.65E-05
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	3.33E-02	3.33E-02	3.33E-02	3.33E-02	3.33E-02	3.33E-02	3.96E-02	3.33E-02
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.66E-02	1.96E-02	1.66E-02
MN--54	4.96E+00	4.96E+00	4.96E+00	4.96E+00	4.96E+00	4.96E+00	5.81E+00	4.96E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	9.74E-01	1.15E+00	9.74E-01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.36E+00	1.59E+00	1.36E+00
CO--60	7.72E+01	7.72E+01	7.72E+01	7.72E+01	7.72E+01	7.72E+01	9.08E+01	7.72E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.67E+00	2.67E+00	2.67E+00	2.67E+00	2.67E+00	2.67E+00	3.07E+00	2.67E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	7.72E-05	7.72E-05	7.72E-05	7.72E-05	7.72E-05	7.72E-05	8.97E-05	7.72E-05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.92E-02	1.92E-02	1.92E-02	1.92E-02	1.92E-02	1.92E-02	2.27E-02	1.92E-02
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.93E+00	1.90E+00	1.93E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.23E-02	2.10E-02	2.23E-02
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.24E+01	1.45E+01	1.24E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	2.14E+00	2.14E+00	2.14E+00	2.14E+00	2.14E+00	2.14E+00	2.47E+00	2.14E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

AGE GROUP = CHILD

PATHWAY = LAKE SHORELINE DEPOSITS

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	6.05E-02	6.05E-02	6.05E-02	6.05E-02	6.05E-02	6.05E-02	7.34E-02	6.35E-02
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	7.36E-03	7.36E-03	7.36E-03	7.36E-03	7.36E-03	7.36E-03	8.95E-03	7.36E-03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.93E-03	5.09E-03	5.93E-03
CS-134	2.46E+01	2.46E+01	2.46E+01	2.46E+01	2.46E+01	2.46E+01	2.87E+01	2.46E+01
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	3.69E+01	3.69E+01	3.69E+01	3.69E+01	3.69E+01	3.69E+01	4.31E+01	3.69E+01
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.68E-01	6.08E-01	6.68E-01
BA-141	4.87E-02	4.87E-02	4.87E-02	4.87E-02	4.87E-02	4.87E-02	5.49E-02	4.87E-02
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	4.05E-01	4.05E-01	4.05E-01	4.05E-01	4.05E-01	4.05E-01	4.67E-01	4.05E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.72E-03	5.72E-03	5.72E-03	5.72E-03	5.72E-03	5.72E-03	6.60E-03	5.72E-03
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CFSEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C----14	0.	0.	0.	0.	0.	0.	0.	0.
F----18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	0.	1.78E+01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	0.	1.19E-01
MN--54	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	0.	5.02E+00
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	0.	4.11E+00
CO--60	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	0.	1.05E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	0.	2.51E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	0.	1.05E-02
SR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	0.	1.23E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	0.	1.12E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	0.	8.22E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	0.	1.78E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	0.	2.19E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	0.	6.62E+00
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	0.	2.28E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	0.	1.12E+00
BA-141	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	0.	2.97E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	0.	1.96E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	0.	3.83E+01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	0.	2.55E-01
MN--54	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	0.	1.08E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	0.	8.84E+00
CO--60	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	0.	2.26E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	0.	5.40E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	0.	2.26E-02
SR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	0.	2.65E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	0.	2.41E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	0.	1.77E+01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	0.	3.83E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	0.	4.71E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	0.	1.42E+01
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	0.	4.91E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	0.	2.41E+00
BA-141	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	0.	6.38E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	0.	4.22E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - POTABLE WATER AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	0.	0.	0.	0.	0.	0.	0.	0.
P--32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	0.	0.	0.	0.	0.	0.	0.	0.
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	0.	0.	0.	0.	0.	0.	0.
CO--60	0.	0.	0.	0.	0.	0.	0.	0.
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	0.	0.	0.	0.	0.	0.	0.	0.
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	0.	0.	0.	0.	0.	0.	0.	0.
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.
AG-111	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	0.	0.	0.	0.	0.	0.	0.	0.
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

AGE GROUP - INFANT

PATHWAY - POTABLE WATER

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	0.	0.	0.	0.	0.	0.	0.	0.
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	0.	0.	0.	0.	0.	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	0.	0.	0.	0.	0.	0.	0.	0.
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA-141	0.	0.	0.	0.	0.	0.	0.	0.
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	0.	0.	0.	0.	0.	0.	0.	0.
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	0.	0.	0.	0.	0.	0.	0.	0.
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	0.	0.	0.	0.	0.	0.	0.
CO--60	0.	0.	0.	0.	0.	0.	0.	0.
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	0.	0.	0.	0.	0.	0.	0.	0.
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
RB--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	0.	0.	0.	0.	0.	0.	0.	0.
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	0.	0.	0.	0.	0.	0.	0.	0.
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - FRESH WATER FISH

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	0.	0.	0.	0.	0.	0.	0.	0.
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	0.	0.	0.	0.	0.	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	0.	0.	0.	0.	0.	0.	0.	0.
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA-141	0.	0.	0.	0.	0.	0.	0.	0.
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	0.	0.	0.	0.	0.	0.	0.	0.
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS — AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	0.	0.	0.	0.	0.	0.	0.	0.
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	0.	0.	0.	0.	0.	0.	0.
CO--60	0.	0.	0.	0.	0.	0.	0.	0.
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	0.	0.	0.	0.	0.	0.	0.	0.
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	0.	0.	0.	0.	0.	0.	0.	0.
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	0.	0.	0.	0.	0.	0.	0.	0.
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - LAKE SHORELINE DEPOSITS

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	0.	0.	0.	0.	0.	0.	0.	0.
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	0.	0.	0.	0.	0.	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	0.	0.	0.	0.	0.	0.	0.	0.
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA-141	0.	0.	0.	0.	0.	0.	0.	0.
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	0.	0.	0.	0.	0.	0.	0.	0.
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F---18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	1.78E+01	0.	1.78E+01
P---32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	1.19E-01	0.	1.19E-01
MN--54	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	5.02E+00	0.	5.02E+00
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	4.11E+00	0.	4.11E+00
CO--60	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	1.05E+01	0.	1.05E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	2.51E+00	0.	2.51E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	1.05E-02	0.	1.05E-02
SR-89M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	1.23E-03	0.	1.23E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	3.43E+00	0.	3.43E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	1.12E+01	0.	1.12E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	8.22E+00	0.	8.22E+00
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - SWIMMING

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	1.78E+00	0.	1.78E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	2.19E+00	0.	2.19E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	6.62E+00	0.	6.62E+00
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	2.28E+00	0.	2.28E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	1.12E+00	0.	1.12E+00
BA-141	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	2.97E-01	0.	2.97E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	1.96E-01	0.	1.96E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	5.48E-01	0.	5.48E-01
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3
(con't)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BO
H----3	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
F--18	0.	0.	0.	0.	0.	0.	0.	0.
NA--24	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	3.83E+01	0.	3.83E+01
P--32	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	0.	2.55E-01
MN--54	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
MN--56	0.	0.	0.	0.	0.	0.	0.	0.
FE--55	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	1.08E+01	0.	1.08E+01
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	8.84E+00	0.	8.84E+00
CO--60	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	2.26E+01	0.	2.26E+01
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
NI--65	0.	0.	0.	0.	0.	0.	0.	0.
CU--64	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	5.40E+00	0.	5.40E+00
ZN--69	0.	0.	0.	0.	0.	0.	0.	0.
BR--82	0.	0.	0.	0.	0.	0.	0.	0.
BR--83	0.	0.	0.	0.	0.	0.	0.	0.
BR--84	0.	0.	0.	0.	0.	0.	0.	0.
BR--85	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	2.26E-02	0.	2.26E-02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	2.65E-03	0.	2.65E-03
SR--91	0.	0.	0.	0.	0.	0.	0.	0.
SR--92	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y--91M	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
Y---92	0.	0.	0.	0.	0.	0.	0.	0.
Y---93	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	7.36E+00	0.	7.36E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--97	0.	0.	0.	0.	0.	0.	0.	0.
MO--99	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
TC--99	0.	0.	0.	0.	0.	0.	0.	0.
TC-99M	0.	0.	0.	0.	0.	0.	0.	0.
TC-101	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-105	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
RH103M	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	2.41E+01	0.	2.41E+01
AG-110	0.	0.	0.	0.	0.	0.	0.	0.
SB-122	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	1.77E+01	0.	1.77E+01
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE-127	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTI

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE L-3

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS FOR LIQUID DISCHARGES

PATHWAY - BOATING

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTOR (MREM/HR PER UCI/ML)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
TE-129	0.	0.	0.	0.	0.	0.	0.	0.
TE131M	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	3.83E+00	0.	3.83E+00
TE-131	0.	0.	0.	0.	0.	0.	0.	0.
TE-132	0.	0.	0.	0.	0.	0.	0.	0.
I--129	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	4.71E+00	0.	4.71E+00
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	1.42E+01	0.	1.42E+01
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	4.91E+00	0.	4.91E+00
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-139	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	2.41E+00	0.	2.41E+00
BA-141	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	6.38E-01	0.	6.38E-01
BA-142	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
LA-142	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-143	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	4.22E-01	0.	4.22E-01
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
PR-144	0.	0.	0.	0.	0.	0.	0.	0.
PR144M	0.	0.	0.	0.	0.	0.	0.	0.
ND-144	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.
W--187	0.	0.	0.	0.	0.	0.	0.	0.
NP-239	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	1.18E+00	0.	1.18E+00
PU-239	0.	0.	0.	0.	0.	0.	0.	0.
U--235	0.	0.	0.	0.	0.	0.	0.	0.
PA-231	0.	0.	0.	0.	0.	0.	0.	0.
AC-227	0.	0.	0.	0.	0.	0.	0.	0.
TH-227	0.	0.	0.	0.	0.	0.	0.	0.
RA-223	0.	0.	0.	0.	0.	0.	0.	0.
TH-231	0.	0.	0.	0.	0.	0.	0.	0.
FR-223	0.	0.	0.	0.	0.	0.	0.	0.
AT-219	0.	0.	0.	0.	0.	0.	0.	0.
RN-219	0.	0.	0.	0.	0.	0.	0.	0.
BI-215	0.	0.	0.	0.	0.	0.	0.	0.
PO-215	0.	0.	0.	0.	0.	0.	0.	0.
PB-211	0.	0.	0.	0.	0.	0.	0.	0.
BI-211	0.	0.	0.	0.	0.	0.	0.	0.
PO-211	0.	0.	0.	0.	0.	0.	0.	0.
TL-207	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 CC/SEC WITH NO ADDITIONAL DILUTION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX B

GASEOUS DOSE CALCULATION DATA

TABLE G-1

Maximum Permissible Concentrations in Air in Unrestricted Areas (10 CFR 20 MPCs)

Nuclide[1]	MPC µCi/cc	Nuclide[1]	MPC µCi/cc
Ar-41	4 E-8	Y-91	1 E-9
Kr-83m	3 E-8	Zr-95	1 E-9
Kr-85m	1 E-7	Nb-95	3 E-9
Kr-85	3 E-7	Ru-103	3 E-9
Kr-87	2 E-8	Ru-106	2 E-10
Kr-88	2 E-8	Ag-110m	3 E-10
Kr-89	3 E-8	Sn-113	2 E-9
Kr-90	3 E-8	In-113m	2 E-7
Xe-131m	4 E-7	Sn-123	1 E-10
Xe-133m	3 E-7	Sn-126	1 E-10
Xe-133	3 E-7	Sb-124	7 E-10
Xe-135m	3 E-8	Sb-125	9 E-10
Xe-135	1 E-7	Te-125m	4 E-9
Xe-137	3 E-8	Te-127m	1 E-9
Xe-138	3 E-8	Te-129m	1 E-9
H-3	2 E-7	I-130	1 E-10
P-32	2 E-9	I-131	1 E-10
Cr-51	8 E-8	I-132	3 E-9
Mn-54	1 E-9	I-133	4 E-10
Fe-59	2 E-9	I-134	6 E-9
Co-57	6 E-9	I-135	1 E-9
Co-58	2 E-9	Cs-134	4 E-10
Co-60	3 E-10	Cs-136	6 E-9
Zn-65	2 E-9	Cs-137	5 E-10
Rb-86	2 E-9	Ba-140	1 E-9
Sr-89	3 E-10	La-140	4 E-9
Sr-90	3 E-11	Ce-141	5 E-9
Rb-88	3 E-8	Ce-144	2 E-10

(1) If a nuclide is not listed, refer to 10 CFR 20, Appendix B, and use the most conservative insoluble/soluble MPC where they are given in Table II, Column 1.

TABLE G-2

TRANSFER FACTORS FOR MAXIMUM DOSE TO A PERSON OFFSITE DUE TO RADIOACTIVE NOBLE GASES

Dose Transfer Factors

Radionuclide	GAMMA K_i mrem / uCi sec/m^3	BETA L_i mrem / uCi sec/m^3	GAMMA + BETA $(L + 1.1 M)_i$ mrem / uCi sec/m^3
Kr-83m	2.4E-9	--	6.7E-7
Kr-85m	3.7E-5	4.6E-5	8.9E-5
Kr-85	5.1E-7	4.2E-5	4.3E-5
Kr-87	1.9E-4	3.1E-4	5.3E-4
Kr-88	4.7E-4	7.5E-5	6.0E-4
Kr-89	5.3E-4	3.2E-4	9.3E-4
Kr-90	4.9E-4	2.3E-4	8.0E-4
Xe-131m	2.9E-6	1.5E-5	2.0E-5
Xe-133m	8.0E-6	3.1E-5	4.2E-5
Xe-133	9.3E-6	9.7E-6	2.2E-5
Xe-135m	9.9E-5	2.3E-5	1.4E-4
Xe-135	5.7E-5	5.9E-5	1.3E-4
Xe-137	4.5E-5	3.9E-4	4.4E-4
Xe-138	2.8E-4	1.3E-4	4.5E-4
Ar-41	2.8E-4	8.5E-5	4.0E-4

Ref: Regulatory Guide 1.109, Revision 1, Table B-1.

TABLE G-3

TRANSFER FACTORS FOR MAXIMUM OFFSITE AIR DOSE

Air Dose Transfer Factors

Radionuclide	GAMMA M_i mrad / uCi sec/m^3	BETA N_i mrad / uCi sec/m^3
Kr-83m	6.1E-7	9.1E-6
Kr-85m	3.9E-5	6.2E-5
Kr-85	5.4E-7	6.2E-5
Kr-87	2.0E-4	3.3E-4
Kr-88	4.8E-4	9.3E-5
Kr-89	5.5E-4	3.4E-4
Kr-90	5.2E-4	2.5E-4
Xe-131m	4.9E-6	3.5E-5
Xe-133m	1.0E-5	4.7E-5
Xe-133	1.1E-5	3.3E-5
Xe-135m	1.1E-4	2.3E-5
Xe-135	6.1E-5	7.8E-5
Xe-137	4.8E-5	4.0E-4
Xe-138	2.9E-4	1.5E-4
Ar-41	2.9E-4	1.0E-4

Ref: Regulatory Guide 1.109, Revision 1, Table B-1.

TABLE G-4

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS P(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION Instantaneous

AGE GROUP - INFANT + Children + Teenager + Adult

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.50E+04	1.30E+04
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	5.50E+06	4.66E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	3.20E+08	2.73E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	4.44E+08	3.79E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.53E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	8.58E+08	7.46E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.81E+04	1.51E+04
RB--97	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.56E+05	3.11E+05
SR--89	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.51E+04	2.16E+04
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.33E+08	5.38E+08
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE G-4

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS P(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION Instantaneous

AGE GROUP - INFANT + Children + Teenager + Adult

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	1.04E+07	8.60E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.48E+06	1.22E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	8.01E+09	6.86E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.70E+08	1.50E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
CS-138	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.62E+05	1.42E+05
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.71E+08	1.87E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1.00 X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE G-5

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS P(I) FOR GASEOUS DISCHARGE . 12

PATHWAY - INHALATION Instantaneous

AGE GROUP - INFANT + Children + Teenager + Adult

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.47E+02	6.47E+02	6.47E+02	6.47E+02	6.47E+02	0.	6.47E+02
N---13	1.98E+01	1.98E+01	1.98E+01	1.98E+01	1.98E+01	1.98E+01	0.	1.98E+01
C---14	2.65E+04	5.31E+03	5.31E+03	5.31E+03	5.31E+03	5.31E+03	0.	5.31E+03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	5.75E+01	1.32E+01	1.28E+04	3.57E+02	0.	8.94E+01
MN--54	0.	2.53E+04	0.	4.98E+03	1.00E+06	7.06E+03	0.	4.98E+03
FE--59	1.36E+04	2.35E+04	0.	0.	1.02E+06	2.48E+04	0.	9.48E+03
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.22E+03	0.	0.	7.77E+05	1.11E+04	0.	1.82E+03
CO--60	0.	8.02E+03	0.	0.	4.51E+06	3.19E+04	0.	1.18E+04
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.93E+04	6.26E+04	0.	3.25E+04	6.47E+05	5.14E+04	0.	3.11E+04
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	3.90E+01	0.	0.	0.	8.09E+00	0.	2.44E+01
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	2.52E+02	0.	0.	0.	1.53E+02	0.	1.30E+02
SR--89	3.98E+05	0.	0.	0.	2.03E+06	6.40E+04	0.	1.14E+04
SR--90	2.74E+07	0.	0.	0.	1.12E+07	1.31E+05	0.	1.83E+06
Y---90	9.62E+00	0.	0.	0.	7.86E+02	3.04E+02	0.	2.58E-01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.15E+05	2.79E+04	0.	3.11E+04	1.75E+06	2.17E+04	0.	2.03E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE G-5

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS P(I) FOR GASEOUS DISCHARGE . 12

PATHWAY - INHALATION Instantaneous

AGE GROUP - INFANT + Children + Teenager + Adult

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	3.79E+04	5.56E+02	1.01E+02	0.	2.65E+06	5.91E+04	0.	1.20E+04
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	3.79E+04	4.43E+04	1.48E+07	5.18E+04	0.	1.06E+03	0.	1.96E+04
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.31E+04	1.90E+04	3.52E+06	2.22E+04	0.	2.14E+03	0.	5.55E+03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	8.97E-07	8.64E-07	0.	2.57E-07	1.01E-07	2.17E-09	0.	4.72E-08
CS-134	3.96E+05	7.03E+05	0.	1.90E+05	7.97E+04	1.33E+03	0.	7.45E+04
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	4.83E+04	1.35E+05	0.	5.64E+04	1.18E+04	1.43E+03	0.	5.29E+04
CS-137	5.49E+05	6.12E+05	0.	1.72E+05	7.13E+04	1.33E+03	0.	4.55E+04
CS-138	1.03E+02	1.55E+02	0.	8.15E+01	1.30E+01	1.74E+02	0.	7.90E+01
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	5.60E+04	5.69E+01	0.	1.34E+01	1.60E+06	3.87E+04	0.	2.90E+03
CE-141	2.77E+04	1.67E+04	0.	5.25E+03	5.17E+05	2.16E+04	0.	1.99E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE G-6

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS P(I) FOR GASEOUS DISCHARGE - 12

PATHWAY - COWS MILK (CONTAMINATED FORAGE) Instantaneous

AGE GROUP - INFANT + Children + Teenager + Adult

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.35E+02	6.35E+02	6.35E+02	6.35E+02	6.35E+02	0.	6.35E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.61E+06	3.44E+05	3.44E+05	3.44E+05	3.44E+05	3.44E+05	0.	3.44E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	4.70E+04	1.03E+04	9.14E+04	2.10E+06	0.	7.20E+04
MN--54	0.	1.56E+07	0.	3.45E+06	0.	5.72E+06	0.	3.53E+06
FE--59	9.62E+07	1.68E+08	0.	0.	4.97E+07	8.03E+07	0.	6.62E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.01E+07	0.	0.	0.	2.51E+07	0.	2.52E+07
CO--60	0.	3.49E+07	0.	0.	0.	8.31E+07	0.	8.25E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.53E+09	8.56E+09	0.	4.15E+09	0.	7.23E+09	0.	3.95E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RH--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	4.24E-05	0.	0.	0.	2.85E-07	0.	1.68E-05
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	5.35E+09	0.	0.	0.	0.	1.10E+08	0.	1.54E+08
SR--90	3.41E+10	0.	0.	0.	0.	6.30E+08	0.	9.20E+09
Y---90	2.53E+03	0.	0.	0.	0.	3.49E+06	0.	6.77E+01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	7.06E+04	2.86E+04	0.	2.07E+04	0.	2.38E+07	0.	1.66E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE G-6
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS P(I) FOR GASEOUS DISCHARGE - 12

PATHWAY - COWS MILK (CONTAMINATED FORAGE) Instantaneous

AGE GROUP - INFANT + Children + Teenager + Adult

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.80E+07	1.30E+06	2.34E+05	0.	5.51E+07	2.71E+08	0.	2.73E+07
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	6.67E+08	7.86E+08	2.58E+11	9.18E+08	0.	2.81E+07	0.	3.46E+08
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	9.02E+06	1.31E+07	2.39E+09	1.55E+07	0.	2.22E+06	0.	3.85E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.84E+00	1.58E+00	0.	4.76E-01	1.91E-01	6.05E-03	0.	8.72E-02
CS-134	1.44E+10	2.68E+10	0.	6.90E+09	2.83E+09	7.28E+07	0.	2.71E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	9.39E+08	2.76E+09	0.	1.10E+09	2.25E+08	4.19E+07	0.	1.03E+09
CS-137	2.09E+10	2.43E+10	0.	6.53E+09	2.64E+09	7.60E+07	0.	1.72E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.15E+08	1.15E+05	0.	2.73E+04	7.06E+04	2.91E+07	0.	5.93E+06
CE-141	1.15E+05	6.98E+04	0.	2.15E+04	0.	3.61E+07	0.	8.22E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.47E+02	6.47E+02	6.47E+02	6.47E+02	6.47E+02	0.	6.47E+02
N---13	1.98E+01	1.98E+01	1.98E+01	1.98E+01	1.98E+01	1.98E+01	0.	1.98E+01
C---14	2.65E+04	5.31E+03	5.31E+03	5.31E+03	5.31E+03	5.31E+03	0.	5.31E+03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	5.75E+01	1.32E+01	1.28E+04	3.57E+02	0.	8.94E+01
MN--54	0.	2.53E+04	0.	4.98E+03	1.00E+06	7.06E+03	0.	4.98E+03
FE--59	1.36E+04	2.35E+04	0.	0.	1.02E+06	2.48E+04	0.	9.48E+03
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.22E+03	0.	0.	7.77E+05	1.11E+04	0.	1.82E+03
CO--60	0.	8.02E+03	0.	0.	4.51E+06	3.19E+04	0.	1.18E+04
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.93E+04	6.26E+04	0.	3.25E+04	6.47E+05	5.14E+04	0.	3.11E+04
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	8.09E+00	0.	2.44E+01
RB--89	0.	3.90E+01	0.	0.	0.	0.	0.	0.
RB--87	0.	0.	0.	0.	0.	1.53E+02	0.	1.30E+02
RB--88	0.	2.52E+02	0.	0.	2.03E+06	6.40E+04	0.	1.14E+04
SR--89	3.98E+05	0.	0.	0.	1.12E+07	1.31E+05	0.	1.83E+06
SR--90	2.74E+07	0.	0.	0.	7.86E+02	3.04E+02	0.	2.58E-01
Y---90	9.62E+00	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	1.75E+06	2.17E+04	0.	2.03E+04
ZR--95	1.15E+05	2.79E+04	0.	3.11E+04	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	3.79E+04	5.56E+02	1.01E+02	0.	2.65E+06	5.91E+04	0.	1.20E+04
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	3.79E+04	4.43E+04	1.48E+07	5.18E+04	0.	1.06E+03	0.	1.96E+04
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.31E+04	1.99E+04	3.52E+06	2.22E+04	0.	2.18E+03	0.	5.55E+03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	9.97E-07	8.64E-07	0.	2.57E-07	1.01E-07	2.17E-09	0.	4.72E-08
CS-134	3.96E+05	7.03E+05	0.	1.30E+05	7.97E+04	1.33E+03	0.	7.45E+04
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	4.83E+04	1.35E+05	0.	5.64E+04	1.18E+04	1.43E+03	0.	5.29E+04
CS-137	5.49E+05	6.12E+05	0.	1.72E+05	7.13E+04	1.33E+03	0.	4.55E+04
CS-139	1.00E+02	1.55E+02	0.	9.15E+01	1.30E+01	1.74E+02	0.	7.90E+01
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA135M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	5.60E+04	5.69E+01	0.	1.34E+01	1.60E+06	3.87E+04	0.	2.90E+03
CE-141	2.77E+04	1.67E+04	0.	5.25E+03	5.17E+05	2.16E+04	0.	1.99E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE .

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.50E+04	1.30E+04
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	5.50E+06	4.66E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.52E+09	1.38E+09
FE--59	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	3.20E+08	2.73E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	4.44E+08	3.79E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.53E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	8.58E+08	7.46E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.81E+04	1.51E+04
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.56E+05	3.11E+05
SR--89	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.51E+04	2.16E+04
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.33E+06	5.35E+06
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.33E+08	5.38E+08
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR K/Q. DEPLETED K/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	1.04E+07	8.60E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.48E+06	1.22E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	8.01E+09	6.86E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.70E+08	1.50E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
CS-138	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.62E+05	1.42E+05
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.71E+08	1.87E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 1, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.35E+02	6.35E+02	6.35E+02	6.35E+02	6.35E+02	0.	6.35E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.61E+06	3.44E+05	3.44E+05	3.44E+05	3.44E+05	3.44E+05	0.	3.44E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	4.70E+04	1.03E+04	9.14E+04	2.10E+06	0.	7.20E+04
MN--54	0.	1.56E+07	0.	3.45E+06	0.	5.72E+06	0.	3.53E+06
FE--59	9.62E+07	1.68E+08	0.	0.	4.97E+07	8.03E+07	0.	6.62E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.01E+07	0.	0.	0.	2.51E+07	0.	2.52E+07
CO--60	0.	3.49E+07	0.	0.	0.	8.31E+07	0.	8.25E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.50E+09	8.56E+09	0.	4.15E+09	0.	7.23E+09	0.	3.95E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	4.24E-05	0.	0.	0.	2.85E-07	0.	1.68E-05
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	5.35E+09	0.	0.	0.	0.	1.10E+08	0.	1.54E+08
SR--90	3.41E+10	0.	0.	0.	0.	6.30E+08	0.	9.20E+09
Y---90	2.53E+03	0.	0.	0.	0.	3.49E+06	0.	6.77E+01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--93	7.06E+04	2.96E+04	0.	2.07E+04	0.	2.38E+07	0.	1.66E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.80E+07	1.30E+06	2.34E+05	0.	5.51E+07	2.71E+08	0.	2.73E+07
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	6.67E+08	7.96E+08	2.58E+11	9.18E+08	0.	2.81E+07	0.	3.46E+08
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	9.02E+06	1.31E+07	2.39E+09	1.55E+07	0.	2.22E+06	0.	3.85E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.84E+00	1.68E+00	0.	4.76E-01	1.81E-01	6.05E-03	0.	8.72E-02
CS-134	1.44E+10	2.68E+10	0.	5.90E+09	2.83E+09	7.28E+07	0.	2.71E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	9.39E+08	2.76E+09	0.	1.10E+09	2.25E+08	4.19E+07	0.	1.03E+09
CS-137	2.09E+10	2.43E+10	0.	6.53E+09	2.64E+09	7.60E+07	0.	1.72E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.15E+08	1.15E+05	0.	2.73E+04	7.06E+04	2.91E+07	0.	5.93E+06
CE-141	1.15E+05	6.98E+04	0.	2.15E+04	0.	3.61E+07	0.	8.22E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

G-15

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC) 1

NUCLIDE	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.30E+03	1.30E+03	1.30E+03	1.30E+03	1.30E+03	0.	1.30E+03
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.61E+06	3.44E+05	3.44E+05	3.44E+05	3.44E+05	3.44E+05	0.	3.44E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	5.89E+03	1.28E+03	1.14E+04	2.61E+05	0.	8.96E+03
MN--54	0.	1.87E+06	0.	4.15E+05	0.	6.88E+05	0.	4.25E+05
FE--59	1.28E+06	2.24E+06	0.	0.	6.60E+05	1.07E+06	0.	8.81E+05
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.23E+06	0.	0.	0.	3.06E+06	0.	3.06E+06
CO--60	0.	4.19E+06	0.	0.	0.	9.98E+06	0.	9.90E+06
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	3.01E+08	1.03E+09	0.	5.00E+08	0.	8.72E+08	0.	4.76E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	5.09E-06	0.	0.	0.	3.43E-08	0.	2.82E-06
RB--88	0.	3.16E-08	0.	0.	0.	3.08E-08	0.	1.73E-08
SR--89	1.15E+10	0.	0.	0.	0.	2.36E+08	0.	3.29E+08
SR--90	7.16E+10	0.	0.	0.	0.	1.32E+09	0.	1.93E+10
Y---90	2.79E+02	0.	0.	0.	0.	3.85E+05	0.	7.47E+00
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	7.68E+03	3.13E+03	0.	2.26E+03	0.	2.59E+06	0.	1.81E+03
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.07E+07	1.58E+05	2.85E+04	0.	6.72E+06	3.31E+07	0.	3.33E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	9.08E+08	1.07E+09	3.52E+11	1.25E+09	0.	3.82E+07	0.	4.70E+08
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	3.46E+07	5.04E+07	9.17E+09	5.93E+07	0.	8.53E+06	0.	1.48E+07
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.59E+08	5.04E+08	0.	1.43E+08	5.45E-01	1.82E-02	0.	2.62E-01
CS-134	4.32E+10	8.75E+10	0.	2.07E+10	8.49E+09	2.19E+08	0.	8.13E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	3.08E+09	8.95E+09	0.	3.57E+09	7.29E+08	1.36E+08	0.	3.34E+09
CS-137	6.23E+10	7.30E+10	0.	1.96E+10	7.93E+09	2.28E+08	0.	5.17E+09
CS-138	2.22E-03	3.60E-03	0.	1.80E-03	2.81E-04	5.76E-03	0.	1.75E-03
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.49E+07	1.49E+04	0.	3.55E+03	9.17E+03	3.77E+06	0.	7.78E+05
CE-141	1.42E+04	9.65E+03	0.	2.67E+03	0.	4.47E+06	0.	1.02E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	0.	1.26E+03
N---13	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	0.	1.62E+01
C---14	1.82E+04	3.41E+03	3.41E+03	3.41E+03	3.41E+03	3.41E+03	0.	3.41E+03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	5.95E+01	2.28E+01	1.44E+04	3.32E+03	0.	1.08E+02
MN--54	0.	3.96E+04	0.	9.84E+03	1.40E+06	7.74E+04	0.	6.30E+03
FE--59	1.18E+04	2.78E+04	0.	0.	1.02E+06	1.88E+05	0.	1.06E+04
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.58E+03	0.	0.	9.28E+05	1.06E+05	0.	2.07E+03
CO--60	0.	1.15E+04	0.	0.	5.97E+06	2.85E+05	0.	1.48E+04
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	3.24E+04	1.03E+05	0.	6.90E+04	8.64E+05	5.34E+04	0.	4.66E+04
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	3.03E+01	0.	0.	0.	0.	0.	2.01E+01
RH--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	1.75E+02	0.	0.	0.	1.51E-09	0.	8.72E+01
SR--89	3.04E+05	0.	0.	0.	1.40E+06	3.50E+05	0.	8.72E+03
SR--90	5.06E+07	0.	0.	0.	9.60E+06	7.22E+05	0.	3.39E+06
Y---90	6.11E+00	0.	0.	0.	4.96E+02	1.48E+03	0.	1.64E-01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.07E+05	3.44E+04	0.	5.42E+04	1.77E+05	1.50E+05	0.	2.33E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE-

PATHWAY - INHALATION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	3.12E+04	5.89E+02	7.55E+01	0.	2.48E+06	4.06E+05	0.	1.24E+04
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	2.52E+04	3.57E+04	1.19E+07	6.12E+04	0.	6.27E+03	0.	2.05E+04
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	8.56E+03	1.47E+04	2.13E+06	2.56E+04	0.	8.80E+03	0.	4.48E+03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	8.32E-07	7.35E-07	0.	2.91E-07	8.95E-08	1.20E-08	0.	3.41E-07
CS-134	3.73E+05	8.48E+05	0.	2.87E+05	9.76E+04	1.04E+04	0.	7.28E+05
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	3.90E+04	1.46E+05	0.	8.56E+04	1.20E+04	1.17E+04	0.	1.10E+05
CS-137	4.78E+05	6.21E+05	0.	2.22E+05	7.52E+04	8.40E+03	0.	4.28E+05
CS-138	6.58E+01	1.23E+02	0.	9.53E+01	9.65E+00	3.70E-04	0.	6.44E+01
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	3.90E+04	4.98E+01	0.	1.67E+01	1.27E+06	2.20E+05	0.	2.57E+03
CE-141	1.99E+04	1.35E+04	0.	6.26E+03	3.62E+05	1.20E+05	0.	1.53E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1.0 FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.50E+04	1.30E+04
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	5.90E+06	4.66E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	3.20E+08	2.73E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	4.44E+08	3.79E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.53E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	8.58E+08	7.46E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.81E+04	1.51E+04
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.56E+05	3.11E+05
SR--89	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.51E+04	2.16E+04
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.33E+08	5.38E+08
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--131	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	1.04E+07	8.60E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.48E+06	1.22E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	8.01E+09	6.86E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.70E+08	1.50E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
CS-138	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.62E+05	1.42E+05
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.71E+08	1.87E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.03E+03	1.03E+03	1.03E+03	1.03E+03	1.03E+03	0.	1.03E+03
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	7.72E+05	1.54E+05	1.54E+05	1.54E+05	1.54E+05	1.54E+05	0.	1.54E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.60E+04	5.91E+03	3.56E+04	6.75E+06	0.	2.68E+04
MN--54	0.	2.60E+08	0.	7.73E+07	0.	7.95E+08	0.	4.95E+07
FE--59	8.78E+07	2.06E+08	0.	0.	5.77E+07	6.88E+08	0.	7.91E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	2.32E+07	0.	0.	0.	4.71E+08	0.	5.20E+07
CO--60	0.	1.43E+08	0.	0.	0.	2.68E+09	0.	3.15E+08
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	3.37E+08	1.07E+09	0.	7.16E+08	0.	6.74E+08	0.	4.84E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	6.17E-06	0.	0.	0.	2.89E-07	0.	2.15E-06
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	7.16E+09	0.	0.	0.	0.	1.15E+09	0.	2.05E+08
SR--90	2.93E+11	0.	0.	0.	0.	1.67E+10	0.	7.85E+10
Y---90	6.43E+05	0.	0.	0.	0.	6.82E+09	0.	1.72E+04
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.07E+06	5.87E+05	0.	5.46E+05	0.	1.58E+09	0.	2.48E+05
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ABLE G-8
(cont.)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS REV. FOR GASEOUS DISCHARGE

PATHWAY - STORED FRUITS AND VEGETABLES

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	7.67E+07	1.45E+06	1.86E+05	0.	5.97E+07	2.18E+09	0.	3.04E+07
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	1.48E+06	2.12E+06	6.95E+08	3.63E+06	0.	5.59E+05	0.	1.21E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	5.09E-01	4.69E-01	0.	1.78E-01	5.32E-02	1.10E-02	0.	2.08E-01
CS-134	3.88E+09	9.24E+09	0.	2.99E+09	9.92E+08	1.62E+08	0.	7.55E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	9.06E+06	3.58E+07	0.	1.99E+07	2.73E+06	4.06E+06	0.	2.57E+07
CS-137	5.71E+09	7.81E+09	0.	2.65E+09	8.82E+08	1.51E+08	0.	5.12E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.58E+07	3.42E+04	0.	1.10E+04	1.86E+04	1.88E+08	0.	1.69E+06
CE-141	1.24E+05	8.37E+04	0.	3.89E+04	0.	3.20E+09	0.	9.49E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - FRESH FRUITS AND VEGETABLES — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.68E+02	1.68E+02	1.68E+02	1.68E+02	1.68E+02	0.	1.68E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.25E+05	2.50E+04	2.50E+04	2.50E+04	2.50E+04	2.50E+04	0.	2.50E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.14E+04	4.19E+03	2.52E+04	4.78E+06	0.	1.90E+04
MN--54	0.	4.79E+07	0.	1.43E+07	0.	1.47E+08	0.	9.14E+06
FE--59	3.56E+07	8.36E+07	0.	0.	2.34E+07	2.79E+08	0.	3.21E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	6.70E+06	0.	0.	0.	1.36E+08	0.	1.50E+07
CO--60	0.	2.36E+07	0.	0.	0.	4.44E+08	0.	5.21E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	6.44E+07	2.05E+08	0.	1.37E+08	0.	1.29E+08	0.	9.27E+07
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
PB--99	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	1.30E-06	0.	0.	0.	4.68E-08	0.	3.48E-07
RB--88	0.	1.65E+01	0.	0.	0.	2.28E-10	0.	8.77E+00
SR--89	2.61E+09	0.	0.	0.	0.	4.18E+08	0.	7.48E+07
SR--90	4.76E+10	0.	0.	0.	0.	2.71E+09	0.	1.28E+10
Y---90	9.13E+04	0.	0.	0.	0.	9.68E+09	0.	2.45E+03
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	2.88E+05	9.46E+04	0.	1.44E+05	0.	3.25E+08	0.	5.28E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS REI FOR GASEOUS DISCHARGE

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	2.45E+07	4.63E+05	5.94E+04	0.	1.91E+07	6.95E+08	0.	9.71E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	3.98E+07	5.55E+07	1.82E+10	9.52E+07	0.	1.47E+07	0.	3.18E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.03E+06	1.80E+06	2.64E+08	3.14E+06	0.	1.62E+06	0.	5.48E+05
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	8.20E-02	7.57E-02	0.	2.86E-02	8.58E-03	1.77E-03	0.	3.36E-02
CS-134	6.68E+08	1.58E+09	0.	5.11E+08	1.70E+08	2.76E+07	0.	1.29E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.33E+07	1.31E+08	0.	7.31E+07	1.00E+07	1.49E+07	0.	9.45E+07
CS-137	9.29E+08	1.27E+09	0.	4.31E+08	1.43E+08	2.46E+07	0.	8.32E+08
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.02E+08	1.35E+05	0.	4.37E+04	7.36E+04	6.64E+08	0.	6.70E+06
CE-141	7.05E+04	4.77E+04	0.	2.21E+04	0.	1.82E+08	0.	5.41E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	8.64E+01	8.64E+01	8.64E+01	8.64E+01	8.64E+01	0.	8.64E+01
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.66E+05	3.33E+04	3.33E+04	3.33E+04	3.33E+04	3.33E+04	0.	3.33E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.88E+03	6.93E+02	4.18E+03	7.91E+05	0.	3.15E+03
MN--54	0.	3.66E+06	0.	1.09E+06	0.	1.12E+07	0.	6.99E+05
FE--59	1.19E+08	2.68E+08	0.	0.	7.48E+07	8.92E+08	0.	1.03E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	7.58E+06	0.	0.	0.	1.54E+08	0.	1.70E+07
CO--60	0.	2.98E+07	0.	0.	0.	5.60E+08	0.	6.57E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.63E+08	5.09E+08	0.	3.41E+08	0.	3.21E+08	0.	2.30E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	2.02E-06	0.	0.	0.	9.47E-08	0.	7.04E-07
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	1.28E+08	0.	0.	0.	0.	2.06E+07	0.	3.68E+06
SR--91	2.62E+09	0.	0.	0.	0.	1.49E+08	0.	7.02E+08
Y---91	3.32E+04	0.	0.	0.	0.	5.32E+08	0.	1.35E+03
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	1.49E+06	6.38E+05	0.	7.77E+05	0.	3.15E+09	0.	3.78E+05
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	8.32E+06	1.57E+05	2.02E+04	0.	6.48E+06	2.36E+08	0.	3.30E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	2.64E+06	3.77E+06	1.24E+09	6.47E+06	0.	9.96E+05	0.	2.16E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	9.91E-02	1.72E-01	2.53E+01	3.01E-01	0.	1.55E-01	0.	5.25E-02
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	3.00E-02	2.77E-02	0.	1.05E-02	3.14E-03	6.47E-04	0.	1.23E-02
CS-134	2.59E+08	6.16E+08	0.	1.99E+08	6.62E+07	1.08E+07	0.	5.04E+08
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	5.71E+06	2.25E+07	0.	1.25E+07	1.72E+06	2.56E+06	0.	1.62E+07
CS-137	3.52E+08	4.82E+08	0.	1.63E+08	5.43E+07	9.32E+06	0.	3.15E+08
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.37E+07	1.74E+04	0.	5.86E+03	9.87E+03	3.28E+07	0.	9.30E+05
CE-141	6.19E+03	4.18E+03	0.	1.94E+03	0.	1.60E+07	0.	4.74E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.03E+02	2.03E+02	2.03E+02	2.03E+02	2.03E+02	0.	2.03E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.82E+05	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	0.	3.63E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	7.62E+03	2.81E+03	1.69E+04	3.21E+06	0.	1.28E+04
MN--54	0.	3.36E+05	0.	9.99E+05	0.	1.03E+07	0.	6.41E+05
FE--59	1.27E+07	2.99E+07	0.	0.	8.36E+06	9.98E+07	0.	1.15E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.96E+06	0.	0.	0.	3.97E+07	0.	4.40E+06
CO--60	0.	6.50E+06	0.	0.	0.	1.22E+08	0.	1.43E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	6.17E+08	1.96E+07	0.	1.31E+09	0.	1.24E+09	0.	8.87E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	5.51E-06	0.	0.	0.	2.58E-07	0.	1.92E-06
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	6.17E+08	0.	0.	0.	0.	9.90E+07	0.	1.77E+07
SR--90	3.84E+09	0.	0.	0.	0.	5.61E+08	0.	2.64E+09
Y---90	2.43E+02	0.	0.	0.	0.	2.78E+06	0.	7.04E+00
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	9.81E+03	5.37E+03	0.	5.38E+03	0.	3.22E+07	0.	2.91E+03
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.08E+07	2.04E+05	2.62E+04	0.	8.42E+06	3.07E+08	0.	4.29E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	7.26E+07	1.04E+08	3.40E+10	1.78E+08	0.	2.74E+07	0.	5.95E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	9.63E+05	1.68E+06	2.46E+08	2.92E+06	0.	1.51E+06	0.	5.11E+05
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	2.54E-01	2.34E-01	0.	8.85E-02	2.65E-02	5.47E-03	0.	1.04E-01
CS-134	2.23E+09	5.30E+09	0.	1.71E+09	5.69E+08	9.27E+07	0.	4.33E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.25E+08	4.94E+08	0.	2.75E+08	3.77E+07	5.61E+07	0.	3.55E+08
CS-137	2.98E+09	4.08E+09	0.	1.38E+09	4.60E+08	7.89E+07	0.	2.67E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA139M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.29E+07	1.61E+04	0.	5.48E+03	9.23E+03	2.71E+07	0.	8.40E+05
CE-141	1.28E+04	8.65E+03	0.	4.32E+03	0.	3.31E+07	0.	9.81E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.15E+02	4.15E+02	4.15E+02	4.15E+02	4.15E+02	0.	4.15E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.82E+05	3.63E+04	3.63E+04	3.63E+04	3.63E+04	3.63E+04	0.	3.63E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	9.49E+02	3.50E+02	2.11E+03	3.99E+05	0.	1.59E+03
MN--54	0.	4.04E+05	0.	1.20E+05	0.	1.24E+06	0.	7.71E+04
FE--59	1.69E+05	3.98E+05	0.	0.	1.11E+05	1.33E+06	0.	1.53E+05
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	2.39E+05	0.	0.	0.	4.84E+06	0.	5.35E+05
CO--60	0.	7.90E+05	0.	0.	0.	1.47E+07	0.	1.72E+06
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.44E+07	2.37E+08	0.	1.58E+08	0.	1.49E+08	0.	1.07E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	6.62E-07	0.	0.	0.	3.10E-08	0.	2.31E-07
RB--88	0.	3.61E-09	0.	0.	0.	0.	0.	1.91E-09
SR--89	1.32E+09	0.	0.	0.	0.	2.12E+08	0.	3.80E+07
SR--90	2.07E+10	0.	0.	0.	0.	1.18E+09	0.	5.55E+09
Y---90	2.90E+01	0.	0.	0.	0.	3.07E+05	0.	8.77E-01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.07E+03	5.83E+02	0.	5.85E+02	0.	3.50E+06	0.	3.15E+02
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.32E+06	2.49E+04	3.20E+03	0.	1.03E+06	3.75E+07	0.	5.23E+05
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	9.88E+07	1.41E+08	4.63E+10	2.42E+08	0.	3.73E+07	0.	8.10E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	3.69E+06	6.43E+06	9.99E+08	1.12E+07	0.	5.77E+06	0.	1.96E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	7.62E-01	7.04E-01	0.	2.66E-01	7.98E-02	1.65E-02	0.	3.12E-01
CS-134	6.69E+09	1.59E+10	0.	5.15E+09	1.71E+09	2.79E+08	0.	1.30E+10
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	4.03E+08	1.60E+09	0.	8.90E+08	1.22E+08	1.82E+08	0.	1.15E+09
CS-137	8.98E+09	1.22E+10	0.	4.15E+09	1.38E+09	2.37E+08	0.	8.01E+09
CS-138	2.39E-04	4.72E-04	0.	3.47E-04	3.42E-05	2.01E-09	0.	2.34E-04
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA135M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.67E+06	2.09E+03	0.	7.12E+02	1.20E+03	3.52E+06	0.	1.09E+05
CE-141	1.59E+03	1.07E+03	0.	4.98E+02	0.	4.10E+06	0.	1.22E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.27E+03	1.27E+03	1.27E+03	1.27E+03	1.27E+03	0.	1.27E+03
N---13	2.23E+01	2.23E+01	2.23E+01	2.23E+01	2.23E+01	2.23E+01	0.	2.23E+01
C---14	2.60E+04	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	0.	4.87E+03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	7.49E+01	3.07E+01	2.10E+04	3.00E+03	0.	1.35E+02
MN--54	0.	5.11E+04	0.	1.27E+04	1.98E+06	6.68E+04	0.	8.40E+03
FE--59	1.59E+04	3.70E+04	0.	0.	1.53E+06	1.78E+05	0.	1.43E+04
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	2.07E+03	0.	0.	1.34E+06	9.52E+04	0.	2.78E+03
CO--60	0.	1.51E+04	0.	0.	8.72E+06	2.59E+05	0.	1.98E+04
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	3.96E+04	1.34E+05	0.	8.64E+04	1.24E+06	4.66E+04	0.	6.24E+04
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-93M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	4.17E+01	0.	0.	0.	4.00E-08	0.	2.76E+01
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	2.47E+02	0.	0.	0.	1.32E-05	0.	1.23E+02
SR--89	4.34E+05	0.	0.	0.	2.42E+06	3.71E+05	0.	1.25E+04
SR--90	5.84E+07	0.	0.	0.	1.65E+07	7.65E+05	0.	3.92E+06
Y---90	8.73E+00	0.	0.	0.	8.56E+02	1.64E+03	0.	2.34E-01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.46E+05	4.58E+04	0.	6.74E+04	2.69E+06	1.49E+05	0.	3.15E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR K/Q. DEPLETED K/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	4.30E+04	7.94E+02	9.76E+01	0.	3.85E+06	3.98E+05	0.	1.69E+04
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	6.48E+03	0.	2.64E+04
I--131	3.54E+04	4.91E+04	1.46E+07	8.39E+04	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	1.02E+04	0.	4.17E+03
I--133	1.21E+04	2.03E+04	2.89E+06	3.56E+04	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	1.27E-08	0.	2.55E-07
I--135	1.19E-06	1.04E-06	0.	4.16E-07	1.54E-07	9.76E+03	0.	5.49E+05
CS-134	5.02E+05	1.13E+06	0.	3.75E+05	1.46E+05	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	1.09E+04	0.	1.37E+05
CS-136	5.15E+04	1.94E+05	0.	1.10E+05	1.78E+04	8.48E+03	0.	3.11E+05
CS-137	6.70E+05	8.48E+05	0.	3.04E+05	1.21E+05	5.37E-02	0.	8.87E+11
CS-138	9.25E+01	1.70E+02	0.	1.32E+02	1.56E+01	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	5.47E+04	6.91E+01	0.	2.28E+01	2.03E+06	2.31E+05	0.	3.52E+03
CE-141	2.88E+04	1.91E+04	0.	8.88E+03	6.14E+05	1.26E+05	0.	2.17E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H---3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.50E+04	1.30E+04
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.65E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.65E+06	5.50E+06	4.66E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	3.20E+08	2.73E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	4.44E+08	3.79E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.53E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	8.58E+08	7.46E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.81E+04	1.51E+04
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.56E+05	3.11E+05
SR--89	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.51E+04	2.16E+04
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	6.33E+08	5.38E+08
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 13

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	1.04E+07	8.60E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.48E+06	1.22E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	8.01E+09	6.86E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.70E+08	1.50E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
CS-138	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.62E+05	1.42E+05
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.71E+08	1.87E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - STORED FRUITS AND VEGETABLES — AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	0.	1.26E+03
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.34E+06	2.67E+05	2.67E+05	2.67E+05	2.67E+05	2.67E+05	0.	2.67E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	2.44E+04	9.64E+03	6.28E+04	7.39E+06	0.	4.40E+04
MN--54	0.	4.06E+08	0.	1.21E+08	0.	8.33E+09	0.	8.05E+07
FE--59	1.44E+08	3.36E+08	0.	0.	1.06E+08	7.95E+08	0.	1.30E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	3.67E+07	0.	0.	0.	5.06E+08	0.	8.46E+07
CO--60	0.	2.27E+08	0.	0.	0.	2.96E+09	0.	5.12E+08
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	4.85E+08	1.69E+09	0.	1.08E+09	0.	7.14E+08	0.	7.86E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	1.06E-05	0.	0.	0.	3.72E-07	0.	3.72E-05
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	1.24E+10	0.	0.	0.	0.	1.48E+09	0.	3.55E+08
SR--90	4.13E+11	0.	0.	0.	0.	2.15E+10	0.	1.11E+11
Y---90	1.11E+06	0.	0.	0.	0.	9.15E+09	0.	2.99E+04
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.75E+06	6.24E+05	0.	8.31E+05	0.	1.79E+09	0.	4.05E+05
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS REI) FOR GASEOUS DISCHARGE _ 1

PATHWAY - STORED FRUITS AND VEGETABLES

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.28E+08	2.37E+06	2.91E+05	0.	1.12E+08	2.59E+09	0.	5.01E+07
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	2.52E+06	3.53E+06	1.03E+09	6.08E+06	0.	6.99E+05	0.	1.90E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	8.78E-01	8.05E-01	0.	3.07E-01	1.11E-01	1.41E-02	0.	1.88E-01
CS-134	6.33E+09	1.49E+10	0.	4.73E+09	1.81E+09	1.85E+08	0.	6.91E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.45E+07	5.70E+07	0.	3.10E+07	4.89E+06	4.58E+06	0.	3.83E+07
CS-137	9.73E+09	1.29E+10	0.	4.40E+09	1.71E+09	1.84E+08	0.	4.51E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	4.39E+07	5.66E+04	0.	1.82E+04	3.61E+04	2.42E+08	0.	2.82E+06
CE-141	2.13E+05	1.42E+05	0.	6.69E+04	0.	4.07E+08	0.	1.63E+04
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - FRESH FRUITS AND VEGETABLES — AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.11E+02	1.11E+02	1.11E+02	1.11E+02	1.11E+02	0.	1.11E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.17E+05	2.35E+04	2.35E+04	2.35E+04	2.35E+04	2.35E+04	0.	2.35E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	9.39E+03	3.70E+03	2.41E+04	2.84E+06	0.	1.69E+04
MN--54	0.	4.06E+07	0.	1.21E+07	0.	8.33E+07	0.	8.05E+06
FE--59	3.16E+07	7.37E+07	0.	0.	2.32E+07	1.74E+08	0.	2.85E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	5.74E+06	0.	0.	0.	7.91E+07	0.	1.32E+07
CO--60	0.	2.04E+07	0.	0.	0.	2.65E+08	0.	4.59E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	5.03E+07	1.75E+08	0.	1.12E+08	0.	7.40E+07	0.	8.15E+07
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	9.33E-07	0.	0.	0.	3.26E-08	0.	3.26E-07
RB--88	0.	1.53E+01	0.	0.	0.	1.31E-06	0.	8.14E+00
SR--89	2.44E+09	0.	0.	0.	0.	2.91E+08	0.	6.99E+07
SR--90	3.64E+10	0.	0.	0.	0.	1.89E+09	0.	9.75E+09
Y---90	8.53E+04	0.	0.	0.	0.	7.04E+08	0.	2.30E+03
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	2.53E+05	8.28E+04	0.	1.18E+05	0.	2.05E+08	0.	5.59E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

1

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	2.22E+07	4.09E+05	5.04E+04	0.	1.94E+07	4.48E+08	0.	8.67E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	3.58E+07	5.02E+07	1.46E+10	8.63E+07	0.	9.92E+06	0.	2.69E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	9.61E+05	1.63E+06	2.28E+08	2.86E+06	0.	1.23E+06	0.	4.97E+09
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	7.67E-02	7.04E-02	0.	2.68E-02	9.71E-03	1.23E-03	0.	1.64E-02
CS-134	5.86E+08	2.38E+09	0.	4.38E+08	1.67E+08	1.72E+07	0.	6.40E+08
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	2.88E+07	1.13E+08	0.	6.17E+07	9.72E+06	9.12E+06	0.	7.61E+07
CS-137	8.55E+08	1.24E+09	0.	3.88E+08	1.51E+08	1.62E+07	0.	3.97E+08
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA139M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	9.39E+07	1.20E+05	0.	3.90E+04	7.74E+04	4.60E+08	0.	6.05E+06
CE-141	6.57E+04	4.39E+04	0.	2.07E+04	0.	1.25E+08	0.	5.04E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.15E+01	5.15E+01	5.15E+01	5.15E+01	5.15E+01	0.	5.15E+01
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	1.47E+05	2.81E+04	2.81E+04	2.81E+04	2.81E+04	2.81E+04	0.	2.81E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.49E+03	9.52E+02	3.59E+03	4.23E+05	0.	2.32E+03
MN--54	0.	2.79E+06	0.	8.33E+05	0.	5.73E+06	0.	5.54E+05
FE--59	9.10E+07	2.12E+08	0.	0.	6.70E+07	5.02E+08	0.	8.20E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	5.85E+06	0.	0.	0.	8.06E+07	0.	1.35E+07
CO--60	0.	2.51E+07	0.	0.	0.	3.01E+08	0.	5.21E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.13E+09	3.91E+08	0.	2.50E+08	0.	1.66E+08	0.	1.82E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	5.94E-08	0.	5.94E-07
RB--87	0.	1.73E-06	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	1.29E+07	0.	3.10E+06
SR--89	1.08E+09	0.	0.	0.	0.	9.38E+07	0.	4.83E+07
SR--90	1.81E+09	0.	0.	0.	0.	3.48E+08	0.	1.14E+03
Y---90	4.23E+04	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	1.75E+09	0.	3.02E+05
ZR--95	1.17E+06	5.00E+05	0.	5.83E+05	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	6.79E+06	1.25E+05	1.54E+04	0.	5.93E+06	1.37E+08	0.	2.65E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	2.19E+06	3.07E+06	8.96E+08	5.29E+06	0.	6.07E+05	0.	1.65E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	8.29E-02	1.41E-01	1.96E+01	2.46E-01	0.	1.06E-01	0.	4.29E-02
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	2.53E-02	2.32E-02	0.	8.84E-03	3.20E-01	4.05E-04	0.	5.42E-03
CS-134	2.05E+08	4.85E+08	0.	1.54E+08	5.88E+07	6.03E+06	0.	2.25E+08
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	4.45E+06	1.75E+07	0.	9.53E+06	1.50E+06	1.41E+06	0.	1.18E+07
CS-137	2.92E+08	3.89E+08	0.	1.32E+08	5.14E+07	5.53E+06	0.	1.36E+08
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.10E+07	1.39E+04	0.	4.72E+03	9.35E+03	2.03E+07	0.	7.31E+05
CE-141	5.13E+03	3.47E+03	0.	1.63E+03	0.	9.92E+06	0.	3.98E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.65E+02	2.65E+02	2.65E+02	2.65E+02	2.65E+02	0.	2.65E+02
K---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	3.35E+05	6.70E+04	6.70E+04	6.70E+04	6.70E+04	6.70E+04	0.	6.70E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.24E+04	4.88E+03	3.18E+04	3.74E+06	0.	2.23E+04
MN--54	0.	5.59E+06	0.	1.67E+06	0.	1.15E+07	0.	1.11E+06
FE--59	2.22E+07	5.19E+07	0.	0.	1.64E+07	1.23E+08	0.	2.08E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	3.30E+06	0.	0.	0.	4.55E+07	0.	7.61E+06
CO--60	0.	1.10E+07	0.	0.	0.	1.43E+08	0.	2.48E+07
NI -63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	9.48E+08	3.29E+09	0.	2.11E+09	0.	1.39E+09	0.	1.54E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	1.01E-05	0.	0.	0.	3.54E-07	0.	3.54E-06
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	1.14E+09	0.	0.	0.	0.	1.36E+08	0.	3.26E+07
SR--90	1.49E+10	0.	0.	0.	0.	7.71E+08	0.	3.97E+09
Y---90	4.82E+02	0.	0.	0.	0.	3.98E+06	0.	1.30E+01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.68E+04	9.13E+03	0.	8.95E+03	0.	3.86E+07	0.	5.05E+03
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.93E+07	3.55E+05	4.38E+04	0.	1.68E+07	3.89E+08	0.	7.52E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	1.32E+08	1.85E+08	5.36E+10	3.19E+08	0.	3.65E+07	0.	9.91E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.75E+06	2.98E+06	4.17E+08	5.23E+06	0.	2.26E+06	0.	9.10E+05
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	4.55E-01	4.28E-01	0.	1.63E-01	5.91E-02	7.48E-03	0.	1.00E-01
CS-134	3.87E+09	9.10E+09	0.	2.89E+09	1.10E+09	1.13E+08	0.	4.22E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	2.13E+08	8.38E+08	0.	4.56E+08	7.19E+07	6.74E+07	0.	5.63E+08
CS-137	5.40E+09	7.19E+09	0.	2.45E+09	9.50E+08	1.02E+08	0.	2.50E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.39E+07	2.84E+04	0.	9.62E+03	1.91E+04	3.67E+07	0.	1.49E+06
CE-141	2.35E+04	1.57E+04	0.	7.37E+03	0.	4.48E+07	0.	1.83E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.41E+02	5.41E+02	5.41E+02	5.41E+02	5.41E+02	0.	5.41E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	3.35E+05	6.70E+04	6.70E+04	6.70E+04	6.70E+04	6.70E+04	0.	6.70E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.54E+03	6.08E+02	3.96E+03	4.66E+05	0.	2.77E+03
MN--54	0.	6.73E+05	0.	2.01E+05	0.	1.38E+06	0.	1.34E+05
FE--59	2.96E+05	6.90E+05	0.	0.	2.18E+05	1.63E+06	0.	2.66E+05
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	4.02E+05	0.	0.	0.	5.54E+06	0.	9.26E+05
CO--60	0.	1.32E+06	0.	0.	0.	1.72E+07	0.	2.98E+06
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.14E+08	3.96E+08	0.	2.54E+08	0.	1.68E+08	0.	1.85E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	1.22E-06	0.	0.	0.	4.25E-08	0.	4.25E-07
RB--88	0.	6.56E-09	0.	0.	0.	0.	0.	3.49E-09
SR--89	2.48E+09	0.	0.	0.	0.	2.90E+08	0.	6.98E+07
SR--90	3.11E+10	0.	0.	0.	0.	1.62E+09	0.	8.34E+09
Y---90	5.32E+01	0.	0.	0.	0.	4.39E+05	0.	1.43E+00
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.82E+05	9.92E+02	0.	9.75E+02	0.	4.19E+06	0.	5.49E+02
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	2.35E+06	4.34E+04	5.34E+03	0.	2.06E+06	4.78E+07	0.	9.18E+05
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	1.79E+08	2.51E+08	7.33E+10	4.32E+08	0.	4.97E+07	0.	1.35E+08
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	6.75E+06	1.14E+07	1.60E+09	2.01E+07	0.	8.66E+06	0.	3.49E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.40E+00	1.29E+00	0.	4.91E-01	1.78E-01	2.25E-02	0.	3.01E-01
CS-134	1.16E+10	2.73E+10	0.	8.64E+09	3.32E+09	3.40E+08	0.	1.27E+10
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	6.90E+08	2.72E+09	0.	1.48E+09	2.33E+08	2.19E+08	0.	1.82E+09
CS-137	1.62E+10	2.16E+10	0.	7.34E+09	2.85E+09	3.07E+08	0.	7.51E+09
CS-138	4.33E-04	8.32E-04	0.	6.14E-04	7.15E-05	3.78E-07	0.	4.16E-04
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135M	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	3.01E+06	3.69E+03	0.	1.25E+03	2.48E+03	4.76E+06	0.	1.99E+05
CE-141	2.90E+03	1.94E+03	0.	9.13E+02	0.	5.55E+06	0.	2.23E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H-----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.13E+03	1.13E+03	1.13E+03	1.13E+03	1.13E+03	0.	1.13E+03
N---13	2.73E+01	2.78E+01	2.78E+01	2.78E+01	2.78E+01	2.78E+01	0.	2.78E+01
C---14	3.59E+04	6.73E+03	6.73E+03	6.73E+03	6.73E+03	6.73E+03	0.	6.73E+03
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	8.55E+01	2.43E+01	1.70E+04	1.08E+03	0.	1.54E+02
MN--54	0.	4.29E+04	0.	1.00E+04	1.58E+06	2.29E+04	0.	9.51E+03
FE--59	2.07E+04	3.34E+04	0.	0.	1.27E+06	7.07E+04	0.	1.67E+04
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	1.77E+03	0.	0.	1.11E+06	3.44E+04	0.	3.16E+03
CO--60	0.	1.31E+04	0.	0.	7.07E+06	9.62E+04	0.	2.26E+04
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	4.26E+04	1.13E+05	0.	7.14E+04	9.95E+05	1.63E+04	0.	7.03E+04
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	4.09E+01	0.	0.	0.	2.24E-01	0.	3.43E+01
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	2.58E+02	0.	0.	0.	7.80E+00	0.	1.66E+02
SR--89	5.99E+05	0.	0.	0.	2.16E+06	1.67E+05	0.	1.72E+04
SR--90	6.77E+07	0.	0.	0.	1.48E+07	3.43E+05	0.	4.51E+06
Y---90	1.20E+01	0.	0.	0.	7.65E+02	7.83E+02	0.	3.24E-01
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	1.90E+05	4.18E+04	0.	5.96E+04	2.23E+05	6.10E+04	0.	3.70E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR K/Q, DEPLETED K/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

B-46

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS REI) FOR GASEOUS DISCHARGE

PATHWAY - INHALATION

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (MREM/YR PER UCI/CU.METER)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.73E+04	7.40E+02	1.26E+02	0.	3.24E+06	1.64E+05	0.	2.90E+04
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	4.81E+04	4.81E+04	1.62E+07	7.87E+04	0.	2.84E+03	0.	2.72E+04
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.64E+04	2.01E+04	3.81E+06	3.35E+04	0.	5.43E+03	0.	7.63E+03
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.64E-06	1.89E-06	0.	4.03E-07	1.38E-07	5.72E-09	0.	1.17E-07
CS-134	6.51E+05	1.01E+06	0.	3.30E+05	1.21E+05	3.85E+03	0.	2.25E+05
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	6.51E+04	1.71E+05	0.	9.54E+04	1.45E+04	4.18E+03	0.	1.16E+05
CS-137	9.07E+05	9.25E+05	0.	2.82E+05	1.04E+05	3.62E+03	0.	1.28E+05
CS-138	1.26E+02	1.67E+02	0.	1.24E+02	1.35E+01	5.35E+01	0.	1.13E+02
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	7.40E+04	6.58E+01	0.	2.11E+01	1.74E+06	1.03E+05	0.	4.33E+03
CE-141	3.92E+04	1.95E+04	0.	9.55E+03	5.44E+05	5.66E+04	0.	2.90E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.30E+04	1.50E+04	1.30E+04
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.66E+06	4.65E+06	5.50E+06	4.66E+06
MN--54	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.38E+09	1.62E+09	1.38E+09
FE--59	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	2.73E+08	3.20E+08	2.73E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	3.79E+08	4.44E+08	3.79E+08
CO--60	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.15E+10	2.53E+10	2.15E+10
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	7.46E+08	8.58E+08	7.46E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.51E+04	1.81E+04	1.51E+04
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.11E+05	3.56E+05	3.11E+05
SR--89	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.16E+04	2.51E+04	2.16E+04
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	5.35E+06	6.33E+06	5.35E+06
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.38E+08	5.33E+08	5.38E+08
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - GROUND PLANE DEPOSITION AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	5.98E+08	6.90E+08	5.98E+08
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	8.60E+06	1.04E+07	8.60E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.48E+06	1.22E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	6.86E+09	8.01E+09	6.86E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.70E+08	1.50E+08
CS-137	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.03E+10	1.20E+10	1.03E+10
CS-138	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05	1.42E+05
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.87E+08	1.71E+08	1.87E+08
CE-141	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.37E+07	1.54E+07	1.37E+07
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

83/05/02

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS REII FOR GASEOUS DISCHARGE

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.99E+03	1.99E+03	1.99E+03	1.99E+03	1.99E+03	0.	1.99E+03
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	3.29E+06	6.58E+05	6.58E+05	6.58E+05	6.58E+05	6.58E+05	0.	6.58E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	4.98E+04	1.36E+04	9.10E+04	4.76E+06	0.	8.98E+04
MN--54	0.	6.38E+04	0.	1.70E+08	0.	5.10E+08	0.	1.62E+08
FE--59	3.34E+08	5.43E+08	0.	0.	1.57E+08	5.63E+08	0.	2.69E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	5.61E+07	0.	0.	0.	3.27E+08	0.	1.72E+08
CO--60	0.	3.53E+08	0.	0.	0.	1.96E+09	0.	1.04E+09
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	9.53E+08	2.54E+09	0.	1.60E+09	0.	4.46E+08	0.	1.58E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	1.98E-05	0.	0.	0.	2.97E-07	0.	9.18E-06
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	3.07E+10	0.	0.	0.	0.	1.19E+09	0.	8.76E+08
SR--93	8.61E+11	0.	0.	0.	0.	1.74E+10	0.	2.31E+11
Y---90	2.75E+06	0.	0.	0.	0.	7.82E+09	0.	7.35E+04
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	4.04E+06	1.00E+05	0.	1.31E+06	0.	1.27E+09	0.	8.49E+05
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - STORED FRUITS AND VEGETABLES

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	3.04E+08	3.94E+06	6.71E+05	0.	1.69E+08	1.93E+09	0.	1.07E+09
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	6.13E+06	6.16E+06	2.04E+09	1.01E+07	0.	5.49E+05	0.	3.50E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	2.16E+00	1.51E+00	0.	5.32E-01	1.78E-01	1.13E-02	0.	1.55E-01
CS-134	1.46E+10	2.40E+10	0.	7.43E+09	2.67E+09	1.29E+08	0.	5.06E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	3.27E+07	8.99E+07	0.	4.79E+07	7.14E+06	3.16E+06	0.	5.81E+07
CS-137	2.34E+10	2.24E+10	0.	7.31E+09	2.63E+09	1.41E+08	0.	3.31E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.05E+08	9.78E+04	0.	3.01E+04	5.52E+04	1.98E+08	0.	6.17E+06
CE-141	5.25E+05	2.62E+05	0.	1.15E+05	0.	3.25E+08	0.	3.89E+04
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION
Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - FRESH FRUITS AND VEGETABLES

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.32E+02	1.32E+02	1.32E+02	1.32E+02	1.32E+02	0.	1.32E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	2.16E+05	4.33E+04	4.33E+04	4.33E+04	4.33E+04	4.33E+04	0.	4.33E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	1.44E+04	3.92E+03	2.62E+04	1.37E+06	0.	2.59E+04
MN--54	0.	4.56E+07	0.	1.28E+07	0.	3.83E+07	0.	1.21E+07
FE--59	5.50E+07	8.89E+07	0.	0.	2.58E+07	9.26E+07	0.	4.43E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	6.58E+06	0.	0.	0.	3.84E+07	0.	2.01E+07
CO--60	0.	2.37E+07	0.	0.	0.	1.32E+08	0.	7.00E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	7.41E+07	1.97E+08	0.	1.24E+08	0.	3.47E+07	0.	1.23E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	1.30E-06	0.	0.	0.	1.95E-08	0.	6.04E-07
RB--88	0.	2.11E+01	0.	0.	0.	1.03E+00	0.	1.47E+01
SR--89	4.54E+09	0.	0.	0.	0.	1.76E+08	0.	1.30E+09
SR--90	5.69E+10	0.	0.	0.	0.	1.15E+09	0.	1.52E+10
Y---90	1.58E+02	0.	0.	0.	0.	4.51E+08	0.	4.24E+03
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	4.39E+05	1.00E+05	0.	1.39E+05	0.	1.12E+08	0.	8.78E+04
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	3.95E+07	5.12E+05	8.71E+04	0.	2.19E+07	2.47E+08	0.	1.38E+07
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	6.52E+07	6.56E+07	2.17E+10	1.08E+08	0.	5.84E+06	0.	5.73E+07
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.75E+06	2.17E+06	4.02E+08	3.61E+06	0.	8.73E+05	0.	8.20E+05
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.42E-01	9.87E-02	0.	3.48E-02	1.16E-02	7.40E-04	0.	1.01E-02
CS-134	1.01E+09	1.67E+09	0.	5.16E+08	1.85E+08	8.97E+06	0.	3.51E+08
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	4.89E+07	1.34E+08	0.	7.14E+07	1.07E+07	4.71E+06	0.	8.68E+07
CS-137	1.55E+09	1.48E+09	0.	4.83E+08	1.74E+08	9.28E+06	0.	2.19E+08
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
BE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	1.79E+08	1.56E+05	0.	4.85E+04	8.88E+04	2.82E+08	0.	9.93E+06
CE-141	1.22E+05	6.06E+04	0.	2.56E+04	0.	7.56E+07	0.	9.08E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION
Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE. -13

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.22E+01	6.22E+01	6.22E+01	6.22E+01	6.22E+01	0.	6.22E+01
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	2.64E+03	5.29E+04	5.29E+04	5.29E+04	5.29E+04	5.29E+04	0.	5.29E+04
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	2.18E+03	5.95E+02	3.98E+03	2.08E+05	0.	3.92E+03
MN--54	0.	3.20E+06	0.	8.96E+05	0.	2.68E+06	0.	8.51E+05
FE--59	1.61E+08	2.41E+08	0.	0.	7.57E+07	2.72E+08	0.	1.30E+08
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	6.83E+06	0.	0.	0.	3.98E+07	0.	2.09E+07
CO--60	0.	2.75E+07	0.	0.	0.	1.52E+08	0.	8.09E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.69E+08	4.50E+08	0.	2.83E+08	0.	7.90E+07	0.	2.80E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--99	0.	0.	0.	0.	0.	0.	0.	0.
RB--97	0.	2.42E-06	0.	0.	0.	3.63E-08	0.	1.12E-06
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	2.05E+08	0.	0.	0.	0.	7.93E+06	0.	5.85E+06
SR--90	2.87E+09	0.	0.	0.	0.	5.82E+07	0.	7.70E+08
Y---90	7.99E+04	0.	0.	0.	0.	2.28E+04	0.	2.14E+03
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	2.05E+06	6.11E+05	0.	8.93E+05	0.	9.31E+08	0.	4.79E+05
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

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ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CO115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	1.23E+07	1.59E+05	2.71E+04	0.	6.82E+06	7.68E+07	0.	4.31E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	4.07E+06	4.09E+06	1.35E+09	6.72E+06	0.	3.64E+05	0.	2.32E+06
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.54E-01	1.90E-01	3.53E+01	3.17E-01	0.	7.67E-02	0.	7.20E-02
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	4.76E-02	3.31E-02	0.	1.17E-02	3.90E-03	2.48E-04	0.	3.40E-03
CS-134	3.63E+08	5.96E+08	0.	1.85E+08	6.63E+07	3.21E+06	0.	1.26E+08
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	7.68E+06	2.11E+07	0.	1.12E+07	1.68E+06	7.42E+05	0.	1.37E+07
CS-137	5.38E+08	5.15E+08	0.	1.68E+08	6.04E+07	3.23E+06	0.	7.61E+07
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA139M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	2.10E+07	1.95E+04	0.	5.97E+03	1.09E+04	1.29E+07	0.	1.22E+06
CE-141	9.78E+03	4.88E+03	0.	2.14E+03	0.	6.08E+06	0.	7.24E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.19E+02	4.19E+02	4.19E+02	4.19E+02	4.19E+02	0.	4.19E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	8.24E+05	1.65E+05	1.65E+05	1.65E+05	1.65E+05	1.65E+05	0.	1.65E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	2.52E+04	6.89E+03	4.60E+04	2.41E+06	0.	4.54E+04
MN--54	0.	8.37E+06	0.	2.35E+06	0.	7.02E+06	0.	2.23E+06
FE--59	5.15E+07	8.34E+07	0.	0.	2.42E+07	8.68E+07	0.	4.15E+07
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	5.04E+06	0.	0.	0.	2.94E+07	0.	1.54E+07
CO--60	0.	1.71E+07	0.	0.	0.	9.47E+07	0.	5.04E+07
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	1.86E+09	4.95E+09	0.	3.12E+09	0.	8.70E+08	0.	3.08E+09
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
PB--89	0.	0.	0.	0.	0.	2.83E-07	0.	8.73E-06
RB--87	0.	1.89E-05	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	1.09E+08	0.	8.04E+07
SR--89	2.82E+09	0.	0.	0.	0.	6.25E+08	0.	8.27E+09
SR--91	3.09E+10	0.	0.	0.	0.	3.40E+06	0.	3.20E+01
Y---91	1.19E+03	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	1.38E+04	0.	2.65E+07	0.	1.04E+04
ZR--95	3.79E+04	1.45E+04	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 13

PATHWAY - COWS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SR-124	4.56E+07	5.92E+05	1.01E+05	0.	2.53E+07	2.85E+08	0.	1.60E+07
SR-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	3.23E+08	3.22E+08	1.06E+11	5.28E+08	0.	2.86E+07	0.	1.83E+08
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	4.27E+06	5.29E+06	9.82E+08	8.81E+06	0.	2.13E+06	0.	2.00E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	1.15E+00	8.00E-01	0.	2.82E-01	9.43E-02	5.99E-03	0.	8.21E-02
CS-134	8.92E+09	1.46E+10	0.	4.53E+09	1.63E+09	7.89E+07	0.	3.09E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	4.81E+08	1.32E+09	0.	7.04E+08	1.05E+08	4.64E+07	0.	8.55E+08
CS-137	1.30E+10	1.25E+10	0.	4.76E+09	1.46E+09	7.80E+07	0.	1.84E+09
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	5.59E+07	4.90E+04	0.	1.59E+04	2.92E+04	2.91E+07	0.	3.26E+06
CE-141	5.79E+04	2.88E+04	0.	1.26E+04	0.	3.59E+07	0.	4.28E+03
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE . 13

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	8.54E+02	8.54E+02	8.54E+02	8.54E+02	8.54E+02	0.	8.54E+02
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	8.24E+05	1.65E+05	1.65E+05	1.65E+05	1.65E+05	1.65E+05	0.	1.65E+05
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	3.14E+03	8.58E+02	5.73E+03	3.08E+05	0.	5.65E+03
MN--54	0.	1.01E+06	0.	2.82E+05	0.	8.45E+05	0.	2.69E+05
FE--59	6.85E+05	1.11E+06	0.	0.	3.22E+05	1.16E+06	0.	5.52E+05
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	6.14E+05	0.	0.	0.	3.58E+06	0.	1.88E+06
CO--60	0.	2.05E+06	0.	0.	0.	1.14E+07	0.	6.06E+06
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	2.24E+08	5.97E+08	0.	3.76E+08	0.	1.05E+08	0.	3.71E+08
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	2.26E-06	0.	0.	0.	3.39E-08	0.	1.05E-06
RB--88	0.	1.21E-08	0.	0.	0.	5.92E-10	0.	8.38E-09
SR--89	6.03E+09	0.	0.	0.	0.	2.34E+08	0.	1.72E+08
SR--90	6.49E+10	0.	0.	0.	0.	1.31E+09	0.	1.74E+10
Y---90	1.32E+02	0.	0.	0.	0.	3.75E+05	0.	3.53E+00
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	4.13E+03	1.57E+03	0.	1.50E+03	0.	2.87E+06	0.	1.13E+03
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 13

PATHWAY - GOATS MILK (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CO115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	5.57E+06	7.22E+04	1.23E+04	0.	3.09E+06	3.48E+07	0.	1.95E+06
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	4.35E+08	4.38E+08	1.45E+11	7.18E+08	0.	3.90E+07	0.	2.49E+08
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	1.64E+07	2.03E+07	3.77E+09	3.38E+07	0.	8.17E+06	0.	7.67E+06
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	3.45E+00	2.41E+00	0.	8.49E-01	2.83E-01	1.80E-02	0.	2.47E-01
CS-134	2.68E+10	4.40E+10	0.	1.36E+10	4.89E+09	2.37E+08	0.	9.27E+09
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	1.56E+09	4.28E+09	0.	2.28E+09	3.40E+08	1.51E+08	0.	2.77E+09
CS-137	3.91E+10	3.74E+10	0.	1.22E+10	4.38E+09	2.34E+08	0.	5.52E+09
CS-138	1.05E-03	1.46E-03	0.	1.03E-03	1.11E-04	6.73E-04	0.	9.26E-04
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	7.25E+06	6.36E+03	0.	2.07E+03	3.79E+03	3.78E+06	0.	4.24E+05
CE-141	7.15E+03	3.57E+03	0.	1.56E+03	0.	4.45E+06	0.	5.30E+02
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN &ND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

83/05/12.

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE . 13

PATHWAY - STORED FRUITS AND VEGETABLES

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	0.	0.	0.	0.	0.	0.	0.	0.
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	0.	0.	0.	0.	0.	0.	0.
CO--60	0.	0.	0.	0.	0.	0.	0.	0.
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-A3M	0.	0.	0.	0.	0.	0.	0.	0.
KR-A5M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RR--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE

PATHWAY- STORED FRUITS AND VEGETABLES — AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	0.	0.	0.	0.	0.	0.	0.	0.
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	0.	0.	0.	0.	0.	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	0.	0.	0.	0.	0.	0.	0.	0.
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 13

PATHWAY - FRESH FRUITS AND VEGETABLES

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	0.	0.	0.	0.	0.	0.	0.	0.
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	0.	0.	0.	0.	0.	0.	0.
CO--60	0.	0.	0.	0.	0.	0.	0.	0.
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q. DEPLETED X/Q AND RELATIVE DEPOSITION

1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 13

PATHWAY - FRESH FRUITS AND VEGETABLES AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	0.	0.	0.	0.	0.	0.	0.	0.
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	0.	0.	0.	0.	0.	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	0.	0.	0.	0.	0.	0.	0.	0.
CS-138	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

1

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 13 .

PATHWAY - MEAT (CONTAMINATED FORAGE)

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							1
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
N---13	0.	0.	0.	0.	0.	0.	0.	0.
C---14	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
CR--51	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	0.	0.	0.	0.	0.	0.	0.
FE--59	0.	0.	0.	0.	0.	0.	0.	0.
CO--57	0.	0.	0.	0.	0.	0.	0.	0.
CO--58	0.	0.	0.	0.	0.	0.	0.	0.
CO--60	0.	0.	0.	0.	0.	0.	0.	0.
NI--63	0.	0.	0.	0.	0.	0.	0.	0.
ZN--65	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--89	0.	0.	0.	0.	0.	0.	0.	0.
RB--87	0.	0.	0.	0.	0.	0.	0.	0.
RB--88	0.	0.	0.	0.	0.	0.	0.	0.
SR--89	0.	0.	0.	0.	0.	0.	0.	0.
SR--90	0.	0.	0.	0.	0.	0.	0.	0.
Y---90	0.	0.	0.	0.	0.	0.	0.	0.
Y---91	0.	0.	0.	0.	0.	0.	0.	0.
ZR--95	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	0.	0.	0.	0.	0.	0.	0.	0.
NB-95M	0.	0.	0.	0.	0.	0.	0.	0.
RU-103	0.	0.	0.	0.	0.	0.	0.	0.
RU-106	0.	0.	0.	0.	0.	0.	0.	0.
AG110M	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER) 1

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

TABLE
(cont

83/05/02.

ENVIRONMENTAL PATHWAY-DOSE CONVERSION FACTORS R(I) FOR GASEOUS DISCHARGE 15

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE FACTORS (SQ.METER-MREM/YR PER UCI/SEC)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	0.	0.	0.	0.	0.	0.	0.	0.
SB-124	0.	0.	0.	0.	0.	0.	0.	0.
SB-125	0.	0.	0.	0.	0.	0.	0.	0.
TE125M	0.	0.	0.	0.	0.	0.	0.	0.
TE127M	0.	0.	0.	0.	0.	0.	0.	0.
TE129M	0.	0.	0.	0.	0.	0.	0.	0.
I--130	0.	0.	0.	0.	0.	0.	0.	0.
I--131	0.	0.	0.	0.	0.	0.	0.	0.
I--132	0.	0.	0.	0.	0.	0.	0.	0.
I--133	0.	0.	0.	0.	0.	0.	0.	0.
I--134	0.	0.	0.	0.	0.	0.	0.	0.
I--135	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	0.	0.	0.	0.	0.	0.	0.	0.
CS-135	0.	0.	0.	0.	0.	0.	0.	0.
CS-136	0.	0.	0.	0.	0.	0.	0.	0.
CS-137	0.	0.	0.	0.	0.	0.	0.	0.
CS-139	0.	0.	0.	0.	0.	0.	0.	0.
XE-133	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
BA137M	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
BA136M	0.	0.	0.	0.	0.	0.	0.	0.
BA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	0.	0.	0.	0.	0.	0.	0.	0.
CE-144	0.	0.	0.	0.	0.	0.	0.	0.
PR-143	0.	0.	0.	0.	0.	0.	0.	0.
ND-147	0.	0.	0.	0.	0.	0.	0.	0.

BASED ON 1 UCI/SEC RELEASE RATE OF EACH ISOTOPE IN AND A VALUE OF 1. FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

NOTE - THE UNITS FOR C---14 AND H----3 ARE (MREM/YR PER UCI/CU.METER)

Ref. EDS © Computer Code RG1.109 Version 2, Rev. 0, Date June 11, 1982

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX C

METEOROLOGICAL DATA

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

TABLE M-1

$\overline{(CHI/Q)}$, $\overline{(Chi/Q)_D}$ and $\overline{(D/Q)}$ Values For Site Boundary
Determined from 1980, 1981, and 1982
Meteorological Data

Direction		Distance (m)	$\overline{(CHI/Q)}$ (sec/m^3)		$\overline{(CHI/Q)}$ (sec/m^3) 8-Day Decay, Depleted		$\overline{(D/Q)}$ (1/m^2)	
			Ground Level	Elevated	Ground Level	Elevated	Ground Level	Elevated
N	W	225	1.8E-07	4.3E-12	1.8E-07	4.3E-12	1.1E-07	7.6E-10
NNE	W	225	8.1E-08	7.3E-13	7.8E-08	7.3E-13	5.3E-08	1.9E-10
NE	W	354	3.1E-08	2.1E-11	2.9E-08	2.1E-11	3.2E-08	4.2E-10
ENE	W	563	1.9E-08	1.6E-10	1.8E-08	1.6E-10	3.5E-08	2.6E-09
E	L	950	8.3E-09	2.0E-10	7.5E-09	2.0E-10	1.5E-08	2.7E-09
ESE	L	1030	5.1E-09	1.3E-10	4.5E-09	1.3E-10	1.1E-08	2.1E-09
SE	L	1110	4.3E-09	1.2E-10	3.9E-09	1.2E-10	8.2E-09	2.0E-09
SSE	L	1754	1.8E-09	6.8E-10	1.6E-09	6.6E-11	2.1E-09	7.6E-10
S	L	2205	1.6E-09	5.6E-11	1.3E-09	5.4E-11	1.5E-09	4.4E-10
SSW	L	2269	1.3E-09	6.5E-11	1.1E-09	6.3E-11	1.1E-09	4.5E-10
SW	L	2382	1.8E-09	5.9E-11	1.5E-09	5.8E-11	1.2E-09	2.6E-10
WSW	L	1867	2.3E-09	2.8E-11	2.0E-09	2.8E-11	1.0E-09	1.2E-10
W	W	644	2.9E-08	3.3E-11	2.7E-08	3.3E-11	1.3E-08	2.4E-10
WNW	W	370	9.1E-08	4.6E-11	8.6E-08	4.6E-11	5.2E-08	4.5E-10
NW	W	306	1.5E-07	6.4E-11	1.5E-07	6.4E-11	9.0E-08	9.8E-10
NNW	W	241	1.7E-07	1.3E-11	1.6E-07	1.3E-11	9.7E-08	7.8E-10

L = Land
W = Water

GROUND LEVEL

TABLE

$\overline{(CHI/Q)}$ (SEC/METER CUBED) FOR EACH SEGMENT

DIRECTION FROM SITE	.5-1	1-2	2-3	SEGMENT BOUNDA 3-4	4-5
S	4.024E-09	1.407E-09	5.555E-10	4.026E-10	2.804E-
SSW	3.578E-09	1.250E-09	5.760E-10	3.997E-10	2.421E-
SW	5.187E-09	1.841E-09	8.543E-10	5.218E-10	3.627E-
WSW	4.634E-09	1.673E-09	7.976E-10	4.959E-10	3.491E-
W	1.121E-08	4.050E-09	1.987E-09	1.260E-09	8.992E-
WNW	1.350E-08	4.852E-09	2.391E-09	1.521E-09	1.089E-
NW	1.617E-08	5.794E-09	2.865E-09	1.827E-09	1.310E-
NNW	1.180E-08	4.246E-09	2.091E-09	1.330E-09	9.513E-
N	1.140E-08	4.135E-09	2.018E-09	1.274E-09	9.069E-
NNE	5.279E-09	1.916E-09	9.204E-10	5.747E-10	4.059E-
NE	4.683E-09	1.698E-09	8.045E-10	4.978E-10	3.493E-
ENE	6.290E-09	2.238E-09	1.044E-09	6.395E-10	4.456E-
E	5.982E-09	2.120E-09	9.909E-10	6.084E-10	4.246E-
ESE	4.125E-09	1.481E-09	6.854E-10	4.055E-10	2.815E-
SE	3.976E-09	1.380E-09	6.376E-10	3.890E-10	2.703E-
SSE	3.436E-09	1.200E-09	5.573E-10	3.516E-10	2.472E-

$\overline{(CHI/Q)}$ (SEC/METER CUBED) FOR EACH SEGMENT 8-Day Decayed, Depleted

DIRECTION FROM SITE	.5-1	1-2	2-3	SEGMENT BOUNDA 3-4	4-5
S	3.604E-09	1.201E-09	5.322E-10	3.141E-10	2.122E-
SSW	3.205E-09	1.070E-09	4.876E-10	2.733E-10	1.832E-
SW	4.645E-09	1.571E-09	6.936E-10	4.077E-10	2.745E-
WSW	4.149E-09	1.427E-09	6.474E-10	3.874E-10	2.642E-
W	1.004E-08	3.455E-09	1.613E-09	9.839E-10	6.804E-
WNW	1.209E-08	4.138E-09	1.941E-09	1.188E-09	8.236E-
NW	1.448E-08	4.942E-09	2.325E-09	1.427E-09	9.914E-
NNW	1.057E-08	3.622E-09	1.697E-09	1.039E-09	7.198E-
N	1.021E-08	3.527E-09	1.638E-09	9.953E-10	6.862E-
NNE	4.727E-09	1.635E-09	7.471E-10	4.490E-10	3.071E-
NE	4.193E-09	1.449E-09	6.531E-10	3.889E-10	2.643E-
ENE	5.633E-09	1.911E-09	8.474E-10	4.997E-10	3.372E-
E	5.357E-09	1.809E-09	8.004E-10	4.753E-10	3.213E-
ESE	3.695E-09	1.230E-09	5.402E-10	3.168E-10	2.131E-
SE	3.562E-09	1.178E-09	5.176E-10	3.039E-10	2.046E-
SSE	3.078E-09	1.024E-09	4.605E-10	2.747E-10	1.870E-

********** (D/Q) RELATIVE DEPOSITION PER UNIT AREA (

DIRECTION FROM SITE	.5-1	1-2	2-3	SEGMENT BOUNDARIES I 3-4	4-5
S	4.260E-09	1.316E-09	5.257E-10	2.862E-10	1.819E-
SSW	3.247E-09	1.003E-09	3.992E-10	2.181E-10	1.386E-
SW	4.020E-09	1.242E-09	4.942E-10	2.701E-10	1.716E-
WSW	2.286E-09	7.062E-10	2.810E-10	1.536E-10	9.759E-
W	4.814E-09	1.487E-09	5.918E-10	3.234E-10	2.055E-
WNW	8.277E-09	2.557E-09	1.018E-09	5.561E-10	3.534E-
NW	1.080E-08	3.337E-09	1.328E-09	7.256E-10	4.612E-
NNW	8.268E-09	2.554E-09	1.016E-09	5.554E-10	3.530E-
N	8.598E-09	2.656E-09	1.057E-09	5.776E-10	3.671E-
NNE	4.113E-09	1.271E-09	5.057E-10	2.763E-10	1.756E-
NE	4.721E-09	1.459E-09	5.805E-10	3.172E-10	2.016E-
ENE	1.050E-08	3.243E-09	1.290E-09	7.052E-10	4.482E-
E	1.056E-08	3.263E-09	1.298E-09	7.096E-10	4.510E-
ESE	8.378E-09	2.589E-09	1.030E-09	5.629E-10	3.577E-
SE	7.419E-09	2.292E-09	9.121E-10	4.984E-10	3.168E-
SSE	4.195E-09	1.296E-09	5.157E-10	2.818E-10	1.791E-

RELEASE

4-2

(NYPA provided XOQDOQ computer runs Reference
EDS Calculation #0900-015-004, dated 4/14/83.)

Also Available On
Aperture Card

MILES IN MILES 5-10	10-20	20-30	30-40	40-50
-10 1,398E-10	5,388E-11	2,078E-11	1,711E-11	1,229E-11
-10 1,191E-10	4,488E-11	2,189E-11	1,381E-11	9,833E-12
-10 1,793E-10	6,799E-11	3,325E-11	2,101E-11	1,497E-11
-10 1,765E-10	6,917E-11	3,469E-11	2,225E-11	1,603E-11
-10 4,650E-10	1,884E-10	9,693E-11	6,313E-11	4,597E-11
-09 5,653E-10	2,305E-10	1,192E-10	7,784E-11	5,682E-11
-09 6,827E-10	2,798E-10	1,452E-10	9,508E-11	6,952E-11
-10 4,939E-10	2,014E-10	1,041E-10	6,798E-11	4,961E-11
-10 4,667E-10	1,878E-10	9,603E-11	6,232E-11	4,526E-11
-10 2,080E-10	8,117E-11	4,084E-11	2,624E-11	1,892E-11
-10 1,753E-10	6,789E-11	3,370E-11	2,146E-11	1,538E-11
-10 2,212E-10	8,436E-11	4,146E-11	2,627E-11	1,876E-11
-10 2,116E-10	8,126E-11	4,021E-11	2,560E-11	1,834E-11
-10 1,391E-10	5,285E-11	2,598E-11	1,648E-11	1,178E-11
-10 1,340E-10	5,125E-11	2,538E-11	1,618E-11	1,162E-11
-10 1,249E-10	4,912E-11	2,478E-11	1,598E-11	1,156E-11

ILES IN MILES 5-10	10-20	20-30	30-40	40-50
10 9,939E-11	3,391E-11	1,489E-11	8,661E-12	5,750E-12
10 8,468E-11	2,826E-11	1,217E-11	6,993E-12	4,600E-12
10 1,275E-10	4,282E-11	1,850E-11	1,064E-11	7,001E-12
10 1,254E-10	4,352E-11	1,929E-11	1,126E-11	7,496E-12
10 3,302E-10	1,185E-10	5,388E-11	3,195E-11	2,150E-11
10 4,013E-10	1,449E-10	6,623E-11	3,940E-11	2,657E-11
10 4,846E-10	1,759E-10	8,070E-11	4,812E-11	3,251E-11
10 3,506E-10	1,266E-10	5,784E-11	3,441E-11	2,320E-11
10 3,314E-10	1,181E-10	5,338E-11	3,154E-11	2,117E-11
10 1,464E-10	5,198E-11	2,271E-11	1,328E-11	8,849E-12
10 1,246E-10	4,274E-11	1,874E-11	1,087E-11	7,194E-12
10 1,572E-10	5,312E-11	2,306E-11	1,330E-11	8,776E-12
10 1,504E-10	5,116E-11	2,236E-11	1,296E-11	8,581E-12
10 9,892E-11	3,328E-11	1,445E-11	8,345E-12	5,512E-12
10 9,527E-11	3,227E-11	1,411E-11	8,194E-12	5,433E-12
10 8,877E-11	3,091E-11	1,376E-11	8,088E-12	5,405E-12

(**-2) BY DOWNWIND SECTORS **********

MILES 5-10	10-20	20-30	30-40	40-50
0 7,813E-11	2,423E-11	9,602E-12	5,128E-12	3,174E-12
0 5,955E-11	1,847E-11	7,319E-12	3,908E-12	2,419E-12
0 7,373E-11	2,286E-11	9,061E-12	4,839E-12	2,995E-12
1 4,192E-11	1,300E-11	5,152E-12	2,751E-12	1,703E-12
0 8,829E-11	2,738E-11	1,085E-11	5,795E-12	3,587E-12
0 1,518E-10	4,708E-11	1,866E-11	9,964E-12	6,167E-12
0 1,981E-10	6,143E-11	2,435E-11	1,300E-11	8,048E-12
0 1,516E-10	4,702E-11	1,864E-11	9,932E-12	6,160E-12
0 1,577E-10	4,890E-11	1,938E-11	1,035E-11	6,406E-12
0 7,544E-11	2,339E-11	9,272E-12	4,951E-12	3,065E-12
0 8,659E-11	2,685E-11	1,064E-11	5,683E-12	3,518E-12
0 1,925E-10	5,970E-11	2,366E-11	1,264E-11	7,821E-12
0 1,937E-10	6,007E-11	2,381E-11	1,271E-11	7,869E-12
0 1,537E-10	4,765E-11	1,889E-11	1,009E-11	6,242E-12
0 1,361E-10	4,219E-11	1,672E-11	8,931E-12	5,528E-12
0 7,694E-11	2,386E-11	9,456E-12	5,050E-12	3,125E-12

$\overline{(CHI/Q)}$ (SEC/METER CUBED) FOR EACH SEGMENT

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5
			SEGMENT BOUNDARIES I		
S	7.856E-11	5.519E-11	4.776E-11	4.016E-11	3.386E-11
SSW	8.040E-11	6.391E-11	5.530E-11	4.566E-11	3.783E-11
SW	6.345E-11	5.844E-11	5.465E-11	4.633E-11	3.893E-11
WSW	3.170E-11	3.003E-11	3.019E-11	2.745E-11	2.427E-11
W	2.501E-11	3.239E-11	3.539E-11	3.274E-11	2.910E-11
WNW	3.638E-11	4.940E-11	5.297E-11	4.763E-11	4.138E-11
NW	7.131E-11	8.486E-11	9.141E-11	8.399E-11	7.408E-11
NNW	7.267E-11	7.724E-11	8.055E-11	7.354E-11	6.481E-11
N	9.589E-11	9.342E-11	9.319E-11	8.386E-11	7.338E-11
NNE	3.489E-11	5.035E-11	5.709E-11	5.397E-11	4.847E-11
NE	4.261E-11	6.564E-11	7.293E-11	6.694E-11	5.899E-11
ENE	1.229E-10	1.179E-10	1.124E-10	9.791E-11	8.397E-11
E	1.858E-10	1.648E-10	1.459E-10	1.212E-10	1.006E-10
ESE	1.259E-10	1.061E-10	9.176E-11	7.513E-11	6.173E-11
SE	1.251E-10	1.003E-10	8.472E-11	6.801E-11	5.513E-11
SSE	9.483E-11	6.535E-11	5.528E-11	4.536E-11	3.753E-11

$\overline{(CHI/Q)}$ (SEC/METER CUBED) FOR EACH SEGMENT 8-Day Decayed, Depleted

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5
			SEGMENT BOUNDARIES I		
S	7.704E-11	5.344E-11	4.588E-11	3.828E-11	3.206E-11
SSW	7.883E-11	6.198E-11	5.318E-11	4.348E-11	3.572E-11
SW	6.230E-11	5.690E-11	5.274E-11	4.427E-11	3.688E-11
WSW	3.111E-11	2.929E-11	2.929E-11	2.648E-11	2.331E-11
W	2.459E-11	3.168E-11	3.440E-11	3.162E-11	2.796E-11
WNW	3.582E-11	4.840E-11	5.145E-11	4.587E-11	3.957E-11
NW	7.012E-11	8.302E-11	8.886E-11	8.111E-11	7.117E-11
NNW	7.138E-11	7.540E-11	7.819E-11	7.094E-11	6.221E-11
N	9.410E-11	9.110E-11	9.038E-11	8.083E-11	7.037E-11
NNE	3.433E-11	4.937E-11	5.566E-11	5.232E-11	4.679E-11
NE	4.199E-11	6.443E-11	7.100E-11	6.465E-11	5.663E-11
ENE	1.206E-10	1.148E-10	1.087E-10	9.398E-11	8.009E-11
E	1.822E-10	1.601E-10	1.405E-10	1.156E-10	9.517E-11
ESE	1.235E-10	1.029E-10	8.822E-11	7.150E-11	5.822E-11
SE	1.226E-10	9.724E-11	8.125E-11	6.449E-11	5.173E-11
SSE	9.300E-11	6.323E-11	5.300E-11	4.307E-11	3.533E-11

**********(D/Q) RELATIVE DEPOSITION PER UNIT AREA (M**-2)

DIRECTION FROM SITE	.5-1	1-2	2-3	3-4	4-5	
				SEGMENT BOUNDARIES IN MILES		
S	8.948E-10	3.999E-10	1.987E-10	1.228E-10	8.338E-11	3
SSW	8.580E-10	4.209E-10	2.215E-10	1.392E-10	9.481E-11	4
SW	4.829E-10	2.624E-10	1.457E-10	9.299E-11	6.350E-11	2
WSW	1.658E-10	8.973E-11	4.971E-11	3.171E-11	2.165E-11	9
W	1.693E-10	9.576E-11	5.417E-11	3.475E-11	2.375E-11	1
WNW	3.719E-10	2.297E-10	1.350E-10	8.746E-11	5.987E-11	2
NW	8.593E-10	4.902E-10	2.785E-10	1.788E-10	1.222E-10	5
NNW	8.779E-10	4.465E-10	2.397E-10	1.515E-10	1.033E-10	4
N	9.710E-10	5.049E-10	2.742E-10	1.739E-10	1.186E-10	5
NNE	3.216E-10	2.099E-10	1.260E-10	8.209E-11	5.625E-11	2
NE	4.420E-10	3.148E-10	1.949E-10	1.279E-10	8.774E-11	4
ENE	1.665E-09	8.876E-10	4.882E-10	3.107E-10	2.121E-10	9
E	2.283E-09	1.183E-09	6.410E-10	4.064E-10	2.772E-10	1
ESE	1.800E-09	8.849E-10	4.662E-10	2.931E-10	1.997E-10	9
SE	1.799E-09	8.527E-10	4.398E-10	2.748E-10	1.870E-10	8
SSE	1.133E-09	4.971E-10	2.439E-10	1.501E-10	1.019E-10	4

EL RELEASE

M-3

(NYPA provided XOQDOQ computer runs Reference
EDS Calculation #0900-015-004, dated 4/14/83.)

Also Available On
Aperture Card

MILES 5-10	10-20	20-30	30-40	40-50
,193E-11	1,123E-11	6,554E-12	4,531E-12	3,425E-12
,363E-11	1,154E-11	6,526E-12	4,442E-12	3,327E-12
,484E-11	1,249E-11	7,222E-12	4,979E-12	3,761E-12
,685E-11	9,299E-12	5,677E-12	4,027E-12	3,101E-12
,010E-11	1,099E-11	6,676E-12	4,736E-12	3,652E-12
,748E-11	1,429E-11	8,371E-12	5,797E-12	4,391E-12
,000E-11	2,608E-11	1,510E-11	1,032E-11	7,724E-12
,395E-11	2,319E-11	1,358E-11	9,358E-12	7,046E-12
,947E-11	2,602E-11	1,526E-11	1,056E-11	7,982E-12
,367E-11	1,620E-11	1,081E-11	7,522E-12	5,706E-12
,022E-11	2,162E-11	1,294E-11	9,060E-12	6,908E-12
,522E-11	2,850E-11	1,661E-11	1,146E-11	8,644E-12
,267E-11	3,028E-11	1,691E-11	1,139E-11	8,462E-12
,783E-11	1,792E-11	9,875E-12	6,607E-12	4,883E-12
,313E-11	1,546E-11	8,530E-12	5,745E-12	4,279E-12
,351E-11	1,157E-11	6,595E-12	4,506E-12	3,381E-12

MILES 5-10	10-20	20-30	30-40	40-50
,047E-11	1,027E-11	5,880E-12	4,008E-12	2,994E-12
,193E-11	1,042E-11	5,758E-12	3,855E-12	2,851E-12
,314E-11	1,138E-11	6,460E-12	4,403E-12	3,299E-12
,604E-11	8,767E-12	5,316E-12	3,756E-12	2,883E-12
,916E-11	1,037E-11	6,263E-12	4,427E-12	3,407E-12
,596E-11	1,330E-11	7,706E-12	5,304E-12	4,002E-12
,756E-11	2,449E-11	1,402E-11	9,518E-12	7,087E-12
,180E-11	2,178E-11	1,262E-11	8,639E-12	6,471E-12
,698E-11	2,439E-11	1,415E-11	9,724E-12	7,317E-12
,226E-11	1,728E-11	1,020E-11	7,070E-12	5,351E-12
,822E-11	2,031E-11	1,207E-11	8,420E-12	6,407E-12
,203E-11	2,642E-11	1,520E-11	1,040E-11	7,796E-12
,827E-11	2,742E-11	1,496E-11	9,923E-12	7,282E-12
,500E-11	1,607E-11	8,614E-12	5,648E-12	4,109E-12
,041E-11	1,369E-11	7,305E-12	4,807E-12	3,516E-12
,173E-11	1,040E-11	5,772E-12	3,866E-12	2,853E-12

BY DOWNWIND SECTORS **********

5-10	10-20	20-30	30-40	40-50
,865E-11	1,329E-11	6,155E-12	3,803E-12	2,579E-12
,378E-11	1,489E-11	6,757E-12	4,103E-12	2,759E-12
,922E-11	9,846E-12	4,386E-12	2,620E-12	1,749E-12
,965E-12	3,359E-12	1,497E-12	8,949E-13	5,975E-13
,092E-11	3,667E-12	1,623E-12	9,641E-13	6,418E-13
,746E-11	9,167E-12	4,008E-12	2,354E-12	1,558E-12
,618E-11	1,886E-11	8,336E-12	4,945E-12	3,290E-12
,764E-11	1,615E-11	7,276E-12	4,391E-12	2,945E-12
,468E-11	1,849E-11	8,300E-12	4,991E-12	3,342E-12
,577E-11	8,573E-12	3,724E-12	2,173E-12	1,434E-12
,014E-11	1,329E-11	5,717E-12	3,306E-12	2,172E-12
,766E-11	3,296E-11	1,473E-11	8,823E-12	5,897E-12
,277E-10	4,322E-11	1,941E-11	1,168E-11	7,823E-12
,219E-11	3,135E-11	1,422E-11	8,630E-12	5,803E-12
,646E-11	2,952E-11	1,349E-11	8,240E-12	5,558E-12
,726E-11	1,630E-11	7,581E-12	4,702E-12	3,194E-12

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JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX D

LIMITED ANALYSIS DOSE ASSESSMENT FOR LIQUID RADIOACTIVE EFFLUENTS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX D

LIMITED ANALYSIS DOSE ASSESSMENT FOR LIQUID RADIOACTIVE EFFLUENTS

The radioactive liquid effluents for the years 1980, 1981, and 1982 (from JAFNPP Semi-Annual Reports) were evaluated to determine the dose contribution of the radionuclide distribution. (See Table D-3) This analysis was performed to evaluate the use of a limited dose analysis for determination of liquid effluent environmental doses. Limiting the dose calculation to a few selected radionuclides that contribute the majority of the dose, along with the application of an appropriate conservatism factor to compensate for variations in isotopic mixtures, provides a simplified method of determining compliance with the dose limits of Technical Specification 2.3.

Tables D-1 and D-2 present the results of this evaluation. Table D-1 presents the fraction of the adult total body dose contributed by the major radionuclides through two dominant pathways, ingestion of fresh water fish and potable water. Table D-2 presents the same data for the adult liver dose. The adult total body and adult liver were determined to be the limiting doses based on an evaluation of all age groups (adult, teenager, child, and infant) and all organs (bone, liver, kidney, lung, skin, and GI-LLI). As the data in the tables show, the radionuclides CS-134, CS-137, MN-54, CO-60 and ZN-65 dominated during 1980-1982 by contributing over 95% of the total body and liver doses via the two ingestion pathways. Although little year-to-year variability is apparent in the overall dose contributions from these 5 radionuclides, a conservatism factor of 0.9 is introduced into the equation (i.e., calculated doses using this approach should be divided by 0.9) to compensate for any unexpected variability in nuclide and pathway dose contribution. Therefore, the dose commitment due to radioactive material in liquid effluents can be reasonably estimated by limiting the dose calculation to these 5 radionuclides and two dose pathways which cumulatively contribute the bulk of the total dose calculated when accounting for all radionuclides detected and all exposure pathways.

Tritium is not included in the limited analysis dose assessment for liquid releases because the potential dose resulting from normal reactor releases is negligible. (i.e., less than 1% of the total dose contribution to the adult liver and whole body dose from the combined fish and potable water ingestion pathways, based on liquid effluent release data for 1980-1982). Furthermore, the release of tritium is a function of operating time and power level and is essentially unrelated to radwaste system operation.

TABLE D-1

ADULT TOTAL BODY DOSE CONTRIBUTION FRACTION

	1980		1981		1982	
RADIONUCLIDE	FISH	POTABLE WATER	FISH	POTABLE WATER	FISH	POTABLE WATER
CS-137	45.5%	37.89%	47.0%	33.11%	42.7%	35.59%
CS-134	51.6%	44.15%	50.0%	35.53%	56.4%	47.21%
MN-54	1%	1.0%	1%	1.10%	1%	1%
ZN-65	1.3%	1.0%	1.6%	1.16%	1%	1.0%
Co-60	1%	13.66%	1%	24.29%	1%	12.34%
TOTAL	98.4%	97.8%	98.6%	95.2%	99.1%	95.1%
Times Fraction of Total Dose Due to Pathway	98.6%	0.6%	99.2%	0.7%	98.6%	0.6%
Overall Fraction of Total Dose Due to the 5 Nuclides in Two Pathways	97.6%		98.5%		98.3%	

$S = 0.005 = 0.5\%$

$\overline{X} = 0.981 = 98.1\%$

TABLE D-2

ADULT LIVER DOSE CONTRIBUTION FRACTION

	1980		1981		1982	
RADIONUCLIDE	FISH	POTABLE WATER	FISH	POTABLE WATER	FISH	POTABLE WATER
CS-137	50.3%	45.29%	51.7%	43.02%	47.9%	43.94%
CS-134	46.6%	42.29%	44.3%	37.04%	50.8%	46.83%
MN-54	1%	3.75%	1.2%	4.90%	1%	1.78%
ZN-65	2.0%	1.87%	2.6%	2.19%	1.0%	1.0%
Co-60	1%	4.84%	1%	9.37%	1%	4.54%
TOTAL	98.9%	98.2%	99.8%	96.52%	99.6%	98.0%
Times Fraction of Total Dose Due to Pathway	99.3%	0.5%	99.1%	0.6%	99.0%	0.5%
Overall Fraction of Total Dose Due to the 5 Nuclides in Two Pathways	98.7%		99.5%		99.1%	

$S = 0.004 = 0.4\%$

$\bar{X} = .991 = 99.1\%$

TABLE D-3

CALCULATON OF TOTAL Ci/YR RELEASES FOR LIQUIDS

(Based on Semi-Annual Effluent Data Reports for the Years 1980, 1981, and 1982)

ISOTOPE	80	81	82	AVERAGE Ci/YR.
H-3	6.55×10^{-1}	6.38×10^{0}	2.81×10^{0}	3.28×10^{0}
AG-110m	1.12×10^{-4}	2.21×10^{-4}	1.15×10^{-5}	1.15×10^{-4}
Cu-64	3.42×10^{-2}	---	---	3.42×10^{-2}
Cs-134	7.30×10^{-2}	8.00×10^{-2}	5.47×10^{-2}	6.92×10^{-2}
Cs-137	1.06×10^{-1}	1.26×10^{-1}	6.96×10^{-2}	1.01×10^{-1}
I-131	2.77×10^{-2}	4.50×10^{-2}	9.05×10^{-4}	2.45×10^{-2}
Ba-La-140	4.61×10^{-4}	1.12×10^{-3}	1.82×10^{-3}	1.13×10^{-3}
Co-58	1.07×10^{-1}	2.08×10^{-1}	2.94×10^{-2}	1.15×10^{-1}
Co-60	5.78×10^{-1}	1.40×10^{0}	3.66×10^{-1}	7.81×10^{-1}
Fe-59	1.31×10^{-2}	1.1×10^{-2}	3.46×10^{-3}	9.19×10^{-3}
Zn-65	3.11×10^{-2}	4.57×10^{-2}	9.81×10^{-3}	2.89×10^{-2}
Mn-54	2.10×10^{-1}	3.44×10^{-1}	6.76×10^{-2}	2.07×10^{-1}
Cr-51	4.63×10^{-2}	4.79×10^{-2}	2.77×10^{-3}	3.23×10^{-2}
Sb-124	4.87×10^{-3}	3.83×10^{-3}	5.37×10^{-4}	3.08×10^{-3}
Mo-99	1.41×10^{-2}	6.44×10^{-4}	1.22×10^{-4}	4.96×10^{-3}
Tc-99m	1.81×10^{-4}	1.67×10^{-3}	3.17×10^{-5}	6.28×10^{-4}
Ce-141	1.72×10^{-5}	6.99×10^{-5}	3.83×10^{-5}	4.18×10^{-5}
Zr-Nb-95	2.14×10^{-3}	2.54×10^{-4}	5.50×10^{-5}	8.16×10^{-4}

TABLE D-3

CALCULATON OF TOTAL Ci/YR RELEASES FOR LIQUIDS

(Continued)

ISOTOPE	80	81	82	AVERAGE Ci/YR.
Ce-144	6.33×10^{-5}	6.58×10^{-4}	2.46×10^{-5}	2.49×10^{-4}
I-133	1.22×10^{-3}	5.35×10^{-3}	1.03×10^{-3}	2.53×10^{-3}
Na-24	1.79×10^{-2}	3.77×10^{-2}	1.70×10^{-3}	1.91×10^{-2}
As-76	2.46×10^{-4}	2.08×10^{-4}	8.67×10^{-5}	1.80×10^{-4}
Np-239	2.24×10^{-3}	4.29×10^{-2}	1.88×10^{-2}	2.13×10^{-2}
Xe-133	9.65×10^{-3}	3.98×10^{-2}	1.05×10^{-2}	2.00×10^{-2}
Xe-135	3.28×10^{-3}	5.85×10^{-2}	1.01×10^{-2}	2.40×10^{-2}
Kr-85m	2.88×10^{-4}	7.28×10^{-6}	7.14×10^{-5}	1.22×10^{-4}
I-135	4.97×10^{-5}	2.47×10^{-3}	1.45×10^{-4}	8.88×10^{-4}
Sr-90	3.47×10^{-5}	1.27×10^{-4}	1.88×10^{-4}	1.17×10^{-4}
Sr-89	----	----	5.53×10^{-4}	5.53×10^{-4}

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX E

TECHNICAL BASES FOR EFFECTIVE DOSE FACTORS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX E

TECHNICAL BASES FOR EFFECTIVE DOSE FACTORS

The evaluation of doses due to releases of radioactive material to the atmosphere can be simplified by the use of effective dose transfer factors instead of using dose factors which are radionuclide specific. These effective factors, which are based on the typical radionuclide distribution in the releases, can be applied to the total radioactivity released to approximate the dose in the environment, i.e., instead of having to sum the isotopic distribution multiplied by the isotope specific dose factor only a single multiplication (K_{eff}, M_{eff} of N_{eff}) times the total quantity of radioactive material released, would be needed. This approach provides a reasonable estimate of the actual dose while eliminating the need for a detailed calculational technique.

Determination of Effective Dose Factors

The effective dose transfer factors are based on past operating data. The radioactive effluent distribution for the past years can be used to derive single effective factors by the following equations.

$$K_{eff} = \sum_{i=1}^{n} K_i \cdot f_i \qquad \text{E-1}$$

where

K_{eff} = the effective total body dose factor due to gamma emissions from all noble gases released.

K_i = the total body dose factor due to gamma emissions from each noble gas radionuclide 'i' released.

f_i = the fractional abundance of noble gas radionuclide 'i' is of the total noble gas radionuclides.

$$(L + 1.1\,M)_{eff} = \sum_{i=1}^{n} (L_i + 1.1\,M_i) \cdot f_i \qquad \text{E-2}$$

where

$(L + 1.1\,M)_{eff}$ = the effective skin dose factor due to beta and gamma emissions from all noble gases released.

$(L_i + 1.1\,M_i)$ = the skin dose factor due to beta and gamma emissions from each noble gas radionuclide i released.

APPENDIX E
(Continued)

TECHNICAL BASES FOR EFFECTIVE DOSE FACTORS

$$M_{eff} = \sum_{i=1}^{n} M_i \cdot f_i \qquad \text{E-3}$$

where

M_{eff} = the effective air dose factor due to gamma emissions from all noble gases released.

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

$$N_{eff} = \sum_{i=1}^{n} N_i \cdot f_i \qquad \text{E-4}$$

where

N_{eff} = the effective air dose factor due to beta emissions from all noble gases released.

N_i = the air dose factor due to beta emissions from each noble gas radionuclide 'i'.

To determine the appropriate effective factors to be used and to evaluate the degree of variability, the atmospheric radioactive effluents for the years 1980, 1981, and 1982 have been evaluated. Tables C-1, C-2, and C-3 present the results of this evaluation.

As can be seen from Tables C-1, C-2 and C-3, the effective dose transfer factors vary little from year to year, particularly in the case of elevated releases which contribute the majority of released noble gas activity and offsite dose.

To provide an additional degree of conservatism, a factor of 0.8 is introduced into the dose calculation process when the effective dose transfer factor is used. This added conservatism provides additional assurance that the evaluation of doses by the use of a single effective factor will not significantly underestimate any actual doses in the environment.

TABLE E-1

EFFECTIVE DOSE FACTORS* FOR NOBLE GASES - TOTAL BODY EFFECTIVE DOSE

[K_{eff}]

YEAR	GROUND RELEASE	ELEVATED RELEASE
	Total Body Effective Dose Factor K_{eff} [mrem/uCi sec/m^3]	Total Body Effective Dose Factor K_{eff} [mrem/uCi sec/m^3]
1980	1.16×10^{-4}	1.37×10^{-4}
1981	6.89×10^{-5}	1.49×10^{-4}
1982	4.55×10^{-5}	1.38×10^{-4}
AVG.	7.68×10^{-5}	1.41×10^{-4}

* Computed in EDS Nuclear Inc. Calculation No. 0900-015-1671 (005), 4/83.

TABLE E-2

EFFECTIVE DOSE FACTORS* FOR NOBLE GASES - AIR DOSES

M_{eff} & N_{eff}

YEAR	GROUND RELEASE		ELEVATED RELEASE	
	Gamma-Air Effective Dose Factor M_{eff} mrad/uCi-sec/m^3	Beta-Air Effective Dose Factor N_{eff} mrad/uCi-sec/m^3	Gamma-Air Effective Dose Factor M_{eff} mrad/uCi-sec/m^3	Beta-Air Effective Dose Factor N_{eff} mrad/uCi-sec/m^3
1980	1.21×10^{-4}	8.03×10^{-5}	1.42×10^{-4}	9.77×10^{-5}
1981	7.44×10^{-5}	5.57×10^{-5}	1.25×10^{-4}	7.66×10^{-5}
1982	4.96×10^{-5}	4.54×10^{-5}	1.44×10^{-4}	1.00×10^{-4}
AVG	8.17×10^{-5}	6.05×10^{-5}	1.37×10^{-4}	9.14×10^{-5}

* Computed in EDS Nuclear Inc. Calculation No. 0900-015-1671 (005), 4/83.

TABLE E-3

EFFECTIVE DOSE FACTORS* FOR NOBLE GASES - SKIN EFFECTIVE DOSE

YEAR	GROUND RELEASE	ELEVATED RELEASE
	Total Skin Effective Dose Factor $(L+1.1\ M)_{eff}$ mrem/uCi-sec/m^3	Total Skin Effective Dose Factor $(L+1.1\ M)_{eff}$ mrem/uCi-sec/m^3
1980	1.94×10^{-4}	2.34×10^{-4}
1981	1.22×10^{-4}	1.76×10^{-4}
1982	8.24×10^{-5}	2.41×10^{-4}
AVG.	1.33×10^{-4}	2.17×10^{-4}

* Computed in EDS Nuclear Inc. Calculation No. 0900-015-1671 (005), 4/83.

TABLE E-4

TABLES OF SOURCE TERMS USED FOR DEVELOPMENT OF EFFECTIVE DOSE TRANSFER FACTORS

(Based On Semi-Annual Effluent Data Reports for the years 1980, 1981, 1982)

ELEVATED GASEOUS RELEASE

ISOTOPE	80	81	82
N-13	1.22×10^{3}	8.41×10^{3}	2.53×10^{3}
Ar-41	2.17×10^{2}	2.21×10^{2}	3.19×10^{2}
Kr-85m	5.17×10^{3}	1.23×10^{4}	1.15×10^{4}
Kr-87	6.02×10^{3}	1.49×10^{4}	1.93×10^{4}
Kr-88	9.58×10^{3}	2.48×10^{4}	2.38×10^{4}
Xe-131m	1.10×10^{4}	3.289×10^{4}	2.85×10^{4}
Xe-133	1.48×10^{4}	3.18×10^{4}	1.83×10^{4}
Xe-133m	1.52×10^{2}	5.49×10^{2}	4.22×10^{2}
Xe-135	2.03×10^{4}	5.18×10^{4}	5.90×10^{4}
Xe-135m	2.22×10^{3}	5.53×10^{3}	8.74×10^{3}
Xe-138	5.01×10^{3}	1.44×10^{4}	2.53×10^{4}
I-131	2.99×10^{-2}	6.37×10^{-2}	4.03×10^{-1}
I-133	6.32×10^{-2}	2.02×10^{-1}	1.69×10^{0}
I-135	4.05×10^{-2}	2.91×10^{-1}	2.03×10^{0}
Mn-54	2.47×10^{-4}	3.52×10^{-4}	1.31×10^{-3}
Co-58	2.07×10^{-5}	1.05×10^{-5}	1.71×10^{-5}
Co-60	1.10×10^{-4}	2.81×10^{-5}	2.34×10^{-5}
Zr-Nb-95	-------	3.92×10^{-6}	7.19×10^{-4}

TABLE E-4
(Continued)

TABLES OF SOURCE TERMS USED FOR DEVELOPMENT OF
EFFECTIVE DOSE TRANSFER FACTORS

(Based On Semi-Annual Effluent Data Reports
for the years 1980, 1981, 1982)

ELEVATED GASEOUS RELEASE

ISOTOPE	80	81	82
Sr-89	1.53×10^{-3}	1.37×10^{-1}	2.75×10^{-1}
Sr-90	3.61×10^{-5}	1.29×10^{-4}	3.05×10^{-4}
Cs-137	1.14×10^{-4}	6.58×10^{-4}	3.55×10^{-3}
Ba-La-140	6.73×10^{-4}	1.13×10^{-2}	2.40×10^{-3}
Cr-51	4.26×10^{-5}	--------	3.97×10^{-5}
Ce-141	---------	--------	8.57×10^{-7}
H-3	4.393	6.649	5.26

TABLE E-5

TABLES OF SOURCE TERMS USED FOR DEVELOPMENT OF EFFECTIVE DOSE TRANSFER FACTORS

(Based On Semi-Annual Effluent Data Reports for the years 1980, 1981, 1982)

GROUND LEVEL RELEASE

ISOTOPE	80	81	82
N-13	8.9×10^{1}	3.84×10^{2}	4.26×10^{1}
Kr-87	4.72×10^{1}	3.08×10^{1}	1.51×10^{1}
Kr-85m	5.59×10^{1}	ND	ND
Kr-88	9.15×10^{1}	1.82×10^{1}	ND
Xe-133	3.95×10^{2}	5.88×10^{2}	1.94×10^{3}
Xe-135	2.23×10^{2}	4.66×10^{2}	7.19×10^{2}
Xe-135m	5.38×10^{1}	4.21×10^{2}	6.50×10^{2}
Xe-138	1.49×10^{2}	8.18×10^{1}	1.06×10^{2}
I-131	4.68×10^{-2}	5.12×10^{-2}	3.15×10^{-2}
I-133	7.07×10^{-2}	3.52×10^{-2}	1.60×10^{-1}
I-135	4.24×10^{-2}	3.97×10^{-2}	2.14×10^{-1}
Cr-51	1.76×10^{-2}	1.35×10^{-3}	2.30×10^{-3}
Mn-54	3.58×10^{-3}	6.37×10^{-4}	4.14×10^{-4}
Co-58	3.33×10^{-3}	4.96×10^{-4}	5.41×10^{-5}
Co-60	1.45×10^{-2}	5.49×10^{-3}	3.79×10^{-3}
Sr-89	8.85×10^{-4}	3.57×10^{-3}	7.88×10^{-4}
Sr-90	2.15×10^{-5}	3.92×10^{-6}	1.63×10^{-5}

TABLE E-5
(Continued)

TABLES OF SOURCE TERMS USED FOR DEVELOPMENT OF
EFFECTIVE DOSE TRANSFER FACTORS

(Based On Semi-Annual Effluent Data Reports
for the years 1980, 1981, 1982)

GROUND LEVEL RELEASE

ISOTOPE	80	81	82
Zr-Nb-95	1.67×10^{-5}	5.27×10^{-5}	2.56×10^{-6}
Cs-134	3.21×10^{-4}	1.73×10^{-4}	4.51×10^{-4}
Cs-137	3.05×10^{-4}	2.04×10^{-4}	4.64×10^{-4}
Ba-La-140	1.48×10^{-3}	3.92×10^{-3}	3.64×10^{-3}
Ce-141	2.30×10^{-5}	2.29×10^{-5}	4.83×10^{-5}
Zn-65	4.04×10^{-4}	4.97×10^{-5}	2.98×10^{-5}

TABLE E-6

RADIONUCLIDE DISTRIBUTION OF GROUND AND ELEVATED RELEASES

RADIONUCLIDE	FRACTION OF TOTAL RELEASES					
	GROUND			ELEVATED		
	1980	1981	1982	1980	1981	1982
Ar-41	----	----	----	.003	.001	.002
Kr-85m	.055	----	----	.008	.065	.059
Kr-87	.046	.019	.004	.095	.079	.099
Kr-88	.090	.011	----	.151	.131	.122
Xe-131m	----	----	----	.173	.174	.146
Xe-133m	----	----	----	.002	.003	.002
Xe-133	.389	.366	.566	.233	.168	.094
Xe-135m	.053	.262	.189	.035	.029	.045
Xe-135	.220	.290	.210	.320	.274	.302
Xe-138	.147	.051	.031	.079	.076	.130

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX F

EFFLUENT MONITOR SAMPLING LOCATIONS AND DESCRIPTIONS

TABLE F-1

ATMOSPHERIC GASEOUS RELEASE POINT DATA

Release Point	Stack	Reactor* Building	Turbine* Building	Radwaste* Building	Refuel Floor
Height above Grade (Feet)	385	172	172	111	172
Release Mode	Elevated	Ground	Ground	Ground	Ground
Effluent Source	Turbine Gland Seal Condenser Gases Mechanical Vacuum Pump Exhaust Steam Jet Air Ejector Exhaust	Secondary and Auxiliary Building Exhaust Building	Turbine Building Exhaust Ventilation	Waste Disposal Building Ventilation	Refuel Floor Exhaust Ventilation

* For purposes of dose projection all four release points are considered as one ground level release.

TABLE F-2

EFFLUENT MONITORING SYSTEM DATA

MONITOR DESCRIPTION	SAMPLING LOCATION	DETECTOR TYPE	RANGE	CONTROL FUNCTIONS	ALARM SETPOINT USED	REFERENCE CALIBRATION SOURCE
Main steam line monitor	Located near the main steam lines downstream of the out-board MSIV's in the steam tunnel	4-gamma sensitive ion chambers	0-10^6mR/hr	Direct scram, containment isolation (closure of MSIV's, recirc system sample isolation valves, vacuum pump line valve)	Yes	Victoreen Cs^{137} gamma dose rate source
Off-gas radiation monitoring system	Turbine 252' west	2-gamma sensitive ion chambers	0-10^6mR/hr	Initiate closure of off-gas system isolation valves	Yes	Gas sample counted on Ge(Li)
Off-gas pipe (Stack) monitor	Stack	Scintillation detectors	0-10^6 CPS	Indicate and record rate of release of radioactive material to the environment	Yes	Gas vent marinelli counted on Ge(Li)
Process liquid radiation monitors	RxBCLC-RX 300' RHR Service H_2O - RX 300' Rad Waste - RW 272' Service H_2O Heater Bay 252'	Scintillation detectors	10^{-1}-10^6 CPS	Monitor for leaks of closed systems. Monitor normal release of radio-active material to the environment	Yes	Representa-tive liquid sample counted on Ge(Li)

JAMES A. FITZPATRICK NUCLEAR POWER PLANT
OFFSITE DOSE CALCULATION MANUAL (ODCM)
TABLE F-2 (Continued)
EFFLUENT MONITORING SYSTEM DATA

MONITOR DESCRIPTION	SAMPLING LOCATION	DETECTOR TYPE	RANGE	CONTROL FUNCTIONS	ALARM SETPOINT USED	REFERENCE CALIBRATION SOURCE
Plant vent particulate and iodine monitors	Turbine-MG set 300' Reactor-RX 344' Refuel-RX 369' Radwaste-TB 272'	Scintillation detectors	$0-10^6$CPS	Provide isolation of potentially contaminated systems	Yes	Gas marinelli counted on Ge(Li)
Drywell continuous air monitor	Reactor 300' south side	Scintillation detectors	$0-10^6$CPM	Monitor airborne radioactivity in Drywell during normal operation	Yes	Gas marinelli counted on Ge(Li)
Containment high range monitors	Drywell penetrations X110C and X100D	2-ion chamber detectors	$0-10^8$R/hr	Accident control and initiates isolation	Yes	Victoreen Cs^{137} gamma dose rate source
High range effluent monitors	Stack, Turbine, Rad Waste	2-ion chamber detectors	$0-10^8$R/hr	Accident control and initials isolation	Yes	Victoreen Cs^{137} gamma dose rate source

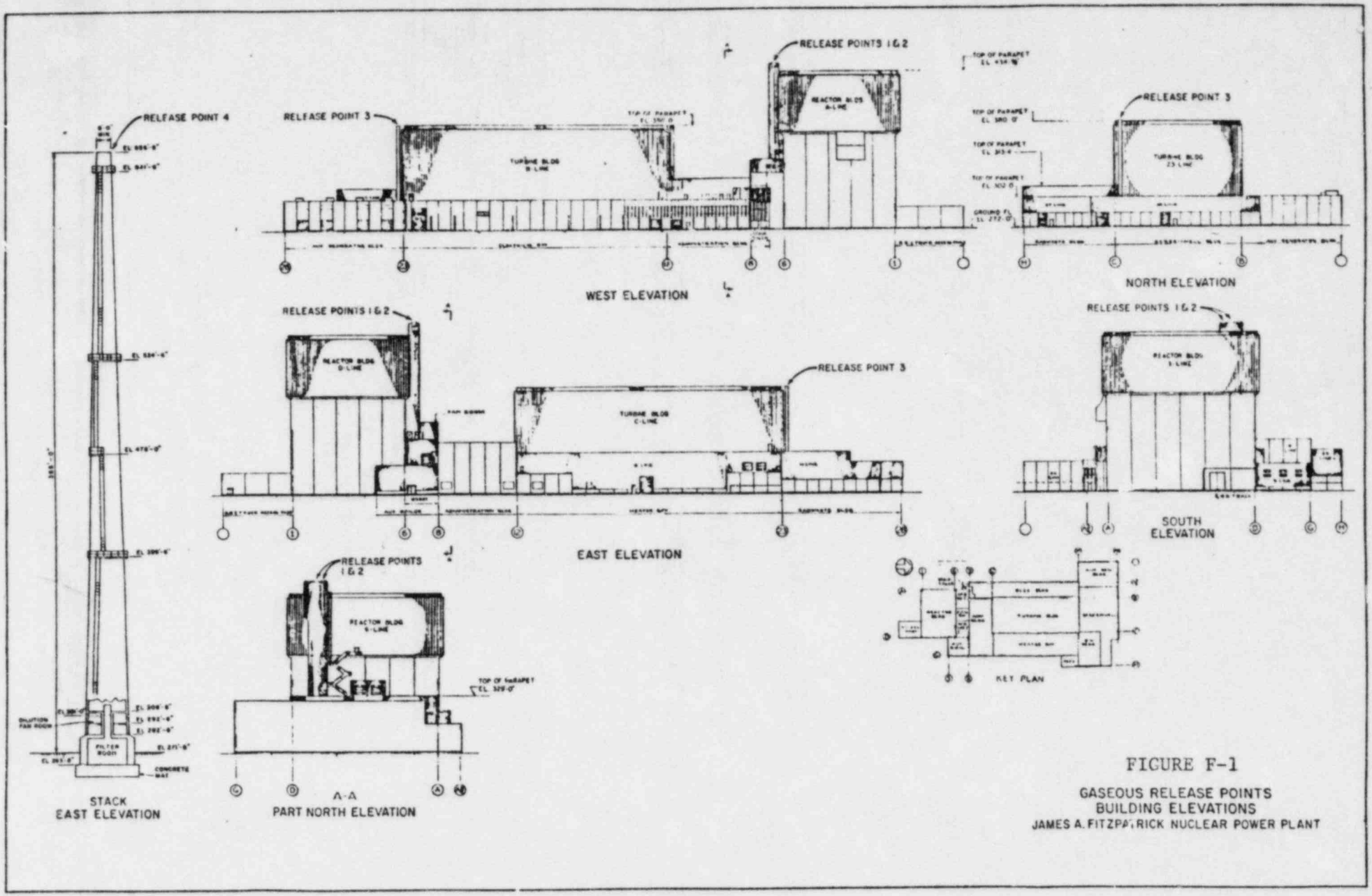


FIGURE F-1

GASEOUS RELEASE POINTS
BUILDING ELEVATIONS
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

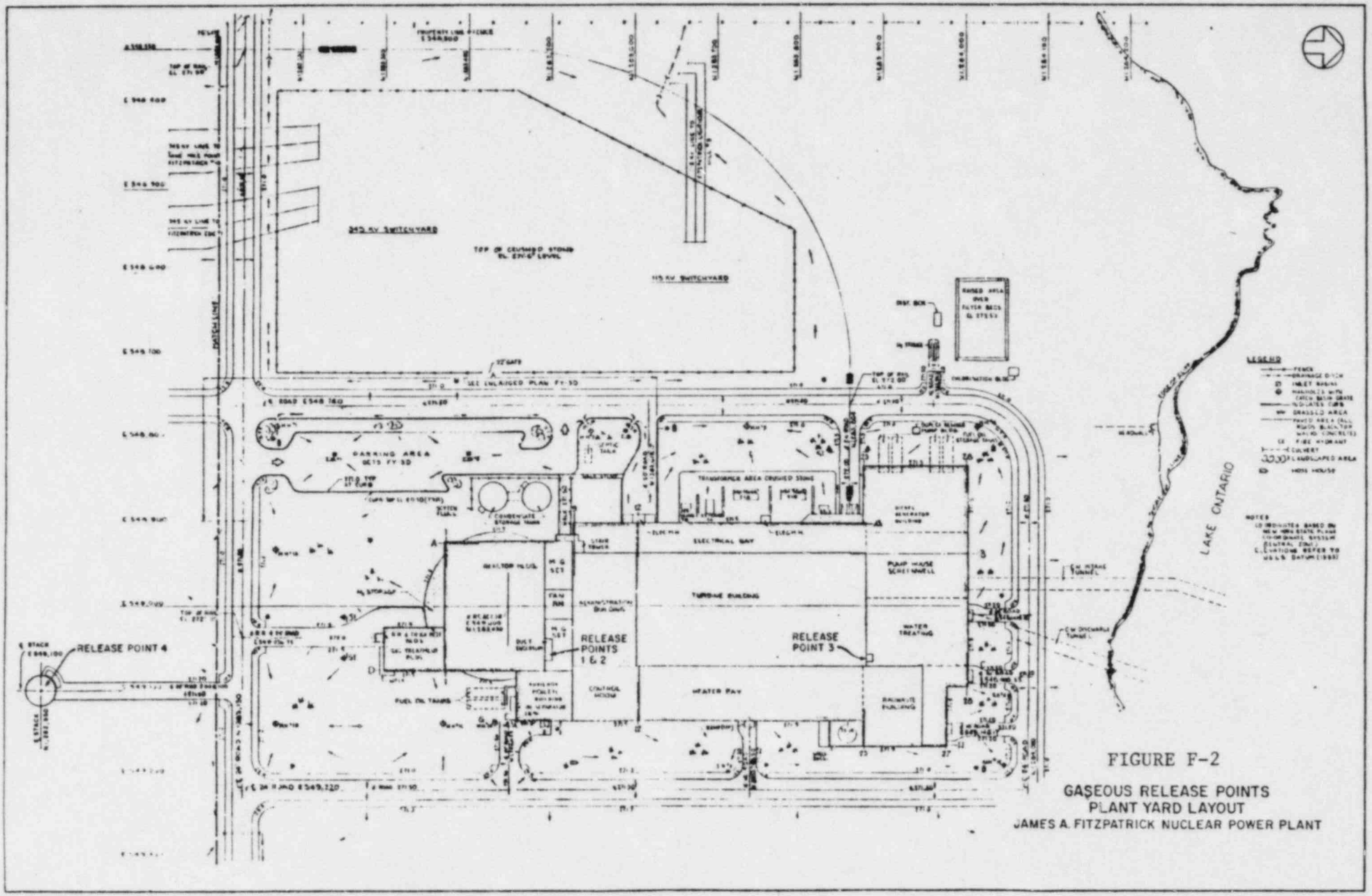
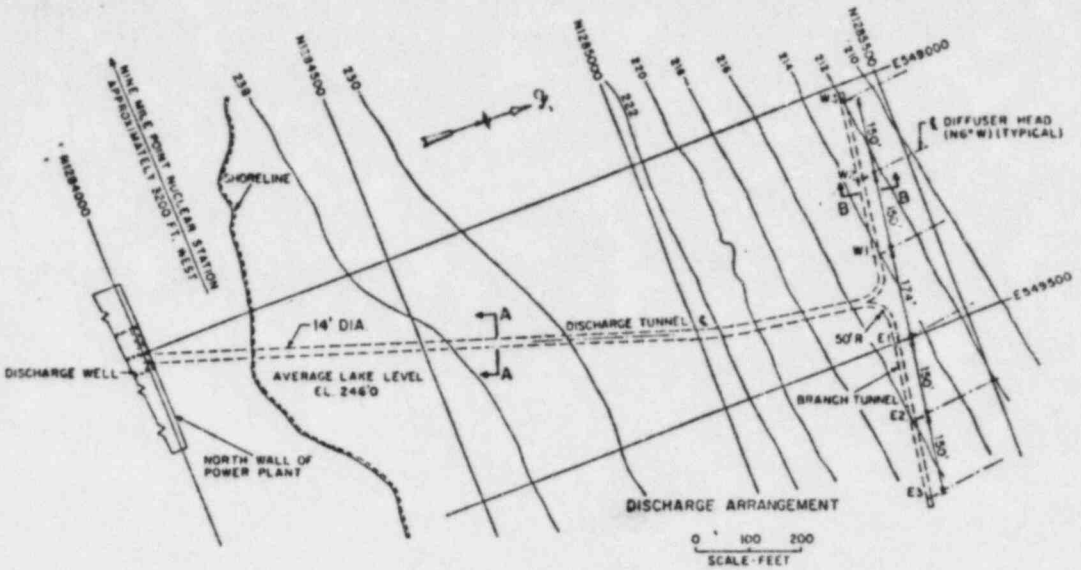
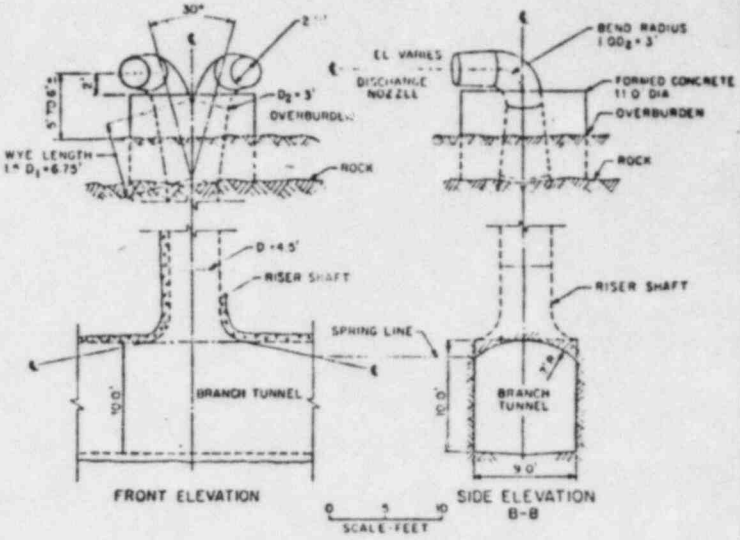
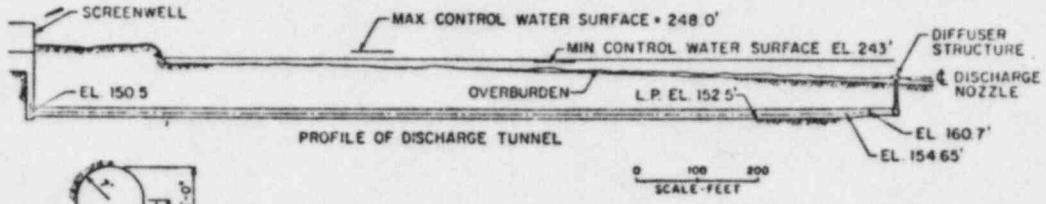


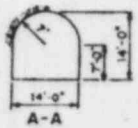
FIGURE F-2

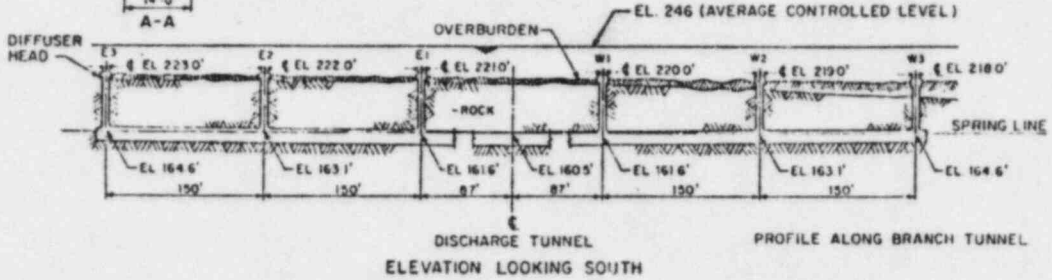
GASEOUS RELEASE POINTS
PLANT YARD LAYOUT
JAMES A. FITZPATRICK NUCLEAR POWER PLANT





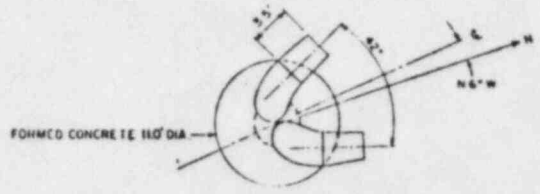






NOTE:
ALL ELEVATIONS BASED ON UNITED STATES LAKE SURVEY 1935 DATUM.

0 50 100
SCALE-FEET



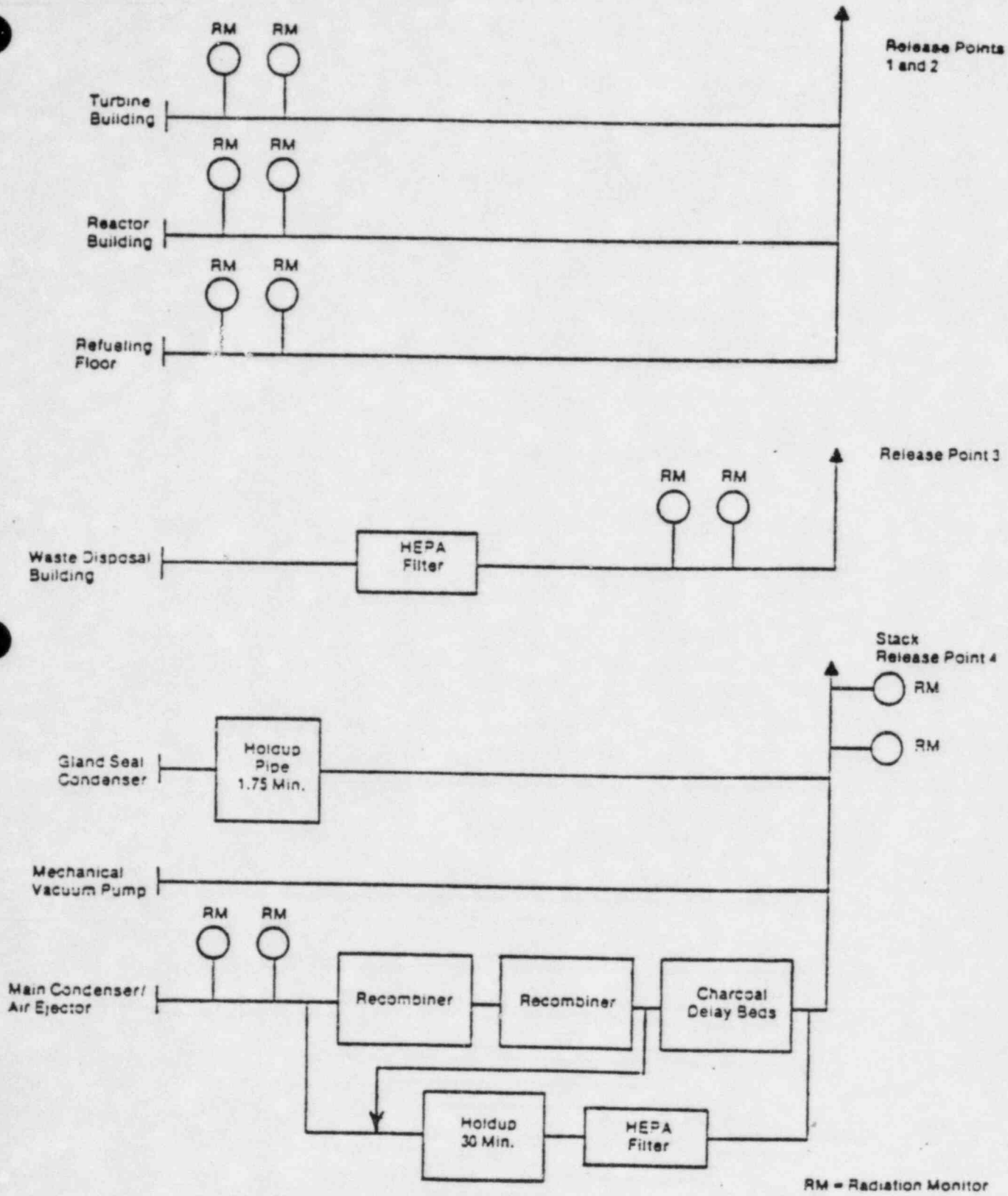
PLAN
DISCHARGE STRUCTURE DIFFUSER HEAD

FIGURE F-3

DISCHARGE TUNNEL PLAN AND PROFILE
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

FIGURE F-4

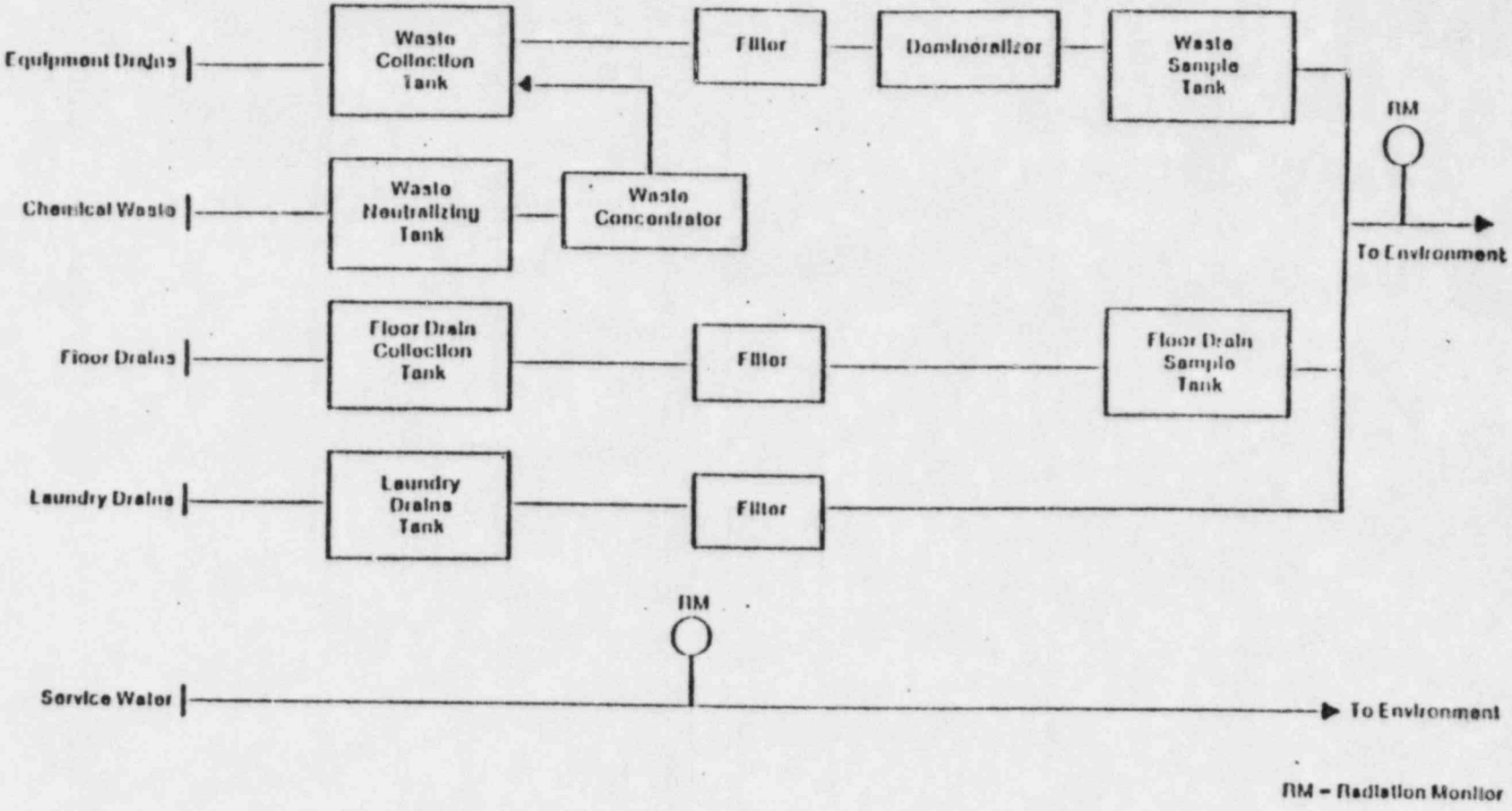
GASEOUS EFFLUENT RELEASE PATHS



Gaseous Effluent Release Paths
James A. FitzPatrick Nuclear Power Plant

FIGURE F-5

LIQUID EFFLUENT RELEASE PATHS



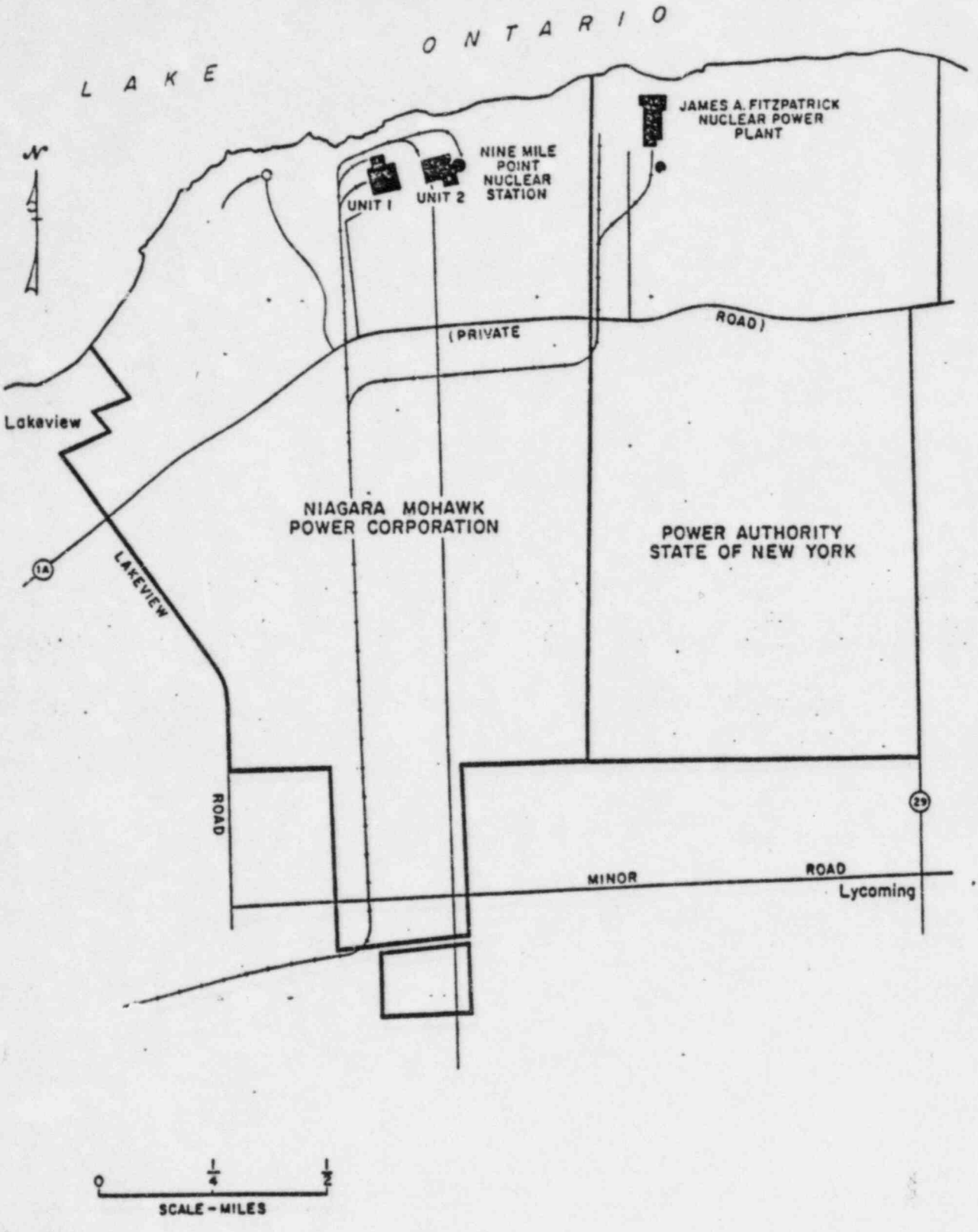
JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX G

UNRESTRICTED AREA MAP

JAFNPP SITE BOUNTARY MAP



J.A. FITZPATRICK N.P.P.
SITE BOUNDARY MAP
ODCM

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX H

ENVIRONMENTAL SAMPLE LOCATIONS

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

ENVIRONMENTAL SAMPLING LOCATIONS

The current sampling locations are specified in Appendix H.

The Environmental Monitoring Program is a joint effort between the Power Authority of the State of New York, the owners and operators of the FitzPatrick Nuclear Power Station, and the Niagara Mohawk Power Corporation. Sampling locations are chosen on the basis of average dispersion parameters from both units.

The average dispersion parameters for the two units have been calculated for the five (5) year period, 1978 through 1982. The calculated dispersion parameters will be compared to the results of the annual land use census. If it is determined that milk animals exists at a location that yields a significantly higher, e.g., five (5) times, calculated D/Q rate, the new milk station will be added to the monitoring program within 30 days. If a new station is added, the old station that yields the lowest calculated dose may be dropped from the program after October 31 of that year.

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

TABLE H-1

RADIATION ENVIRONMENTAL MONITORING SAMPLING LOCATIONS

Type of Sample	Map Location	Collection Site	Location
Radioiodine and Particulates (air)	1	Village of Lycoming, NY	1.9 mi @ 145° SE
Radioiodine and Particulates (air)	2	TBD	-
Radioiodine and Particulates (air)	3	TBD	-
Radioiodine and Particulates (air)	4	TBD	-
Radioiodine and Particulates (air)	5	TBD	-
Direct Radiation (TLD)	6	North Shoreline Area	0.1 mi @ 0° N
Direct Radiation (TLD)	7	North Shoreline Area	0.1 mi @ 25° NNE
Direct Radiation (TLD)	8	North Shoreline Area	0.2 mi @ 45° NE
Direct Radiation (TLD)	9	North Shoreline Area	0.9 mi @ 75° ENE
Direct Radiation (TLD)	10	Sunset Bay Road	1.2 mi @ 90° E
Direct Radiation (TLD)	11	Rt. 29	1.3 mi @ 115° ESE
Direct Radiation (TLD)	12	Rt. 29	1.5 mi @ 135° SE
Direct Radiation (TLD)	13	Miner Road	1.8 mi @ 160° SSE
Direct Radiation (TLD)	14	Miner Road	1.7 mi @ 180° S
Direct Radiation (TLD)	15	Lakeview Road	1.1 mi @ 200° SSW
Direct Radiation (TLD)	16	Lakeview Road	0.7 mi @ 225° SW
Direct Radiation (TLD)	17	Site Meteorological Tower	0.7 mi @ 250° WSW
Direct Radiation (TLD)	18	Energy Information Center	0.5 mi @ 268° W

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

TABLE H-1 (Continued)

RADIATION ENVIRONMENTAL MONITORING SAMPLING LOCATIONS

Type of Sample	Map Location	Collection Site	Location
Direct Radiation (TLD)	19	North Shoreline	0.2 mi @ 290° WNW
Direct Radiation (TLD)	20	North Shoreline	0.1 mi @ 315° NW
Direct Radiation (TLD)	21	North Shoreline	0.1 mi @ 335° NNW
Direct Radiation (TLD)	22	Demster Beach Road	4.5 mi @ 100° E
Direct Radiation (TLD)	23	Leavitt Road	4.2 mi @ 115° ESE
Direct Radiation (TLD)	24	Rt. 104	4.2 mi @ 140° SE
Direct Radiation (TLD)	25	Rt. 51A	4.8 mi @ 160° SSE
Direct Radiation (TLD)	26	Maiden Lane Road	4.4 mi @ 190° S
Direct Radiation (TLD)	27	Rt. 53	4.8 mi @ 205° SSW
Direct Radiation (TLD)	28	Mitchell Street	4.8 mi @ 220° SW
Direct Radiation (TLD)	29	Lake Shoreline	4.4 mi @ 240° WSW
Direct Radiation (TLD)	30	Phoenix, NY Control	20.0 mi @ 165° S-SSE
Direct Radiation (TLD)	31	S.W. Oswego, Control	12.8 mi @ 225° SW
Direct Radiation (TLD)	32	Scriba, NY	4.1 mi @ 195° SSW
Direct Radiation (TLD)	33	Alcan Aluminum, RT. 1A	3.2 mi @ 220° SW
Direct Radiation (TLD)	34	Lycoming, NY	1.9 mi @ 145° SE
Direct Radiation (TLD)	35	New Haven, NY	5.4 mi @ 120° ESE
Direct Radiation (TLD)	36	W. Boundary, Bible Camp	0.9 mi @ 238° SW-WSW
Direct Radiation (TLD)	37	Lake Road	1.1 mi @ 105° E-ESE
Surface Water	38	OSS Inlet Canal	7.7 mi @ 230° SW-WSW
Surface Water	39	JAFNPP Inlet Canal	0.5 mi @ 70° ENE

TABLE H-1 (Continued)

RADIATION ENVIRONMENTAL MONITORING SAMPLING LOCATIONS

Type of Sample	Map Location	Collection Site	Location
Shoreline Sediment	40	NMPNS Shoreline	0.3 mi @ 275° W
Fish	41	NMP Site Discharge Area	0.3 mi @ 315° NW and/or
Fish	42	NMP Site Discharge Area	0.6 mi @ 55° NE
Fish	43	Oswego Harbor Area	6.3 mi @ 235° WSW
Milk	44	TBD	-
Milk	45	TBD	-
Milk	46	TBD	-
Milk	47	TBD	-
Food Product	48	TBD	-
Food Product	49	TBD	-
Food Product	50	TBD	-
Food Product	51	TBD	-

TBD = To Be Determined

FIGURE H-1
ENVIRONMENTAL SAMPLING LOCATION MAP

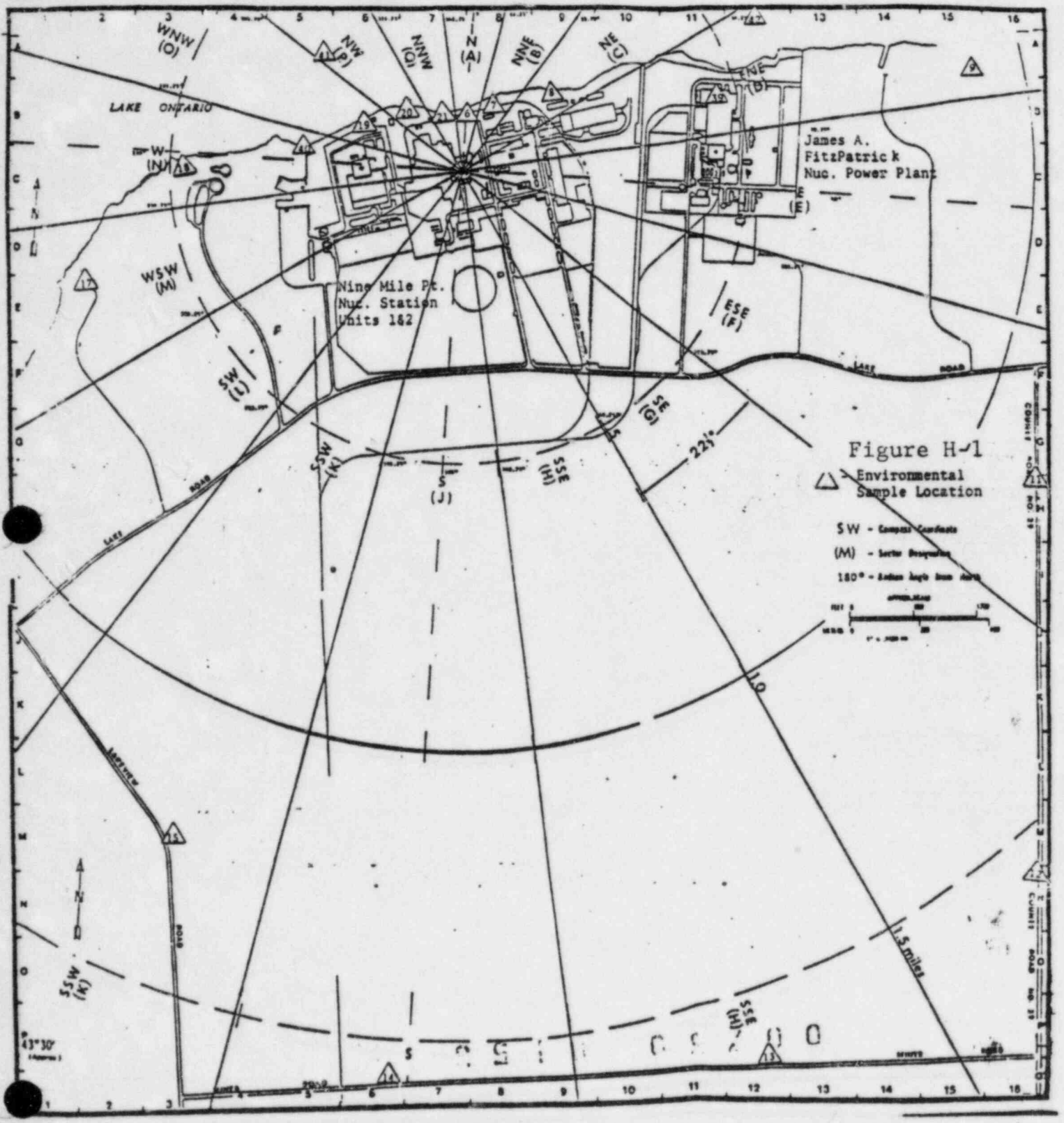


FIGURE H-2

ENVIRONMENTAL SAMPLING LOCATION MAP

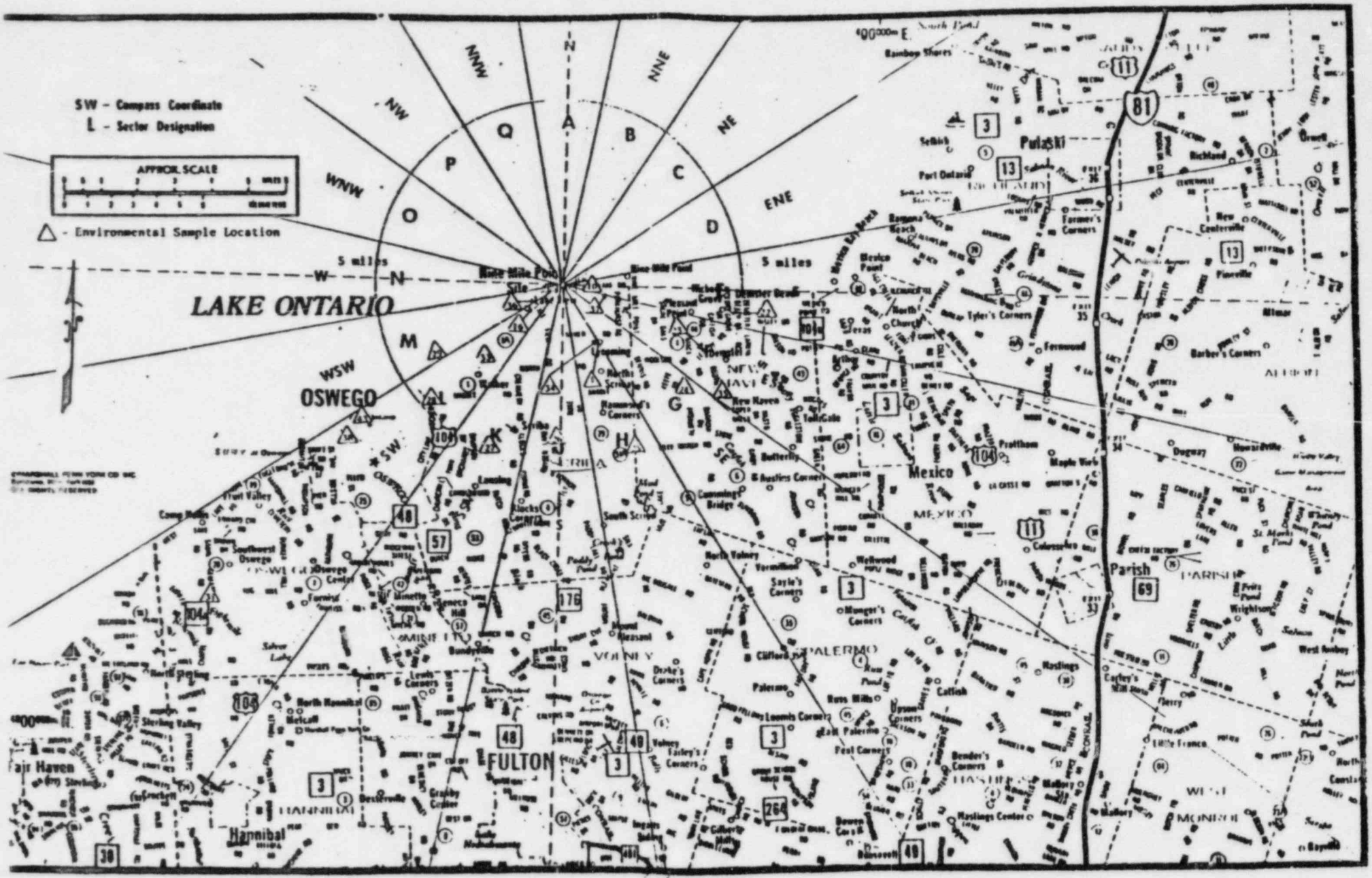
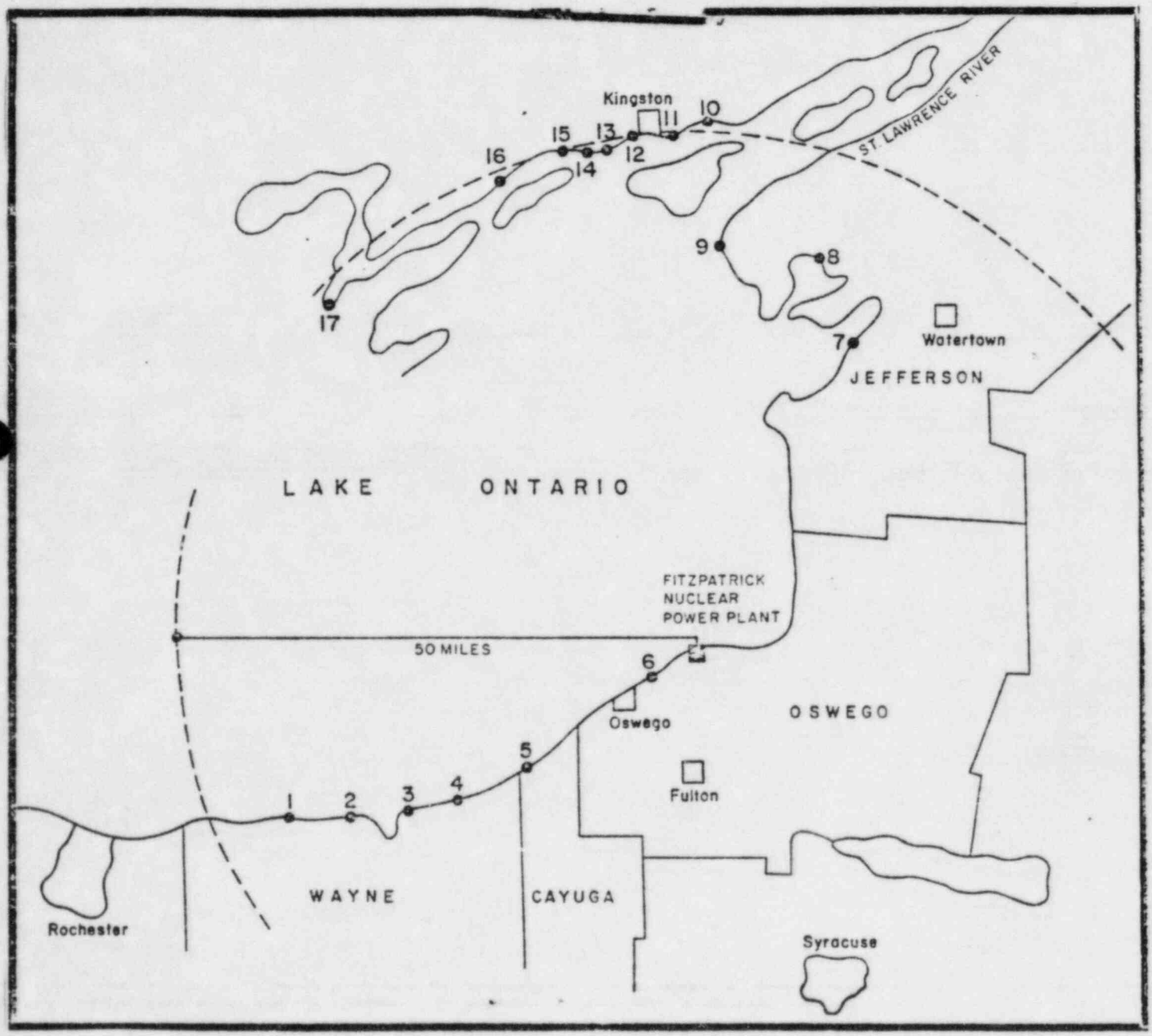


FIGURE H-3

LIQUID EFFLUENT PATHWAY - WATER INTAKE POINTS



JAMES A. FITZPATRICK NUCLEAR POWER PLANT

OFFSITE DOSE CALCULATION MANUAL (ODCM)

APPENDIX I

TABLE I-1

RADIOACTIVE EFFLUENT RELEASE LIMITS - SUMMARY TABLE

Dose/Dose Commitment	Path/ Source	Monthly Period (1)			Calendar Quarter			Calendar Year		
		Whole Body (mrem)	Skin (mrad)	Any Organ (mrem)	Whole Body (mrem)	Skin (mrad)	Any Organ (mrem)	Whole Body (mrem)	Skin (mrad)	Any Organ (mrem)
Member of the Public	Plant Liquid (2) Effluents	0.06	None	0.2	1.5	None	5	3	None	10
Member of the Public	Plant Gaseous (2) Effluents	0.2*	0.4	0.3	5*	10	7.5	10*	20	15
At or Beyond Site Boundary	Plant Gaseous (3) Effluents	None	None	None	None	None	None	500	3000	1500
Member of the Public	Uranium (4) Fuel Cycle (Site)	None	None	None	None	None	None	25	None	25(5)

(1) Equipment operability requirements for projected exposures. Refer to Specifications 2.4 (Liquid) and 3.6 (Gaseous).

(2) Plant Liquid and Gaseous release limitations in accordance with Appendix I to 10 CFR 50. Refer to Specifications 2.3 (Liquids), 3.3 (Noble Gases) and 3.4 (Iodines and Particulates).

(3) Plant Gaseous release limitations in accordance with 10 CFR 20. Refer to Specification 3.2.

(4) Site Gaseous release limitations in accordance with 40 CFR 190. Refer to Specification 5.0.

(5) Limits to any organ except the thyroid which shall be limited to 75 mrem.

*mrad, air dose.