OFFSITE DOSE ASSESSMENT MANUAL

for

GASEOUS AND LIQUID EFFLUENTS

Duane Arnold Energy Center

Iowa Electric Light and Power Company

Approved by:	Herb Grieger Radiation Protection Supervisor	11/14/85 Date
Reviewed by:	[signature] Operations Committee Chairman	11-19-85 Date
Reviewed by:	[signature] Plant Superintendent	11-26-85 Date

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1.0 INTRODUCTION

This Manual describes acceptable methods of calculating radioactivity concentrations in the environment and the potentially resultant personal doses* offsite** that are associated with LWR liquid and gaseous effluents. The radioactivity concentrations and dose estimates are used to demonstrate compliance with Environmental Technical Specifications required by 10 CFR 50.36. The methodology stated in this Manual is acceptable for use in demonstrating operational compliance with 10 CFR 20.106, 10 CFR 50 Appendix I, and 40 CFR 190. Only the dose attributable to the Duane Arnold Energy Center is considered in demonstrating compliance with 40 CFR 190 since no other nuclear facility exists within 50 miles of the Center.

Calculations are made monthly to assess the potential air doses offsite and to a nearby resident in order to guide the management of station effluents. The receptor is described such that the dose to any resident near the Station is unlikely to be underestimated. Calculations made to assess the radioactive noble gas dose to air are based on the location offsite that could be occupied by a person where the maximum air dose is expected. For these monthly accumulated dose calculations, atmospheric dispersion and deposition of gaseous effluents is based on reference meteorological conditions.*** More conservative conditions (i.e., location and/or exposure pathways expected to yield higher computed doses) than appropriate for the maximally exposed person may be assumed in the dose estimated.

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* Dose is commonly used to mean personal dose equivalent commitment.

** Offsite means outside of the boundary of property owned, leased, or controlled by IELP on which DAEC is sited, i.e., outside the exclusion area. The DAEC site boundary is identified in UFSAR Figure 1.2-1.

*** Reference meteorological conditions are 1971, 1974, and 1975 data composited as discussed in "Duane Arnold Energy Center, Evaluation of Liquid and Gaseous Effluent Releases in Accordance with 10 CFR 50 Appendix I," submitted to the NRC June 3, 1976.

Calculations of dose committed from radioactive releases over extended time (3 and 12 months) are also made for the purpose of verifying compliance with regulatory limits on offsite dose. For these calculations the receptor is selected on the basis of the combination of applicable exposure pathways identified in the land use census and the maximum ground level X/Q at a residence, or on the basis of more conservative conditions such that the dose to any resident near the Station is unlikely to be underestimated.

2.0 LIQUID EFFLUENT

2.1 Radioactivity In Liquid Waste

The concentration of radionuclides in liquid waste is determined by sampling and analysis in accord with surveillance requirement 4.14.2, Table 4.14-2 of the Technical Specifications. When a radionuclide concentration is below the LLD for the analysis, it is not reported as being present in the sample.

2.2 Aqueous Concentration

Radioactive material in liquid effluent is diluted successively by water flowing in the discharge canal and in the River. The diluted concentration of radionuclide i in a receiving stream is estimated with the equation

$$C_{zi} = C_i \frac{F_1}{F_2}$$

where C_i = concentration of radionuclide i in liquid radwaste released (μCi/ml)

C_{zi} = concentration of radionuclide i in the receiving stream (μCi/ml)

F_1 = release rate of liquid radwaste (ml/sec)*

F_2 = dilution flow of receiving stream of water (ml/sec)*

*F_1, F_2 and F_C may have any convenient units of flow (i.e., volume/time) provided the units of all are identical.

For the purpose of calculating the radioactivity concentration in water at the restricted area boundary (section 2.4), the flow in the discharge canal, F_C, is assigned to F_2. The water flow in the discharge canal may include the liquid waste effluent flow, the liquid radwaste dilution water flow, the cooling tower blowdown flow and other streams such as RHR and emergency service water discharged via the dilution structure and discharge canal.

In the River immediately beyond the discharge canal and the restricted area boundary, the effective dilution is

$$F_2 = F_C \times M$$

where F_C = discharge canal flow

M = factor of additional mixing in the River

A near field mixing ratio from the canal into the near field of the River, $M = 5$, is assigned when estimating maximum potential individual doses involving exposure by eating fish. In the event water is drawn from the River downstream of the Station for drinking water or another exposure pathway, F_2 represents the portion of the River flow into which the liquid effluent from the Station is effectively mixed.

2.3 Method of Establishing Alarm Setpoints

Liquid waste effluent monitors are connected to alarms which provide automatic indication when 10 CFR Part 20 Appendix B, Table 2, Column 2 concentrations are being exceeded offsite. With prompt action to reduce radioactive releases following an alarm, the liquid release limit of 10 CFR Part 20.106 and the limits provided by 10 CFR Part 50 Appendix I, Section IV should not be exceeded after the alarm.

The alarm setpoint for the liquid effluent radiation monitor is derived from the concentration limit provided in 10 CFR Part 20 Appendix B Table 2 Column 2 applied at the restricted area boundary where the discharge canal flows into the river. The alarm setpoint

does not consider dilution, dispersion, or decay of radioactive material beyond the site boundary. That is, the alarm setpoint is based on a concentration limit at the end of the discharge canal. The radiation monitoring and isolation points are located in each line through which radioactive waste effluent is eventually discharged into the discharge canal.

The alarm setpoint for effluent monitors on batch releases is based on measurements, according to Table 4.14-2 of the Technical Specifications. For liquids released in continuous aqueous discharge which are normally radioactively clean, the setpoint is based on the effective MPC for the most likely contaminating source, i.e., the primary coolant water. A measured spectrum from the primary coolant water is used to determine the effective MPC based on MPC fractions according to 10 CFR 20 Appendix B. Alternately, the alarm setpoint may be based upon gross β-γ activity analysis of the liquid waste provided the unrestricted area MPC for unidentified emitters, 1×10^{-7} μCi/ml, is observed in accord with Specification 4.14.2.

2.3.1 Setpoint for a Batch Release

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 ratio, $FMPC_b$, of the activity concentration in the tank to the unrestricted area MPC (10 CFR Part 20, Appendix B, Table 2, Column 2) is calculated with the equation

$$FMPC_b = \left(\sum_i \frac{C_{bi}}{MPC_i}\right)$$

where $FMPC_b$ = fraction of unrestricted area MPC in batch derived from activity measured prior to release.

C_{bi} = concentration of radionuclide i (including I-131 and principal gamma emitters) in batch sample taken prior to release (μCi/ml)

In the event total or gross β-γ analysis alone is used to determine the radioactivity in a batch prior to release, the fraction of the unrestricted area MPC in the batch is just

$$FMPC_b = \frac{C_b}{1 \times 10^{-7}}$$

where C_b = the total or gross β-γ activity measured in the batch sample (μCi/ml)

1×10^{-7} = the unrestricted area MPC for unidentified radionuclides (μCi/ml)

Whether radioiodine and primary gamma emitters are identified prior to a batch release or not, the liquid radwaste effluent line radiation monitor alarm setpoint is determined with the equation

$$S = \frac{A}{FMPC_b} \times \frac{F_{S2}}{F_{S1}} \times g + Bkg$$

where S = radiation monitor alarm setpoint (cpm)

A = counting rate (cpm/ml) or activity concentration (μCi/ml) of sample in laboratory analysis. A equals $\sum_i C_{bi}$ if an isotopic analysis was performed or C_b if a gross activity analysis was performed.

g = ratio of effluent radiation monitor counting rate to laboratory counting rate or activity concentration in a given batch of liquid (cpm per cpm/ml or cpm per μCi/ml)

Bkg = monitoring instrument background (cpm)

F_{S1} = flow in the batch release line (gal/min).* Value not greater than the discharge line flow alarm maximum setpoint.

F_{S2} = minimum flow in the discharge canal (gal/min).* Value not less than the discharge canal flow alarm minimum setpoint.

Note that $A/FMPC_b$ represents the counting rate of a solution having the same radionuclide distribution as the sample and having the maximum permissible concentration of that mixture.

2.3.2 Setpoint for a Continuous Release. Continuous aqueous discharges are sampled and analyzed according to the schedule in Table 4.14-2. The ratio, $FMPC_c$, of the activity concentration in each of the continuous release streams to the unrestricted area MPC is calculated with the equations

$$FMPC_c = \left(\sum_i \frac{C_{ci}}{MPC_i}\right)$$

where $FMPC_c$ = fraction of unrestricted area MPC in continuous release based upon activity measured in primary coolant sample(s)

C_{ci} = concentration of radionuclide i in sample(s) ($\mu Ci/ml$)

In the event the total or gross β-γ analysis alone is used to determine the radioactivity, the fraction of the unrestricted area MPC in the continuous release is

$$FMPC_c = \frac{C_c}{1 \times 10^{-7}}$$

*Any suitable but identical units of flow (volume/time)

where C_c = the total or gross β-γ activity measured in the continuous release sample (μCi/ml)

The alarm setpoint of the radiation monitor on a continuous radioactive discharge line is determined with the equation

$$S = \frac{A}{FMPC_c} \times \frac{F_{s2}}{F_{s1}} \times g + Bkg$$

where A = activity concentration (uCi/ml) or counting rate (cpm/ml) in laboratory of monthly reactor primary coolant sample.

F_{s1} = Flow in the liquid discharge line (ml/sec).* Value not greater than discharge line flow alarm maximum setpoint.

F_{s2} = flow in the discharge canal (ml/sec).* Value not less than discharge canal flow alarm minimum setpoint.

g = ratio of effluent radiation monitor counting rate to laboratory counting rate or activity concentration in a given batch of liquid (cpm per cpm/ml or cpm per μCi/ml)

The radioactivity concentration in continuous aqueous effluent is usually so low that measurement of a representative radionuclide in a sample of the water is uncertain. Thus, the ratio, $A/FMPC_c$, which represents the MPC of a given spectrum of radionuclides, is usually derived from reactor primary coolant analysis(es). Alternatively, it may be determined from analyses of the continuous effluent itself.

In the event the concentration of radioactive material in the sample from the continuous release is below measurable levels (i.e., less than the lower limit of detection), the value of

*Any suitable but identical units of flow (volume/time).

1×10^{-7} uCi/ml or the equivalent counting rate (cpm/ml) may be substituted for the factor $\frac{A}{FMPC_c}$ (i.e., $\frac{A}{FMPC_c} = 1 \times 10^{-7}$).

2.4 Radioactivity Concentration in Water at the Restricted Area Boundary

Technical Specification 3.14.2 provides limits on radioactivity concentration in the unrestricted area due to aqueous effluents from DAEC. Compliance is assessed by monitoring and by sampling and analysis according to Specification 4.14.2. As long as a liquid effluent monitor named in Table 3.14-1 does not exceed an alarm or trip setpoint, determined in accordance with section 2.3 herein, or as long as the total or gross activity concentration, measured as required in Specification 4.14.2, does not exceed 1×10^{-7} uCi/ml after dilution in the discharge canal, Specification 3.14.2 is satisfied. Results from sample analysis will be used to ensure the concentration limits have not been exceeded.

Otherwise, the average radionuclide concentration entering the unrestricted area from the discharge canal, expressed as a fraction of the unrestricted area MPC, shall be computed on the basis of measured releases of Fe-55, Sr-89, and Sr-90 averaged over no more than 92 days and other radionuclides averaged over no more than 31 days.

The average concentration of radioactive noble gases in discharge canal water may be calculated separately as a fraction of the MPC, 2×10^{-4} µCi/ml, since the critical exposure pathway for it, immersion in water, differs from the critical exposure pathway for other radionuclides in water, which is via ingestion of the water.

The average concentration, expressed as a fraction of the maximum permissible concentration is calculated with the equation:

$$FMPC = \frac{1}{(TE-TB)} \sum_k \sum_i \frac{C_{ik} \times Fl_k \times \Delta t_k}{MPC_i \times F2_k}$$

where FMPC = fraction of the unrestricted area maximum permissible concentration of a mixture of radionuclides in water (unitless)

TE-TB = increment of time between beginning and ending period of interest during which the concentration is averaged (min)

C_{ik} = concentration of radionuclide i in sample k representing a radioactive liquid effluent release into an unrestricted area (μCi/ml)

Fl_k = release rate of radwaste liquid represented by sample k and in which C_{ik} was measured (gal/min)*

$F2_k$ = flow into unrestricted area of aqueous stream into which radioactive release represented by sample k is diluted, i.e., the discharge canal flow during the release represented by sample k (gal/min)*

Δt_k = duration of radioactive release represented by sample k which occurs within time boundaries TB and TE (min).

MPC_i = unrestricted area maximum permissible concentration of radionuclide i per 10 CFR Part 20 Appendix B, Table 2, column 2 (μCi/ml)

MPC_i = 2×10^{-4} μCi/ml for radioactive noble gases in water. Reference NUREG-0133.

2.5 Accumulated Personal Maximum Dose

Technical Specification 4.14.3 requires an assessment to be performed at least once every 31 days in any quarter in which radioactive effluent is discharged which determines whether the dose or dose commitment to a person offsite due to radioactive material released in liquid effluent calculated on a cumulative basis exceeds Specification 3.14.3. The requirement is satisfied by computing the

*Any suitable but identical units of flow (volume/time).

accumulated dose commitment to the most exposed organ and to the total body of a hypothetical person exposed by eating fish and drinking water taken from the river offsite downstream of the discharge canal.

The accumulated dose commitment is computed at least once every 31 days but may be computed as analyses become available. The computation is made in the following way.

$$\Delta D_{ank} = 3.785 \times 10^{-3} \sum_i A_{eani} C_{ik} \Delta t_k \frac{F_{1k}}{F_{2k}}$$

$$D_{an} = \sum_k \Delta D_{ank}$$

where ΔD_{ank} = the dose commitment (mrem) to organ n of age group a due to the isotopes identified in analysis k, where the analyses are those required by Table 4.14-2 of the Technical Specifications. Thus the contribution to the dose from gamma emitters become available on a batch basis for batch releases and on a weekly basis for continuous releases. Similarly the contributions from H-3 is available on a monthly basis and the contributions from Fe-55, Sr-89, and Sr-90 become available on a quarterly basis.

D_{an} = the dose commitment during the quarter-to-date to organ n, including total body, of the maximally exposed person in age group a (mrem).

A_{eani} = transfer factor relating a unit release of radionuclide i (Ci) in a unit stream flow (gal/min) to dose commitment to organ n, or total body, of an exposed person in age group a $\left(\frac{\text{mrem gal}}{\text{Ci min}}\right)$ via environmental pathway e.

C_{ik} = the concentration of radionuclide i in the undiluted liquid waste represented by sample k to be discharged (μCi/ml)

Δt_k = duration of radioactive release represented by sample k which occurs within time boundaries TB and TE and during which concentration C_{ik} and flows Fl_k and $F2_k$ exist. (min.)

3.785×10^{-3} = conversion constant (3785 ml/gal x 10^{-6} Ci/μCi)

Pathway-to-dose transfer factors, A_{eani}, for use in calculating the dose commitment arising from radioactive material released in aqueous effluents are tabulated in Appendix A. Appropriate tables representing applicable environmental pathways of exposure and most exposed age group(s) are selected and used in calculating the dose commitment. The pathway(s) and/or age group(s) selected may vary by season. For instance, fishing near the DAEC is non-existent during the winter; thus, a dose evaluation of the fish pathway is not required for aqueous effluent discharged during the winter months of January, February, or March.

For the purpose of calculating the dose to a Member of the Public who is potentially exposed by eating fish taken from the river offsite near the discharge canal, $F_2 = 5F_C$. The age group potentially the most exposed via eating fish is expected to be the adult.

The age group potentially the most exposed via drinking water taken from the Cedar River is expected to be the infant. As long as water is known not to be taken from the Cedar River within 3 miles downstream of the DAEC, for drinking water, as verified by the annual land use survey, the potential dose to a Member of the Public via drinking water will be assessed on the basis of water assumed to be taken from the river three miles downstream. At that location, F_2 is conservatively assumed to be $F_2 = 10F_C$. Variables F_1, F_2, and F_C are defined in section 2.2.

2.6 Projected Maximum Dose to a Person Offsite

The dose commitment to a person offsite due to radioactive material released in liquid effluent may be projected by calculating the extrapolated total body and most exposed organ dose commitments to a hypothetical person exposed via the same pathways evaluated in section 2.5. The potential dose commitments to organs and to the total body are computed separately.

The dose commitment to a maximally exposed hypothetical person will be projected by calculating the doses accumulated during the most recent three months (according to the method described in section 2.5) and by assuming the result represents the projected doses during the current quarter.

Alternatively, the quarterly dose commitment may be projected by using the equation:

$$P_{an} = \frac{92\ D_{an}}{X}$$

where P_{an} = projected dose commitment (mrem) to organ n (including total body) of age group a for the current quarter

92 = number of days in a quarter

X = number of days to date in current quarter

D_{an} = dose commitment to organ n, including total body, of the maximally exposed person in age group a based on available aqueous effluent measurements during the quarter to date (mrem).

3.0 GASEOUS EFFLUENT

3.1 Introduction

The Station discharges gaseous effluent through a stack and discharges ventilation air from the reactor and radwaste building through the reactor building vents. Ventilation air from the Turbine Building is discharged through the Turbine Building vent and through the Reactor Building vent. These gaseous effluent streams, radioactivity monitoring points, and effluent discharge points are shown schematically in Figure 3-1. Gaseous release point locations and elevations at the Station are described in Table 3-1. Gaseous discharges from the stack are treated as an elevated release while discharges via the building vents are assumed to be ground- level, building wake, or split wake releases.

3.2 Radioactivity in Gaseous Effluent

For the purpose of estimating offsite radionuclide concentrations and radiation doses, measured radionuclide concentrations in gaseous effluent and in ventilation air exhausted from the Station are relied upon.

The gross radioactivity of noble gases discharged is measured by the radioactive noble gas effluent monitors according to Technical Specification Tables 3.15-1 and 4-15-2. Radionuclides other than noble gases in gaseous effluents are measured by sampling and analyses in accordance with Table 4.15-2. Each radionuclide measured in an effluent may be assumed to be discharged uniformly during the sampling period. When a radioactivity concentration is below the LLD for the analysis, it is not reported as being present in the sample.

The quantity of radioactive noble gas discharged via the offgas stack or a vent during an interval of time is determined by integrating the release rate measurement of each effluent noble gas

monitor. An hourly interval is normally used for dose rate assessments and a daily or longer interval is used for dose assessments. If ΔQ_j represents the gross activity of noble gas discharged via the offgas stack or a vent and g_i represents the fraction of radionuclide i in the distribution of radioactive gases in that effluent stream, then the quantity of radionuclide i released in the gaseous effluent stream during counting interval j is estimated by the relation:

$$\Delta Q_{ij} = \Delta Q_j \cdot g_i$$

The distribution of radioactive noble gases in gaseous effluent streams is determined by gamma spectrum analysis of gaseous effluent samples in accordance with Technical Specification Table 4.15-2. Results of one or more previous analyses may be averaged to obtain a representative spectrum. In the event a representative distribution is not available or is unobtainable from sample(s) of an effluent stream taken during the current quarter, it will be derived from past measurements, e.g., earlier sample results or semi-annual radioactive material release reports. Alternatively, a noble gas spectrum for a given effluent stream in Table 3-2 herein, may be assumed.

An airborne discharge of radionuclides other than noble gases may be represented by multiple samples with each sample providing a measure of the concentration of specific radionuclides, C_i, in gaseous effluent discharged at flow, F_a, during a time increment Δt. Thus, each release is quantified according to the relation:

$$Q_{ik} = \sum_j C_{ik} F_{aj} \Delta t_j$$

where Q_{ik} = the quantity of radionuclide i released in a given effluent stream based on analysis k (Ci)

C = concentration of radionuclide i in gaseous effluent identified by analysis k ($\mu Ci/ml$ or Ci/m^3)

F_{aj} = effluent stream discharge rate during the increment Δt_j (m^3/sec)

Δt_j = time increment during which radionuclide i at concentration C_{ik} is being discharged (sec)

The analysis index k may represent either a grab sample, integrated sample, or a composite sample required by the effluent sampling and analysis program specified in Technical Specification Table 4.15-2.

3.3 Main Condenser Offgas Pretreatment Monitor Alarm Setpoint

A noble gas activity monitor is provided to measure gross gamma activity in gases from the main condenser air ejector. The pretreatment monitor includes an alarm that is set to report when the gamma radiation level in gas discharged by the main condenser air ejector indicates the gross radioactivity discharge rate, after 30 minutes delay and decay, exceeds 1 Ci/sec.

The alarm setpoint is determined with the relation

$$S = \frac{2120\ g}{F \sum f_i e^{-\lambda_i t}} + Bkg$$

where S = main condenser air ejector noble gas monitor alarm setpoint (cpm) or (mR/hr)

2120 = [1.0 E6 $\mu Ci/sec$ / (1 ft^3 / 28317 cm^3)] x 60 sec/min

F = air ejector discharge rate (ft^3/min)

g = noble gas monitor calibration or counting rate response for gamma radiation

$$\left(\frac{cpm}{uCi/cm^3}\right) \quad \text{or} \quad \left(\frac{mR/hr}{uCi/cm^3}\right)$$

f_i = fraction of noble gas gross activity due to noble gas radionuclide i in a representative spectrum of noble gases at the main condenser offgas detector

λ_i = radioactive decay constant of noble gas nuclide i (min^{-1})

t = 30 min; decay time in delay line

3.4 Effluent Noble Gas Monitor Alarm Setpoint

Specification 3.15.2 provides limits on dose equivalent rates associated with airborne radioactive materials concentrations in the unrestricted area due to airborne effluents from the Station. Instrumentation is provided to monitor gamma radiation in the airborne effluents according to Technical Specification Table 3.15-1. Each effluent noble gas monitor includes an alarm that can be set to activate when the dose rate offsite or the noble gas concentration at ground level offsite is expected (calculated) to exceed a specified level. Compliance with the limits on dose rate from noble gases is demonstrated by setting each gaseous effluent monitor alarm setpoint so that an alarm will occur at or before either dose rate limit or the MPC* for noble gases is reached. If an alarm occurs with the setpoint at the limit, compliance with Specification 3.15.2.1 is assessed as described in section 3.5.

On the basis of effluent noble gases from the DAEC during recent years, the gamma dose rate to a person's body is expected to be a

*MPC means the 10 CFR Part 20, Appendix B, Table 2, column 1 limit for radioactive noble gases.

larger fraction of the limit, 500 mrem/yr, than is the beta plus gamma dose rate to skin is to its limit, 3000 mrem/yr. In which case, a gaseous effluent monitor setpoint may be derived on the basis of the gamma dose rate to a person's body alone such that an alarm is set to occur at or before the total body dose rate offsite exceeds 500 mrem/yr.

A noble gas monitor may be set to activate an alarm at a lower setting than the derived setpoint corresponding to the dose rate limit (or corresponding concentration limit). In the event an alarm occurs at the lower setting, the monitor record is compared with the derived setpoint. If the derived setpoint is exceeded, compliance with Specification 3.15.2.1 is assessed as described in section 3.5.

Each radioactive noble gas effluent monitor setpoint is derived either on the basis of total body dose equivalent rate in the unrestricted area offsite or on the basis of the 10 CFR Part 20, Appendix B, Table 2, column 1 limit for radioactive noble gases.

For the purpose of deriving a setpoint, the distribution of radioactive noble gases in an effluent stream is determined as described in section 3.2.

Setpoint Based on Dose Rate

The alarm setpoint of a radioactive noble gas effluent monitor may be calculated on the basis of whole body dose equivalent rate offsite, 500 mrem/yr. A setpoint of a monitor of an elevated release, e.g., from the stack, may be calculated with the equation:

$$S = 1.06 \frac{h}{f} \frac{\sum_i C_i}{\sum_i C_i \times DF_i^s} + Bkg$$

The setpoint of a monitor of a ground-level or building release, e.g., from the turbine building vent or 3 reactor building vents may be calculated with the equation

$$S = 1.06 \frac{h}{f \frac{X}{Q}} \frac{\sum_i C_i}{\sum_i C_i \times DF_i^V} + Bkg$$

where S = the alarm setpoint (cpm) or (mR/hr)

h = monitor response to activity concentration of effluent being monitored, $\left(\frac{cpm}{\mu Ci/cm^3}\right)$ or $\left(\frac{mR/hr}{\mu Ci/cm^3}\right)$

C_i = relative concentration of noble gas radionuclide i in effluent at the point of monitoring ($\mu Ci/cm^3$)

X/Q = atmospheric dispersion from point of ground-level or building wake release to the location of potential exposure (sec/m^3)

DF_i^S = factor converting elevated release rate of radionuclide i to total body dose equivalent rate at the location of potential exposure $\left(\frac{mrem}{yr \cdot \frac{\mu Ci}{sec}}\right)$

DF_i^V = factor converting ground-level of split-wake release of radionuclide i to the total body dose equivalent rate at the location of potential exposure $\left(\frac{mrem}{yr \cdot \frac{\mu Ci}{m^3}}\right)$

f = flow of gaseous effluent stream, i.e., flow past the monitor (ft^3/min)

Bkg = monitoring instrument background (cpm) or (mR/hr)

$$1.06 = 500 \frac{\text{mrem}}{\text{yr}} \times 60 \frac{\text{sec}}{\text{min}} \times 35.3 \frac{\text{ft}^3}{\text{m}^3} \times \frac{1\ \text{m}^3}{10^6\ \text{cm}^3}$$

Each monitoring channel has a unique response, h, which is determined by the instrument calibration.

The concentration of each noble gas radionuclide, C_i, in a gaseous effluent is determined as discussed earlier in this section.

Since the dose rate limits for airborne effluents apply everywhere offsite, alarm setpoints are determined and compliance is assessed at the site boundary where the minimum atmospheric dispersion (maximum χ/Q) occurs. The atmospheric dispersion factor and the dose conversion factor DF_i^S depend on local conditions. The value of χ/Q adopted in a setpoint calculation will be based either on prevailing meteorological conditions or on reference meteorological conditions at the DAEC. The minimum atmospheric dispersion offsite from a ground-level or building wake release derived from reference meteorological conditions is at the site boundary 1260 meters NNW of the Station where:

$$\left(\frac{\chi}{Q}\right)_{\text{vent}} = 4.3 \times 10^{-6}\ \text{sec/m}^3$$

The dose conversion factors, DF_i, used in setpoint calculations for gaseous effluent monitors are in Table 3-4. In the event DF_i^S is derived on the basis of prevailing meteorology, it will be calculated in accordance with Regulatory Guide 1.109, Appendix B.

Setpoint Based on Concentration

The alarm setpoint of an effluent noble gas monitor may be calculated on the basis of the 10 CFR Part 20, Appendix B, Table II, Column 1 concentration limit for radioactive noble gases, corresponding to the expectation of the concentration reaching the limit at ground level offsite.

The gross activity concentration of noble gas corresponding to the 10 CFR Part 20 Appendix B Table 2 Column 1 limit is calculated from the distribution with the equation

$$MPC = \sum_i C_i \div \sum_i \frac{C_i}{MPC_i}$$

where MPC = gross activity concentration of noble gas mixture corresponding to 10 CFR 20 Appendix B Table 2 Column 1 limit ($\mu Ci/cm^3$).

C_i = relative concentration of noble gas radionuclide i in gaseous release ($\mu Ci/cm^3$).

MPC_i = 10 CFR Part 20 Appendix B Table 2 Column 1 value.

Note that this is simply the aggregate of the concentrations of radionuclide i in a sample divided by the fraction of MPC constituted by radionuclide i in the same sample.

For the purpose of deriving an effluent monitor setpoint, the relative concentration, i.e., the distribution or spectrum, of radioactive noble gases in an effluent is determined as described in section 3.2.

Alternatively, the total activity concentration of the noble gases may be used with the MPC value of Kr-88 (2×10^{-8} $\mu Ci/cm^3$) for the purpose of conservatively determining an activity concentration of noble gases that will be less than the 10 CFR 20 Appendix B, Table 2, Column 1 limit. If this approach is used, the value of MPC is simply 2×10^{-8} $\mu Ci/cm^3$.

The alarm setpoint for the effluent noble gas monitor is then calculated with the equation

$$S = \frac{MPC \times h}{4.7 \times 10^{-4} \times F \times \frac{X}{Q}} + Bkg$$

where S = alarm counting rate setpoint (cpm) or (mR/hr)

h = effluent noble gas monitor counting rate response $\left(\frac{cpm}{\mu Ci/cm^3}\right)$ or calibration $\left(\frac{mR/hr}{\mu Ci/cm^3}\right)$ for noble gas gamma radiation

F = discharge rate of gaseous effluent (ft^3/min)

X/Q = minimum atmospheric dispersion from release point to unrestricted area ($\mu Ci/m^3$ per $\mu Ci/sec$)

4.7×10^{-4} = conversion constant $\left(\frac{1\ m^3}{35.31\ ft^3} \times \frac{1\ min}{60\ sec}\right)$

MPC = maximum permissible concentration for the effluent noble gas mixture as determined above

Bkg = monitoring instrument background (cpm) or (mR/hr)

The value of X/Q adopted in a setpoint calculation will be based either on prevailing meteorological conditions or on reference meteorological conditions. Minimum atmospheric dispersion offsite derived from reference meteorological conditions at the site boundary 1260 meters NNW of the Station are:

$\left(\frac{X}{Q}\right)_{stack} = 2.8 \times 10^{-7}\ sec/m^3$ $\left(\frac{X}{Q}\right)_{vent} = 4.3 \times 10^{-6}\ sec/m^3$

3.5 Dose Equivalent Rate Offsite

Specification 3.15.2 provides limits on dose equivalent rates associated with airborne radioactive materials concentrations in the unrestricted area due to airborne effluents from the Station. Compliance is assessed on the basis of measurements specified in Table 4.15-2.

3.5.1 Noble Gas

Limits on radioactive noble gas in the unrestricted area are provided in Specification 3.15.2.1. Each radioactive noble gas effluent monitor is set to alarm when, or below when, the noble gas in airborne effluent from a monitored stack or vent is expected to cause either dose rate limit in Specification 3.15.2.1 to be exceeded. In the event an airborne effluent release from the Station exceeds the derived setpoint (limit) for an effluent noble gas monitor, an assessment of compliance is performed as described herein.

The quantity of radioactive noble gas released in an increment of time is measured by the radioactive noble gas effluent monitors and the distribution of radioactive noble gases in a gaseous effluent stream is determined as described in section 3.2 herein.

Compliance with Specification 3.15.2.1 may be assessed by calculating the dose equivalent rate as described hereafter and by comparing it with the limiting dose rate in the Specification.

3.5.1.1 Total Body Dose Rate

The total body dose equivalent rate due to noble gas gamma radiation is calculated with the equation:

$$\dot{D}\gamma = \frac{1}{3.156 \times 10^7} \sum_i \left(\frac{Q \cdot g_i}{t} \times P\gamma_i\right)_s + \sum_v \sum_i \left(\frac{Q \cdot g_i}{t} \times \frac{X}{Q} \times P\gamma_i\right)_v$$

where $\dot{D}\gamma$ = noble gas gamma dose rate to total body (mrem/hr)

$Q \cdot g_i/t$ = quantity of noble gas radionuclide i discharged (μCi) during time increment t (hr)

$P\gamma_S$ = factor converting unit noble gas nuclide i stack release to total body dose at ground level received from the overhead plume $\left(\frac{\text{mrem}}{(\mu\text{Ci yr})/\text{sec}}\right)$

$P\gamma_V$ = factor converting time integrated, ground level concentration of noble gas nuclide i to total body dose from gamma radiation $\left(\frac{\text{mrem}}{(\mu\text{Ci yr})/\text{m}^3}\right)$

$\frac{1}{3.156 \times 10^7}$ = conversion (yr/sec)

Specification 3.15.2.1 total body dose rate is evaluated by calculating the noble gas gamma dose equivalent rate offsite at 1260 meters NNW of the Station, which location is identified in Figure 3-2. At that location the referenced atmospheric dispersion factor to be used in the calculation is

$$\left(\frac{X}{Q}\right)_v = 4.3 \times 10^{-6} \text{ sec/m}^3$$

Alternatively, averaged meteorological dispersion data coincident with the period of release may be used to evaluate the dose rate. The noble gas plume gamma-to-total body dose factor, $P\gamma_{S_i}$, is calculated from plume data. The noble gas semi-infinite cloud gamma-to-total body dose factor, $P\gamma_{V_i}$, is derived from Regulatory Guide 1.109, Table B-1. Values of $P\gamma_{S_i}$ and $P\gamma_{V_i}$ applicable at 1260 meters NNW of the Station are in Table 3-4.

3.5.1.2 Skin Dose Rate

The skin dose equivalent rate due to radioactive noble gas is calculated with the equation

$$\dot{D}_\beta = \frac{1}{3.156 \times 10^7} \sum_i S\beta_i \left(\frac{Q}{t}_i \times \frac{X}{Q}\right)_s + \sum_v \sum_i S\beta_i \left(\frac{Q}{t}_i \times \frac{X}{Q}\right)_v$$

where $\dot{D}_\beta$ = noble gas beta dose rate to skin (mrem/hr)

Q_i/t = quantity of noble gas radionuclide i (μCi) discharged during time increment t (hr)

$S\beta_i$ = factor converting time integrated ground level concentration of noble gas to skin dose from beta radiation $\frac{\text{mrem m}^3}{\mu\text{Ci yr}}$

$\frac{1}{3.156 \times 10^7}$ = conversion (yr/sec)

Compliance with Specification 3.15.2.1 dose rate to skin is evaluated by calculating the noble gas beta dose equivalent rate offsite at a location 1260

meters NNW of the Station, which is also identified in Figure 3-2. At that location, the reference atmospheric dispersion factors to be used in the calculations are:

$$\left(\frac{X}{Q}\right)_v = 4.3 \times 10^{-6} \text{ sec/m}^3 \text{ and } \left(\frac{X}{Q}\right)_s = 2.8 \times 10^{-7} \text{ sec/m}^3$$

Alternatively, averaged meteorological dispersion data coincident with the period of release may be used to evaluate the dose rate. The semi-infinite noble gas cloud-to-skin dose equivalent factors are in Table 3-4. They are also derived from Regulatory Guide 1.109, Table B-1.

3.5.2 Iodine, Tritium, and Particulates

Specification 3.15.2.2 provides a limit on iodine-131, iodine-133, H-3, and on radioactive particulates having 8 day or longer half-lives in air in the unrestricted area around the Station. In the event airborne effluent from the Station causes a radioactive noble gas effluent monitor to alarm or if the assessment required by Specification 4.15.4.2 shows Specification 3.15.4 to have been exceeded, an assessment of compliance with Specification 3.15.2.2 will be performed using a method described in this section.

3.5.2.1 Organ Dose Rate[1]

Compliance with Specification 3.15.2.2 is assessed by calculating the dose rate[1] to the most exposed

[1]For inhaled or ingested radioactive material, the consequent "dose" means the committed dose equivalent. The "dose rate" is the committed dose equivalent per unit of time of exposure to the radioactive material in the environment.

organ of an assumed adult member of the public inhaling airborne I-131, I-133, H-3, and inhaling radioactive particulates having half-lives of 8 days or longer at the location in the unrestricted area having the maximum potential concentration of the effluents (i.e., the location at which reference meteorological data indicates minimum atmospheric dispersion from the Station (max X/Q).

The organ dose rate is calculated with the following equations:

For an offgas stack discharge:

$$\dot{D}_{ans} = \frac{1}{TE-TB} \sum_i \sum_k \Lambda Q_{iks} \, TA_{ani} \left(\frac{X}{Q}_i\right)_s$$

For a vent discharge:

$$\dot{D}_{anv} = \frac{1}{TE-TB} \sum_i \sum_k \Lambda Q_{ikv} \, TA_{ani} \left(\frac{X}{Q}_i\right)_v$$

Combining separate release points gives

$$\dot{D}_{an} = \dot{D}_{ans} + \sum_v \dot{D}_{anv}$$

where $\dot{D}_{an}$ = the dose equivalent rate to organ n of a person in age group a due to radionuclides discharged in airborne effluents during time interval TB to TE (mrem/hr)

$\dot{D}_{ans}$ = dose equivalent rate from a stack discharge (mrem/hr)

$\dot{D}_{anv}$ = dose equivalent rate from a vent discharge (mrem/hr)

$\hat{Q}_{iks}$, $\hat{Q}_{ikv}$ = quantity of radionuclide i released in a given effluent stream based on analysis k (μCi) during discharge time increment TB to TE (hr) of interest

TA_{ani} = factor converting airborne concentration of radionuclide i to dose commitment to organ n of a person in age group a where exposure is directly to airborne material $\left(\frac{\text{mrem}}{(\mu\text{Ci sec})/\text{m}^3}\right)$

$\left(\frac{X}{Q}i\right)_s$, $\left(\frac{X}{Q}i\right)_v$ = atmospheric dispersion from stack and vent, respectively, to ground level at location of interest (sec/m^3)

Radionuclides other than noble gases in airborne effluent are measured and quantified as described in section 3.2. Normally, radioactive material measured in effluent is assumed to be discharged uniformly over the period represented by the sample. The averaging time of the measured releases used to evaluate compliance will not exceed 92 days for Sr-89 and Sr-90 and will not exceed 31 days for the other radionuclides.

The maximum offsite exposure potential (based on Appendix C) is expected to occur at 1260 meters NNW of the Station where the reference atmospheric dispersion, to be used in the calculation is

$$\left(\frac{X}{Q}\right)_v = 4.3 \times 10^{-6} \text{ sec/m}^3 \text{ and}$$

$$\left(\frac{X}{Q}\right)_s = 2.8 \times 10^{-7} \text{ sec/m}^3$$

Currently, compliance with Specification 3.15.2.2 is evaluated by calculating an adult inhalation dose rate at 1260 meters NNW of the Station. The dose transfer factors, TA_{ani}, used in the computation are tabulated in Appendix A.

3.6 Noble Gas Gamma Radiation Dose Accumulated in Air

Technical Specification 3.15.3 requires that the offsite air dose during any calendar quarter not exceed 5 mrad and the annual air dose not exceed 10 mrad from noble gas gamma radiation. Specification 4.15.3.1 requires a monthly calculational assessment to verify that the cumulative air dose due to gamma radiation from radioactive noble gas released in gaseous effluents during the quarter and year do not exceed Specification 3.15.3.

The distribution of radioactive noble gases in gaseous releases and the quantity of radioactive noble gas discharged during an interval of time are determined as described in section 3.2 herein.

The gamma radiation dose to air offsite as a consequence of noble gas discharge from DAEC is calculated with the

$$D_\gamma = \sum_i \sum_j \left(\Delta Q_j \times g_i \times A\gamma_{s_i}\right) + \sum_v \sum_i A\gamma_v \sum_{ij} \left(\Delta Q_j \times g_i \times \frac{X}{Q}\right)_v$$

where D_γ = noble gas gamma dose to air due to effluent from stack and vent (mrad)

ΔQ_j = total measured radioactivity release via stack or vent measured by noble gas effluent monitor during counting interval j (μCi)

g_i = the fraction of radioactive gas in a given effluent stream attributable to noble gas radionuclide i.

$A\gamma_{s_i}$ = factor converting unit release of noble gas radionuclide i from the stack to air dose at ground-level received from gamma radiation from the overhead plume (mrad/μCi)

$A\gamma_{v_i}$ = factor converting time integrated, ground-level concentration of noble gas to air dose from gamma radiation $\left(\frac{\text{mrad}}{(\mu\text{Ci sec})/\text{m}^3}\right)$

$(X/Q)_v$ = atmospheric dispersion factor for a vent (ground-level or building wake) discharge (sec/m^3)

Specification 4.15.3.1 is satisfied by calculating the noble gas gamma radiation dose to air at the offsite location identified in Figure 3-2. At that location, 1260 meters NNW of the Station, the reference* atmospheric dispersion factor to be used is

$$\left(\frac{X}{Q}\right)_v = 4.3 \times 10^{-6} \text{ sec/m}^3$$

Values of $A\gamma_{s_i}$ and $A\gamma_{v_i}$ appropriate for use at that location, assuming reference meteorological conditions, are listed in Table 3-3.

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*Reference atmospheric conditions are summarized and discussed in "Duane Arnold Energy Center, Evaluation of Liquid and Gaseous Effluent Releases in Accordance with 10 CFR 50 Appendix I, "submitted to NRC June 3, 1976, Reference atmospheric dispersion factors tabulated therein, also appear in Appendix B herein.

3.6.1 Alternate Method of Evaluating Compliance with Gamma Air Dose Limits

Alternatively, the gamma radiation dose to air offsite may be calculated with the equation

$$D_\gamma = \frac{1}{0.8} \sum_j \left(\Delta Q_j \times A\gamma_{seff} \right)_s + \frac{1}{0.8} \sum_v \sum_j \left(\Delta Q_j \times \frac{X}{Q} \times A\gamma_{veff} \right)_v$$

where $A\gamma_{seff}$ = an effective dose conversion factor based on the typical radionuclide distribution in stack releases converting unit release of radioactive noble gases from the stack to air dose at ground level at a specific location (mrad/μCi).

$A\gamma_{veff}$ = an effective dose conversion factor based on the typical radioactive distribution in vent releases converting a time integrated, ground level concentration of noble gases to air dose from gamma radiation $\left(\frac{\text{mrad}}{(\mu\text{Ci sec/m}^3)}\right)$

0.8 = a factor of conservatism which compensates for variability in radionuclide distribution

The derivation and basis of the effective gamma air dose conversion factor are provided in Appendix B. Values of the effective factors are tabulated in Table 3-3. By inserting the appropriate values for D_γ (5 mrad/quarter γ-air dose) and for $A\gamma_{seff}$ (1.6×10^{-11} mrad/μCi) or $A\gamma_{veff}$ (6.4×10^{-5} mrad/(μCi sec/m^3)) into the equation above and solving for either $(\Delta Q_j)_s$ or $(\Delta Q_j)_v$, respectively, release quantities of noble gases from either the stack or vent corresponding to the technical specification limit of 5 mrad/quarter (total for all release points) may be determined. At the location, 1260 meters NNW of the station,

(which is the controlling location based on reference meteorology) the release limits are individually

Release Point	Quarterly Limit (Ci)	Annual Limit (Ci)
Stack	2.5×10^5	5.0×10^5
Vent	1.25×10^4	2.5×10^4

The following equations may be used to assess both the stack and vent discharges for compliance with the quarterly release limits on noble gas gamma dose to air.

$$\frac{\sum_j (\Delta Q_j)_s}{250{,}000} + \sum_v \frac{\sum_j (\Delta Q_j)_v}{12{,}500} \leq 1$$

or, on a monthly rate basis (although not a requirement)

$$\frac{\sum_j (\Delta Q_j)_s}{250{,}000} + \sum_v \frac{\sum_j (\Delta Q_j)_v}{12{,}500} \leq \frac{1}{3}$$

The equations which may be used to assess both the stack and vent discharges for compliance with the annual air dose limits from noble gas are:

$$\frac{\sum_j (\Delta Q_j)_s}{500{,}000} + \sum_v \frac{\sum_j (\Delta Q_j)_v}{25{,}000} \leq 1$$

or, on a monthly rate basis (although not a requirement)

$$\frac{\sum_j (\Delta Q_j)_s}{500{,}000} + \sum_v \frac{\sum_j (\Delta Q_j)_v}{25{,}000} \leq \frac{1}{12}$$

As long as these relations are satisfied for both stack and vent releases of noble gases, no additional calculations are needed to verify compliance with the gamma-air dose limits of Technical Specification 3.15.3. Calculations of beta air doses per Section 3.6 may be omitted as discussed in Appendix B.

3.7 Noble Gas Beta Radiation Dose Accumulated in Air

Technical Specification 3.15.3 requires that the offsite air dose during any calendar quarter not exceed 10 mrad from noble gas beta radiation and not exceed 20 mrad during any calendar year. Specification 4.15.3.1 requires a monthly assessment to verify that the cumulative air dose due to beta radiation from radioactive noble gas released gaseous effluents not exceed either limit of Specification 3.15.3.

The radioactive noble gas distribution and activity discharged are determined as described in § 3.6 herein.

The beta radiation dose to air offsite as a consequence of noble gas released from the Station is calculated with the equation:

$$D_\beta = \sum_i A\beta_i \sum_j \left(\Delta Q_j \, g_i \frac{X}{Q}\right)_s + \sum_v \sum_i A\beta_i \sum_j \left(\Delta Q_j \, g_i \frac{X}{Q}\right)_v$$

where $D\beta$ = noble gas beta dose to air due to stack and vent releases (mrad)

$A\beta_i$ = factor converting time-integrated, ground-level concentration of noble gas radionuclide i to air dose from beta radiation $\left(\frac{\text{mrad-m}^3}{\mu\text{Ci-sec}}\right)$

$(X/Q)_s$ = atmospheric dispersion factor for a discharge via the stack (sec/m^3)

$(X/Q)_v$ = atmospheric dispersion factor for a vent (ground level or building wake) discharge (sec/m^3).

Specification 4.15.3.1 is satisfied by calculating the noble gas beta radiation dose to air at the location identified on Figure 3-2. At that location, 1260 meters NNW of the reactor, the reference atmospheric dispersion factors to be used are

$$\left(\frac{X}{Q}\right)_s = 2.8 \times 10^{-7}$$

$$\left(\frac{X}{Q}\right)_v = 4.3 \times 10^{-6}$$

Beta radiation-to-air dose conversion factors, $A\beta_i$, for noble gas radionuclides are listed in Table 3-3.

3.8 Dose Due to Iodine and Particulates in Gaseous Effluents*

Technical Specification 3.15.4 requires that I-131, I-133, H-3, and radioactive material in particulate form having half-lives greater than 8 days in gaseous effluents released to the area offsite cause no more than 7.5 mrem to any organ of a member of the public during a calendar quarter and no more than 15 mrem during any calendar year. Specification 4.15.4 requires an assessment at least once every month to verify that the cumulative dose commitment does not exceed either limit of Specification 3.15.4.

Airborne releases are discharged either via the offgas stack as an elevated release or via building vents and treated as a ground-

*The dose to any organ of a person arising from radioactive iodine-131, iodine-133, tritium, and radioactive material in particulate form having half-lives greater than 8 days. Noble gases not considered.

level, building wake, or split wake release. Radionuclides mentioned above in airborne effluents that are measured by the sampling and analysis schedule in Technical Specification Table 4.15-2 are included in the release term used to calculate doses. Section 3.2 describes the quantification of these radionuclides other than noble gases.

A person may be exposed directly to an airborne concentration of radioactive material discharged in effluent and indirectly via pathways involving deposition of radioactive material onto the ground. Dose estimates account for the separate exposure pathways. The dose commitment to a person offsite associated with a gaseous release, Q_{ik}, of radioactive material other than noble gas is calculated with the appropriate one(s) of the following equations for a stack release:

$$D_{anske} = Q_{iks} \left[\sum_i TA_{anie} \left(\frac{X}{Q} \right)_s + \sum_i TG_{anie} \left(\frac{D}{Q} \right)_s \right]$$

for a vent release:

$$D_{anvke} = Q_{ivk} \left[\sum_i TA_{anie} \left(\frac{X}{Q} \right)_v + \sum_i TG_{anie} \left(\frac{D}{Q} \right)_v \right]$$

where D_{anske} = the dose commitment (mrem) to organ n of a person in age group a via exposure pathway e due to radionuclides identified in analysis k of a stack release where the analysis is required by Technical Specification Table 4.15-2.

D_{anvke} = the dose commitment via pathway e from a vent release (mrem)

TA_{anie} = factor converting airborne concentration of radionuclide i to dose commitment to organ n of a person in any group a where exposure is directly to airborne material via exposure pathway e. $\left(\frac{\text{mrem}}{(\text{Ci sec})/\text{m}^3}\right)$

TG_{anie} = factor converting ground deposition of radionuclide i to dose commitment to organ n of a person in age group a where exposure is directly or indirectly to radioactive material that has been deposited on the ground via exposure pathway e. $\left(\frac{\text{mrem}}{\text{Ci}/\text{m}^2}\right)$

Q_{ik} = quantity of radionuclide i released in a given effluent stream based on analysis k (Ci)

$\frac{D}{Q_s}$, $\frac{D}{Q_v}$ = relative deposition factor, i.e., factor converting airborne effluent discharge from stack or vent, respectively, to a real deposition on land (m^{-2}).

The analysis index k may represent either an analysis of a grab sample, a weekly composite analysis, a monthly composite analysis, or a quarterly composite analysis.

Since tritium in water vapor is absorbed directly by vegetation, the tritium concentration in growing vegetation is proportional to the airborne concentration rather than to relative deposition as in the case of particulates. Thus the dose commitment from airborne tritium via vegetation (fruit and vegetables), air-grass-cow-milk, or air-grass-cow-meat pathways is calculated with the appropriate one(s) of the equations:

for a stack release

$$D_{anse} = \left(\frac{X}{Q}\right)_s \sum_i \sum_k Q_{iks} \, TA_{anie}$$

for a vent release

$$D_{anve} = \left(\frac{X}{Q}\right)_v \sum_i \sum_k Q_{ikv} \, TA_{anie}$$

The dose commitment accumulated by a person offsite is computed at least every 30 days to satisfy Specification 4.15.4.2 but may be calculated as analytical results of effluent measurements, performed as specified in Table 4.15-2 in the Technical Specification, become available.

The dose accumulated as a result of stack discharge is computed with

$$D_{ans} = \sum_{e} D_{anse}$$

and the dose accumulated as a result of vent discharge is computed with

$$D_{anv} = \sum_{e} D_{anve}$$

Doses committed during the same time period due to discharges from the stack and vents are additive, thus

$$D_{an} = D_{ans} + \sum_{v} D_{anv}$$

where D_{an} = the dose commitment accumulated during the quarter to date as a result of all measured radioactive gaseous discharges except noble gases to any organ n, including total body, of a person offsite in age group a (mrem).

When the dose to a person from iodine and particulates discharged in gaseous effluents is calculated as required by Specification 4.15.4, appropriate environmental pathways (from among those for which dose transfer factors are provided in Appendix A) will be evaluated. The dose calculated is to a receptor at the location identified in

Figure 3-2 where reference atmospheric dispersion and deposition factors are:

$$\frac{X}{Q_s} = 3.1 \times 10^{-7} \text{ sec/m}^3 \qquad \frac{D}{Q_s} = 7.2 \times 10^{-9} \text{ m}^{-2}$$

$$\frac{X}{Q_v} = 3.9 \times 10^{-6} \text{ sec/m}^3 \qquad \frac{D}{Q_v} = 1.3 \times 10^{-8} \text{ m}^{-2}$$

Food pathways are evaluated with reference meteorology applicable at the location of food production. Seasonal appropriateness of pathways is considered.

The air-grass (fresh or stored)-cow-milk-man pathway is evaluated where a cow is located, 2650m WNW of DAEC, and where reference meteorological data are

$$\left(\frac{D}{Q}\right)_s = 2.1 \times 10^{-9} \text{ m}^{-2} \qquad \left(\frac{D}{Q}\right)_v = 4.28 \times 10^{-9} \text{ m}^{-2}$$

3.8.1 Alternate Method of Evaluating Doses Due to Iodine and Particulates in Gaseous Effluents

Alternatively, the dose commitment to a maximally exposed, hypothetical individual may be calculated by the equation

$$D_{\text{inf-thy}} = \frac{1}{0.8} \times \sum_i \left(Q_i \times TG_{\text{inf-thy-I-131}} \times D/Q\right)_s$$

$$= \frac{1}{0.8} \times \sum_i \left(Q_i \times TG_{\text{inf-thy-I-131}} \times D/Q\right)_v$$

where $D_{\text{inf-thy}}$ = the dose commitment accumulated during the quarter to date to a hypothetical infant's thyroid as a result of the releases of I-131 (mrem)

Q_i = the measured quantity of I-131 released in a given effluent stream, stack or vent (Ci)

$TG_{inf\text{-}thy\text{-}I\text{-}131}$ = the dose transfer factor for the infant thyroid from the cow-milk pathway for I-131 measured in the effluent stream $\left(\frac{mrem}{Ci/m^2}\right)$

$\frac{1}{0.8}$ = a factor of conservatism which accounts for the dose contribution for releases of particulate radioactive material other than I-131

When the maximum organ dose is evaluated by using the equation above, analyses of other organ doses via other pathways are not needed to demonstrate compliance within the dose limits of Technical Specification 3.15.4.

The rationale for only evaluating the dose contribution of I-131 is derived from an evaluation of the radioactive material releases and the environmental pathways. The air-grass-cow-milk-man pathway is by far the controlling pathway and the infant's thyroid is the limiting organ. This pathway typically contributes greater than 90% of the total calculated dose to the infant's thyroid and I-131 contributes essentially all of the dose (~95%). Therefore, it is possible to demonstrate compliance with the dose limits of Technical Specification 3.15.4 by the conservative calculational method presented above.

3.9 Dose to a Person from Noble Gases

Technical Specification 4.16.1 requires the calculation of the dose or dose commitment to a person offsite exposed to 12 consecutive

months of radioactive liquid and gaseous effluents from the Station. One component of personal dose is total body irradiation by gamma rays from noble gases. Another is irradiation of skin by beta and gamma radiation from noble gases. The methods of calculating these doses are presented in sections 3.9.1 and 3.9.2.

The amount of radioactive noble gas discharged is determined in the manner described in section 3.2.

3.9.1 Gamma Dose to Total Body

The gamma radiation dose to the whole body of a member of the public as a consequence of noble gas released from the Station is calculated with the equation:

$$D_\gamma = 0.7 \sum_i (Q_i \times P\gamma_{S_i})_S + 0.7 \sum_v \sum_i (Q_i \times \frac{X}{Q} \times P\gamma_{V_i})_v$$

where D_γ = noble gas gamma dose to total body (mrem)

Q_i = quantity of noble gas nuclide i released via stack or vent (μCi)

$P\gamma_{S_i}$ = factor converting unit noble gas nuclide i stack release to total body dose at ground level received from the overhead plum (mrem/μCi)

$P\gamma_{V_i}$ = factor converting time integrated, ground level concentration of noble gas nuclide i to total body dose from gamma radiation $(\frac{\text{mrem}}{(\mu\text{Ci sec})/\text{m}^3})$

0.7 = reduction in dose due to shielding by housing

When the total body dose due to gamma radiation from noble gas is computed as required by Technical Specification 4.16.1, the nearby resident exposed to maximal ground-level

noble gas concentrations (maximum X/Q) is selected as the receptor. Alternatively, the total body dose to a maximally exposed, hypothetical individual may be calculated at location 1260 meters NNW of the reactor, in which case values of the dose factors, particularly $P\gamma_{S_i}$, in Table 3-5 are employed.

Noble gas plume gamma-to-total body dose factors, $P\gamma_{S_i}$, are calculated in accordance with Regulatory Guide 1.109, Appendix B. Noble gas semi-infinite cloud gamma-to-total body dose factors, $P\gamma_{V_i}$, are listed in Table 3-5 herein, and finite plume gamma-to-total body dose factors, $P\gamma_{S_i}$, for the location 1260 meters NNW are listed in Table 3-5.

3.9.2 Dose to Skin

The beta radiation dose to the skin of a member of the public due to beta radiation from noble gas released from the Station may be calculated with the equation

$$D_\beta = \sum_i S\beta_i \left(Q_i \times \frac{X}{Q}\right)_S + \sum_v \sum_i S\beta_i \left(Q_i \times \frac{X}{Q}\right)_v$$

where D_β = noble as dose to skin (mrem)

$S\beta_i$ = factor converting time integrated ground level concentration of noble gas to skin dose from beta radiation

$$\left(\frac{\text{mrem}}{\mu\text{Ci}\ \frac{\text{sec}}{\text{m}^3}}\right)$$

Semi-infinite cloud noble gas beta-to-skin dose factors, $S\beta_i$, appear in Table 3-5.

The total dose to the skin from noble gases is approximately equal to the beta radiation dose to the skin plus the gamma radiation dose to the total body.

When the skin dose due to noble gas beta radiation is computed as required by Specification 4.16.1, the receptor selected is the nearby resident exposed to maximal ground-level concentrations (maximum X/Q). Alternatively, the skin dose to a postulated receptor (resident) at 1260 meters NNW of the reactor may be calculated.

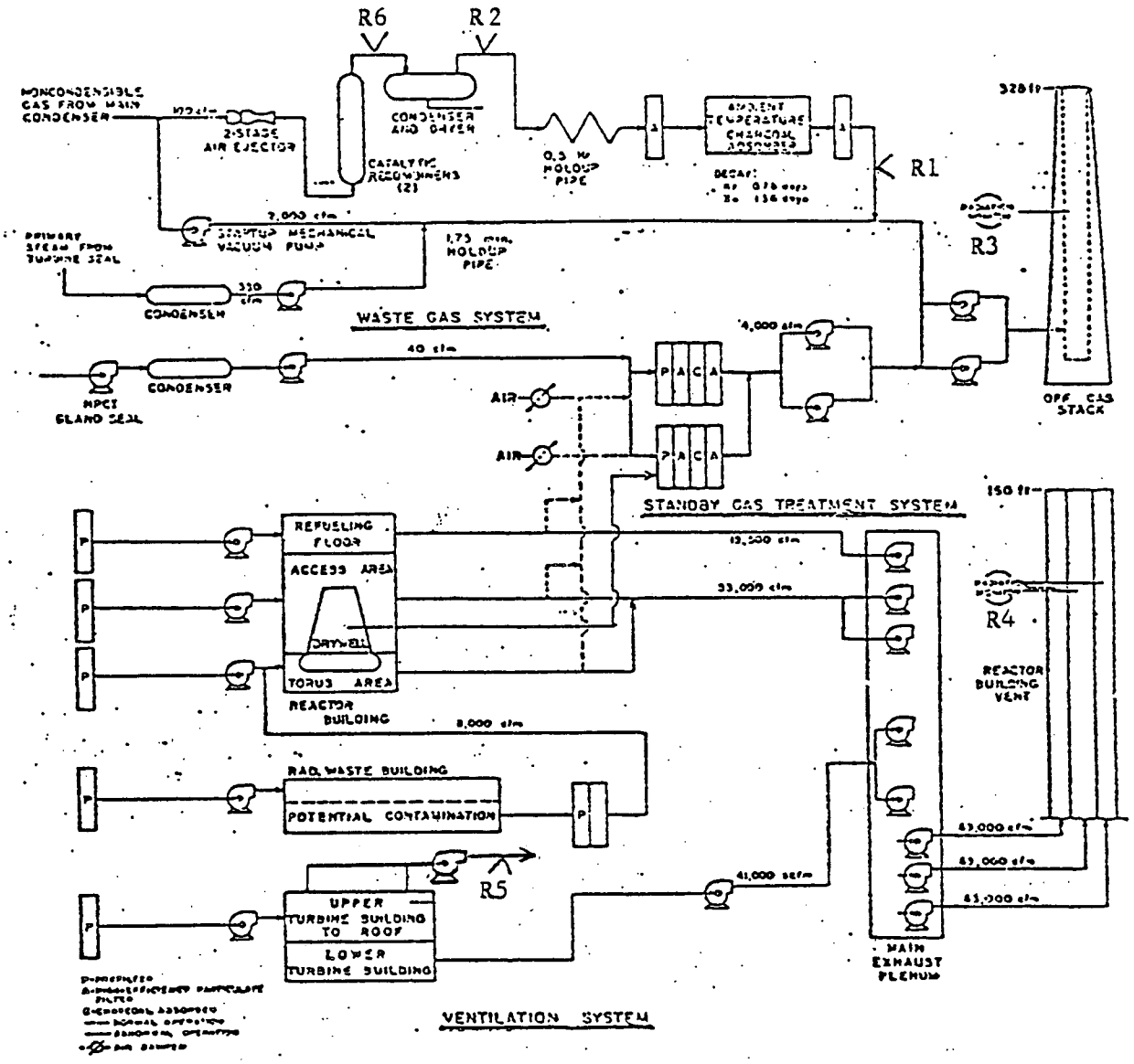

Figure 3-1 Gaseous Radioactive Waste Flow Diagram

R1 Main Condenser SJAE Offgas Post-treatment Noble Gas Activity Monitor

R2 Main Condenser SJAE Offgas Hydrogen Monitor

R3 Offgas Stack Radiation Monitoring System

R4 Reactor Building Exhaust Vent Monitoring System

R5 Turbine Building Exhaust Vent Monitoring System

R6 Main Condenser SJAE Offgas Pretreatment Noble Gas Activity Monitor

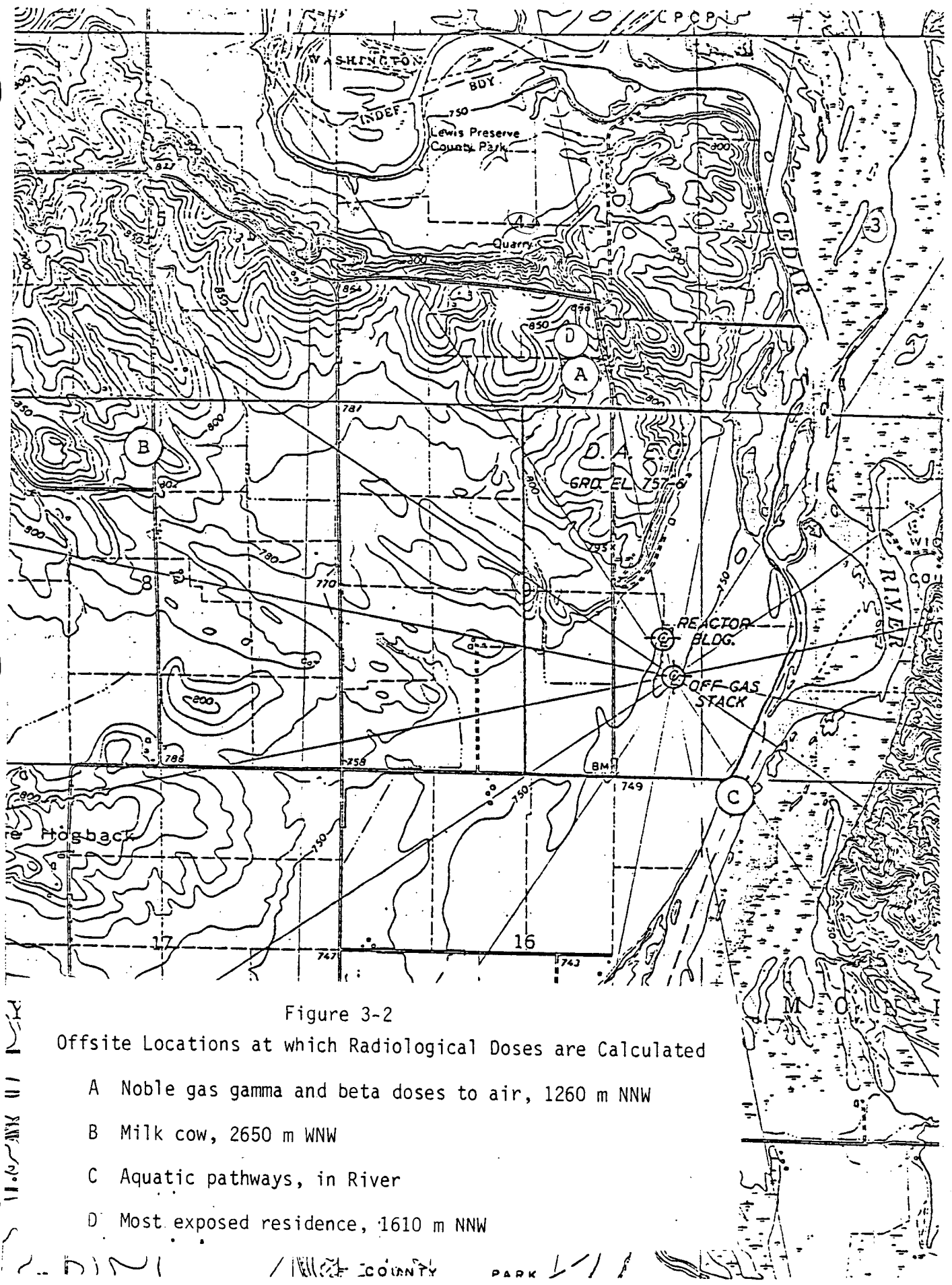

Figure 3-2

Offsite Locations at which Radiological Doses are Calculated

A Noble gas gamma and beta doses to air, 1260 m NNW

B Milk cow, 2650 m WNW

C Aquatic pathways, in River

D Most exposed residence, 1610 m NNW

Table 3-1

Atmospheric Gaseous Release Points
at the Duane Arnold Energy Center

Parameter	Release Point		
	Offgas Stack	Reactor Bldg. Vent	Turbine Bldg. Vent
Release Height	328 ft	154 ft	160 ft
Release Mode	elevated	wake-split	wake-split
Effluent Source	Waste Gas System Standby Gas Treatment System	Reactor Bld. Radwaste Bld. Lower Turbine Building	Upper Turbine Bld.

Table 3-2

Computed Releases of Radioactive Noble Gases in Gaseous Effluent from Duane Arnold Energy Center

Nuclide	Stack Release		Plant Vents Release	
	(Ci/yr)[a]	fraction[b]	(Ci/yr)[a]	fraction[b]
Kr-83m	4.90E+01	2.53E-03	0	0
Kr-85m	2.34E+03	1.21E-01	7.40E+01	1.98E-02
Kr-85	1.40E+02	7.23E-03	0	0
Kr-87	1.56E+02	8.06E-03	1.36E+02	3.64E-02
Kr-88	1.65E+03	8.52E-02	2.36E+02	6.32E-02
Kr-89	6.40E+02	3.31E-02	0	0
Xe-131m	4.80E+01	2.48E-03	0	0
Xe-133m	3.50E+01	1.81E-03	0	0
Xe-133	1.24E+04	6.41E-01	3.92E+02	1.05E-01
Xe-135m	1.80E+01	9.30E-04	7.42E+02	1.99E-01
Xe-135	5.10E+02	2.63E-02	7.34E+02	1.99E-01
Xe-137	7.80E+02	4.03E-02	0	0
Xe-138	5.90E+02	3.05E-02	1.41E+03	3.78E-01
	19356	1.0	3733.	1.0

[a] Releases computed by BWR-GALE for DAEC Base Case gaseous radwaste treatment. Computed releases are included only to show the basis of the radionuclide distribution.

[b] This is the calculated distribution of radionuclides in gaseous effluents in each release pathway. To estimate radionuclide concentrations in a sample in which only the total activity concentration has been measured, multiply the total activity concentration by the fraction of respective radionuclides listed above.

Table 3-3

Transfer Factors for Maximum Offsite Air Dose
Based on Reference Meteorology

Radionuclide	Air Dose Transfer Factors		
	$A\gamma_{s_i}$ [a,b] $\left(\frac{\text{mrad}}{\mu\text{Ci}}\right)$	$A\gamma_{v_i}$ $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$	$A\beta_i$ $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$
Kr-83m	4.3E-14	6.1E-7	9.1E-6
Kr-85m	6.0E-12	3.9E-5	6.2E-5
Kr-85	8.4E-14	5.4E-7	6.2E-5
Kr-87	2.3E-11	2.0E-4	3.3E-4
Kr-88	6.4E-11	4.8E-4	9.3E-5
Kr-89	3.0E-11	5.5E-4	3.4E-4
Kr-90	-	5.2E-4	2.5E-4
Xe-131m	1.8E-12	4.9E-6	3.5E-5
Xe-133m	1.4E-12	1.0E-5	4.7E-5
Xe-133	1.5E-12	1.1E-5	3.3E-5
Xe-135m	1.1E-11	1.1E-4	2.3E-5
Xe-135	9.5E-12	6.1E-5	7.8E-5
Xe-137	2.6E-12	4.8E-5	4.0E-4
Xe-138	3.6E-11	2.9E-4	1.5E-4
Ar-41	4.4E-11	2.9E-4	1.0E-4

[a] Based on reference meteorology at DAEC
[b] Receptor located 1260 meters NNW of Station

Table 3-4

Transfer Factors for Dose Equivalent Rate to A Person Offsite Due to Radioactive Noble Gases

Radionuclide	Dose Transfer Factors		
	$P\gamma_{S_i}$[a,b] -or- DF_{S_i}[a,b] $\frac{mrem}{(\mu Ci\ yr)/sec}$	$P\gamma_{V_i}$ -or- DF_{V_i} $\frac{mrem}{(\mu Ci\ yr)/m^3}$	$S\beta_i$ $\frac{mrem}{(\mu Ci\ yr)/m^3}$
Kr-83m	6.27E-9	7.56E-2	0
Kr-85m	1.81E-4	1.17E+3	1.46E+3
Kr-85	2.51E-6	1.61E+1	1.34E+3
Kr-87	6.97E-4	5.92E+3	9.73E+3
Kr-88	1.91E-3	1.47E+4	2.37E+3
Kr-89	9.14E-4	1.66E+4	1.01E+4
Kr-90	---	1.56E+4	7.29E+3
Xe-131m	4.83E-5	9.15E+1	4.76E+2
Xe-133m	3.61E-5	2.51E+2	9.94E+2
Xe-133	4.09E-5	2.94E+2	3.06E+2
Xe-135m	3.39E-4	3.12E+3	7.11E+2
Xe-135	2.84E-4	1.81E+3	1.86E+3
Xe-137	7.90E-5	1.42E+3	1.22E+4
Xe-138	1.08E-3	8.83E+3	4.13E+3
Ar-41	1.32E-3	8.84E+3	2.69E+3

[a] Receptor located 1260 meters NNW of Station
[b] Based on reference meteorology at DAEC

Table 3-5

Transfer Factors for Maximum Dose to A
Person Offsite Due to Radioactive Noble Gases

Radionuclide	Dose Transfer Factors		
	$P\gamma_{S_i}$[a,b] mrem / μCi	$P\gamma_{V_i}$ mrem / μCi sec/m³	$S\beta_i$ mrem / μCi sec/m³
Kr-83m	1.99E-16	2.4E-9	---
Kr-85m	5.75E-12	3.7E-5	4.6E-5
Kr-85	7.97E-14	5.1E-7	4.2E-5
Kr-87	2.21E-11	1.9E-4	3.1E-4
Kr-88	6.07E-11	4.7E-4	7.5E-5
Kr-89	2.90E-11	5.3E-4	3.2E-4
Kr-90	---	4.9E-4	2.3E-4
Xe-131m	1.53E-12	2.9E-6	1.5E-5
Xe-133m	1.15E-12	8.0E-6	3.1E-5
Xe-133	1.29E-12	9.3E-6	9.7E-6
Xe-135m	1.07E-11	9.9E-5	2.3E-5
Xe-135	9.01E-12	5.7E-5	5.9E-5
Xe-137	2.50E-12	4.5E-5	3.9E-4
Xe-138	3.42E-11	2.8E-4	1.3E-4
Ar-41	4.17E-11	2.8E-4	8.5E-5

[a] Receptor located 1260 meters NNW of Station
[b] Based on reference meteorology at DAEC

4.0 DOSE COMMITMENT FROM RELEASE OVER EXTENDED TIME

4.1 Dose Assessment for 10 CFR Part 50, Appendix I

Technical Specifications 4.14.3, 4.15.3, and 4.15.4 require quarterly and annual assessments to demonstrate compliance with Appendix I dose limits. The assessment includes the following calculations of dose as described by equations for:

1. total body and maximally exposed organ doses due to liquid effluent via drinking water and eating fish from the River as in § 2.5.

2. total body and maximally exposed organ doses due to gaseous effluents* other than noble gases as in §3.8.

3. doses to air offsite due to noble gas γ as in § 3.6 and due to noble gas β as in § 3.7.

The dose calculations are based on liquid and gaseous effluents from the Station during each calendar quarter and for a calendar year, determined in accord with Technical Specification Tables 4.14-2 and 4.15-2.

Environmental concentrations depend on dispersion and dilution of the effluent. For aqueous effluents over extended time, the aquatic concentration is estimated according to section 2.2. Atmospheric dispersion and deposition factors used to estimate the dose commitment due to gaseous effluents are ordinarily derived from reference meteorological data. Otherwise, quarterly averaged or

*Radioactive iodine-131, iodine-133, tritium, and radioactive material in particulate form having half-lives greater than 8 days.

annual averaged meteorological conditions concurrent with the gaseous release being evaluated will be used to estimate atmospheric dispersion and deposition.

The receptor of the dose is described such that the dose to any resident near the Station is unlikely to be underestimated. That is, the receptor is selected on the basis of the combination of applicable pathways of exposure to gaseous effluent identified in the annual land use census and maximum ground level X/Q at the residence. Conditions (i.e., location, X/Q, and/or pathways) more conservative (i.e, expected to yield higher calculated doses) than appropriate for the maximally exposed individual may be assumed in the dose assessment.

Seasonal appropriateness of exposure pathways may be considered. Exposure by eating fresh vegetation or drinking milk from cows or goats fed fresh forage is an inappropriate assumption during the first or fourth calendar quarter; rather consumption of stored vegetation and stored forage is assumed during those quarters. Otherwise, during the second and third calendar quarters, exposure by eating fresh vegetation and/or drinking milk from cows or goats fed fresh forage is assumed where those pathways exist. Similarly, the liquid effluent-river-fish-man pathway is not assumed during the winter quarter.

Factors converting stack-released noble gas to gamma radiation dose from the overhead plume are calculated on the basis of reference meteorological data for the receptor location. Other environmental pathway-to-dose transfer factors used in the dose calculations are provided in Appendix A.

4.2 Dose Assessment for 40 CFR Part 190

The regulation governing the maximum allowable dose or dose commitment to a member of the public from all uranium fuel cycle sources of radiation and radioactive material in the environment is stated in 40 CFR Part 190. It requires that the dose or dose commitment to a member of the public from all sources not exceed 25 mrem/yr to any organ or 75 mrem/yr to the thyroid. Technical Specification 4.16.1 requires calculation of the dose at least once every year to assess compliance with the regulation. More frequent calculations may be performed if higher than normal releases are experienced (twice the design objective rates in a single quarter).

Fuel cycle sources or nuclear power reactors other than the Station itself do not measurably or significantly increase the radioactivity concentration in the vicinity of the Station; therefore, only radiation and radioactivity in the environment attributable to the Station itself are considered in the assessment of compliance with 40 CFR Part 190.

Contributions to the dose due to liquid and gaseous effluent are calculated as described by the equations for:

1. total body and maximally exposed organ doses due to liquid effluent via drinking water and eating fish from the River as in § 2.5

2. total body dose due to noble gas γ as in § 3.9.1

3. skin dose due to noble gas β as in § 3.9.2

4. total body and maximally exposed organ doses due to gaseous effluents* other than noble gases as in § 3.8.

The doses are calculated on the basis of liquid and gaseous effluents from the Station during 12 consecutive months, determined in accord with Technical Specification Tables 4.14-2 and 4.15-2. For the purpose of the Annual Radiological Environmental Report, doses are based upon release during a calendar year.

Aqueous radioactive material concentrations are estimated according to § 2.2 on the basis of annual averaged stream flow. Annual averaged meteorological conditions concurrent with gaseous releases being evaluated are used to estimate atmospheric dispersion, deposition, and elevated plume gamma exposure.

The receptor of the dose is described such that the dose to any resident near the Station is not likely to be underestimated, although conditions more conservative than appropriate for the maximally exposed person may be assumed in the dose assessment. Ordinarily, the receptor is selected on the basis of the applicable combination of existing pathways of exposure to gaseous effluent identified in the annual land use census and the maximum ground level X/Q at the residence.

When assessing compliance with 40 CFR 190, Radiological Environmental Monitoring Program results may be used to indicate actual radioactivity levels in the environment attributable to the DAEC. These measured levels may be used to supplement the evaluation of doses to members of the public for assessing compliance with 40 CFR 190.

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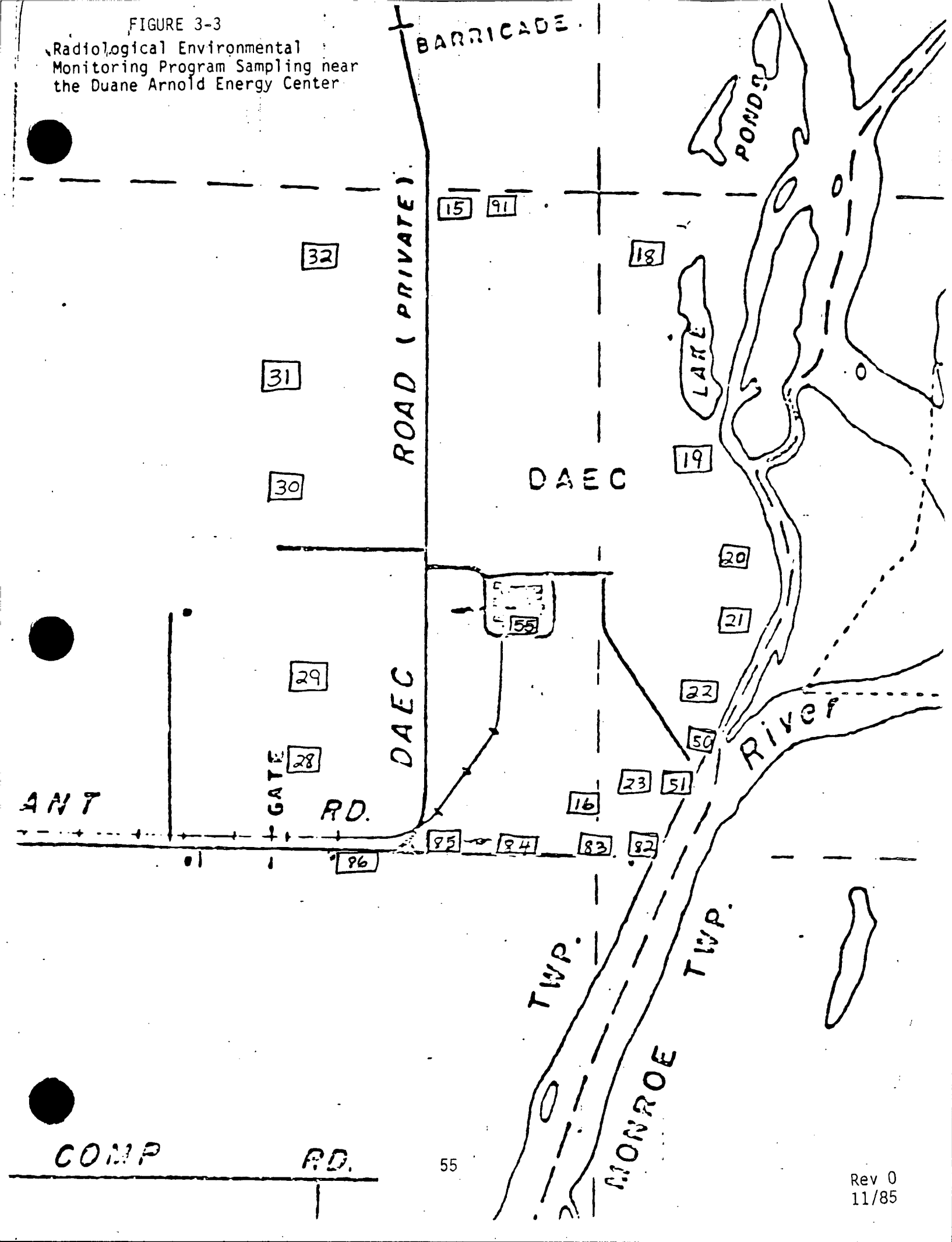
*Radioactive iodine-131, iodine-133, tritium, and radioactive material in particulate form having half-lives greater than 8 days.

Factors converting stack-released noble gas to gamma radiation dose from the overhead plume are calculated on the basis of annual averaged meteorological data for the receptor location. Other environmental pathway-to-dose transfer factors are listed in Appendix A.

5.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLING STATION LOCATIONS

Sampling station locations identified in Table 5-1 correspond to the minimum required number of radiological environmental monitoring program sampling stations in Technical Specifications Table 3.16-1. Environmental monitoring locations are shown on Figures 3-3 and 3-4. IELP may conduct additional environmental monitoring exclusive of the requirements of Specifications 3.16.2 and 6.11.1.e.

FIGURE 3-3
Radiological Environmental Monitoring Program Sampling near the Duane Arnold Energy Center



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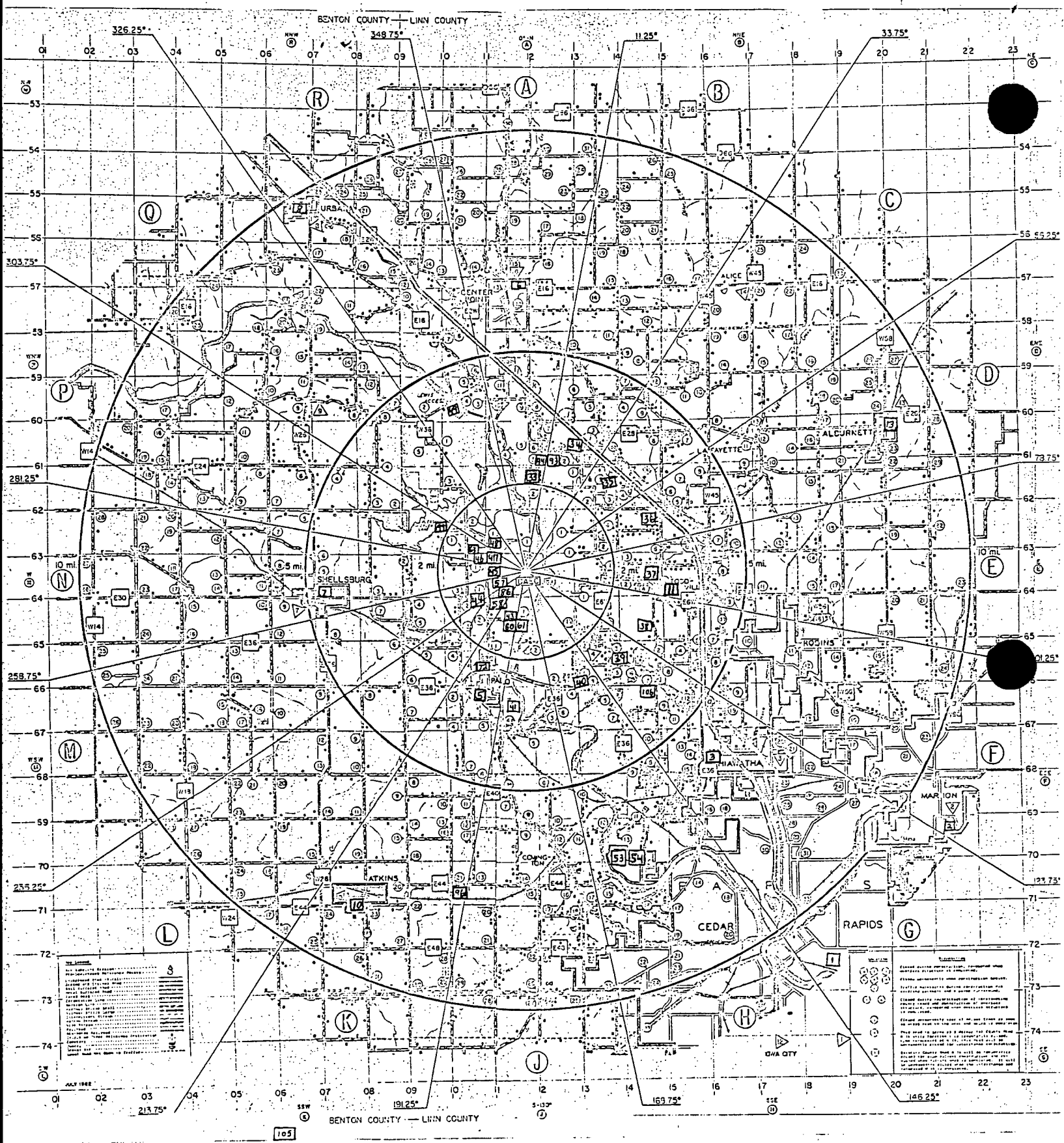

FIGURE 3-4
Radiological Environmental
Monitoring Program Sampling
Stations Outside 0.5 miles

Table 5-1

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
1	Location: Cedar Rapids, 11 miles (135°) SE Type : TLD Control Airborne Particulate Control
2	Location: Marion, 11 miles (125°) ESE Type : TLD Control Airborne Particulate and Iodine Control
3	Location: Hiawatha, 7 miles (130°) SE Type : TLD Control Airborne Particulate
4	Not used
5	Location: Palo, 3 miles (200°) SSW Type : TLD Control Airborne Particulate and Iodine
6	Location: Center Point, 7 miles (0°) N Type : TLD Control Airborne Particulate
7	Location: Shellsburg, 6 miles (255°) W Type : TLD Control Airborne Particulate and Iodine
8	Location: Urbana, 10 miles (345°) NW Type : TLD Control Airborne Particulate and Iodine
9	Not used

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
10	Location: Atkins, 9 miles (210°) SSW Type : TLD Control Airborne Particulate
11	Location: Toddville, 4 miles (90°) E Type : TLD Control Airborne Particulate and Iodine
12	Not used
13	Location: Alburnett, 9 miles (70°) ENE Type : TLD Control Airborne Particulate Control
14	Not used
15	Location: On-site North, 0.5 miles (305°) NW Type : TLD Control Airborne Particulate and Iodine
16	Location: On-site South, 0.5 miles (190°) SSE Type : TLD Control Airborne Particulate Vegetation
17	Not used
18	Location: On-site, 0.5 miles NNE Type : TLD
19	Location: On-site, 0.5 miles NE Type : TLD

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
20	Location: On-site, 0.5 miles ENE Type : TLD
21	Location: On-site, 0.5 miles ENE Type : TLD
22	Location: On-site, 0.5 miles E Type : TLD
23	Location: On-site, 0.5 miles ESE Type : TLD
24	Not used
25	Not used
26	Not used
27	Not used
28	Location: On-site, 0.5 miles WSW Type : TLD
29	Location: On-site, 0.5 miles W Type : TLD
30	Location: On-site, 0.5 miles WNW Type : TLD
31	Location: On-site, 0.5 miles NW Type : TLD

Table 5-1 (Continued)
REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
32	Location: On-site, 0.5 miles NNW Type : TLD
33	Location: 3 miles N Type : TLD
34	Location: 3 miles NNE Type : TLD
35	Location: 3 miles NE Type : TLD
36	Location: 3 miles ENE Type : TLD
37	Location: 3 miles E Type : TLD
38	Location: 3 miles ESE Type : TLD
39	Location: 3 miles SE Type : TLD
40	Location: 3 miles SSE Type : TLD
41	Location: 3 miles S Type : TLD
42	Not used

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
43	Location: 1 mile SSW Type : TLD
44	Location: 1 mile WSW Type : TLD
45	Location: 1 mile W Type : TLD
46	Location: 1 mile WNW Type : TLD
47	Location: 1 mile WNW Type : TLD
48	Location: 1 mile NW Type : TLD
49	Location: Lewis Access, upstream of DAEC 4 miles NNW Type : Fish Control Surface Water Control
50	Location: Plant Intake Type : Sediment Surface Water
51	Location: Plant Discharge Type : Sediment Surface Water
52	Not used

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
53	Location: Treated Municipal Water Type : Ground Water
54	Location: Inlet to Municipal Water Treatment System Type : Ground Water
55	Location: On-site Well Type : Ground Water
56	Not used
57	Location: Farm, 1 mile WSW Type : Ground Water Vegetation
58	Location: Farm, 1 mile WSW-SW Type : Ground Water Vegetation
59	Not used
60	Location: Farm, 1 mile SSW Type : Ground Water
61	Location: Cedar River about one-half mile downstream from DAEC discharge Type : Fish
62	Not used
63	Location: Farm, 1.5 miles WNW Type : Milk Vegetation

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
64	Not used
65	Not used
66	Not used
67	Not used
68	Not used
69	Not used
70	Not used
71	Not used
72	Location: Farm, 2 miles SW Type : Milk Vegetation
73	Not used
74	Not used
75	Not used
76	Not used
77	Not used
78	Not used
79	Not used
80	Not used
81	Not used
82	Location: On-site, 0.5 miles SE Type : TLD
83	Location: On-site, 0.5 miles SSE Type : TLD
84	Location: On-site, 0.5 miles S Type : TLD
85	Location: On-site, 0.5 miles SSW Type : TLD

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
86	Location: On-site, 0.5 miles SW Type : TLD
87	Not used
88	Not used
89	Not used
90	Not used
91	Location: On-site, 0.5 miles N Type : TLD
92	Not used
93	Location: Farm, 2.8 miles NNW Type : Vegetation Milk
94	Location: Farm, 2.7 miles N Type : Vegetation Milk
95	Not used
96	Location: Farm, 8 miles SSW Type : Milk
97	Not used
98	Not used
99	Location: Pleasant Creek Lake, 2.5 miles WNW Type : Surface Water

Table 5-1 (Continued)

REQUIRED ENVIRONMENTAL SAMPLE STATIONS

Station Number	Station Location and Sample Type
100	Not used
101	Not used
102	Not used
103	Not used
104	Not used
105	Location: Farm, 21.3 miles SSW Type : Milk Control Vegetation Control
106	Location: Farm, 4.5 miles SE Type : Milk Vegetation

APPENDIX A

PATHWAY-DOSE TRANSFER FACTORS

Environmental pathway transfer factors, usage factors, and dose commitment factors appropriate for each exposure pathway, age, and organ are combined into integrated environmental concentration-to-dose factors for each radionuclide. This appendix includes tables of values of the transfer factors calculated in accord with equations and values recommended in Regulatory Guide 1.109, Revision 0. The transfer factors have been tabulated for individual pathways. If a single, composite transfer factor is desired, it can be obtained by summing the factors for appropriate pathways for a given organ and age group of interest.

DOSE FACTORS FOR [illegible]EOUS DISCHARGES

BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - INHALATION AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	3.10E+01	3.10E+01	3.10E+01	3.10E+01	3.10E+01	0.	3.10E+01
C---14	5.28E+02	9.88E+01	9.88E+01	9.88E+01	9.88E+01	9.88E+01	0.	9.88E+01
P---32	3.82E+04	2.23E+03	0.	0.	0.	2.50E+03	0.	1.45E+03
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.15E+03	0.	2.85E+02	4.05E+04	2.24E+03	0.	1.82E+02
FE--59	3.40E+02	8.03E+05	0.	0.	2.94E+04	5.44E+03	0.	3.03E+02
CO--58	0.	4.58E+01	0.	0.	2.69E+04	3.08E+03	0.	6.00E+01
CO--60	0.	3.33E+02	0.	0.	1.73E+05	8.24E+03	0.	4.28E+02
ZN--65	9.38E+02	2.99E+03	0.	2.00E+03	2.52E+04	1.55E+03	0.	1.35E+03
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	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.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
KR--90	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	3.91E+03	0.	0.	0.	4.82E+02	0.	1.71E+03
SR--89	8.80E+03	0.	0.	0.	4.05E+04	1.01E+04	0.	2.52E+02
SR--90	2.87E+06	0.	0.	0.	2.78E+05	2.09E+04	0.	1.78E+05
Y---91	1.34E+04	0.	0.	0.	4.93E+04	1.11E+04	0.	3.59E+02
ZR--95	3.10E+03	9.95E+02	0.	1.57E+03	5.14E+04	4.35E+03	0.	6.74E+02
NB--95	4.07E+02	2.26E+02	0.	2.24E+02	1.46E+04	3.01E+03	0.	1.22E+02
RU-103	4.42E+01	0.	0.	1.69E+02	1.40E+04	3.19E+03	0.	1.91E+01
RU-106	2.00E+03	0.	0.	3.87E+03	2.73E+05	2.04E+04	0.	2.52E+02
AG110M	3.13E+02	2.89E+02	0.	5.69E+02	1.34E+05	8.75E+03	0.	1.72E+02
CD115M	0.	5.69E+03	0.	4.58E+03	4.07E+04	1.11E+04	0.	1.84E+02
SN-123	6.99E+03	1.54E+02	1.31E+02	0.	6.07E+04	9.07E+03	0.	2.27E+02
SN-125	3.66E+04	9.68E+02	2.85E+02	0.	2.71E+05	3.68E+03	0.	1.39E+03
SB-124	9.03E+02	1.70E+01	2.19E+00	0.	7.18E+04	1.18E+04	0.	3.59E+02
SB-125	1.91E+03	2.06E+01	1.70E+00	0.	6.37E+04	2.92E+03	0.	3.84E+02
TE127	3.66E+02	1.63E+02	9.51E+01	1.32E+03	2.78E+04	4.33E+03	0.	4.54E+01
TE129M	2.82E+02	1.35E+02	9.95E+01	1.05E+03	3.36E+04	1.11E+04	0.	4.58E+01
I--131	7.29E+02	1.04E+03	3.45E+05	1.78E+03	0.	1.82E+02	0.	5.93E+02
I--133	2.50E+02	4.31E+02	8.47E+04	7.52E+02	0.	2.52E+02	0.	1.31E+02
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.08E+04	2.45E+04	0.	8.33E+03	2.82E+03	3.01E+02	0.	2.11E+04
CS-136	1.13E+03	4.24E+03	0.	2.48E+03	3.47E+02	3.38E+02	0.	3.22E+03
CS-137	1.38E+04	1.80E+04	0.	6.44E+03	2.18E+03	2.43E+02	0.	1.24E+04
BA-140	1.13E+03	1.42E+00	0.	4.86E-01	3.08E+04	8.32E+03	0.	7.43E+01
CE-141	5.76E+02	3.91E+02	0.	1.81E+02	1.05E+04	3.47E+03	0.	4.42E+01
CE-144	9.93E+04	4.14E+04	0.	2.45E+04	2.25E+05	2.30E+04	0.	5.32E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - GROUND PLANE DEPOSITION — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	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.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	5.14E+07	4.39E+07
FE--59	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	1.03E+07	8.73E+06
CO--58	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.41E+07	1.21E+07
CO--60	6.80E+08	6.80E+08	6.80E+08	6.80E+08	6.80E+08	6.80E+08	8.00E+08	6.80E+08
ZN--65	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.71E+07	2.36E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	1.13E+04	9.90E+03
KR--89	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	9.70E+02	8.08E+02
KR--90	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	7.29E-03	6.16E-03
RB--86	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	3.20E+05	2.86E+05
SR--89	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	7.97E+02	6.87E+02
SR--90	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	2.01E+05	1.70E+05
Y---91	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.86E+04	3.43E+04
ZR--95	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.80E+07	1.59E+07
NB--95	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	5.09E+06	4.33E+06
RU-103	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	4.07E+06	3.49E+06
RU-106	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.59E+07	1.33E+07
AG110M	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.32E+08	1.13E+08
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	4.35E+04	0.
SN-126	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.83E+09	1.64E+09
SB-124	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	2.19E+07	1.90E+07
SB-125	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	8.21E+07	7.27E+07
TE127M	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	3.09E+04	2.79E+04
TE129M	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.43E+06	1.22E+06
I--131	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	3.32E+05	2.73E+05
I--133	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	4.77E+04	3.92E+04
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE--135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	1.01E+02	8.69E+01
XE-138	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.87E+03	6.01E+03
CS-134	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.58E+08	2.22E+08
CS-136	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	5.30E+06	4.73E+06
CS-137	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.81E+08	3.27E+08
BA-140	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	6.02E+06	5.30E+06
CE-141	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.88E+05	4.33E+05
CE-144	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	4.15E+06	3.59E+06

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - FRESH FRUITS AND VEGETABLES — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.80E+00	6.80E+00	6.80E+00	6.80E+00	6.80E+00	0.	6.80E+00
C---14	3.96E+03	7.94E+02	7.94E+02	7.94E+02	7.94E+02	7.94E+02	0.	7.94E+02
P---32	3.59E+07	2.25E+06	0.	0.	0.	4.03E+06	0.	1.39E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.52E+06	0.	4.52E+05	0.	4.66E+06	0.	2.96E+05
FE--59	1.13E+06	2.68E+06	0.	0.	7.45E+05	8.86E+06	0.	1.02E+05
CO--58	0.	2.13E+05	0.	0.	0.	4.31E+06	0.	4.76E+05
CO--60	0.	7.53E+05	0.	0.	0.	1.41E+07	0.	1.65E+05
ZN--65	2.05E+06	6.49E+06	0.	4.34E+06	0.	4.09E+06	0.	2.94E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.93E-08	0.	0.	0.	1.37E-09	0.	1.02E-08
KR--88	0.	5.25E-01	0.	0.	0.	0.	0.	2.78E-01
KR--89	3.64E+03	0.	0.	0.	0.	5.82E+02	0.	1.04E+02
KR--90	1.09E+02	0.	0.	0.	0.	2.50E+00	0.	2.65E+01
RB--86	0.	4.15E+06	0.	0.	0.	8.18E+05	0.	1.93E+06
SR--89	8.29E+07	0.	0.	0.	0.	1.33E+07	0.	2.38E+05
SR--90	2.99E+09	0.	0.	0.	0.	7.08E+07	0.	7.30E+08
Y---91	3.89E+04	0.	0.	0.	0.	2.14E+07	0.	1.04E+05
ZR--95	9.02E+03	3.01E+03	0.	4.59E+03	0.	1.02E+07	0.	1.96E+03
NB--95	1.52E+03	8.46E+02	0.	8.39E+02	0.	9.13E+06	0.	3.33E+02
RU-103	4.72E+04	0.	0.	1.80E+05	0.	5.51E+06	0.	2.04E+04
RU-106	9.46E+05	0.	0.	1.83E+06	0.	6.12E+07	0.	1.20E+05
AG110M	5.78E+04	5.35E+04	0.	1.05E+05	0.	2.18E+07	0.	3.18E+04
CD115M	0.	4.99E+05	0.	3.96E+05	0.	2.10E+07	0.	1.59E+04
SN-123	3.18E-07	5.27E-09	4.47E-09	0.	0.	6.46E-07	0.	7.75E-08
SN-126	2.96E+07	5.86E+06	1.72E+05	0.	1.55E+05	2.91E+07	0.	9.25E+05
SB-124	7.80E+05	1.47E+04	1.88E+03	0.	6.05E+05	2.21E+07	0.	3.08E+05
SB-125	1.54E+06	2.90E+05	2.35E+05	3.16E+05	7.99E+07	9.86E+06	0.	2.58E+05
TE127M	3.05E+06	1.07E+06	8.02E+05	1.24E+07	0.	1.39E+07	0.	3.75E+05
TE129M	3.32E+06	1.24E+06	1.15E+06	1.38E+07	0.	1.67E+07	0.	5.20E+05
I--131	1.23E+06	1.77E+06	5.78E+08	3.03E+06	0.	4.66E+05	0.	1.01E+05
I--133	3.37E+04	5.85E+04	1.13E+07	1.02E+05	0.	5.14E+04	0.	1.79E+04
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.
XE135M	1.11E-04	1.03E-04	0.	3.88E-05	1.17E-05	2.40E-06	0.	4.50E-05
XE-135	3.83E-03	3.54E-03	0.	1.34E-03	4.03E-04	8.27E-05	0.	1.57E-03
XE-137	7.85E+00	1.07E+01	0.	3.05E+00	1.21E+00	2.07E-01	0.	7.03E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.11E+07	5.01E+07	0.	1.03E+07	5.38E+06	8.77E+05	0.	4.10E+07
CS-136	1.05E+06	4.15E+06	0.	2.31E+06	5.17E+05	4.71E+05	0.	2.99E+05
CS-137	2.95E+07	4.03E+07	0.	1.37E+07	4.54E+06	7.70E+05	0.	2.04E+07
BA-140	3.25E+06	4.28E+03	0.	1.39E+03	2.34E+03	2.11E+07	0.	2.14E+05
CE-141	2.24E+03	1.52E+03	0.	7.03E+02	0.	5.78E+06	0.	1.72E+02
CE-144	1.58E+05	6.56E+04	0.	3.90E+04	0.	5.32E+07	0.	8.49E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - STORED FRUITS AND VEGETABLES — AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.47E+01	5.47E+01	5.47E+01	5.47E+01	5.47E+01	0.	5.47E+01
C---14	3.22E+04	6.45E+03	6.45E+03	6.45E+03	6.45E+03	6.45E+03	0.	6.45E+03
P---32	1.67E+07	1.05E+06	0.	0.	0.	1.88E+06	0.	6.46E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.08E+07	0.	3.22E+06	0.	3.32E+07	0.	2.67E+06
FE--59	3.70E+06	8.79E+06	0.	0.	2.44E+06	2.90E+07	0.	3.35E+05
CO--58	0.	9.72E+05	0.	0.	0.	1.97E+07	0.	2.18E+05
CO--60	0.	5.99E+06	0.	0.	0.	1.12E+08	0.	1.32E+07
ZN--65	1.40E+07	4.46E+07	0.	2.98E+07	0.	2.81E+07	0.	2.02E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.38E-07	0.	0.	0.	1.11E-08	0.	8.27E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	1.32E+04	0.	0.	0.	0.	2.11E+03	0.	3.78E+02
KR--90	8.78E+02	0.	0.	0.	0.	2.21E+01	0.	2.15E+02
RB--86	0.	3.78E+06	0.	0.	0.	7.46E+05	0.	1.70E+05
SR--89	3.00E+08	0.	0.	0.	0.	4.80E+07	0.	8.60E+05
SR--90	2.42E+10	0.	0.	0.	0.	6.08E+08	0.	5.91E+09
Y---91	1.58E+05	0.	0.	0.	0.	8.70E+07	0.	4.24E+03
ZR--95	4.50E+04	1.04E+04	0.	2.32E+04	0.	6.41E+07	0.	9.80E+05
NB--95	3.85E+03	2.14E+03	0.	2.12E+03	0.	1.30E+07	0.	8.40E+02
RU-103	1.38E+05	0.	0.	5.27E+05	0.	1.61E+07	0.	5.95E+04
RU-106	6.87E+06	0.	0.	1.33E+07	0.	4.45E+08	0.	8.70E+05
AG110M	4.02E+05	3.72E+05	0.	7.30E+05	0.	1.52E+08	0.	2.41E+05
CD115M	0.	1.57E+06	0.	1.24E+06	0.	6.59E+07	0.	5.01E+04
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.41E+08	4.79E+06	1.40E+06	0.	2.12E+06	3.51E+08	0.	8.05E+05
SB-124	3.21E+06	6.06E+04	7.76E+03	0.	2.49E+06	9.09E+07	0.	1.27E+05
SB-125	1.28E+07	2.55E+06	2.08E+06	2.79E+07	6.23E+08	8.01E+07	0.	2.12E+06
TE127M	1.68E+07	5.87E+06	4.42E+06	6.81E+07	0.	7.62E+07	0.	2.07E+05
TE129M	8.10E+06	3.03E+06	2.79E+06	3.38E+07	0.	4.07E+07	0.	1.29E+05
I--131	6.23E+04	8.93E+04	2.92E+07	1.53E+05	0.	2.55E+04	0.	5.11E+04
I--133	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.
XE135M	9.06E-04	8.36E-04	0.	3.17E-04	9.53E-05	1.96E-05	0.	3.72E-04
XE-135	3.13E-02	2.89E-02	0.	1.09E-02	3.29E-03	6.75E-04	0.	1.28E-02
XE-137	6.35E+01	8.68E+01	0.	2.95E+01	9.79E+00	1.67E+00	0.	5.69E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.62E+08	3.86E+08	0.	1.25E+08	4.15E+07	6.70E+06	0.	3.16E+08
CS-136	3.68E+05	1.45E+06	0.	8.07E+05	1.11E+05	1.65E+05	0.	1.04E+05
CS-137	2.39E+08	3.26E+08	0.	1.11E+08	3.68E+07	6.28E+06	0.	2.14E+08
BA-140	1.08E+06	1.44E+03	0.	4.02E+02	7.78E+02	7.90E+06	0.	7.14E+04
CE-141	5.17E+03	3.50E+03	0.	1.02E+03	0.	1.34E+07	0.	3.90E+02
CE-144	1.11E+06	4.63E+05	0.	2.75	0.	3.75E+08	0.	5.95E+04

DOSE FACTORS F[illegible]SEOUS DISCHARGES

BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE[illegible] UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.99E+00	6.99E+00	6.99E+00	6.99E+00	6.99E+00	0.	6.99E+00
C---14	1.06E+04	2.12E+03	2.12E+03	2.12E+03	2.12E+03	2.12E+03	0.	2.12E+03
P---32	1.30E+08	8.50E+06	0.	0.	0.	1.53E+07	0.	5.25E+06
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.17E+05	0.	6.46E+04	0.	6.65E+05	0.	4.15E+04
FE--59	6.77E+06	1.61E+07	0.	0.	4.40E+06	5.30E+07	0.	0.12E+05
CO--58	0.	4.50E+05	0.	0.	0.	9.11E+06	0.	1.01E+06
CO--60	0.	1.77E+06	0.	0.	0.	3.32E+07	0.	3.89E+06
ZN--65	9.56E+06	3.04E+07	0.	2.03E+07	0.	1.91E+07	0.	1.37E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	1.14E-07	0.	0.	0.	5.32E-09	0.	3.95E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	3.35E+02	0.	0.	0.	0.	5.30E+01	0.	9.59E+00
KR--90	1.12E+01	0.	0.	0.	0.	1.30E+00	0.	2.74E+00
RB--86	0.	1.35E+07	0.	0.	0.	2.65E+06	0.	6.26E+05
SR--89	7.03E+06	0.	0.	0.	0.	1.22E+06	0.	2.18E+05
SR--90	3.08E+08	0.	0.	0.	0.	3.58E+07	0.	7.54E+07
Y---91	2.83E+04	0.	0.	0.	0.	1.56E+07	0.	7.58E+02
ZR--95	8.79E+04	3.80E+04	0.	4.04E+04	0.	1.85E+08	0.	1.91E+04
NB--95	5.96E+04	3.31E+04	0.	3.28E+04	0.	2.01E+08	0.	1.30E+04
RU-103	2.73E+06	0.	0.	1.04E+07	0.	3.19E+08	0.	1.18E+05
RU-106	6.68E+07	0.	0.	1.29E+08	0.	4.33E+09	0.	8.40E+06
AG110M	1.66E+05	1.54E+05	0.	3.02E+05	0.	0.27E+07	0.	9.14E+04
CD115M	0.	3.80E+04	0.	3.02E+04	0.	1.60E+06	0.	1.22E+03
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-125	4.31E+08	8.55E+06	2.51E+06	0.	1.47E+05	1.44E+08	0.	1.24E+07
SB-124	4.94E+05	9.32E+03	1.19E+03	0.	3.83E+05	1.40E+07	0.	1.95E+05
SB-125	5.27E+06	1.72E+06	1.42E+06	1.92E+07	5.81E+07	2.37E+07	0.	7.44E+05
TE127M	3.28E+07	1.15E+07	8.64E+06	1.33E+08	0.	1.49E+08	0.	4.05E+05
TE129M	3.22E+07	1.20E+07	1.11E+07	1.34E+08	0.	1.61E+08	0.	5.09E+06
I--131	1.57E+05	2.25E+05	7.30E+07	3.85E+05	0.	5.92E+04	0.	1.29E+05
I--133	6.51E-03	1.13E-02	2.17E+00	1.97E-02	0.	9.93E-03	0.	3.45E-03
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.
XE135M	7.59E-05	7.01E-05	0.	2.66E-05	7.98E-06	1.04E-06	0.	3.12E-05
XE-135	2.62E-03	2.42E-03	0.	9.17E-04	2.70E-04	5.66E-05	0.	1.08E-03
XE-137	5.57E+00	7.01E+00	0.	2.59E+00	8.58E-01	1.47E-01	0.	4.99E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.54E+07	3.65E+07	0.	1.19E+07	3.32E+06	6.39E+05	0.	2.99E+07
CS-136	3.34E+05	1.32E+06	0.	7.35E+05	1.01E+05	1.50E+05	0.	9.50E+05
CS-137	2.09E+07	2.80E+07	0.	9.73E+06	3.23E+06	5.51E+05	0.	1.88E+07
BA-140	8.15E+05	1.02E+03	0.	3.48E+02	5.80E+02	1.95E+06	0.	5.38E+04
CE-141	3.67E+02	2.48E+02	0.	1.15E+02	0.	9.47E+05	0.	2.81E+01
CE-144	3.42E+04	1.43E+04	0.	8.45E+03	0.	1.15E+07	0.	1.83E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - MEAT (CONTAMINATED FEED) AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.89E+00	6.89E+00	6.89E+00	6.89E+00	6.89E+00	0.	6.89E+00
C---14	1.06E+04	2.12E+03	2.12E+03	2.12E+03	2.12E+03	2.12E+03	0.	2.12E+03
P---32	7.19E+05	4.51E+04	0.	0.	0.	6.09E+04	0.	2.70E+04
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	8.20E+04	0.	2.44E+04	0.	2.51E+05	0.	1.57E+04
FE--59	7.25E+05	1.72E+06	0.	0.	4.70E+05	5.08E+06	0.	6.55E+05
CO--58	0.	8.20E+04	0.	0.	0.	1.66E+06	0.	1.84E+05
CO--60	0.	8.09E+05	0.	0.	0.	1.51E+07	0.	1.78E+05
ZN--65	3.86E+06	1.23E+07	0.	8.20E+05	0.	7.73E+06	0.	5.55E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	7.79E-08	0.	0.	0.	3.65E-09	0.	2.71E-03
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	4.22E+01	0.	0.	0.	0.	6.75E+00	0.	1.21E+03
KR--90	5.55E+00	0.	0.	0.	0.	6.46E-01	0.	1.36E+00
RB--86	0.	1.94E+05	0.	0.	0.	3.83E+04	0.	9.07E+04
SR--89	9.61E+05	0.	0.	0.	0.	1.54E+05	0.	2.75E+04
SR--90	1.53E+08	0.	0.	0.	0.	1.78E+07	0.	3.74E+07
Y---91	4.27E+03	0.	0.	0.	0.	2.35E+06	0.	1.15E+02
ZR--95	2.72E+04	1.33E+04	0.	1.47E+04	0.	7.32E+07	0.	5.92E+03
NB--95	4.23E+03	2.35E+03	0.	2.33E+03	0.	1.43E+07	0.	9.24E+02
RU-103	2.46E+05	0.	0.	9.38E+05	0.	2.87E+07	0.	1.06E+05
RU-106	2.65E+07	0.	0.	5.12E+07	0.	1.71E+09	0.	3.35E+06
AG110M	6.32E+04	5.85E+04	0.	1.15E+05	0.	2.39E+07	0.	3.40E+04
CD115M	0.	3.92E+03	0.	3.11E+03	0.	1.65E+05	0.	1.25E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-125	2.01E+08	4.00E+06	1.17E+06	0.	8.56E+04	6.92E+07	0.	5.70E+06
SB-124	7.64E+04	1.44E+03	1.85E+02	0.	5.93E+04	2.16E+06	0.	3.02E+04
SB-125	4.95E+06	1.71E+06	1.42E+06	1.92E+07	2.54E+07	2.10E+07	0.	6.80E+05
TE127M	9.83E+06	3.44E+06	2.59E+06	3.98E+07	0.	4.46E+07	0.	1.21E+06
TE129M	2.38E+06	8.89E+05	8.20E+05	9.93E+06	0.	1.20E+07	0.	3.70E+05
I--131	2.58E+01	3.70E+01	1.21E+04	6.33E+01	0.	9.74E+00	0.	2.12E+01
I--133	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.
XE135M	3.83E-05	3.54E-05	0.	1.34E-05	4.03E-06	8.28E-07	0.	1.57E-05
XE-135	1.32E-03	1.22E-03	0.	4.63E-04	1.39E-04	2.80E-05	0.	5.43E-04
XE-137	2.68E+00	3.66E+00	0.	1.25E+00	4.13E-01	7.65E-02	0.	2.40E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	6.56E+06	1.56E+07	0.	5.00E+05	1.66E+06	2.73E+05	0.	1.28E+07
CS-136	1.08E+03	4.27E+03	0.	2.38E+03	3.20E+02	4.85E+02	0.	3.07E+03
CS-137	1.01E+07	1.38E+07	0.	4.68E+06	1.55E+06	2.05E+05	0.	9.02E+06
BA-140	2.44E+03	3.08E+00	0.	1.04E+00	1.70E+00	5.83E+03	0.	1.01E+02
CE-141	2.26E+01	1.53E+01	0.	7.0[illegible]+00	0.	5.83E+04	0.	1.73E+00
CE-144	1.25E+04	5.21E+03	0.	3.[illegible]+03	0.	4.21E+06	0.	8.09E+02

DOSE FACTORS FOR GASEOUS DISCHARGES

BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.65E+01	1.65E+01	1.65E+01	1.65E+01	1.65E+01	0.	1.65E+01
C---14	1.15E+04	2.31E+03	2.31E+03	2.31E+03	2.31E+03	2.31E+03	0.	2.31E+03
P---32	4.97E+08	3.12E+07	0.	0.	0.	5.59E+07	0.	1.96E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.99E+05	0.	5.92E+04	0.	6.09E+05	0.	3.80E+04
FE--59	7.55E+05	1.79E+06	0.	0.	4.98E+05	5.92E+06	0.	6.82E+05
CO--58	0.	1.16E+05	0.	0.	0.	2.35E+06	0.	2.60E+05
CO--60	0.	3.87E+05	0.	0.	0.	7.24E+06	0.	8.50E+05
ZN--65	3.69E+07	1.17E+08	0.	7.83E+07	0.	7.38E+07	0.	5.30E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.10E-07	0.	0.	0.	1.45E-08	0.	1.08E-07
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	1.61E+03	0.	0.	0.	0.	2.58E+02	0.	4.61E+01
KR--90	4.21E+01	0.	0.	0.	0.	5.71E-01	0.	1.05E+01
RB--86	0.	7.15E+07	0.	0.	0.	1.41E+07	0.	3.34E+07
SR--89	3.67E+07	0.	0.	0.	0.	5.86E+06	0.	1.05E+06
SR--90	1.16E+09	0.	0.	0.	0.	1.58E+07	0.	2.84E+08
Y---91	2.14E+02	0.	0.	0.	0.	1.18E+05	0.	5.74E+00
ZR--95	5.80E+02	3.17E+02	0.	3.18E+02	0.	1.90E+06	0.	1.27E+02
NB--95	2.14E+03	1.19E+03	0.	1.18E+03	0.	7.22E+06	0.	4.67E+02
RU-103	2.63E+01	0.	0.	1.01E+02	0.	3.07E+03	0.	1.15E+01
RU-106	4.87E+02	0.	0.	9.42E+02	0.	3.15E+04	0.	6.17E+01
AG110M	1.45E+06	1.34E+06	0.	2.63E+06	0.	5.40E+08	0.	7.95E+05
CD115M	0.	3.24E+04	0.	2.57E+04	0.	1.37E+06	0.	1.04E+03
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	3.81E+07	7.56E+05	2.22E+05	0.	9.80E+04	2.41E+07	0.	1.14E+05
SB-124	6.43E+05	1.21E+04	1.55E+03	0.	4.99E+05	1.82E+07	0.	2.54E+05
SB-125	7.85E+05	7.54E+04	5.77E+04	7.73E+05	6.22E+07	6.02E+06	0.	1.45E+05
TE127M	1.35E+06	4.74E+05	3.56E+05	5.50E+06	0.	6.15E+06	0.	1.67E+05
TE129M	1.69E+06	6.35E+05	5.86E+05	7.09E+06	0.	8.53E+06	0.	2.69E+05
I--131	4.31E+06	6.18E+06	2.02E+09	1.06E+07	0.	1.63E+06	0.	3.53E+05
I--133	5.92E+04	1.03E+05	1.97E+07	1.79E+05	0.	9.02E+04	0.	3.13E+04
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.
XE135M	6.42E-04	5.93E-04	0.	2.25E-04	6.75E-05	1.39E-05	0.	2.65E-04
XE-135	2.22E-02	2.05E-02	0.	7.75E-03	2.33E-03	4.79E-04	0.	9.09E-03
XE-137	4.71E+01	6.44E+01	0.	2.19E+01	7.27E+00	1.24E+00	0.	4.22E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.32E+08	3.14E+08	0.	1.02E+08	3.37E+07	5.49E+06	0.	2.57E+08
CS-136	7.38E+06	2.91E+07	0.	1.62E+07	2.22E+06	3.31E+06	0.	2.10E+07
CS-137	1.77E+08	2.42E+08	0.	8.24E+07	2.73E+07	4.66E+06	0.	1.59E+08
BA-140	7.61E+05	9.56E+02	0.	3.25E+02	9.47E+02	1.61E+06	0.	9.02E+04
CE-141	7.59E+02	5.13E+02	0.	2.38E+02	0.	1.96E+06	0.	5.81E+01
CE-144	5.03E+04	2.10E+04	0.	1.25E+04	0.	1.70E+07	0.	2.70E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.62E+01	1.62E+01	1.62E+01	1.62E+01	1.62E+01	0.	1.62E+01
C---14	1.15E+04	2.31E+03	2.31E+03	2.31E+03	2.31E+03	2.31E+03	0.	2.31E+03
P---32	2.64E+06	1.65E+05	0.	0.	0.	2.96E+05	0.	1.02E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	7.52E+04	0.	2.24E+04	0.	2.30E+05	0.	1.44E+04
FE--59	8.09E+04	1.92E+05	0.	0.	5.33E+04	6.34E+05	0.	7.31E+04
CO--58	0.	2.12E+04	0.	0.	0.	4.29E+05	0.	4.75E+04
CO--60	0.	1.76E+05	0.	0.	0.	3.30E+06	0.	3.87E+05
ZN--65	1.49E+07	4.73E+07	0.	3.15E+07	0.	2.98E+07	0.	2.14E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.13E-07	0.	0.	0.	9.96E-09	0.	7.40E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	2.03E+02	0.	0.	0.	0.	3.24E+01	0.	5.81E+00
KR--90	2.09E+01	0.	0.	0.	0.	2.63E-01	0.	5.11E+00
RB--86	0.	1.03E+06	0.	0.	0.	2.04E+05	0.	4.82E+05
SR--89	4.62E+06	0.	0.	0.	0.	7.38E+05	0.	1.32E+05
SR--90	5.76E+08	0.	0.	0.	0.	7.80E+06	0.	1.41E+08
Y---91	3.23E+01	0.	0.	0.	0.	1.78E+04	0.	8.67E-01
ZR--95	5.45E+02	3.02E+02	0.	3.00E+02	0.	1.83E+06	0.	1.19E+02
NB--95	1.52E+02	8.45E+01	0.	8.37E+01	0.	5.13E+05	0.	3.32E+01
RU-103	2.36E+00	0.	0.	9.03E+00	0.	2.76E+02	0.	1.02E+00
RU-106	1.93E+02	0.	0.	3.73E+02	0.	1.65E+04	0.	2.44E+01
AG110M	5.50E+05	5.08E+05	0.	1.00E+06	0.	2.08E+08	0.	3.02E+05
CD115M	0.	3.34E+03	0.	2.65E+03	0.	1.41E+05	0.	1.07E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.79E+07	3.55E+05	1.04E+05	0.	9.52E+04	1.78E+07	0.	5.61E+05
SB-124	9.93E+04	1.87E+03	2.40E+02	0.	7.71E+04	2.81E+06	0.	3.92E+04
SB-125	4.64E+05	7.66E+04	6.15E+04	8.27E+05	2.72E+07	3.11E+06	0.	7.97E+04
TE127M	4.05E+05	1.41E+05	1.07E+05	1.65E+06	0.	1.85E+06	0.	5.00E+04
TE129M	1.25E+05	4.70E+04	4.34E+04	5.24E+05	0.	6.31E+05	0.	1.99E+04
I--131	7.09E+02	1.02E+03	3.32E+05	1.74E+03	0.	2.68E+02	0.	5.81E+02
I--133	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.
XE135M	3.24E-04	2.99E-04	0.	1.13E-04	3.41E-05	7.00E-06	0.	1.33E-04
XE-135	1.12E-02	1.03E-02	0.	3.91E-03	1.18E-03	2.41E-04	0.	4.59E-03
XE-137	2.27E+01	3.10E+01	0.	1.05E+01	3.50E+00	5.97E-01	0.	2.05E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	5.04E+07	1.34E+08	0.	4.35E+07	1.44E+07	2.35E+06	0.	1.10E+08
CS-136	2.39E+04	9.42E+04	0.	5.24E+04	7.19E+03	1.07E+04	0.	8.78E+04
CS-137	8.52E+07	1.16E+08	0.	3.96E+07	1.31E+07	2.24E+06	0.	7.05E+07
BA-140	2.28E+03	2.86E+00	0.	9.74E-01	1.04E+00	4.84E+03	0.	1.90E+02
CE-141	4.67E+01	3.10E+01	0.	1.47E+01	0.	1.21E+05	0.	3.58E+00
CE-144	1.84E+04	7.60E+03	0.	4.[illegible]E+03	0.	6.20E+06	0.	9.84E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.36E+01	3.36E+01	3.36E+01	3.36E+01	3.36E+01	0.	3.36E+01
C---14	1.15E+04	2.31E+03	2.31E+03	2.31E+03	2.31E+03	2.31E+03	0.	2.31E+03
P---32	6.41E+08	4.02E+07	0.	0.	0.	7.21E+07	0.	2.48E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.39E+04	0.	7.13E+03	0.	7.34E+04	0.	4.57E+03
FE--59	1.01E+04	2.39E+04	0.	0.	6.02E+03	7.87E+04	0.	9.08E+03
CO--58	0.	1.42E+04	0.	0.	0.	2.87E+05	0.	3.17E+04
CO--60	0.	4.65E+04	0.	0.	0.	8.69E+05	0.	1.02E+05
ZN--65	4.45E+06	1.41E+07	0.	9.44E+06	0.	8.89E+06	0.	6.39E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.72E-08	0.	0.	0.	1.74E-09	0.	1.29E-08
KR--88	0.	3.75E-10	0.	0.	0.	0.	0.	1.99E-10
KR--89	3.45E+03	0.	0.	0.	0.	5.52E+02	0.	9.89E+01
KR--90	8.85E+01	0.	0.	0.	0.	1.19E+00	0.	2.10E+01
RB--86	0.	9.07E+06	0.	0.	0.	1.79E+06	0.	4.23E+06
SR--89	7.86E+07	0.	0.	0.	0.	1.26E+07	0.	2.25E+06
SR--90	2.44E+09	0.	0.	0.	0.	3.27E+07	0.	5.96E+08
Y---91	2.62E+01	0.	0.	0.	0.	1.44E+04	0.	7.01E-01
ZR--95	6.30E+01	3.43E+01	0.	3.43E+01	0.	2.06E+05	0.	1.37E+01
NB--95	2.65E+02	1.47E+02	0.	1.46E+02	0.	8.92E+05	0.	5.78E+01
RU-103	3.24E+00	0.	0.	1.24E+01	0.	3.78E+02	0.	1.40E+00
RU-106	5.86E+01	0.	0.	1.13E+02	0.	3.80E+03	0.	7.42E+00
AG110M	1.74E+05	1.61E+05	0.	3.17E+05	0.	6.57E+07	0.	9.58E+04
CD115M	0.	3.99E+03	0.	3.17E+03	0.	1.68E+05	0.	1.28E+02
SN-123	1.61E-02	2.68E-04	2.27E-04	0.	0.	3.28E-02	0.	3.94E-04
SN-126	4.57E+06	9.08E+04	2.66E+04	0.	1.09E+04	2.76E+06	0.	1.30E+05
SB-124	7.85E+04	1.48E+03	1.90E+02	0.	6.09E+04	2.22E+06	0.	3.10E+04
SB-125	9.45E+04	9.12E+03	6.99E+03	9.35E+04	7.47E+06	7.24E+05	0.	1.75E+04
TE127M	1.65E+05	5.74E+04	4.31E+04	6.65E+05	0.	7.43E+05	0.	2.03E+04
TE129M	2.11E+05	7.86E+04	7.25E+04	8.77E+05	0.	1.06E+06	0.	3.35E+04
I--131	5.89E+06	8.43E+06	2.76E+09	1.44E+07	0.	2.22E+06	0.	4.83E+05
I--133	2.33E+05	4.04E+05	7.77E+07	7.06E+05	0.	3.55E+05	0.	1.23E+05
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.
XE135M	1.93E-03	1.78E-03	0.	6.74E-04	2.02E-04	4.16E-05	0.	7.90E-04
XE-135	6.65E-02	6.14E-02	0.	2.33E-02	6.99E-03	1.44E-03	0.	2.73E-02
XE-137	1.41E+02	1.93E+02	0.	6.58E+01	2.18E+01	3.72E+00	0.	1.27E+02
XE-138	7.10E-05	1.40E-04	0.	1.03E-04	1.02E-05	5.98E-10	0.	6.90E-05
CS-134	3.96E+08	9.43E+08	0.	3.06E+08	1.01E+08	1.65E+07	0.	7.71E+08
CS-136	2.40E+07	9.47E+07	0.	5.27E+07	7.22E+06	1.06E+07	0.	8.82E+07
CS-137	5.31E+08	7.26E+08	0.	2.47E+08	8.19E+07	1.40E+07	0.	4.70E+08
BA-140	9.90E+04	1.24E+02	0.	4.23E+01	7.12E+01	2.09E+05	0.	6.54E+03
CE-141	9.40E+01	6.30E+01	0.	2.95E+01	0.	2.43E+05	0.	7.20E+00
CE-144	6.06E+03	2.93E+03	0.	1.50E+03	0.	2.04E+06	0.	3.25E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
FOR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - GOATS MILK (CONTAMINATED FEED). AGE GROUP - ADULT

ORGAN DOSE (MREM)

	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
	0.	3.31E+01	3.31E+01	3.31E+01	3.31E+01	3.31E+01	0.	3.31E+01
	2.19E+04	2.31E+03	2.31E+03	2.31E+03	2.31E+03	2.31E+03	0.	2.31E+03
	3.40E+06	2.13E+05	0.	0.	0.	3.83E+05	0.	1.32E+05
	0.	0.	0.	0.	0.	0.	0.	0.
	0.	9.05E+03	0.	2.69E+03	0.	2.77E+04	0.	1.73E+03
	1.08E+03	2.50E+03	0.	0.	7.09E+02	8.43E+03	0.	9.72E+02
	0.	2.58E+03	0.	0.	0.	5.23E+04	0.	5.78E+03
	0.	2.12E+04	0.	0.	0.	3.90E+05	0.	4.65E+04
	1.80E+06	5.70E+05	0.	3.81E+05	0.	3.59E+06	0.	2.58E+05
KR--83M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.55E-08	0.	0.	0.	1.20E-09	0.	8.88E-09
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	4.35E+02	0.	0.	0.	0.	6.95E+01	0.	1.25E+01
KR--90	4.39E+01	0.	0.	0.	0.	5.88E-01	0.	1.07E+01
RB--86	0.	1.31E+05	0.	0.	0.	2.58E+04	0.	6.11E+04
SR--89	9.90E+06	0.	0.	0.	0.	1.58E+06	0.	2.84E+05
SR--90	1.21E+09	0.	0.	0.	0.	1.62E+07	0.	2.95E+08
Y---91	3.95E+00	0.	0.	0.	0.	2.17E+03	0.	1.06E-01
ZR--95	6.60E+01	3.66E+01	0.	3.62E+01	0.	2.21E+05	0.	1.44E+01
NB--95	1.68E+01	1.04E+01	0.	1.04E+01	0.	6.34E+04	0.	4.10E+00
RU-103	2.91E-01	0.	0.	1.11E+00	0.	3.40E+01	0.	1.20E-01
RU-106	2.32E+01	0.	0.	4.49E+01	0.	1.50E+03	0.	2.94E+00
AG110M	6.62E+04	6.12E+04	0.	1.20E+05	0.	2.50E+07	0.	3.64E+04
CD115M	0.	4.11E+02	0.	3.25E+02	0.	1.73E+04	0.	1.31E+01
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.15E+06	4.20E+04	1.25E+04	0.	1.15E+04	2.14E+06	0.	6.74E+04
SB-124	1.21E+04	2.29E+02	2.93E+01	0.	9.41E+03	3.43E+05	0.	4.79E+03
SB-125	5.61E+04	9.33E+03	7.48E+03	1.01E+05	3.27E+06	3.76E+05	0.	9.61E+03
TE127M	4.91E+04	1.72E+04	1.29E+04	1.99E+05	0.	2.23E+05	0.	6.05E+03
TE129M	1.55E+04	5.82E+03	5.42E+03	6.49E+04	0.	7.81E+04	0.	2.47E+03
I--131	9.68E+02	1.39E+03	4.54E+05	2.37E+03	0.	5.65E+02	0.	7.93E+02
I--133	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.
XE135M	9.72E-04	8.98E-04	0.	3.40E-04	1.02E-04	2.10E-05	0.	3.99E-04
XE-135	3.35E-02	3.10E-02	0.	1.17E-02	3.53E-03	7.24E-04	0.	1.38E-02
XE-137	6.80E+01	9.29E+01	0.	3.15E+01	1.05E+01	1.79E+00	0.	6.10E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.69E+08	4.03E+08	0.	1.31E+08	4.33E+07	7.05E+06	0.	3.30E+08
CS-136	7.76E+04	3.06E+05	0.	1.70E+05	2.34E+04	3.48E+04	0.	2.20E+05
CS-137	2.56E+08	3.49E+08	0.	1.19E+08	3.94E+07	6.73E+06	0.	2.29E+08
BA-140	2.97E+02	3.73E-01	0.	1.27E-01	2.13E-01	6.30E+02	0.	1.96E+01
CE-141	5.79E+00	3.92E+00	0.	1.82E+00	0.	1.50E+04	0.	4.44E-01
CE-144	2.21E+03	9.23E+02	0.	5.4[illegible]2	0.	7.47E+05	0.	1.19E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - INHALATION

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.71E+01	1.71E+01	2.17E+01	1.71E+01	1.71E+01	0.	1.71E+01
C---14	9.15E+01	9.15E+01	9.15E+01	6.91E+01	9.15E+01	9.15E+01	0.	9.15E+01
P---32	2.67E+04	1.56E+03	0.	0.	0.	1.75E+03	0.	1.01E+03
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	8.01E+02	0.	1.99E+02	2.83E+04	1.56E+03	0.	1.27E+02
FE--59	2.38E+02	5.61E+03	0.	0.	2.05E+04	3.00E+03	0.	2.14E+02
CO--58	0.	3.56E+00	0.	0.	2.77E+04	1.92E+03	0.	4.74E+00
CO--60	0.	2.51E+01	0.	0.	1.73E+05	4.76E+03	0.	3.35E+01
ZN--65	6.55E+02	2.09E+03	0.	1.39E+03	1.70E+04	1.08E+03	0.	9.41E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	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.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
KR--90	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	2.73E+03	0.	0.	0.	3.36E+02	0.	1.19E+03
SR--89	7.83E+02	0.	0.	0.	5.00E+04	7.15E+03	0.	2.29E+01
SR--90	2.39E+05	0.	0.	0.	3.35E+05	1.46E+04	0.	1.45E+04
Y---91	1.09E+03	0.	0.	0.	5.77E+04	7.95E+03	0.	2.91E+01
ZR--95	2.20E+02	7.34E+01	0.	1.14E+03	5.18E+04	2.69E+03	0.	5.13E+01
NB--95	2.75E+01	1.67E+01	0.	1.56E+02	1.45E+04	1.78E+03	0.	9.35E+00
RU-103	3.30E+00	0.	0.	1.18E+02	1.52E+04	1.91E+03	0.	1.48E+00
RU-106	1.70E+02	0.	0.	2.70E+03	3.32E+05	1.88E+04	0.	2.14E+01
AG110M	2.18E+02	2.02E+02	0.	3.90E+02	9.38E+04	6.11E+03	0.	1.20E+02
CD115M	0.	3.98E+03	0.	3.20E+03	2.85E+04	7.76E+03	0.	1.29E+02
SN-123	5.64E+02	1.24E+01	9.95E+00	0.	7.91E+04	6.32E+03	0.	1.86E+01
SN-126	2.56E+04	6.76E+02	1.99E+02	0.	1.89E+05	2.57E+03	0.	9.70E+02
SB-124	6.31E+02	1.19E+01	1.53E+00	0.	5.01E+04	8.22E+03	0.	2.51E+02
SB-125	1.34E+03	1.44E+01	1.19E+00	0.	4.45E+04	2.04E+03	0.	2.69E+02
TE127M	2.56E+02	1.14E+02	6.05E+01	9.25E+02	1.94E+04	3.02E+03	0.	3.17E+01
TE129M	2.41E+01	1.14E+01	7.89E+00	7.39E+02	4.11E+04	7.76E+03	0.	3.88E+00
I--131	6.81E+02	9.54E+02	2.81E+05	1.24E+03	0.	1.21E+02	0.	5.69E+02
I--133	2.49E+02	4.17E+02	7.75E+04	5.25E+02	0.	2.02E+02	0.	1.28E+02
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	9.77E+03	2.23E+04	0.	5.82E+03	2.91E+03	1.81E+02	0.	1.10E+04
CS-135	7.91E+02	2.96E+03	0.	1.73E+03	2.43E+02	2.30E+02	0.	2.29E+03
CS-137	1.30E+04	1.07E+04	0.	4.50E+03	2.38E+03	1.55E+02	0.	6.13E+03
BA-140	1.07E+02	9.80E-02	0.	3.30E-01	4.09E+04	4.29E+02	0.	6.91E+00
CE-141	4.59E+01	3.07E+01	0.	1.27E+02	1.18E+04	2.30E+03	0.	3.55E+00
CE-144	8.47E+03	3.51E+03	0.	1.71E+04	2.78E+05	1.70E+04	0.	4.53E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - GROUND PLANE DEPOSITION — AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	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.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	5.14E+07	4.39E+07
FE--59	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	1.03E+07	8.73E+06
CO--58	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.41E+07	1.21E+07
CO--60	6.80E+08	6.80E+08	6.80E+08	6.80E+08	6.80E+08	6.80E+08	8.00E+08	6.80E+08
ZN--65	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.71E+07	2.36E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	1.13E+04	9.90E+03
KR--89	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	9.70E+02	8.08E+02
KR--90	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	7.29E-03	6.16E-03
RB--86	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	3.20E+05	2.86E+05
SR--89	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	7.97E+02	6.87E+02
SR--90	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	2.01E+05	1.70E+05
Y---91	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.80E+04	3.43E+04
ZR--95	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.80E+07	1.59E+07
NB--95	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	5.09E+06	4.33E+06
RU-103	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	4.07E+06	3.49E+06
RU-106	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.59E+07	1.33E+07
AG110M	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.32E+08	1.13E+08
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	4.35E+04	0.
SN-126	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.83E+09	1.64E+09
SB-124	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	2.19E+07	1.90E+07
SB-125	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	8.21E+07	7.27E+07
TE127M	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	3.09E+04	2.79E+04
TE129M	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.43E+06	1.22E+06
I--131	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	3.32E+05	2.73E+05
I--133	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	4.77E+04	3.92E+04
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	1.01E+02	8.69E+01
XE-138	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.87E+03	6.01E+03
CS-134	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.53E+08	2.22E+08
CS-135	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	5.30E+06	4.73E+06
CS-137	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.81E+08	3.27E+08
BA-140	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	6.02E+06	5.30E+06
CE-141	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.88E+05	4.33E+05
CE-144	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	4.19E+06	3.59E+06

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - FRESH FRUITS AND VEGETABLES — AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.53E+00	3.53E+00	4.45E+00	3.53E+00	3.53E+00	0.	3.53E+00
C---14	6.91E+02	6.91E+02	6.91E+02	5.21E+02	6.91E+02	6.91E+02	0.	6.91E+02
P---32	2.35E+07	1.48E+06	0.	0.	0.	2.65E+06	0.	9.11E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	9.97E+05	0.	2.97E+05	0.	3.06E+06	0.	1.91E+05
FE--59	7.42E+05	1.70E+06	0.	0.	4.69E+05	5.82E+06	0.	6.70E+05
CO--58	0.	1.66E+05	0.	0.	0.	2.51E+06	0.	4.25E+05
CO--60	0.	6.34E+05	0.	0.	0.	7.61E+06	0.	1.45E+05
ZN--65	1.34E+06	4.20E+06	0.	2.85E+05	0.	2.68E+06	0.	1.93E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	1.92E-08	0.	0.	0.	8.99E-10	0.	6.68E-09
KR--88	0.	3.45E-01	0.	0.	0.	0.	0.	1.83E-01
KR--89	3.56E+03	0.	0.	0.	0.	3.86E+02	0.	1.02E+02
KR--90	9.73E+01	0.	0.	0.	2.69E-01	2.84E+00	0.	2.41E+01
RB--86	0.	2.72E+06	0.	0.	0.	5.37E+05	0.	1.27E+05
SR--89	8.10E+07	0.	0.	0.	0.	8.79E+06	0.	2.33E+06
SR--90	2.08E+09	0.	0.	0.	7.40E+06	7.82E+07	0.	6.02E+08
Y---91	3.55E+04	0.	0.	0.	0.	1.30E+07	0.	9.47E+02
ZR--95	7.23E+03	2.51E+03	0.	3.02E+03	0.	5.85E+06	0.	1.72E+03
NB--95	1.16E+03	7.00E+02	0.	5.50E+02	0.	2.80E+06	0.	3.95E+02
RU-103	3.97E+04	0.	0.	1.18E+05	0.	3.10E+06	0.	1.78E+04
RU-106	9.03E+05	0.	0.	1.20E+06	0.	4.09E+07	0.	1.14E+05
AG110M	3.80E+04	3.51E+04	0.	6.90E+04	0.	1.43E+07	0.	2.09E+04
CD115M	0.	3.27E+05	0.	2.60E+05	0.	1.38E+07	0.	1.05E+04
SN-123	2.93E-07	4.84E-09	3.87E-09	0.	0.	4.23E-07	0.	7.24E-09
SN-126	1.94E+07	3.85E+05	1.13E+05	0.	1.02E+05	1.91E+07	0.	6.07E+05
SB-124	5.12E+05	9.65E+03	1.24E+03	0.	3.97E+05	1.45E+07	0.	2.02E+05
SB-125	1.23E+06	2.60E+05	2.06E+05	2.08E+06	5.24E+07	6.47E+06	0.	1.98E+05
TE127M	2.01E+06	7.04E+05	5.33E+05	8.12E+06	0.	1.01E+07	0.	2.49E+05
TE129M	3.14E+06	1.16E+06	1.00E+06	9.09E+06	0.	1.10E+07	0.	4.94E+05
I--131	1.08E+06	1.53E+06	4.42E+08	1.93E+05	0.	2.90E+05	0.	9.13E+05
I--133	3.14E+04	5.33E+04	9.68E+06	6.70E+04	0.	3.87E+04	0.	1.64E+04
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.
XE135M	7.29E-05	6.73E-05	0.	2.53E-05	7.06E-06	1.97E-06	0.	2.99E-05
XE-135	2.51E-03	2.32E-03	0.	8.79E-04	2.64E-04	5.43E-05	0.	1.03E-03
XE-137	6.91E+00	9.29E+00	0.	2.39E+00	1.23E+00	1.24E-01	0.	3.26E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.79E+07	4.31E+07	0.	1.07E+07	5.22E+06	4.98E+05	0.	2.01E+07
CS-135	6.90E+05	2.72E+06	0.	1.52E+06	2.08E+05	3.09E+05	0.	1.96E+06
CS-137	2.59E+07	3.49E+07	0.	8.99E+06	4.03E+06	4.06E+05	0.	1.22E+07
BA-140	2.97E+06	3.83E+03	0.	9.11E+02	2.45E+03	1.01E+07	0.	1.91E+05
CE-141	1.98E+03	1.53E+03	0.	4.01E+02	0.	3.59E+06	0.	1.52E+02
CE-144	1.53E+05	6.27E+04	0.	2.56E+04	0.	3.60E+07	0.	8.11E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - STORED FRUITS AND VEGETABLES — AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.25E+01	5.25E+01	6.63E+01	5.25E+01	5.25E+01	0.	5.25E+01
C---14	1.04E+04	1.04E+04	1.04E+04	7.82E+03	1.04E+04	1.04E+04	0.	1.04E+04
P---32	2.02E+07	1.27E+06	0.	0.	0.	2.27E+06	0.	7.83E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.31E+07	0.	3.91E+06	0.	4.02E+07	0.	2.51E+05
FE--59	4.49E+06	1.07E+07	0.	0.	2.90E+06	3.52E+07	0.	4.05E+05
CO--58	0.	1.57E+06	0.	0.	0.	2.12E+07	0.	3.57E+05
CO--60	0.	9.31E+06	0.	0.	0.	1.12E+08	0.	2.13E+07
ZN--65	1.70E+07	5.40E+07	0.	3.61E+07	0.	3.40E+07	0.	2.45E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.88E-07	0.	0.	0.	1.35E-08	0.	1.00E-07
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	2.38E+04	0.	0.	0.	0.	2.58E+03	0.	6.83E+02
KR--90	1.45E+03	0.	0.	0.	4.00E+00	4.42E+01	0.	3.59E+02
RB--86	0.	4.58E+05	0.	0.	0.	9.04E+05	0.	2.14E+05
SR--89	5.42E+08	0.	0.	0.	0.	5.87E+07	0.	1.55E+07
SR--90	4.00E+10	0.	0.	0.	1.27E+08	1.22E+09	0.	9.90E+09
Y---91	2.66E+05	0.	0.	0.	0.	1.02E+08	0.	7.10E+03
ZR--95	6.62E+04	2.52E+04	0.	2.81E+04	0.	6.75E+07	0.	1.67E+04
NB--95	5.42E+03	3.26E+03	0.	2.57E+03	0.	1.53E+07	0.	1.84E+03
RU-103	2.14E+05	0.	0.	6.39E+05	0.	1.67E+07	0.	9.58E+04
RU-106	1.21E+07	0.	0.	1.61E+07	0.	5.48E+08	0.	1.52E+06
AG110M	4.87E+05	4.50E+05	0.	8.85E+05	0.	1.84E+08	0.	2.68E+05
CD115M	0.	1.90E+06	0.	1.51E+06	0.	7.98E+07	0.	6.05E+04
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.32E+08	5.81E+06	1.71E+06	0.	2.57E+06	4.26E+08	0.	9.72E+05
SB-124	3.89E+06	7.34E+04	9.40E+03	0.	3.02E+06	1.10E+08	0.	1.54E+05
SB-125	1.91E+07	4.33E+06	3.30E+05	3.38E+07	7.55E+06	9.70E+07	0.	3.03E+05
TE127M	2.04E+07	7.16E+06	5.41E+06	8.25E+07	0.	1.03E+08	0.	2.53E+05
TE129M	1.41E+07	5.24E+06	4.53E+06	4.09E+07	0.	4.93E+07	0.	2.25E+06
I--131	1.01E+05	1.43E+05	4.12E+07	1.85E+05	0.	2.71E+04	0.	8.51E+04
I--133	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.
XE135M	1.10E-03	1.01E-03	0.	3.84E-04	1.15E-04	2.37E-05	0.	4.50E-04
XE-135	3.79E-02	3.50E-02	0.	1.33E-02	3.98E-03	8.18E-04	0.	1.55E-02
XE-137	1.03E+02	1.39E+02	0.	3.58E+01	1.84E+01	1.85E+00	0.	4.87E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.54E+08	6.13E+08	0.	1.52E+08	7.43E+07	7.08E+06	0.	2.80E+08
CS-136	4.45E+05	1.70E+06	0.	9.78E+05	1.34E+05	2.00E+05	0.	1.27E+05
CS-137	3.88E+08	5.22E+08	0.	1.34E+08	6.92E+07	6.90E+06	0.	1.83E+08
BA-140	1.83E+06	2.38E+03	0.	5.00E+02	1.90E+03	7.51E+06	0.	1.17E+05
CE-141	8.42E+03	5.05E+03	0.	1.97E+03	0.	1.53E+07	0.	8.48E+02
CE-144	1.99E+06	8.14E+05	0.	3.[illegible]	0.	4.68E+08	0.	1.05E+05

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	3.27E+00	3.27E+00	4.13E+00	3.27E+00	3.27E+00	0.	3.27E+00
C---14	1.06E+03	1.06E+03	1.06E+03	1.25E+03	1.06E+03	1.06E+03	0.	1.06E+03
P---32	8.01E+07	5.02E+06	0.	0.	0.	9.01E+06	0.	3.15E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.28E+05	0.	3.82E+04	0.	3.93E+05	0.	2.45E+04
FE--59	4.00E+06	9.50E+06	0.	0.	2.04E+06	3.13E+07	0.	3.01E+05
CO--58	0.	3.54E+05	0.	0.	0.	4.78E+06	0.	0.05E+05
CO--60	0.	1.35E+05	0.	0.	0.	1.61E+07	0.	3.07E+05
ZN--65	5.05E+06	1.00E+07	0.	1.20E+07	0.	1.13E+07	0.	0.12E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.71E-08	0.	0.	0.	3.14E-09	0.	2.34E-05
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	2.95E+02	0.	0.	0.	0.	3.20E+01	0.	8.45E+00
KR--90	9.04E+00	0.	0.	0.	2.50E-01	9.17E-01	0.	2.24E+04
RB--86	0.	7.95E+05	0.	0.	0.	1.57E+06	0.	3.71E+05
SR--89	6.71E+06	0.	0.	0.	0.	7.28E+05	0.	1.93E+05
SR--90	2.49E+08	0.	0.	0.	6.88E+06	2.53E+07	0.	6.16E+07
Y---91	2.32E+04	0.	0.	0.	0.	6.93E+06	0.	6.2HE+02
ZR--95	6.21E+04	2.83E+04	0.	2.75E+04	0.	9.41E+07	0.	1.75E+04
NB--95	4.09E+04	2.46E+04	0.	1.94E+04	0.	1.01E+08	0.	1.35E+04
RU-103	2.07E+06	0.	0.	6.17E+05	0.	1.61E+08	0.	9.25E+05
RU-106	5.74E+07	0.	0.	7.64E+07	0.	2.60E+09	0.	7.22E+05
AG110M	9.82E+04	9.08E+04	0.	1.79E+05	0.	3.71E+07	0.	5.40E+04
CD115M	0.	2.25E+04	0.	1.78E+04	0.	9.46E+05	0.	7.18E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.55E+08	5.05E+06	1.48E+06	0.	6.65E+04	6.47E+07	0.	7.30E+05
SB-124	2.92E+05	5.51E+03	7.06E+02	0.	2.27E+05	6.26E+06	0.	1.15E+05
SB-125	4.31E+06	1.42E+06	1.12E+06	1.13E+07	3.43E+07	1.40E+07	0.	9.94E+05
TE127M	1.95E+07	6.83E+06	5.17E+06	7.88E+07	0.	9.80E+07	0.	2.42E+05
TE129M	2.75E+07	1.01E+07	8.77E+06	7.93E+07	0.	9.55E+07	0.	4.31E+05
I--131	1.24E+05	1.70E+05	5.06E+07	2.27E+05	0.	3.32E+04	0.	1.05E+05
I--133	5.40E-03	9.20E-03	1.68E+00	1.17E-02	0.	0.73E-03	0.	2.85E-03
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.
XE135M	4.49E-05	4.14E-05	0.	1.57E-05	4.72E-06	9.09E-07	0.	1.04E-05
XE-135	1.55E-03	1.43E-03	0.	5.42E-04	1.03E-04	3.33E-05	0.	0.33E-04
XE-137	4.41E+00	5.94E+00	0.	1.53E+00	7.68E-01	7.92E-02	0.	2.30E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.17E+07	2.63E+07	0.	7.00E+06	3.43E+06	3.27E+05	0.	1.32E+07
CS-136	1.98E+05	7.60E+05	0.	4.34E+05	5.95E+04	6.66E+04	0.	5.62E+05
CS-137	1.06E+07	2.23E+07	0.	5.75E+06	2.90E+06	2.98E+05	0.	7.63E+05
BA-140	6.71E+05	8.28E+02	0.	2.06E+02	5.53E+02	2.60E+05	0.	4.32E+04
CE-141	2.91E+02	1.30E+02	0.	6.80E+01	0.	5.30E+05	0.	2.24E+02
CE-144	2.98E+04	1.22E+04	0.	5.00E+03	0.	7.02E+06	0.	1.50E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - MEAT (CONTAMINATED FEED) AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	3.22E+00	3.22E+00	4.07E+00	3.22E+00	3.22E+00	0.	3.22E+00
C---14	1.66E+03	1.66E+03	1.66E+03	1.25E+03	1.66E+03	1.66E+03	0.	1.66E+03
P---32	4.25E+05	2.67E+04	0.	0.	0.	4.78E+04	0.	1.65E+04
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	4.85E+04	0.	1.44E+04	0.	1.49E+05	0.	9.26E+03
FE--59	4.29E+05	1.02E+06	0.	0.	2.83E+05	3.30E+06	0.	3.87E+05
CO--58	0.	6.45E+04	0.	0.	0.	8.71E+05	0.	1.47E+05
CO--60	0.	6.13E+05	0.	0.	0.	7.30E+06	0.	1.40E+05
ZN--65	2.28E+06	7.25E+06	0.	4.85E+06	0.	4.57E+06	0.	3.28E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	4.61E-08	0.	0.	0.	2.16E-09	0.	1.60E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	3.71E+01	0.	0.	0.	0.	4.03E+00	0.	1.07E+00
KR--90	4.49E+00	0.	0.	0.	1.24E-01	4.55E-01	0.	1.11E+00
RB--86	0.	1.15E+05	0.	0.	0.	2.26E+04	0.	5.36E+04
SR--89	8.45E+05	0.	0.	0.	0.	9.17E+04	0.	2.43E+04
SR--90	1.24E+08	0.	0.	0.	3.41E+06	1.25E+07	0.	3.05E+07
Y---91	3.51E+03	0.	0.	0.	0.	1.55E+06	0.	9.37E+01
ZR--95	1.89E+04	9.90E+03	0.	8.64E+03	0.	3.68E+07	0.	5.84E+03
NB--95	2.91E+03	1.75E+03	0.	1.38E+03	0.	7.15E+06	0.	9.87E+02
RU-103	1.86E+05	0.	0.	5.54E+05	0.	1.45E+07	0.	8.31E+04
RU-106	2.27E+07	0.	0.	3.02E+07	0.	1.03E+09	0.	2.80E+05
AG110M	3.73E+04	3.45E+04	0.	6.79E+04	0.	1.41E+07	0.	2.05E+04
CD115M	0.	2.32E+03	0.	1.84E+03	0.	9.75E+04	0.	7.40E+01
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.19E+08	2.36E+06	6.93E+05	0.	5.80E+04	4.10E+07	0.	5.42E+05
SB-124	4.51E+04	8.51E+02	1.09E+02	0.	3.50E+04	1.28E+06	0.	1.78E+04
SB-125	4.12E+06	1.42E+06	1.12E+06	1.13E+07	1.50E+07	1.24E+07	0.	5.57E+05
TE127M	2.85E+06	2.04E+06	1.55E+06	2.36E+07	0.	2.93E+07	0.	7.25E+05
TE129M	2.02E+06	7.51E+05	5.49E+05	5.87E+05	0.	7.07E+06	0.	3.19E+05
I--131	2.04E+01	2.89E+01	8.32E+03	3.76E+01	0.	5.40E+00	0.	1.72E+01
I--133	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.
XE135M	2.27E-05	2.09E-05	0.	7.92E-06	2.38E-06	4.89E-07	0.	9.29E-05
XE-135	7.82E-04	7.21E-04	0.	2.73E-04	8.22E-05	1.69E-05	0.	3.21E-04
XE-137	2.12E+00	2.86E+00	0.	7.30E-01	3.79E-01	3.81E-02	0.	1.00E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	5.02E+06	1.21E+07	0.	2.93E+05	1.47E+06	1.40E+05	0.	5.65E+05
CS-136	6.39E+02	2.52E+03	0.	1.40E+03	1.92E+02	2.07E+02	0.	1.82E+03
CS-137	7.97E+06	1.07E+07	0.	2.77E+06	1.42E+06	1.43E+05	0.	3.75E+05
BA-140	2.01E+03	2.48E+00	0.	6.17E-01	1.03E+00	7.78E+02	0.	1.29E+02
CE-141	1.79E+01	1.21E+01	0.	4.19E+00	0.	3.26E+04	0.	1.38E+00
CE-144	1.09E+04	4.40E+03	0.	1.[illegible]03	0.	2.50E+06	0.	5.78E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.08E+01	1.68E+01	2.12E+01	1.08E+01	1.68E+01	0.	1.68E+01
C---14	3.95E+03	3.95E+03	3.95E+03	2.98E+03	3.95E+03	3.95E+03	0.	3.95E+03
P---32	8.41E+08	4.02E+07	0.	0.	0.	7.21E+07	0.	2.48E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.57E+05	0.	7.64E+04	0.	7.86E+05	0.	4.90E+04
FE--59	9.75E+05	2.31E+06	0.	0.	8.42E+05	7.04E+06	0.	8.80E+05
CO--58	0.	2.00E+05	0.	0.	0.	2.70E+06	0.	4.55E+05
CO--60	0.	8.41E+05	0.	0.	0.	7.69E+06	0.	1.40E+05
ZN--65	4.76E+07	1.51E+08	0.	1.01E+08	0.	9.52E+07	0.	8.84E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	4.00E-07	0.	0.	0.	1.87E-08	0.	1.39E-07
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	3.09E+03	0.	0.	0.	0.	3.56E+02	0.	8.88E+01
KR--90	7.43E+01	0.	0.	0.	2.84E-03	1.58E+00	0.	1.84E+01
RB--86	0.	9.23E+07	0.	0.	0.	1.82E+07	0.	4.36E+07
SR--89	7.05E+07	0.	0.	0.	0.	7.64E+06	0.	2.02E+06
SR--90	2.05E+09	0.	0.	0.	7.83E+04	4.35E+07	0.	5.06E+08
Y---91	3.84E+02	0.	0.	0.	0.	1.48E+05	0.	1.03E+01
ZR--95	8.72E+02	5.15E+02	0.	4.10E+02	0.	2.08E+06	0.	2.95E+02
NB--95	3.21E+03	1.93E+03	0.	1.52E+03	0.	7.89E+06	0.	1.09E+03
RU-103	4.35E+01	0.	0.	1.30E+02	0.	3.39E+03	0.	1.94E+01
RU-106	9.14E+02	0.	0.	1.22E+03	0.	4.14E+04	0.	1.15E+02
AG110M	1.87E+06	1.73E+06	0.	3.39E+06	0.	7.04E+08	0.	1.03E+05
CD115M	0.	4.19E+04	0.	5.32E+04	0.	1.76E+06	0.	1.34E+03
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	4.92E+07	9.76E+05	2.86E+05	0.	1.27E+05	3.11E+07	0.	1.40E+06
SB-124	8.29E+05	1.56E+04	2.00E+03	0.	6.43E+05	2.35E+07	0.	3.28E+05
SB-125	1.12E+06	1.33E+05	9.95E+04	9.97E+05	8.03E+07	7.77E+06	0.	2.01E+05
TE127M	1.76E+06	6.14E+05	4.65E+05	7.09E+06	0.	8.82E+06	0.	2.10E+05
TE129M	3.16E+06	1.17E+06	1.01E+06	9.15E+06	0.	1.10E+07	0.	4.97E+05
I--131	7.45E+06	1.05E+07	3.04E+09	1.36E+07	0.	1.99E+06	0.	6.27E+06
I--133	1.08E+05	1.84E+05	3.34E+07	2.31E+05	0.	1.34E+05	0.	5.00E+04
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.
XE135M	8.28E-04	7.65E-04	0.	2.90E-04	8.71E-05	1.79E-05	0.	3.40E-04
XE-135	2.86E-02	2.64E-02	0.	1.00E-02	3.01E-03	6.18E-04	0.	1.17E-02
XE-137	8.16E+01	1.10E+02	0.	2.83E+01	1.40E+01	1.40E+00	0.	3.85E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.20E+08	5.31E+08	0.	1.31E+08	8.43E+07	8.13E+06	0.	2.40E+08
CS-136	9.53E+06	3.76E+07	0.	2.09E+07	2.87E+06	4.27E+06	0.	2.71E+07
CS-137	3.07E+08	4.12E+08	0.	1.05E+08	5.47E+07	5.50E+06	0.	1.45E+08
BA-140	1.57E+06	1.68E+05	0.	4.20E+02	1.13E+03	2.58E+05	0.	8.80E+04
CE-141	1.32E+03	8.84E+02	0.	3.07E+02	0.	2.39E+06	0.	1.01E+02
CE-144	9.59E+04	3.93E+04	0.	1.01E+04	0.	2.20E+07	0.	5.00E+03

DOSE FACTORS FOR GASEOUS DISCHARGES

BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	1.06E+01	1.06E+01	2.10E+01	1.00E+01	1.00E+01	0.	1.00E+01
C---14	3.95E+03	3.95E+03	3.95E+03	2.93E+03	3.95E+03	3.95E+03	0.	3.95E+03
P---32	3.40E+06	2.13E+05	0.	0.	0.	3.03E+05	0.	1.32E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	9.70E+04	0.	2.89E+04	0.	2.97E+05	0.	1.85E+04
FE--59	1.04E+05	2.48E+05	0.	0.	6.08E+04	8.18E+05	0.	9.45E+04
CO--58	0.	3.04E+04	0.	0.	0.	4.91E+05	0.	8.29E+04
CO--60	0.	2.92E+05	0.	0.	0.	3.51E+06	0.	8.67E+05
ZN--65	1.92E+07	8.10E+07	0.	4.08E+07	0.	3.85E+07	0.	2.76E+07
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.74E-07	0.	0.	0.	1.28E-08	0.	9.54E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	3.90E+02	0.	0.	0.	0.	4.23E+01	0.	1.12E+01
KR--90	3.69E+01	0.	0.	0.	1.54E-03	7.84E-01	0.	9.11E+00
RB--86	0.	1.33E+06	0.	0.	0.	2.63E+05	0.	6.22E+05
SR--89	8.87E+06	0.	0.	0.	0.	9.62E+05	0.	2.59E+05
SR--90	1.02E+09	0.	0.	0.	4.24E+04	2.10E+07	0.	2.91E+06
Y---91	5.80E+01	0.	0.	0.	0.	2.23E+04	0.	1.55E+03
ZR--95	8.18E+02	4.91E+02	0.	3.88E+02	0.	2.00E+06	0.	2.77E+02
ND--95	2.28E+02	1.37E+02	0.	1.08E+02	0.	5.01E+05	0.	7.75E+01
RU-103	3.91E+00	0.	0.	1.17E+01	0.	3.05E+02	0.	1.75E+00
RU-106	3.62E+02	0.	0.	4.81E+02	0.	1.04E+04	0.	4.55E+01
AG110M	7.09E+05	6.56E+05	0.	1.29E+06	0.	2.66E+08	0.	3.96E+05
CD115M	0.	4.32E+03	0.	3.42E+03	0.	1.82E+05	0.	1.58E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.31E+07	4.58E+05	1.34E+05	0.	1.23E+05	2.38E+07	0.	7.23E+05
SB-124	1.28E+05	2.42E+03	3.10E+02	0.	9.94E+04	3.83E+06	0.	9.00E+04
SB-125	7.11E+05	1.38E+05	1.06E+05	1.07E+05	3.91E+07	4.02E+06	0.	1.17E+05
TE127M	5.25E+05	1.84E+05	1.39E+05	2.12E+06	0.	6.04E+06	0.	6.51E+04
TE129M	2.34E+05	8.67E+04	7.49E+04	6.77E+05	0.	8.16E+05	0.	3.08E+04
I--131	1.23E+03	1.73E+03	4.99E+05	2.24E+03	0.	3.28E+02	0.	1.03E+03
I--133	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.
XE135M	4.18E-04	3.86E-04	0.	1.48E-04	4.40E-05	9.03E-06	0.	1.72E-04
XE-135	1.44E-02	1.33E-02	0.	5.05E-03	1.52E-03	3.12E-04	0.	5.92E-03
XE-137	3.92E+01	5.28E+01	0.	1.36E+01	7.00E+00	7.04E-01	0.	1.03E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	9.42E+07	2.27E+08	0.	5.01E+07	2.75E+07	2.62E+06	0.	1.00E+07
CS-135	3.08E+04	1.22E+05	0.	8.75E+04	9.27E+03	1.38E+04	0.	8.75E+04
CS-137	1.47E+08	1.98E+08	0.	5.11E+07	2.03E+07	2.05E+06	0.	6.90E+07
BA-140	4.10E+03	5.04E+00	0.	1.23E+00	3.37E+00	7.97E+02	0.	2.04E+02
CE-141	8.11E+01	5.44E+01	0.	1.09E+01	0.	1.47E+05	0.	8.24E+00
CE-144	3.50E+04	1.44E+04	0.	5.07E+03	0.	8.24E+06	0.	1.05E+05

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.38E+01	3.38E+01	4.27E+01	3.38E+01	3.38E+01	0.	3.38E+01
C---14	3.95E+03	3.95E+03	3.95E+03	2.98E+03	3.95E+03	3.95E+03	0.	3.95E+03
P---32	4.39E+06	2.75E+05	0.	0.	0.	4.94E+05	0.	1.70E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.17E+04	0.	3.48E+03	0.	3.58E+04	0.	2.23E+03
FE--59	1.39E+03	3.30E+03	0.	0.	9.15E+02	1.09E+04	0.	1.20E+03
CO--58	0.	4.43E+03	0.	0.	0.	5.98E+04	0.	1.01E+04
CO--60	0.	3.51E+04	0.	0.	0.	4.21E+05	0.	8.01E+04
ZN--65	2.32E+06	7.36E+06	0.	4.92E+06	0.	4.63E+06	0.	3.35E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.29E-08	0.	0.	0.	1.54E-09	0.	1.15E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	8.35E+02	0.	0.	0.	0.	9.06E+01	0.	2.40E+01
KR--90	7.74E+01	0.	0.	0.	1.78E-04	1.04E+00	0.	1.91E+01
RB--86	0.	1.69E+05	0.	0.	0.	3.33E+04	0.	7.89E+04
SR--89	1.90E+07	0.	0.	0.	0.	2.06E+06	0.	5.46E+05
SR--90	2.13E+09	0.	0.	0.	4.90E+03	4.51E+07	0.	5.27E+08
Y---91	7.09E+00	0.	0.	0.	0.	2.72E+03	0.	1.89E-01
ZR--95	9.90E+01	5.94E+01	0.	4.68E+01	0.	2.42E+05	0.	3.35E+01
NB--95	2.82E+01	1.70E+01	0.	1.34E+01	0.	6.93E+04	0.	9.58E+00
RU-103	4.81E-01	0.	0.	1.44E+00	0.	3.70E+01	0.	2.15E-01
RU-106	4.36E+01	0.	0.	5.73E+01	0.	1.97E+03	0.	5.48E+00
AG110M	8.54E+04	7.90E+04	0.	1.55E+05	0.	3.23E+07	0.	4.70E+04
CD115M	0.	5.31E+02	0.	4.21E+02	0.	2.23E+04	0.	1.70E+01
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.76E+06	5.50E+04	1.61E+04	0.	1.48E+04	2.77E+06	0.	8.69E+04
SB-124	1.57E+04	2.95E+02	3.78E+01	0.	1.21E+04	4.43E+05	0.	6.18E+03
SB-125	8.61E+04	1.67E+04	1.29E+04	1.30E+05	4.22E+06	4.85E+05	0.	1.42E+04
TE127M	6.37E+04	2.23E+04	1.68E+04	2.57E+05	0.	5.20E+05	0.	7.88E+03
TE129M	2.90E+04	1.07E+04	9.36E+03	8.37E+04	0.	1.01E+05	0.	4.55E+03
I--131	1.67E+03	2.36E+03	6.82E+05	3.05E+03	0.	4.47E+02	0.	1.41E+05
I--133	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.
XE135M	1.26E-03	1.16E-03	0.	4.39E-04	1.32E-04	2.71E-05	0.	5.15E-04
XE-135	4.35E-02	4.00E-02	0.	1.51E-02	4.55E-03	9.35E-04	0.	1.78E-02
XE-137	1.18E+02	1.58E+02	0.	4.08E+01	2.10E+01	2.11E+00	0.	5.55E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.83E+08	8.82E+08	0.	1.09E+08	8.20E+07	7.87E+06	0.	3.18E+08
CS-136	1.00E+05	3.95E+05	0.	2.20E+05	3.01E+04	4.49E+04	0.	2.84E+05
CS-137	4.42E+08	5.95E+08	0.	1.53E+08	7.89E+07	7.93E+06	0.	2.09E+08
BA-140	5.33E+02	6.56E-01	0.	1.64E-01	4.39E-01	1.04E+02	0.	3.43E+01
CE-141	1.00E+01	6.74E+00	0.	2.34E+00	0.	1.83E+04	0.	7.75E-01
CE-144	4.22E+03	1.73E+03	0.	7.05E+02	0.	9.95E+05	0.	2.24E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - INHALATION

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.74E+01	1.74E+01	1.15E+01	1.74E+01	1.74E+01	0.	1.74E+01
C---14	1.45E+02	1.45E+02	1.45E+02	3.06E+01	1.45E+02	1.45E+02	0.	1.45E+02
P---32	1.41E+04	8.26E+02	0.	0.	0.	9.25E+02	0.	5.37E+02
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	4.24E+02	0.	1.05E+02	1.50E+04	8.28E+02	0.	6.74E+01
FE--59	1.26E+02	2.97E+03	0.	0.	1.09E+04	2.01E+03	0.	1.13E+02
CO--58	0.	3.52E+00	0.	0.	2.00E+04	8.37E+02	0.	0.19E+00
CO--60	0.	2.48E+01	0.	0.	1.60E+05	2.17E+03	0.	4.34E+01
ZN--65	3.47E+02	1.10E+03	0.	7.38E+02	9.33E+03	5.72E+02	0.	4.98E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	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.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
KR--90	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	1.45E+03	0.	0.	0.	1.78E+02	0.	6.32E+02
SR--89	1.24E+03	0.	0.	0.	5.19E+04	3.90E+03	0.	3.50E+01
SR--90	3.79E+05	0.	0.	0.	3.43E+05	7.97E+03	0.	2.31E+04
Y---91	1.72E+03	0.	0.	0.	5.91E+04	4.13E+03	0.	4.59E+01
ZR--95	3.26E+02	7.59E+01	0.	5.80E+02	4.90E+04	1.33E+03	0.	6.89E+01
NB--95	3.94E+01	1.68E+01	0.	8.28E+01	1.35E+04	7.67E+02	0.	1.23E+01
RU-103	5.00E+00	0.	0.	6.24E+01	1.45E+04	9.76E+02	0.	2.02E+03
RU-106	2.67E+02	0.	0.	1.43E+03	3.37E+05	1.01E+04	0.	3.32E+01
AG110M	1.16E+02	1.07E+02	0.	2.11E+02	4.97E+04	3.24E+03	0.	0.30E+01
CD115M	0.	2.11E+03	0.	1.70E+03	1.51E+04	4.11E+03	0.	6.61E+01
SN-123	8.90E+02	1.49E+01	1.58E+01	0.	8.10E+04	3.45E+03	0.	2.94E+01
SN-126	1.35E+04	3.58E+02	1.05E+02	0.	1.00E+05	1.36E+03	0.	5.14E+02
SB-124	3.34E+02	6.30E+00	8.08E-01	0.	2.05E+04	4.35E+03	0.	1.33E+02
SB-125	7.07E+02	7.63E+00	0.28E-01	0.	2.35E+04	1.08E+03	0.	1.42E+02
TE127M	1.35E+02	6.01E+01	3.52E+01	4.90E+02	1.03E+04	1.60E+03	0.	1.68E+01
TE129M	3.80E+01	1.35E+01	1.25E+01	3.91E+02	4.17E+04	4.22E+03	0.	6.02E+03
I--131	1.05E+03	1.07E+03	3.50E+05	6.57E+02	0.	6.14E+01	0.	8.11E+02
I--133	3.88E+02	4.74E+02	1.16E+05	2.78E+02	0.	1.28E+02	0.	1.86E+02
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.44E+04	2.30E+04	0.	3.08E+03	2.75E+03	8.73E+01	0.	5.15E+03
CS-136	4.19E+02	1.57E+03	0.	9.15E+02	1.28E+02	1.25E+02	0.	1.19E+03
CS-137	2.00E+04	1.85E+04	0.	2.38E+03	2.32E+03	7.89E+01	0.	2.89E+03
BA-140	1.05E+02	1.08E-01	0.	1.79E-01	4.02E+04	2.30E+02	0.	9.70E+00
CE-141	7.25E+01	3.03E+01	0.	6.7 +01	1.13E+04	1.26E+03	0.	5.39E+00
CE-144	1.34E+04	4.20E+03	0.	9. 3	2.84E+05	9.25E+03	0.	7.17E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - GROUND PLANE DEPOSITION — AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	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.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	5.14E+07	4.39E+07
FE--59	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	1.03E+07	8.73E+06
CO--58	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.41E+07	1.21E+07
CO--60	6.80E+08	6.80E+08	6.80E+08	6.80E+08	6.80E+08	6.80E+08	8.00E+08	6.80E+08
ZN--65	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.71E+07	2.36E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	1.13E+04	9.90E+03
KR--89	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	9.70E+02	8.08E+02
KR--90	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	7.29E-03	6.16E-03
RB--86	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	3.26E+05	2.86E+05
SR--89	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	7.97E+02	6.87E+02
SR--90	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	2.01E+05	1.70E+05
Y---91	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.80E+04	3.43E+04
ZR--95	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.80E+07	1.59E+07
NB--95	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	5.09E+06	4.33E+06
RU-103	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	4.07E+06	3.49E+06
RU-106	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.59E+07	1.33E+07
AG110M	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.32E+08	1.13E+08
CD115M	0.	0.	0.	0.	0.	0.	4.35E+04	0.
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.83E+09	1.64E+09
SB-124	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	2.19E+07	1.90E+07
SB-125	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	8.21E+07	7.27E+07
TE127M	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	3.09E+04	2.79E+04
TE129M	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.43E+06	1.22E+06
I--131	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	3.32E+05	2.73E+05
I--133	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	4.77E+04	3.92E+04
XE131M	0.	0.	0.	0.	0.	0.	0.	0.
XE133M	0.	0.	0.	0.	0.	0.	0.	0.
XE133	0.	0.	0.	0.	0.	0.	0.	0.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE135	0.	0.	0.	0.	0.	0.	0.	0.
XE137	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	1.01E+02	8.69E+01
XE138	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.87E+03	6.01E+03
CS-134	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.58E+08	2.22E+08
CS-136	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	5.36E+06	4.73E+06
CS-137	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.81E+08	3.27E+08
BA-140	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	6.02E+06	5.30E+06
CE-141	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.88E+05	4.33E+05
CE-144	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	4.13E+06	3.59E+06

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - FRESH FRUITS AND VEGETABLES — AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.18E+00	4.18E+00	2.76E+00	4.18E+00	4.18E+00	0.	4.18E+00
C---14	1.28E+03	1.28E+03	1.28E+03	3.23E+02	1.28E+03	1.28E+03	0.	1.28E+03
P---32	1.46E+07	9.13E+05	0.	0.	0.	1.04E+06	0.	5.64E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	6.17E+05	0.	1.84E+05	0.	1.89E+06	0.	1.18E+05
FE--59	4.60E+05	1.09E+06	0.	0.	3.03E+05	3.60E+06	0.	4.15E+05
CO--58	0.	2.14E+05	0.	0.	0.	1.28E+06	0.	6.47E+05
CO--60	0.	7.36E+05	0.	0.	0.	4.07E+06	0.	2.21E+05
ZN--65	8.31E+05	2.64E+06	0.	1.76E+06	0.	1.00E+06	0.	1.19E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	1.19E-08	0.	0.	0.	5.57E-10	0.	4.14E-09
KR--88	0.	2.13E-01	0.	0.	0.	0.	0.	1.13E-01
KR--89	6.61E+03	0.	0.	0.	0.	2.47E+02	0.	1.89E+02
KR--90	9.96E+01	0.	0.	0.	0.	1.86E+00	0.	2.53E+01
RB--86	0.	1.69E+06	0.	0.	0.	3.32E+05	0.	7.85E+05
SR--89	1.50E+08	0.	0.	0.	0.	5.61E+06	0.	4.31E+05
SR--90	2.74E+09	0.	0.	0.	0.	5.12E+07	0.	6.90E+08
Y---91	6.56E+04	0.	0.	0.	0.	8.71E+06	0.	1.75E+03
ZR--95	1.25E+04	3.03E+03	0.	1.87E+03	0.	3.31E+06	0.	2.71E+03
NB--95	1.94E+03	8.26E+02	0.	3.41E+02	0.	1.43E+06	0.	6.07E+02
RU-103	7.03E+04	0.	0.	7.33E+04	0.	1.85E+06	0.	2.84E+04
RU-106	1.66E+06	0.	0.	7.44E+05	0.	2.59E+07	0.	2.07E+05
AG110M	2.35E+04	2.17E+04	0.	4.27E+04	0.	8.87E+06	0.	1.29E+04
CD115M	0.	2.03E+05	0.	1.01E+05	0.	8.53E+06	0.	6.48E+03
SN-123	5.43E-07	6.80E-09	7.17E-09	0.	0.	2.70E-07	0.	1.34E-08
SN-126	1.20E+07	2.38E+05	6.98E+04	0.	6.23E+04	1.18E+07	0.	3.76E+05
SB-124	3.17E+05	5.97E+03	7.05E+02	0.	2.46E+05	8.96E+06	0.	1.25E+05
SB-125	1.65E+06	3.67E+05	3.77E+05	1.28E+06	3.25E+07	4.05E+06	0.	2.41E+05
TE127M	1.30E+06	4.47E+05	3.66E+05	5.03E+06	0.	7.48E+06	0.	1.00E+05
TE129M	5.79E+06	1.61E+06	1.85E+05	5.63E+06	0.	6.97E+06	0.	8.95E+05
I--131	1.96E+06	2.01E+06	6.54E+08	1.23E+06	0.	1.72E+05	0.	1.52E+05
I--133	5.73E+04	7.07E+04	1.71E+07	4.15E+04	0.	2.87E+04	0.	2.78E+04
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.
XE135M	4.51E-05	4.16E-05	0.	1.58E-05	4.74E-06	9.74E-07	0.	1.85E-05
XE-135	1.56E-03	1.44E-03	0.	5.44E-04	1.64E-04	3.36E-05	0.	6.39E-04
XE-137	1.25E+01	1.21E+01	0.	1.48E+00	1.41E+00	7.35E-02	0.	1.80E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	3.08E+07	5.19E+07	0.	6.60E+06	5.70E+06	2.61E+05	0.	1.10E+07
CS-136	4.27E+05	1.69E+05	0.	9.38E+05	1.23E+05	1.92E+05	0.	1.21E+05
CS-137	4.08E+07	4.53E+07	0.	5.57E+05	5.31E+06	2.70E+05	0.	6.75E+06
BA-140	5.37E+06	4.93E+03	0.	5.64E+02	2.81E+03	6.58E+06	0.	3.15E+05
CE-141	3.65E+03	1.03E+03	0.	2.85E+02	0.	2.29E+06	0.	2.72E+02
CE-144	2.60E+05	6.78E+04	0.	1.5[illegible]	0.	2.28E+07	0.	1.49E+04

DOSE FACTORS FOR [illegible]EOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - STORED FRUITS AND VEGETABLES — AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	8.29E+01	8.29E+01	5.47E+01	8.29E+01	8.29E+01	0.	8.29E+01
C---14	2.56E+04	2.56E+04	2.56E+04	6.45E+03	2.56E+04	2.56E+04	0.	2.56E+04
P---32	1.07E+07	1.05E+06	0.	0.	0.	1.88E+06	0.	6.40E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	1.08E+07	0.	3.22E+06	0.	3.32E+07	0.	2.07E+05
FE--59	3.70E+06	8.79E+06	0.	0.	2.44E+06	2.90E+07	0.	3.35E+05
CO--58	0.	2.41E+06	0.	0.	0.	1.43E+07	0.	7.27E+05
CO--60	0.	1.44E+07	0.	0.	0.	7.97E+07	0.	4.32E+07
ZN--65	1.40E+07	4.46E+07	0.	2.98E+07	0.	2.81E+07	0.	2.02E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.38E-07	0.	0.	0.	1.11E-08	0.	8.27E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	5.89E+04	0.	0.	0.	0.	2.20E+03	0.	1.69E+03
KR--90	1.99E+03	0.	0.	0.	0.	3.86E+01	0.	5.03E+02
RB--86	0.	3.78E+06	0.	0.	0.	7.40E+05	0.	1.76E+05
SR--89	1.34E+09	0.	0.	0.	0.	5.00E+07	0.	3.84E+07
SR--90	5.47E+10	0.	0.	0.	0.	1.06E+09	0.	1.39E+10
Y---91	6.56E+05	0.	0.	0.	0.	8.71E+07	0.	1.75E+04
ZR--95	1.51E+05	4.02E+04	0.	2.32E+04	0.	4.91E+07	0.	3.47E+04
NB--95	1.20E+04	5.14E+03	0.	2.12E+03	0.	8.69E+06	0.	3.77E+03
RU-103	5.06E+05	0.	0.	5.27E+05	0.	1.33E+07	0.	2.04E+05
RU-106	2.97E+07	0.	0.	1.33E+07	0.	4.62E+08	0.	3.70E+06
AG110M	4.02E+05	3.72E+05	0.	7.30E+05	0.	1.52E+08	0.	2.21E+05
CD115M	0.	1.57E+06	0.	1.24E+06	0.	6.59E+07	0.	5.01E+04
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.41E+08	4.79E+06	1.40E+06	0.	2.12E+06	3.51E+08	0.	8.03E+06
SB-124	3.21E+06	6.66E+04	7.76E+03	0.	2.49E+06	9.09E+07	0.	1.27E+05
SB-125	3.52E+07	7.97E+06	8.20E+06	2.79E+07	6.23E+08	8.09E+07	0.	5.09E+05
TE127M	1.76E+07	6.06E+05	4.97E+05	6.81E+07	0.	1.02E+08	0.	2.24E+05
TE129M	3.48E+07	9.70E+06	1.11E+07	3.38E+07	0.	4.19E+07	0.	5.38E+05
I--131	2.44E+05	2.50E+05	8.14E+07	1.53E+05	0.	2.14E+04	0.	1.89E+05
I--133	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.
XE135M	9.06E-04	8.56E-04	0.	3.17E-04	9.53E-05	1.96E-05	0.	3.72E-04
XE-135	3.13E-02	2.89E-02	0.	1.09E-02	3.23E-03	6.75E-04	0.	1.28E-02
XE-137	2.48E+02	2.40E+02	0.	2.95E+01	2.82E+01	1.47E+00	0.	3.58E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	5.84E+08	9.63E+08	0.	1.25E+08	1.09E+08	5.32E+06	0.	2.89E+08
CS-136	3.68E+05	1.45E+06	0.	8.07E+05	1.11E+05	1.05E+05	0.	1.04E+05
CS-137	9.33E+08	9.03E+08	0.	1.11E+08	1.06E+08	5.50E+06	0.	1.39E+08
BA-140	4.40E+06	4.08E+03	0.	4.62E+02	2.30E+03	6.35E+06	0.	2.58E+05
CE-141	2.07E+04	1.04E+04	0.	1.02E+03	0.	1.30E+07	0.	1.54E+05
CE-144	4.86E+06	1.52E+06	0.	2.75E+05	0.	3.95E+08	0.	2.59E+05

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - MEAT (CONTAMINATED FEED)

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.89E+00	3.89E+00	2.57E+00	3.89E+00	3.89E+00	0.	3.89E+00
C---14	3.13E+03	3.13E+03	3.13E+03	7.68E+02	3.13E+03	3.13E+03	0.	3.13E+03
P---32	2.68E+05	1.68E+04	0.	0.	0.	3.02E+04	0.	1.04E+04
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	3.06E+04	0.	9.10E+03	0.	9.30E+04	0.	5.84E+03
FE--59	2.70E+05	6.42E+05	0.	0.	1.78E+05	2.12E+06	0.	2.44E+05
CO--58	0.	7.58E+04	0.	0.	0.	4.51E+05	0.	2.29E+05
CO--60	0.	7.25E+05	0.	0.	0.	4.01E+06	0.	2.17E+05
ZN--65	1.44E+06	4.57E+06	0.	3.05E+06	0.	2.88E+06	0.	2.07E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.91E-08	0.	0.	0.	1.36E-09	0.	1.01E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	7.02E+01	0.	0.	0.	0.	2.62E+00	0.	2.01E+01
KR--90	4.68E+00	0.	0.	0.	0.	3.12E-01	0.	1.19E+00
RB--86	0.	7.25E+04	0.	0.	0.	1.43E+04	0.	3.38E+04
SR--89	1.60E+06	0.	0.	0.	0.	5.97E+04	0.	4.58E+04
SR--90	1.29E+08	0.	0.	0.	0.	6.61E+06	0.	5.27E+07
Y---91	6.61E+03	0.	0.	0.	0.	8.78E+05	0.	1.70E+02
ZR--95	3.25E+04	1.20E+04	0.	5.43E+03	0.	1.91E+07	0.	9.19E+03
NB--95	4.94E+03	2.11E+03	0.	8.68E+02	0.	3.65E+06	0.	1.55E+03
RU-103	3.35E+05	0.	0.	3.50E+05	0.	8.80E+06	0.	1.36E+05
RU-106	4.27E+07	0.	0.	1.91E+07	0.	6.63E+08	0.	5.31E+06
AG110M	2.36E+04	2.18E+04	0.	4.28E+04	0.	6.89E+06	0.	1.30E+04
CD115M	0.	1.46E+03	0.	1.10E+03	0.	6.15E+04	0.	4.67E+01
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	7.51E+07	1.49E+06	4.36E+05	0.	3.19E+04	2.58E+07	0.	2.10E+06
SB-124	2.85E+04	5.37E+02	6.88E+01	0.	2.21E+04	8.06E+05	0.	1.13E+04
SB-125	7.56E+06	2.03E+06	2.10E+06	7.14E+06	9.48E+06	6.01E+06	0.	1.01E+05
TE127M	3.85E+06	1.32E+06	1.08E+06	1.48E+07	0.	2.22E+07	0.	4.90E+05
TE129M	3.81E+06	1.06E+06	1.22E+06	3.70E+06	0.	4.58E+06	0.	5.89E+05
I--131	3.77E+01	3.86E+01	1.26E+04	2.36E+01	0.	5.31E+00	0.	2.91E+01
I--133	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.
XE135M	1.43E-05	1.32E-05	0.	5.00E-06	1.50E-06	3.09E-07	0.	5.80E-06
XE-135	4.93E-04	4.55E-04	0.	1.72E-04	5.18E-05	1.06E-05	0.	2.02E-04
XE-137	3.90E+00	3.78E+00	0.	4.64E-01	4.43E-01	2.30E-02	0.	5.65E-01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	8.81E+06	1.48E+07	0.	1.89E+06	1.65E+06	8.02E+04	0.	5.15E+05
CS-136	4.03E+02	1.59E+03	0.	8.85E+02	1.21E+02	1.81E+02	0.	1.15E+03
CS-137	1.47E+07	1.42E+07	0.	1.74E+06	1.66E+06	8.65E+04	0.	2.12E+05
BA-140	3.70E+03	3.26E+00	0.	3.89E-01	1.94E+00	5.11E+02	0.	2.17E+02
CE-141	3.38E+01	1.69E+01	0.	2.64E+00	0.	2.12E+04	0.	2.52E+00
CE-144	2.04E+04	6.37E+03	0.	1.1[illegible]	0.	1.66E+06	0.	1.08E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - MEAT (CONTAMINATED FORAGE) AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.95E+00	3.95E+00	2.81E+00	3.95E+00	3.95E+00	0.	3.95E+00
C---14	3.13E+03	3.13E+03	3.13E+03	7.88E+02	3.13E+03	3.13E+03	0.	3.13E+03
P---32	5.05E+07	3.17E+06	0.	0.	0.	5.68E+06	0.	1.90E+06
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	8.09E+04	0.	2.41E+04	0.	2.48E+05	0.	1.55E+04
FE--59	2.52E+06	5.99E+06	0.	0.	1.00E+06	1.98E+07	0.	2.20E+05
CO--58	0.	4.16E+05	0.	0.	0.	2.47E+06	0.	1.25E+05
CO--60	0.	1.59E+06	0.	0.	0.	8.60E+06	0.	4.77E+05
ZN--65	3.57E+06	1.13E+07	0.	7.57E+06	0.	7.15E+06	0.	5.12E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	4.23E-08	0.	0.	0.	1.98E-09	0.	1.47E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	5.58E+02	0.	0.	0.	0.	2.08E+01	0.	1.60E+01
KR--90	9.43E+00	0.	0.	0.	0.	6.30E-01	0.	2.39E+00
RB--86	0.	5.02E+06	0.	0.	0.	3.89E+05	0.	2.34E+05
SR--89	1.27E+07	0.	0.	0.	0.	4.74E+05	0.	3.63E+05
SR--90	2.60E+08	0.	0.	0.	0.	1.74E+07	0.	6.59E+07
Y---91	4.38E+04	0.	0.	0.	0.	5.81E+06	0.	1.17E+05
ZR--95	1.08E+05	3.44E+04	0.	1.73E+04	0.	4.99E+07	0.	2.77E+04
NB--95	6.95E+04	2.97E+04	0.	1.22E+04	0.	5.13E+07	0.	2.18E+04
RU-103	3.73E+06	0.	0.	3.89E+06	0.	9.80E+07	0.	1.51E+06
RU-106	1.08E+08	0.	0.	4.82E+07	0.	1.06E+09	0.	1.34E+07
AG110M	6.20E+04	5.73E+04	0.	1.13E+05	0.	2.34E+07	0.	3.41E+04
CD115M	0.	1.42E+04	0.	1.13E+04	0.	5.96E+05	0.	4.53E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.61E+08	3.19E+06	9.35E+05	0.	5.40E+04	5.34E+07	0.	4.60E+05
SB-124	1.84E+05	3.47E+03	4.45E+02	0.	1.43E+05	5.21E+06	0.	7.28E+04
SB-125	7.68E+06	2.03E+06	2.10E+05	7.15E+06	2.17E+07	9.04E+06	0.	1.04E+05
TE127M	1.29E+07	4.42E+06	3.63E+06	4.97E+07	0.	7.41E+07	0.	1.64E+05
TE129M	5.14E+07	1.43E+07	1.64E+07	5.00E+07	0.	6.19E+07	0.	7.90E+05
I--131	2.29E+05	2.35E+05	7.64E+07	1.44E+05	0.	2.01E+04	0.	1.77E+05
I--133	1.02E-02	1.25E-02	3.02E+00	7.35E-03	0.	5.08E-03	0.	4.92E-03
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.
XE135M	2.63E-05	2.61E-05	0.	9.90E-06	2.98E-06	6.11E-07	0.	1.13E-05
XE-135	9.77E-04	9.02E-04	0.	3.42E-04	1.03E-04	2.11E-05	0.	4.01E-04
XE-137	8.12E+00	7.86E+00	0.	9.65E-01	9.21E-01	4.79E-02	0.	1.17E+00
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.06E+07	3.47E+07	0.	4.42E+06	3.60E+06	1.60E+05	0.	7.38E+05
CS-136	1.25E+05	4.92E+05	0.	2.74E+05	3.75E+04	5.59E+04	0.	3.54E+05
CS-137	3.05E+07	2.95E+07	0.	3.63E+06	3.40E+06	1.80E+05	0.	4.40E+05
BA-140	1.24E+06	1.08E+03	0.	1.30E+02	8.40E+02	1.71E+05	0.	7.25E+04
CE-141	5.48E+02	2.74E+02	0.	4.29E+01	0.	3.44E+05	0.	4.60E+01
CE-144	5.27E+04	1.75E+04	0.	3.15E+03	0.	4.53E+06	0.	2.97E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.65E+01	2.65E+01	1.75E+01	2.65E+01	2.65E+01	0.	2.65E+01
C---14	9.76E+03	9.76E+03	9.76E+03	2.46E+03	9.76E+03	9.76E+03	0.	9.76E+03
P---32	5.29E+08	3.32E+07	0.	0.	0.	5.95E+07	0.	2.05E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.12E+05	0.	0.30E+04	0.	6.49E+05	0.	4.04E+04
FE--59	8.04E+05	1.91E+06	0.	0.	5.30E+05	6.30E+06	0.	7.26E+05
CO--58	0.	3.07E+05	0.	0.	0.	1.83E+06	0.	9.26E+05
CO--60	0.	9.91E+05	0.	0.	0.	5.48E+06	0.	2.97E+05
ZN--65	3.93E+07	1.25E+08	0.	8.36E+07	0.	7.85E+07	0.	5.64E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.30E-07	0.	0.	0.	1.54E-08	0.	1.15E-07
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	7.66E+03	0.	0.	0.	0.	2.86E+02	0.	2.19E+02
KR--90	1.01E+02	0.	0.	0.	0.	1.36E+00	0.	2.57E+01
RB--86	0.	7.61E+07	0.	0.	0.	1.50E+07	0.	3.55E+07
SR--89	1.74E+08	0.	0.	0.	0.	6.51E+06	0.	4.99E+05
SR--90	2.79E+09	0.	0.	0.	0.	3.74E+07	0.	7.08E+08
Y---91	9.46E+02	0.	0.	0.	0.	1.26E+05	0.	2.52E+01
ZR--95	1.95E+03	8.11E+02	0.	3.39E+02	0.	1.39E+06	0.	5.99E+02
NB--95	7.14E+03	3.04E+03	0.	1.25E+03	0.	5.27E+06	0.	2.24E+03
RU-103	1.03E+02	0.	0.	1.07E+02	0.	2.69E+03	0.	4.15E+01
RU-106	2.24E+03	0.	0.	1.80E+03	0.	3.49E+04	0.	2.79E+02
AG110M	1.54E+06	1.42E+06	0.	2.80E+06	0.	5.81E+08	0.	8.46E+05
CD115M	0.	3.45E+04	0.	2.74E+04	0.	1.45E+06	0.	1.10E+05
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	4.06E+07	8.65E+05	2.36E+05	0.	1.05E+05	2.56E+07	0.	1.21E+06
SB-124	6.84E+05	1.29E+04	1.65E+03	0.	5.31E+05	1.94E+07	0.	2.70E+05
SB-125	1.50E+06	2.40E+05	2.43E+05	8.23E+05	6.02E+07	6.43E+06	0.	2.42E+05
TE127M	1.51E+06	5.21E+05	4.20E+05	5.84E+06	0.	8.72E+06	0.	1.93E+05
TE129M	7.76E+06	2.16E+06	2.48E+06	7.55E+06	0.	9.34E+06	0.	1.20E+06
I--131	1.80E+07	1.84E+07	5.99E+09	1.13E+07	0.	1.58E+06	0.	1.39E+07
I--133	2.04E+05	3.25E+05	7.84E+07	1.91E+05	0.	1.32E+05	0.	1.28E+05
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.
XE135M	6.83E-04	6.31E-04	0.	2.39E-04	7.18E-05	1.48E-05	0.	2.80E-04
XE-135	2.36E-02	2.18E-02	0.	8.25E-03	2.48E-03	5.10E-04	0.	9.68E-03
XE-137	1.96E+02	1.96E+02	0.	2.33E+01	2.25E+01	1.16E+00	0.	2.65E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	5.06E+08	8.51E+08	0.	1.08E+08	9.46E+07	4.01E+06	0.	1.81E+08
CS-136	7.86E+06	3.10E+07	0.	1.73E+07	2.37E+06	3.53E+06	0.	2.25E+07
CS-137	7.37E+08	7.14E+08	0.	8.77E+07	8.30E+07	4.35E+06	0.	1.06E+08
BA-140	3.30E+06	2.89E+03	0.	3.45E+02	1.72E+03	2.19E+05	0.	1.93E+05
CE-141	3.24E+03	1.02E+03	0.	2.53E+02	0.	2.03E+06	0.	2.41E+02
CE-144	2.34E+05	7.34E+04	0.	1.3	0.	1.91E+07	0.	1.25E+04

DOSE FACTORS FOR GASEOUS DISCHARGES

BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF 1 FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.62E+01	2.62E+01	1.73E+01	2.62E+01	2.62E+01	0.	2.62E+01
C---14	3.76E+03	9.70E+03	3.76E+03	2.40E+03	9.70E+03	9.70E+03	0.	9.70E+03
P---32	2.81E+06	1.76E+05	0.	0.	0.	3.10E+05	0.	1.09E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	8.00E+04	0.	2.38E+04	0.	2.45E+05	0.	1.53E+04
FE--59	8.61E+04	2.04E+05	0.	0.	5.68E+04	6.75E+05	0.	7.78E+04
CO--58	0.	5.60E+04	0.	0.	0.	3.33E+05	0.	1.69E+05
CO--60	0.	4.52E+05	0.	0.	0.	2.50E+06	0.	1.35E+05
ZN--65	1.59E+07	5.04E+07	0.	3.37E+07	0.	3.17E+07	0.	2.28E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.26E-07	0.	0.	0.	1.06E-08	0.	7.87E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	9.65E+02	0.	0.	0.	0.	3.60E+01	0.	2.76E+01
KR--90	5.03E+01	0.	0.	0.	0.	0.73E-01	0.	1.27E+01
RB--86	0.	1.10E+06	0.	0.	0.	2.17E+05	0.	5.13E+05
SR--89	2.20E+07	0.	0.	0.	0.	8.20E+05	0.	6.29E+05
SR--90	1.39E+09	0.	0.	0.	0.	1.65E+07	0.	3.51E+08
Y---91	1.43E+02	0.	0.	0.	0.	1.90E+04	0.	3.81E+00
ZR--95	1.81E+03	7.73E+02	0.	3.19E+02	0.	1.33E+06	0.	5.66E+02
NB--95	5.07E+02	2.16E+02	0.	8.91E+01	0.	3.74E+05	0.	1.59E+02
RU-103	9.22E+00	0.	0.	9.61E+00	0.	2.42E+02	0.	3.75E+00
RU-106	8.88E+02	0.	0.	3.97E+02	0.	1.38E+04	0.	1.11E+02
AG110M	5.85E+05	5.41E+05	0.	1.00E+06	0.	2.21E+08	0.	3.22E+05
CD115M	0.	3.50E+03	0.	2.83E+03	0.	1.50E+05	0.	1.14E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.91E+07	3.78E+05	1.11E+05	0.	1.01E+05	1.89E+07	0.	5.97E+05
SB-124	1.06E+05	1.99E+03	2.56E+02	0.	8.20E+04	2.99E+06	0.	4.18E+04
SB-125	1.20E+06	2.53E+05	2.59E+05	8.81E+05	2.90E+07	3.34E+06	0.	1.79E+05
TE127M	4.52E+05	1.55E+05	1.27E+05	1.75E+06	0.	2.61E+06	0.	5.77E+04
TE129M	2.74E+05	1.60E+05	1.83E+05	5.29E+05	0.	6.92E+05	0.	8.89E+04
I--131	2.96E+03	3.03E+03	9.85E+05	1.85E+03	0.	2.59E+02	0.	2.29E+05
I--133	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.
XE135M	3.45E-04	3.19E-04	0.	1.21E-04	3.63E-05	7.45E-06	0.	1.42E-04
XE-135	1.19E-02	1.10E-02	0.	4.15E-03	1.25E-03	2.57E-04	0.	4.88E-03
XE-137	9.44E+01	9.13E+01	0.	1.12E+01	1.07E+01	5.57E-01	0.	1.36E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.16E+08	3.04E+08	0.	4.03E+07	4.04E+07	1.97E+06	0.	7.74E+07
CS-136	2.54E+04	1.00E+05	0.	5.58E+04	7.65E+03	1.14E+04	0.	7.22E+04
CS-137	3.25E+08	3.43E+08	0.	4.22E+07	4.02E+07	2.09E+06	0.	9.11E+07
BA-140	9.87E+03	8.07E+00	0.	1.04E+00	5.10E+00	8.75E+02	0.	5.80E+02
CE-141	2.00E+02	9.98E+01	0.	1.53E+01	0.	1.25E+05	0.	1.49E+01
CE-144	8.56E+04	2.08E+04	0.	4.84E+03	0.	8.96E+06	0.	4.50E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.42E+01	5.42E+01	3.58E+01	5.42E+01	5.42E+01	0.	5.42E+01
C---14	9.76E+03	9.76E+03	9.76E+03	2.46E+03	9.76E+03	9.76E+03	0.	9.76E+03
P---32	6.83E+08	4.78E+07	0.	0.	0.	7.68E+07	0.	2.64E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.55E+04	0.	7.59E+03	0.	7.81E+04	0.	4.87E+03
FE--59	1.07E+04	2.54E+04	0.	0.	7.05E+03	8.38E+04	0.	9.66E+03
CO--58	0.	3.74E+04	0.	0.	0.	2.22E+05	0.	1.13E+04
CO--60	0.	1.19E+05	0.	0.	0.	6.58E+05	0.	3.57E+05
ZN--65	4.73E+06	1.50E+07	0.	1.01E+07	0.	9.40E+06	0.	6.80E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.96E-08	0.	0.	0.	1.85E-09	0.	1.38E-08
KR--88	0.	4.00E-10	0.	0.	0.	0.	0.	2.12E-10
KR--89	1.64E+04	0.	0.	0.	0.	0.13E+02	0.	4.70E+02
KR--90	2.13E+02	0.	0.	0.	0.	2.83E+00	0.	5.46E+01
RB--86	0.	9.66E+06	0.	0.	0.	1.90E+06	0.	4.50E+05
SR--89	3.74E+08	0.	0.	0.	0.	1.40E+07	0.	1.07E+07
SR--90	5.86E+09	0.	0.	0.	0.	7.81E+07	0.	1.49E+09
Y---91	1.16E+02	0.	0.	0.	0.	1.53E+04	0.	3.08E+00
ZR--95	2.10E+02	8.78E+01	0.	3.67E+01	0.	1.51E+05	0.	6.49E+01
NB--95	8.62E+02	3.76E+02	0.	1.55E+02	0.	6.51E+05	0.	2.70E+02
RU-103	1.26E+01	0.	0.	1.32E+01	0.	3.32E+02	0.	5.11E+00
RU-106	2.70E+02	0.	0.	1.21E+02	0.	4.20E+03	0.	3.35E+01
AG110M	1.85E+05	1.72E+05	0.	3.37E+05	0.	7.00E+07	0.	1.02E+05
CD115M	0.	4.25E+03	0.	3.37E+03	0.	1.79E+05	0.	1.30E+02
SN-123	7.23E-02	9.05E-04	9.55E-04	0.	0.	3.59E-02	0.	1.78E-03
SN-126	4.87E+06	9.66E+04	2.83E+04	0.	1.10E+04	2.94E+06	0.	1.42E+05
SB-124	8.35E+04	1.58E+03	2.02E+02	0.	0.48E+04	2.36E+06	0.	3.30E+04
SB-125	1.80E+05	2.90E+04	2.93E+04	9.96E+04	7.96E+06	7.74E+05	0.	2.92E+04
TE127M	1.83E+05	6.31E+04	5.10E+04	7.08E+05	0.	1.05E+06	0.	2.54E+04
TE129M	9.61E+05	2.68E+05	3.08E+05	9.34E+05	0.	1.16E+06	0.	1.48E+05
I--131	2.46E+07	2.52E+07	8.16E+09	1.54E+07	0.	2.15E+06	0.	1.90E+07
I--133	1.04E+06	1.28E+06	3.09E+08	7.51E+05	0.	5.19E+05	0.	5.05E+05
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.
XE135M	2.05E-03	1.89E-03	0.	7.17E-04	2.15E-04	4.43E-05	0.	8.41E-04
XE-135	7.08E-02	6.54E-02	0.	2.48E-02	7.44E-03	1.55E-03	0.	2.90E-02
XE-137	5.89E+02	5.70E+02	0.	7.00E+01	0.08E+01	3.47E+00	0.	0.49E+01
XE-138	7.56E-05	1.49E-04	0.	1.10E-04	1.09E-05	0.37E-10	0.	7.41E-05
CS-134	1.52E+09	2.96E+09	0.	3.23E+08	2.04E+08	1.06E+07	0.	5.44E+08
CS-136	2.55E+07	1.01E+08	0.	5.01E+07	7.09E+06	1.15E+07	0.	7.26E+07
CS-137	2.21E+09	2.14E+09	0.	2.63E+08	2.21E+08	1.30E+07	0.	3.19E+08
BA-140	4.29E+05	3.76E+02	0.	4.51E+01	2.24E+02	2.79E+04	0.	2.52E+04
CE-141	4.01E+02	2.01E+02	0.	3.1[illegible]E+01	0.	2.52E+05	0.	2.99E+01
CE-144	2.82E+04	8.84E+03	0.	1.[illegible]E+03	0.	2.30E+06	0.	1.50E+05

DOSE FACTORS FOR ...EOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE ...SUNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

..NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.34E+01	5.34E+01	5.53E+01	5.34E+01	5.34E+01	0.	5.34E+01
C---14	9.76E+03	9.76E+03	9.76E+03	2.46E+03	9.75E+03	9.76E+03	0.	9.76E+03
P---32	3.62E+06	2.27E+05	0.	0.	0.	4.07E+05	0.	1.40E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	9.63E+03	0.	2.87E+03	0.	2.95E+04	0.	1.84E+03
FE--59	1.15E+03	2.72E+03	0.	0.	7.55E+02	6.98E+03	0.	1.04E+03
CO--58	0.	6.82E+03	0.	0.	0.	4.05E+04	0.	2.05E+04
CO--60	0.	5.42E+04	0.	0.	0.	3.00E+05	0.	1.03E+05
ZN--65	1.91E+06	6.07E+06	0.	4.05E+05	0.	3.82E+06	0.	2.75E+05
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.72E-08	0.	0.	0.	1.27E-09	0.	9.45E-09
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	2.07E+03	0.	0.	0.	0.	7.72E+01	0.	5.92E+01
KR--90	1.06E+02	0.	0.	0.	0.	1.41E+00	0.	2.60E+01
RB--86	0.	1.40E+05	0.	0.	0.	2.75E+04	0.	6.51E+04
SR--89	4.71E+07	0.	0.	0.	0.	1.76E+06	0.	1.35E+06
SR--90	2.91E+09	0.	0.	0.	0.	3.87E+07	0.	7.37E+05
Y---91	1.75E+01	0.	0.	0.	0.	2.32E+03	0.	4.65E-01
ZR--95	2.20E+02	9.35E+01	0.	3.87E+01	0.	1.01E+05	0.	6.87E+01
NB--95	6.27E+01	2.67E+01	0.	1.10E+01	0.	4.63E+04	0.	1.96E+01
RU-103	1.14E+00	0.	0.	1.18E+00	0.	2.98E+01	0.	4.59E-01
RU-106	1.07E+02	0.	0.	4.78E+01	0.	1.66E+03	0.	1.33E+01
AG110M	7.05E+04	6.52E+04	0.	1.28E+05	0.	2.66E+07	0.	3.88E+04
CD115M	0.	4.38E+02	0.	3.47E+02	0.	1.84E+04	0.	1.40E+01
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.28E+06	4.54E+04	1.33E+04	0.	1.22E+04	2.28E+06	0.	7.17E+04
SB-124	1.29E+04	2.44E+02	3.12E+01	0.	1.00E+04	3.65E+05	0.	5.10E+03
SB-125	1.45E+05	3.08E+04	3.15E+04	1.07E+03	3.48E+06	4.02E+05	0.	2.17E+04
TE127M	5.48E+04	1.89E+04	1.54E+04	2.12E+03	0.	3.16E+05	0.	6.99E+03
TE129M	7.11E+04	1.98E+04	2.30E+04	6.91E+04	0.	8.96E+04	0.	1.10E+04
I--131	4.04E+03	4.14E+03	1.35E+06	2.53E+03	0.	3.54E+02	0.	3.12E+03
I--133	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.
XE135M	1.04E-03	9.55E-04	0.	3.62E-04	1.09E-04	2.24E-05	0.	4.25E-04
XE-135	3.57E-02	3.30E-02	0.	1.25E-02	3.75E-03	7.71E-04	0.	1.47E-02
XE-137	2.03E+02	2.74E+02	0.	3.37E+01	3.21E+01	1.67E+00	0.	4.08E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	8.49E+08	1.09E+09	0.	1.39E+08	1.22E+08	5.91E+06	0.	2.33E+08
CS-136	8.26E+04	3.26E+05	0.	1.81E+05	2.49E+04	3.70E+04	0.	2.35E+05
CS-137	1.06E+09	1.05E+09	0.	1.27E+08	1.21E+08	6.27E+06	0.	1.55E+08
BA-140	1.28E+03	1.13E+00	0.	1.35E-01	6.72E-01	8.79E+01	0.	7.54E+01
CE-141	2.47E+01	1.24E+01	0.	1.93E+00	0.	1.55E+04	0.	1.84E+00
CE-144	1.03E+04	5.23E+03	0.	5.83E+02	0.	8.38E+05	0.	5.49E+02

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - INHALATION AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.85E+01	1.85E+01	8.07E+00	1.85E+01	1.85E+01	0.	1.85E+01
C---14	2.17E+02	1.84E+02	1.84E+02	2.57E+01	1.84E+02	1.84E+02	0.	1.84E+02
P---32	9.94E+03	5.81E+02	0.	0.	0.	6.51E+02	0.	3.78E+02
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.98E+02	0.	7.41E+01	1.03E+04	5.83E+02	0.	4.74E+01
FE--59	8.86E+01	2.09E+03	0.	0.	7.05E+03	1.42E+03	0.	7.95E+01
CO--58	0.	5.06E+00	0.	0.	3.78E+04	5.22E+02	0.	7.23E+00
CO--60	0.	3.62E+01	0.	0.	2.40E+05	1.41E+03	0.	5.05E+01
ZN--65	2.44E+02	7.77E+02	0.	5.19E+02	6.57E+03	4.03E+02	0.	3.51E+02
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	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.
KR--89	0.	0.	0.	0.	0.	0.	0.	0.
KR--90	0.	0.	0.	0.	0.	0.	0.	0.
RB--86	0.	1.02E+03	0.	0.	0.	1.25E+02	0.	4.45E+02
SR--89	1.86E+03	0.	0.	0.	9.96E+04	2.95E+03	0.	5.33E+01
SR--90	5.09E+05	0.	0.	0.	0.57E+05	5.96E+03	0.	3.47E+04
Y---91	2.57E+03	0.	0.	0.	1.13E+05	3.09E+03	0.	6.87E+01
ZR--95	4.06E+02	1.18E+02	0.	4.08E+02	7.77E+04	0.09E+02	0.	8.38E+01
NB--95	5.52E+01	2.48E+01	0.	5.83E+01	2.05E+04	5.22E+02	0.	1.45E+01
RU-103	7.29E+00	0.	0.	4.39E+01	2.43E+04	6.81E+02	0.	2.52E+00
RU-106	4.01E+02	0.	0.	1.01E+03	0.45E+05	7.59E+03	0.	4.92E+01
AG110M	8.13E+01	7.53E+01	0.	1.48E+02	3.49E+04	2.28E+03	0.	4.48E+01
CD115M	0.	1.48E+03	0.	1.19E+03	1.00E+04	2.89E+03	0.	4.79E+01
SN-123	1.34E+03	2.78E+01	2.78E+01	0.	1.55E+05	2.58E+03	0.	4.40E+01
SN-126	9.52E+03	2.52E+02	7.41E+01	0.	7.05E+04	9.58E+02	0.	3.62E+02
SB-124	2.35E+02	4.43E+00	5.09E-01	0.	1.87E+04	3.06E+03	0.	9.34E+01
SB-125	4.98E+02	5.37E+00	4.42E-01	0.	1.00E+04	7.59E+02	0.	1.00E+02
TE127M	9.52E+01	4.23E+01	2.48E+01	3.45E+02	7.23E+03	1.13E+03	0.	1.18E+01
TE129M	5.69E+01	2.49E+01	2.19E+01	2.75E+02	7.89E+04	3.15E+03	0.	0.65E+00
I--131	1.56E+03	1.84E+03	6.09E+05	4.62E+02	0.	4.02E+01	0.	1.06E+05
I--133	5.76E+02	8.31E+02	2.01E+05	1.95E+02	0.	9.82E+01	0.	2.52E+02
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE-135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	0.	0.	0.	0.	0.	0.	0.	0.
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.07E+04	3.55E+04	0.	2.17E+03	4.35E+03	5.90E+01	0.	3.15E+03
CS-136	2.95E+02	1.10E+03	0.	6.45E+02	9.04E+01	8.80E+01	0.	8.38E+02
CS-137	2.95E+04	3.15E+04	0.	1.68E+03	4.07E+03	5.69E+01	0.	1.90E+03
BA-140	2.45E+02	1.84E-01	0.	1.25E-01	7.03E+04	1.67E+02	0.	1.27E+01
CE-141	1.08E+02	6.69E+01	0.	4.72E+01	2.25E+04	8.80E+02	0.	7.77E+00
CE-144	2.01E+04	7.83E+03	0.	6.3	5.40E+03	6.93E+03	0.	1.07E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - GROUND PLANE DEPOSITION — AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE (MREM)							
	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.
P---32	0.	0.	0.	0.	0.	0.	0.	0.
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	4.39E+07	5.14E+07	4.39E+07
FE--59	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	8.73E+06	1.03E+07	8.73E+06
CO--58	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.21E+07	1.41E+07	1.21E+07
CO--60	8.80E+08	8.80E+08	8.80E+08	8.80E+08	8.80E+08	8.80E+08	8.80E+08	8.80E+08
ZN--65	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.36E+07	2.71E+07	2.36E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	0.	0.	0.	0.	0.	0.	0.
KR--88	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	9.90E+03	1.13E+04	9.90E+03
KR--89	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	8.08E+02	9.70E+02	8.08E+02
KR--90	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	6.16E-03	7.29E-03	6.16E-03
RB--86	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	2.86E+05	3.26E+05	2.86E+05
SR--89	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	6.87E+02	7.97E+02	6.87E+02
SR--90	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	1.70E+05	2.01E+05	1.70E+05
Y---91	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.43E+04	3.86E+04	3.43E+04
ZR--95	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.59E+07	1.80E+07	1.59E+07
NB--95	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	4.33E+06	5.09E+06	4.33E+06
RU-103	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	3.49E+06	4.07E+06	3.49E+06
RU-106	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.33E+07	1.59E+07	1.33E+07
AG110M	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.13E+08	1.32E+08	1.13E+08
CD115M	0.	0.	0.	0.	0.	0.	0.	0.
SN-123	0.	0.	0.	0.	0.	0.	4.33E+04	0.
SN-126	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.64E+09	1.83E+09	1.64E+09
SB-124	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	1.90E+07	2.19E+07	1.90E+07
SB-125	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	7.27E+07	8.21E+07	7.27E+07
TE127M	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	2.79E+04	3.09E+04	2.79E+04
TE129M	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.22E+06	1.43E+06	1.22E+06
I--131	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	2.73E+05	3.32E+05	2.73E+05
I--133	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	3.92E+04	4.77E+04	3.92E+04
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.
XE135M	0.	0.	0.	0.	0.	0.	0.	0.
XE--135	0.	0.	0.	0.	0.	0.	0.	0.
XE-137	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	8.69E+01	1.01E+02	8.69E+01
XE-138	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.01E+03	6.87E+03	6.01E+03
CS-134	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.22E+08	2.58E+08	2.22E+08
CS-136	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	4.73E+06	5.30E+06	4.73E+06
CS-137	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.27E+08	3.81E+08	3.27E+08
BA-140	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	5.30E+06	6.02E+06	5.30E+06
CE-141	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.33E+05	4.88E+05	4.33E+05
CE-144	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	3.59E+06	4.15E+06	3.59E+06

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.01E+01	4.01E+01	1.75E+01	4.01E+01	4.01E+01	0.	4.01E+01
C---14	2.08E+04	2.08E+04	2.08E+04	2.40E+03	2.08E+04	2.08E+04	0.	2.08E+04
P---32	5.29E+08	3.32E+07	0.	0.	0.	5.95E+07	0.	2.05E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.12E+05	0.	0.30E+04	0.	0.49E+05	0.	4.04E+04
FE--59	8.04E+05	1.91E+06	0.	0.	5.30E+05	0.30E+06	0.	7.20E+05
CO--58	0.	0.27E+05	0.	0.	0.	1.02E+06	0.	1.54E+06
CO--60	0.	2.05E+06	0.	0.	0.	0.06E+06	0.	4.91E+05
ZN--65	3.93E+07	1.25E+08	0.	8.34E+07	0.	7.85E+07	0.	5.04E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.30E-07	0.	0.	0.	1.54E-08	0.	1.15E-07
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	1.63E+04	0.	0.	0.	0.	3.04E+02	0.	4.67E+02
KR--90	1.48E+02	0.	0.	0.	0.	1.44E+00	0.	3.77E+01
RB--86	0.	7.61E+07	0.	0.	0.	1.50E+07	0.	3.55E+07
SR--89	3.70E+08	0.	0.	0.	0.	0.92E+06	0.	1.06E+07
SR--90	4.07E+09	0.	0.	0.	0.	3.96E+07	0.	1.04E+09
Y---91	2.02E+03	0.	0.	0.	0.	1.34E+05	0.	5.38E+01
ZR--95	3.87E+03	1.70E+03	0.	3.39E+02	0.	1.35E+06	0.	1.01E+05
NB--95	1.42E+04	6.40E+03	0.	1.26E+03	0.	5.12E+06	0.	3.77E+05
RU-103	2.13E+02	0.	0.	1.07E+02	0.	2.66E+03	0.	7.34E+01
RU-106	4.79E+03	0.	0.	1.00E+03	0.	3.72E+04	0.	5.88E+02
AG110M	1.54E+06	1.42E+06	0.	2.80E+06	0.	5.81E+08	0.	8.40E+05
CD115M	0.	3.45E+04	0.	2.74E+04	0.	1.45E+06	0.	1.10E+03
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	4.06E+07	8.05E+05	2.36E+05	0.	1.05E+05	2.56E+07	0.	1.21E+05
SB-124	6.84E+05	1.29E+04	1.65E+03	0.	5.31E+05	1.94E+07	0.	2.70E+05
SB-125	2.46E+06	6.25E+05	6.05E+05	8.23E+05	0.02E+07	0.48E+06	0.	3.72E+05
TE127M	1.62E+06	5.62E+05	5.22E+05	5.84E+05	0.	9.44E+06	0.	2.16E+05
TE129M	1.05E+07	5.06E+06	6.19E+06	7.55E+06	0.	9.92E+06	0.	2.51E+05
I--131	3.77E+07	4.49E+07	1.45E+10	1.13E+07	0.	1.09E+06	0.	2.63E+07
I--133	5.55E+05	8.11E+05	1.92E+08	1.91E+05	0.	1.44E+05	0.	2.40E+05
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.
XE135M	0.83E-04	0.31E-04	0.	2.39E-04	7.18E-05	1.48E-05	0.	2.80E-04
XE-135	2.36E-02	2.18E-02	0.	8.25E-03	2.48E-03	5.10E-04	0.	9.60E-03
XE-137	4.11E+02	4.06E+02	0.	2.33E+01	5.54E+01	1.19E+00	0.	2.64E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.03E+09	1.86E+09	0.	1.08E+08	2.15E+08	4.43E+06	0.	1.57E+08
CS-136	7.80E+06	3.10E+07	0.	1.73E+07	2.37E+06	3.53E+06	0.	2.23E+07
CS-137	1.54E+09	1.73E+09	0.	8.77E+07	2.00E+08	4.47E+06	0.	9.92E+07
BA-140	0.34E+06	6.98E+03	0.	3.40E+02	4.27E+03	2.30E+05	0.	3.59E+03
CE-141	6.89E+03	4.23E+03	0.	2.53E+02	0.	2.05E+06	0.	4.90E+02
CE-144	4.92E+05	1.94E+05	0.	1.33	0.	2.03E+07	0.	2.02E+04

DOSE FACTORS F[illegible]SEOUS DISCHARGES

BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE [illegible]ONLY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

PATHWAY - COWS MILK (CONTAMINATED FEED)

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H-----3	0.	3.96E+01	3.96E+01	1.73E+01	3.96E+01	3.96E+01	0.	3.96E+01
C---14	2.08E+04	2.08E+04	2.08E+04	2.45E+03	2.08E+04	2.08E+04	0.	2.08E+04
P---32	2.81E+06	1.76E+05	0.	0.	0.	3.16E+05	0.	1.09E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	8.00E+04	0.	2.38E+04	0.	2.45E+05	0.	1.55E+04
FE--59	8.61E+04	2.04E+05	0.	0.	2.68E+04	6.75E+05	0.	7.78E+04
CO--58	0.	1.14E+05	0.	0.	0.	2.96E+05	0.	2.86E+05
CO--60	0.	9.35E+05	0.	0.	0.	2.31E+06	0.	2.24E+05
ZN--65	1.59E+07	5.04E+07	0.	3.37E+07	0.	3.17E+07	0.	2.28E+07
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.26E-07	0.	0.	0.	1.06E-08	0.	7.87E-08
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	2.05E+03	0.	0.	0.	0.	3.83E+01	0.	5.89E+01
KR--90	7.34E+01	0.	0.	0.	0.	7.14E-01	0.	1.87E+01
RB--86	0.	1.10E+06	0.	0.	0.	2.17E+05	0.	5.13E+05
SR--89	4.66E+07	0.	0.	0.	0.	8.72E+05	0.	1.34E+06
SR--90	2.02E+09	0.	0.	0.	0.	1.97E+07	0.	5.15E+08
Y---91	3.05E+02	0.	0.	0.	0.	2.62E+04	0.	8.13E+00
ZR--95	3.63E+03	1.63E+03	0.	3.19E+02	0.	1.30E+06	0.	9.58E+02
NB--95	1.01E+03	4.55E+02	0.	8.91E+01	0.	3.64E+05	0.	2.68E+02
RU-103	1.92E+01	0.	0.	9.61E+00	0.	2.39E+02	0.	8.59E+00
RU-105	1.90E+03	0.	0.	3.97E+02	0.	1.47E+04	0.	2.33E+02
AG110M	5.65E+05	5.41E+05	0.	1.06E+06	0.	2.21E+08	0.	3.22E+05
CD115M	0.	3.56E+03	0.	2.83E+03	0.	1.50E+05	0.	1.14E+02
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	1.91E+07	3.78E+05	1.11E+05	0.	1.01E+05	1.89E+07	0.	5.97E+05
SB-124	1.06E+05	1.99E+03	2.56E+02	0.	8.20E+04	2.99E+06	0.	4.16E+04
SB-125	2.24E+06	6.05E+05	6.46E+05	8.81E+05	2.90E+07	3.40E+06	0.	3.18E+05
TE127M	4.83E+05	1.08E+05	1.56E+05	1.75E+06	0.	2.83E+06	0.	6.45E+04
TE129M	1.22E+06	4.19E+05	4.59E+05	5.59E+05	0.	7.35E+05	0.	1.80E+05
I--131	6.20E+03	7.38E+03	2.38E+06	1.85E+03	0.	2.78E+02	0.	4.32E+03
I--133	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.
XE135M	3.45E-04	3.19E-04	0.	1.21E-04	3.63E-05	7.45E-06	0.	1.42E-04
XE-135	1.19E-02	1.10E-02	0.	4.16E-03	1.25E-03	2.57E-04	0.	4.80E-03
XE-137	1.98E+02	2.21E+02	0.	1.12E+01	2.07E+01	5.72E-01	0.	1.27E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	4.42E+08	7.95E+08	0.	4.63E+07	9.09E+07	1.89E+06	0.	6.75E+07
CS-136	2.54E+04	1.60E+05	0.	5.58E+04	7.65E+03	1.14E+04	0.	7.22E+04
CS-137	7.42E+08	8.31E+08	0.	4.22E+07	1.00E+08	2.15E+06	0.	4.77E+07
BA-140	2.08E+04	2.09E+01	0.	1.04E+00	1.28E+01	7.08E+02	0.	1.07E+03
CE-141	4.25E+02	2.61E+02	0.	1.53E+01	0.	1.26E+05	0.	3.05E+01
CE-144	1.80E+05	7.08E+04	0.	4.84E+03	0.	7.40E+06	0.	9.68E+03

DOSE FACTORS FOR GASEOUS DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	8.19E+01	8.19E+01	3.58E+01	8.19E+01	8.19E+01	0.	8.19E+01
C---14	2.08E+04	2.08E+04	2.08E+04	2.40E+03	2.08E+04	2.08E+04	0.	2.08E+04
P---32	6.83E+08	4.28E+07	0.	0.	0.	7.08E+07	0.	2.64E+07
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	2.55E+04	0.	7.59E+03	0.	7.81E+04	0.	4.87E+03
FE--59	1.07E+04	2.54E+04	0.	0.	7.05E+03	8.38E+04	0.	9.60E+03
CO--58	0.	7.64E+04	0.	0.	0.	1.98E+05	0.	1.87E+05
CO--60	0.	2.46E+05	0.	0.	0.	6.08E+05	0.	5.89E+05
ZN--65	4.73E+06	1.50E+07	0.	1.01E+07	0.	9.46E+06	0.	6.80E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	3.90E-08	0.	0.	0.	1.85E-09	0.	1.38E-08
KR--88	0.	4.00E-10	0.	0.	0.	0.	0.	2.12E-10
KR--89	3.49E+04	0.	0.	0.	0.	0.52E+02	0.	1.00E+03
KR--90	3.11E+02	0.	0.	0.	0.	3.01E+00	0.	7.92E+01
RB--86	0.	9.66E+06	0.	0.	0.	1.90E+06	0.	4.50E+05
SR--89	7.94E+08	0.	0.	0.	0.	1.48E+07	0.	2.28E+07
SR--90	8.56E+09	0.	0.	0.	0.	8.28E+07	0.	2.10E+09
Y---91	2.47E+02	0.	0.	0.	0.	1.03E+04	0.	6.58E+00
ZR--95	4.20E+02	1.85E+02	0.	3.07E+01	0.	1.40E+05	0.	1.10E+02
NB--95	1.76E+03	7.92E+02	0.	1.55E+02	0.	6.33E+05	0.	4.65E+02
RU-103	2.63E+01	0.	0.	1.32E+01	0.	3.28E+02	0.	9.04E+00
RU-106	5.76E+02	0.	0.	1.21E+02	0.	4.47E+03	0.	7.08E+01
AG110M	1.85E+05	1.72E+05	0.	3.37E+05	0.	7.00E+07	0.	1.06E+05
CD115M	0.	4.25E+03	0.	3.57E+03	0.	1.79E+05	0.	1.36E+02
SN-123	1.54E-01	2.39E-03	2.39E-03	0.	0.	3.81E-02	0.	3.79E-03
SN-126	4.87E+06	9.06E+04	2.83E+04	0.	1.10E+04	2.94E+06	0.	1.42E+05
SB-124	8.35E+04	1.58E+03	2.02E+02	0.	6.48E+04	2.30E+06	0.	3.30E+04
SB-125	2.98E+05	7.56E+04	7.32E+04	9.95E+04	7.96E+06	7.80E+05	0.	4.49E+04
TE127M	1.96E+05	6.80E+04	6.31E+04	7.08E+05	0.	1.14E+06	0.	2.01E+04
TE129M	2.04E+06	7.00E+05	7.67E+05	9.34E+05	0.	1.23E+06	0.	5.10E+05
I--131	5.15E+07	6.13E+07	1.97E+10	1.56E+07	0.	2.31E+06	0.	3.59E+07
I--133	2.19E+06	3.19E+06	7.55E+08	7.51E+05	0.	5.07E+05	0.	9.68E+05
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.
XE135M	2.05E-03	1.89E-03	0.	7.17E-04	2.10E-04	4.43E-05	0.	8.41E-04
XE-135	7.08E-02	6.54E-02	0.	2.48E-02	7.44E-03	1.53E-03	0.	2.90E-02
XE-137	1.23E+03	1.38E+03	0.	7.00E+01	1.60E+02	3.57E+00	0.	7.92E+01
XE-138	7.56E-05	1.49E-04	0.	1.10E-04	1.03E-05	6.37E-10	0.	7.41E-05
CS-134	3.11E+09	5.59E+09	0.	3.29E+08	6.39E+08	1.33E+07	0.	4.73E+08
CS-136	2.55E+07	1.01E+08	0.	5.61E+07	7.09E+06	1.15E+07	0.	7.25E+07
CS-137	4.03E+09	5.18E+09	0.	2.63E+08	6.25E+06	1.34E+07	0.	2.38E+08
BA-140	9.03E+05	9.09E+02	0.	4.91E+01	5.56E+02	2.93E+04	0.	4.07E+04
CE-141	8.54E+02	5.24E+02	0.	3.14E+01	0.	2.54E+05	0.	6.14E+01
CE-144	5.92E+04	2.34E+04	0.	1.0	0.	2.44E+06	0.	3.19E+03

DOSE FACTORS FOR SEQUOYAH DISCHARGES
BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE AND A VALUE OF UNITY FOR X/Q, DEPLETED X/Q AND RELATIVE DEPOSITION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	8.08E+01	8.08E+01	3.53E+01	8.08E+01	8.08E+01	0.	8.08E+01
C---14	2.08E+04	2.08E+04	2.08E+04	2.46E+03	2.08E+04	2.08E+04	0.	2.08E+04
P---32	3.62E+06	2.27E+05	0.	0.	0.	4.07E+05	0.	1.40E+05
AR--41	0.	0.	0.	0.	0.	0.	0.	0.
MN--54	0.	9.63E+03	0.	2.87E+03	0.	2.95E+04	0.	1.84E+03
FE--59	1.15E+03	2.72E+03	0.	0.	7.55E+02	8.98E+03	0.	1.04E+03
CO--58	0.	1.39E+04	0.	0.	0.	3.01E+04	0.	3.41E+04
CO--60	0.	1.12E+05	0.	0.	0.	2.77E+05	0.	2.69E+05
ZN--65	1.91E+06	6.07E+06	0.	4.06E+06	0.	3.82E+06	0.	2.75E+06
KR-83M	0.	0.	0.	0.	0.	0.	0.	0.
KR-85M	0.	0.	0.	0.	0.	0.	0.	0.
KR--85	0.	0.	0.	0.	0.	0.	0.	0.
KR--87	0.	2.72E-08	0.	0.	0.	1.27E-09	0.	9.45E-09
KR--88	0.	0.	0.	0.	0.	0.	0.	0.
KR--89	4.39E+03	0.	0.	0.	0.	8.21E+01	0.	1.20E+02
KR--90	1.54E+02	0.	0.	0.	0.	1.49E+00	0.	3.93E+01
RB--86	0.	1.40E+05	0.	0.	0.	2.75E+04	0.	6.51E+04
SR--89	9.99E+07	0.	0.	0.	0.	1.87E+06	0.	2.87E+05
SR--90	4.24E+09	0.	0.	0.	0.	4.11E+07	0.	1.08E+09
Y---91	3.73E+01	0.	0.	0.	0.	2.47E+03	0.	9.95E-01
ZR--95	4.39E+02	1.97E+02	0.	3.87E+01	0.	1.57E+05	0.	1.16E+02
NB--95	1.25E+02	5.02E+01	0.	1.10E+01	0.	4.50E+04	0.	3.31E+01
RU-103	2.36E+00	0.	0.	1.18E+00	0.	2.95E+01	0.	8.12E-01
RU-106	2.28E+02	0.	0.	4.78E+01	0.	1.77E+03	0.	2.80E+01
AG110M	7.05E+04	6.52E+04	0.	1.28E+05	0.	2.60E+07	0.	3.68E+04
CD115M	0.	4.38E+02	0.	3.47E+02	0.	1.84E+04	0.	1.40E+01
SN-123	0.	0.	0.	0.	0.	0.	0.	0.
SN-126	2.28E+06	4.54E+04	1.33E+04	0.	1.22E+04	2.28E+06	0.	7.17E+04
SB-124	1.29E+04	2.44E+02	3.12E+01	0.	1.00E+04	3.65E+05	0.	5.10E+03
SB-125	2.72E+05	8.09E+04	7.87E+04	1.07E+05	3.48E+06	4.09E+05	0.	3.80E+04
TE127M	5.86E+04	2.04E+04	1.89E+04	2.12E+05	0.	3.42E+05	0.	7.82E+03
TE129M	1.51E+05	5.18E+04	5.73E+04	6.91E+04	0.	9.09E+04	0.	2.30E+04
I--131	8.47E+03	1.01E+04	3.25E+06	2.53E+03	0.	3.79E+02	0.	5.90E+03
I--133	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.
XE135M	1.04E-03	9.55E-04	0.	3.62E-04	1.03E-04	2.24E-05	0.	4.25E-04
XE-135	3.57E-02	3.30E-02	0.	1.25E-02	3.75E-03	7.71E-04	0.	1.47E-02
XE-137	5.93E+02	5.63E+02	0.	3.37E+01	8.00E+01	1.72E+00	0.	3.81E+01
XE-138	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.33E+09	2.39E+09	0.	1.39E+08	2.73E+08	5.68E+06	0.	2.02E+08
CS-136	8.26E+04	3.20E+05	0.	1.01E+05	2.49E+04	3.70E+04	0.	2.35E+05
CS-137	2.23E+09	2.49E+09	0.	1.27E+08	3.00E+08	6.44E+06	0.	1.43E+08
BA-140	2.71E+03	2.72E+00	0.	1.32E-01	1.00E+00	9.22E+01	0.	1.40E+02
CE-141	5.20E+01	3.23E+01	0.	1.93E+00	0.	1.57E+04	0.	3.78E+00
CE-144	2.16E+04	8.53E+03	0.	5.83E+02	0.	8.91E+05	0.	1.17E+03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - POTABLE WATER AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	4.92E+01	4.92E+01	4.92E+01	4.92E+01	4.92E+01	0.	4.92E+01
P---32	6.91E+04	4.33E+03	0.	0.	0.	7.77E+03	0.	2.08E+03
CR--51	0.	0.	5.76E-01	2.13E-01	1.28E+00	2.42E+02	0.	9.64E-01
MN--54	0.	1.68E+03	0.	4.98E+02	0.	5.13E+03	0.	3.20E+02
FE--55	2.27E+03	1.02E+04	0.	0.	1.19E+04	4.00E+03	0.	2.69E+03
FE--59	1.58E+03	3.75E+03	0.	0.	1.04E+03	1.24E+04	0.	1.43E+03
CO--58	0.	2.72E+02	0.	0.	0.	5.51E+03	0.	6.10E+02
CO--60	0.	7.89E+02	0.	0.	0.	1.48E+04	0.	1.73E+03
ZN--65	1.78E+03	5.64E+03	0.	3.77E+03	0.	3.55E+03	0.	2.55E+03
RB--86	0.	7.60E+03	0.	0.	0.	1.50E+03	0.	3.54E+03
SR--89	1.13E+05	0.	0.	0.	0.	1.80E+04	0.	3.23E+03
SR--90	2.79E+06	0.	0.	0.	0.	4.20E+04	0.	6.82E+05
Y---91	5.14E+01	0.	0.	0.	0.	2.63E+04	0.	1.38E+00
ZR--95	1.11E+01	3.57E+00	0.	5.63E+00	0.	1.12E+04	0.	2.41E+00
ZR--97	3.91E-01	7.95E-02	0.	1.19E-01	0.	2.36E+04	0.	3.65E-02
NB--95	2.26E+00	1.26E+00	0.	1.23E+00	0.	7.63E+03	0.	4.96E-01
MO--99	5.67E-02	1.40E+03	0.	3.17E+03	7.86E-02	3.33E+03	0.	2.66E+02
RU-103	6.73E+01	0.	0.	2.57E+02	0.	7.86E+03	0.	2.90E+01
RU-106	1.01E+03	0.	0.	1.95E+03	0.	6.53E+04	0.	1.28E+02
AG110M	5.86E+01	5.42E+01	0.	1.07E+02	0.	2.21E+04	0.	3.22E+01
SB-124	1.03E+03	1.93E+01	2.48E+00	0.	7.95E+02	2.90E+04	0.	4.05E+02
SB-125	8.19E+02	9.25E+00	1.10E+00	5.00E+00	8.55E+04	7.23E+03	0.	1.04E+02
TE125M	9.77E+02	3.55E+02	2.94E+02	3.98E+03	0.	3.90E+03	0.	1.31E+02
TE127M	2.50E+03	8.75E+02	6.50E+02	1.02E+04	0.	1.02E+04	0.	3.07E+02
TE129M	4.19E+03	1.56E+03	1.45E+03	1.74E+04	0.	2.10E+04	0.	6.66E+02
TE131M	5.34E+02	3.13E+02	2.64E+04	2.50E+03	0.	2.31E+04	0.	2.40E+02
TE-132	8.41E+03	7.20E+02	2.42E+04	5.50E+03	0.	2.54E+04	0.	5.69E+02
I--131	1.46E+03	2.10E+03	6.85E+05	3.59E+03	0.	5.52E+02	0.	1.20E+03
I--133	3.53E+02	6.12E+02	1.10E+05	1.07E+03	0.	5.30E+02	0.	1.87E+02
CS-134	2.28E+04	5.43E+04	0.	1.76E+04	5.83E+03	9.50E+02	0.	4.44E+04
CS-136	2.33E+03	9.10E+03	0.	5.11E+03	7.00E+02	1.04E+03	0.	6.61E+03
CS-137	2.93E+04	4.00E+04	0.	1.36E+04	4.51E+03	7.71E+02	0.	2.62E+04
BA-140	7.25E+03	9.20E+00	0.	3.10E+00	5.21E+00	2.12E+04	0.	4.79E+02
LA-140	7.46E-01	3.76E-01	0.	0.	0.	2.70E+04	0.	9.96E-04
CE-141	3.40E+00	2.30E+00	0.	1.07E+00	0.	8.79E+03	0.	2.61E-01
CE-143	5.46E+01	3.48E+02	0.	1.70E-01	0.	1.33E+04	0.	4.22E-02
CE-144	1.79E+02	7.48E+01	0.	4.43E+01	0.	6.05E+04	0.	9.60E+00
NP-239	3.90E-01	3.88E-02	0.	1.17E-01	0.	7.60E+03	0.	2.07E-02

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - FRESH WATER FISH

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.27E+00	1.27E+00	1.27E+00	1.27E+00	1.27E+00	0.	1.27E+00
P---32	1.94E+08	1.22E+07	0.	0.	0.	2.18E+07	0.	7.51E+06
CR--51	0.	0.	3.27E+00	1.21E+00	7.27E+00	1.38E+03	0.	5.48E+03
MN--54	0.	1.93E+04	0.	5.73E+03	0.	5.90E+04	0.	3.60E+03
FE--55	6.54E+03	2.94E+04	0.	0.	3.41E+04	1.15E+04	0.	7.73E+03
FE--59	4.51E+03	1.07E+04	0.	0.	2.97E+03	3.53E+04	0.	4.07E+03
CO--58	0.	3.90E+02	0.	0.	0.	7.89E+03	0.	8.73E+02
CO--60	0.	1.13E+03	0.	0.	0.	2.12E+04	0.	2.49E+03
ZN--65	1.02E+05	3.24E+05	0.	2.17E+05	0.	2.04E+05	0.	1.47E+05
RB--86	0.	4.29E+05	0.	0.	0.	8.46E+04	0.	2.00E+05
SR--89	9.65E+04	0.	0.	0.	0.	1.54E+04	0.	2.76E+03
SR--90	2.41E+06	0.	0.	0.	0.	3.84E+04	0.	5.89E+05
Y---91	3.68E+01	0.	0.	0.	0.	2.02E+04	0.	9.80E-01
ZR--95	3.89E+01	2.13E+01	0.	2.13E+01	0.	1.28E+05	0.	8.48E+00
ZR--97	6.72E+00	1.69E+00	0.	1.98E+00	0.	7.62E+03	0.	6.20E-01
NB--95	1.93E+03	1.07E+03	0.	1.07E+03	0.	6.52E+06	0.	4.22E+02
MO--99	2.77E-02	3.55E+02	0.	8.06E+02	3.84E-02	8.69E+02	0.	6.85E+01
RU-103	1.92E+01	0.	0.	7.33E+01	0.	2.24E+03	0.	8.28E+00
RU-106	2.90E+02	0.	0.	5.61E+02	0.	1.88E+04	0.	3.67E+01
AG110M	3.87E+00	3.58E+00	0.	7.05E+00	0.	1.46E+03	0.	2.13E+00
SB-124	2.93E+01	5.53E-01	7.09E-02	0.	2.28E+01	8.30E+02	0.	1.16E+01
SB-125	5.17E+01	1.05E+01	8.52E+00	1.15E+02	2.46E+03	3.21E+02	0.	8.51E+00
TE125M	1.12E+04	4.06E+03	3.37E+03	4.53E+04	0.	4.40E+04	0.	1.50E+03
TE127M	2.88E+04	1.01E+04	7.54E+03	1.17E+05	0.	1.25E+05	0.	3.54E+03
TE129M	4.77E+04	1.78E+04	1.64E+04	2.06E+05	0.	2.40E+05	0.	7.50E+03
TE131M	4.17E+03	2.07E+03	2.24E+04	2.04E+04	0.	1.99E+05	0.	1.71E+03
TE-132	8.63E+04	5.66E+03	1.56E+04	5.40E+04	0.	2.63E+05	0.	5.25E+03
I--131	6.04E+02	8.66E+02	2.83E+05	1.48E+03	0.	2.28E+02	0.	4.95E+02
I--133	1.03E+02	1.78E+02	3.42E+04	3.11E+02	0.	1.56E+02	0.	5.43E+01
CS-134	1.31E+06	3.12E+06	0.	1.01E+06	3.35E+05	5.40E+04	0.	2.55E+05
CS-136	1.30E+05	5.14E+05	0.	2.86E+05	3.92E+04	5.84E+04	0.	3.70E+05
CS-137	1.68E+06	2.30E+06	0.	7.83E+05	2.63E+05	4.43E+04	0.	1.51E+05
BA-140	8.12E+02	1.13E+00	0.	3.47E-01	5.84E-01	9.71E+03	0.	5.30E+01
LA-140	4.36E-01	2.20E-01	0.	0.	0.	1.61E+04	0.	5.83E-02
CE-141	9.08E-02	6.55E-02	0.	3.04E-02	0.	2.50E+02	0.	7.42E-03
CE-143	1.05E-01	7.82E+00	0.	2.51E-02	0.	7.02E+02	0.	5.52E-03
CE-144	5.16E+00	2.15E+00	0.	1.27E+00	0.	1.74E+03	0.	2.70E-01
NP-239	9.62E-02	9.53E-03	0.	2.89E-02	0.	1.89E+03	0.	5.13E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - FRESH FRUITS AND VEGETABLES

AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	1.71E+04	1.07E+03	0.	0.	0.	1.92E+03	0.	6.61E+02
CR--51	0.	0.	1.75E-01	6.46E-02	3.88E-01	7.36E+01	0.	2.93E-01
MN--54	0.	7.32E+02	0.	2.18E+02	0.	2.24E+03	0.	1.40E+02
FE--55	9.96E+02	4.48E+03	0.	0.	5.19E+03	1.75E+03	0.	1.18E+03
FE--59	5.48E+02	1.30E+03	0.	0.	3.01E+02	4.29E+03	0.	4.95E+02
CO--58	0.	1.03E+02	0.	0.	0.	2.09E+03	0.	2.31E+02
CO--60	0.	3.61E+02	0.	0.	0.	6.75E+03	0.	7.93E+02
ZN--65	9.42E+02	2.99E+03	0.	2.00E+03	0.	1.89E+03	0.	1.35E+03
RB--86	0.	2.00E+03	0.	0.	0.	3.95E+02	0.	9.34E+02
SR--89	4.01E+04	0.	0.	0.	0.	6.42E+03	0.	1.15E+03
SR--90	1.41E+06	0.	0.	0.	0.	3.30E+04	0.	3.44E+05
Y---91	1.88E+01	0.	0.	0.	0.	1.04E+04	0.	5.05E-01
ZR--95	4.37E+00	1.46E+00	0.	2.22E+00	0.	4.92E+03	0.	9.50E-01
ZR--97	5.40E-03	1.09E-03	0.	1.64E-03	0.	3.26E+02	0.	5.00E-04
NB--95	7.37E-01	4.10E-01	0.	4.05E-01	0.	2.49E+03	0.	1.61E-01
MO--99	5.44E-03	9.03E+01	0.	2.18E+02	7.53E-03	2.32E+02	0.	1.85E+01
RU-103	2.28E+01	0.	0.	8.73E+01	0.	2.67E+03	0.	9.85E+00
RU-106	4.53E+02	0.	0.	8.77E+02	0.	2.93E+04	0.	5.73E+01
AG110M	2.74E+01	2.53E+01	0.	4.98E+01	0.	1.03E+04	0.	1.51E+01
SB-124	3.77E+02	7.12E+00	9.12E-01	0.	2.93E+02	1.07E+04	0.	1.49E+02
SB-125	6.73E+02	1.15E+02	9.20E+01	1.24E+03	3.85E+04	4.47E+03	0.	1.13E+02
TE125M	4.38E+02	1.59E+02	1.32E+02	1.78E+03	0.	1.75E+03	0.	5.87E+01
TE127M	1.38E+03	4.83E+02	3.63E+02	5.61E+03	0.	6.26E+03	0.	1.71E+02
TE129M	1.55E+03	5.82E+02	5.36E+02	6.50E+03	0.	7.81E+03	0.	2.47E+02
TE131M	5.03E+01	5.89E+01	1.70E+04	1.58E+02	0.	6.82E+02	0.	3.54E+01
TE-132	7.01E+02	5.97E+01	1.98E+03	4.58E+02	0.	2.12E+03	0.	4.73E+01
I--131	2.39E+02	3.43E+02	1.12E+05	5.87E+02	0.	9.03E+01	0.	1.90E+02
I--133	6.54E+00	1.13E+01	2.18E+03	1.98E+01	0.	9.97E+00	0.	3.40E+01
CS-134	1.02E+04	2.42E+04	0.	7.84E+03	2.60E+03	4.23E+02	0.	1.98E+04
CS-136	5.09E+02	2.01E+03	0.	1.12E+03	1.53E+02	2.28E+02	0.	1.45E+03
CS-137	1.40E+04	1.91E+04	0.	6.52E+03	2.16E+03	3.69E+02	0.	1.23E+04
BA-140	1.57E+03	2.07E+00	0.	6.73E-01	1.13E+00	1.02E+04	0.	1.04E+02
LA-140	3.03E-02	1.53E-02	0.	0.	0.	1.12E+03	0.	4.05E-03
CE-141	1.08E+00	7.34E-01	0.	3.40E-01	0.	2.80E+03	0.	8.31E-02
CE-143	8.85E-02	1.13E+01	0.	2.19E-02	0.	7.43E+02	0.	4.88E-03
CE-144	7.64E+01	3.19E+01	0.	1.89E+01	0.	2.58E+04	0.	4.09E+00
NP-239	5.10E-02	6.14E-03	0.	9.74E-03	0.	4.41E+02	0.	1.91E-03

DOSE FACTOR FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITION DILUTION

PATHWAY - STORED FRUITS AND VEGETABLES AGE GROUP - ADULT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	7.95E+03	4.98E+02	0.	0.	0.	8.93E+02	0.	3.08E+02
CR--51	0.	0.	3.26E-01	1.21E-01	7.23E-01	1.37E+02	0.	5.40E-01
MN--54	0.	5.22E+03	0.	1.55E+03	0.	1.60E+04	0.	9.96E+02
FE--55	7.73E+03	3.48E+04	0.	0.	4.03E+04	1.36E+04	0.	9.13E+03
FE--59	1.79E+03	4.26E+03	0.	0.	1.18E+03	1.41E+04	0.	1.62E+03
CO--58	0.	4.71E+02	0.	0.	0.	9.53E+03	0.	1.05E+03
CO--60	0.	2.87E+03	0.	0.	0.	5.37E+04	0.	6.31E+03
ZN--65	6.47E+03	2.06E+04	0.	1.37E+04	0.	1.29E+04	0.	9.30E+03
RB--86	0.	1.83E+03	0.	0.	0.	3.60E+02	0.	8.52E+02
SR--89	1.45E+05	0.	0.	0.	0.	2.32E+04	0.	4.15E+03
SR--90	1.14E+07	0.	0.	0.	0.	2.89E+05	0.	2.78E+06
Y---91	7.65E+01	0.	0.	0.	0.	4.21E+04	0.	2.05E+00
ZR--95	2.18E+01	7.92E+00	0.	1.12E+01	0.	3.10E+04	0.	4.75E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	1.86E+00	1.03E+00	0.	1.03E+00	0.	6.28E+03	0.	4.07E-01
MO--99	2.05E-05	3.70E-04	0.	1.15E-03	2.60E-06	1.81E-03	0.	9.14E-04
RU-103	6.67E+01	0.	0.	2.55E+02	0.	7.79E+03	0.	2.68E+01
RU-106	3.29E+03	0.	0.	6.37E+03	0.	2.13E+05	0.	4.17E+02
AG110M	1.90E+02	1.70E+02	0.	3.46E+02	0.	7.18E+04	0.	1.05E+02
SB-124	1.55E+03	2.93E+01	3.76E+00	0.	1.21E+03	4.40E+04	0.	6.14E+02
SB-125	5.61E+03	1.03E+03	8.29E+02	1.12E+04	3.00E+05	3.63E+04	0.	9.44E+02
TE125M	1.76E+03	6.39E+02	5.30E+02	7.16E+03	0.	7.02E+03	0.	2.36E+02
TE127M	7.60E+03	2.66E+03	2.00E+03	3.09E+04	0.	3.46E+04	0.	9.38E+02
TE129M	3.80E+03	1.42E+03	1.31E+03	1.58E+04	0.	1.91E+04	0.	6.02E+02
TE131M	2.12E+00	3.03E+00	9.93E+02	5.19E+00	0.	7.99E-01	0.	1.74E+00
TE-132	1.96E-02	1.67E-03	5.50E-02	1.28E-02	0.	5.92E-02	0.	1.32E-03
I--131	1.21E+01	1.73E+01	5.67E+03	2.96E+01	0.	4.56E+00	0.	9.91E+00
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	7.82E+04	1.86E+05	0.	6.04E+04	2.00E+04	3.26E+03	0.	1.52E+03
CS-136	1.78E+02	7.03E+02	0.	3.91E+02	5.36E+01	7.98E+01	0.	3.06E+02
CS-137	1.14E+05	1.55E+05	0.	5.28E+04	1.75E+04	2.99E+03	0.	1.02E+03
BA-140	5.24E+02	6.95E-01	0.	2.24E-01	3.77E-01	3.82E+03	0.	3.46E+01
LA-140	0.	0.	0.	0.	0.	2.27E-07	0.	0.
CE-141	2.50E+00	1.69E+00	0.	7.85E-01	0.	9.46E+03	0.	1.92E-01
CE-143	3.39E-02	1.36E-02	0.	7.85E-03	0.	1.49E+02	0.	1.68E-03
CE-144	5.38E+02	2.24E+02	0.	1.33E+02	0.	1.81E+05	0.	2.88E+01
NP-239	2.66E-01	3.63E-02	0.	2.78E-02	0.	2.34E-02	0.	6.57E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.25E+01	1.25E+01	1.25E+01	1.25E+01	1.25E+01	0.	1.25E+01
P---32	4.09E+04	2.57E+03	0.	0.	0.	4.60E+03	0.	1.59E+03
CR--51	0.	0.	3.11E-02	1.15E-02	6.91E-02	1.31E+01	0.	5.21E-02
MN--54	0.	1.06E+01	0.	3.16E+00	0.	5.20E+01	0.	2.03E+00
FE--55	6.94E+01	3.13E+02	0.	0.	3.62E+02	1.22E+02	0.	8.21E+01
FE--59	4.72E+01	1.12E+02	0.	0.	3.11E+01	3.70E+02	0.	4.20E+01
CO--58	0.	6.84E+00	0.	0.	0.	1.38E+02	0.	1.53E+01
CO--60	0.	2.01E+01	0.	0.	0.	3.70E+02	0.	4.41E+01
ZN--65	1.76E+03	5.58E+03	0.	3.73E+03	0.	3.52E+03	0.	2.53E+03
RB--86	0.	5.50E+03	0.	0.	0.	1.08E+03	0.	2.50E+03
SR--89	2.25E+03	0.	0.	0.	0.	5.60E+02	0.	6.44E+01
SR--90	5.69E+04	0.	0.	0.	0.	7.67E+02	0.	1.39E+04
Y---91	1.29E-02	0.	0.	0.	0.	7.09E+00	0.	3.45E-04
ZR--95	6.89E-03	3.51E-03	0.	3.74E-03	0.	1.99E+01	0.	1.30E-03
ZR--97	1.97E-04	4.91E-05	0.	5.82E-05	0.	8.66E-01	0.	1.81E-05
NB--95	1.40E-01	7.77E-02	0.	7.71E-02	0.	4.72E+02	0.	3.00E-02
MO--99	3.45E-02	1.84E+02	0.	4.18E+02	4.78E-02	4.84E+02	0.	3.62E+01
RU-103	1.67E-03	0.	0.	6.38E-03	0.	1.95E-01	0.	7.21E-04
RU-106	2.56E-02	0.	0.	4.96E-02	0.	1.66E+00	0.	3.24E-03
AG110M	7.44E+01	6.88E+01	0.	1.35E+02	0.	2.81E+04	0.	4.09E+01
SB-124	3.85E+01	7.20E-01	9.31E-02	0.	2.99E+01	1.09E+03	0.	1.52E+01
SB-125	3.13E+01	3.81E-01	6.51E-02	5.05E-01	3.20E+03	2.76E+02	0.	6.29E+00
TE125M	2.45E+01	8.88E+00	7.37E+00	9.95E+01	0.	9.77E+01	0.	3.28E+00
TE127M	6.36E+01	2.23E+01	1.67E+01	2.58E+02	0.	2.80E+02	0.	7.83E+00
TE129M	1.03E+02	3.87E+01	3.57E+01	4.32E+02	0.	5.20E+02	0.	1.04E+01
TE131M	2.66E+01	3.33E+01	1.01E+04	7.81E+01	0.	2.55E+02	0.	1.97E+01
TE-132	1.62E+02	3.05E+01	2.71E+03	1.29E+02	0.	4.75E+02	0.	1.66E+01
I--131	1.96E+02	2.81E+02	9.21E+04	4.82E+02	0.	7.41E+01	0.	1.61E+02
I--133	1.65E+01	2.85E+01	5.49E+03	4.98E+01	0.	2.51E+01	0.	8.71E+00
CS-134	6.97E+03	1.66E+04	0.	5.38E+03	1.78E+03	2.90E+02	0.	1.36E+04
CS-136	6.56E+02	2.59E+03	0.	1.44E+03	1.98E+02	2.94E+02	0.	1.07E+03
CS-137	8.95E+03	1.22E+04	0.	4.15E+03	1.38E+03	2.36E+02	0.	8.02E+03
BA-140	6.81E+01	8.56E-02	0.	2.91E-02	4.90E-02	1.42E+02	0.	4.50E+00
LA-140	5.11E-05	2.57E-05	0.	0.	0.	1.89E+00	0.	6.82E-06
CE-141	5.04E-02	3.41E-02	0.	1.58E-02	0.	1.30E+02	0.	3.86E-03
CE-143	3.41E-03	2.50E+00	0.	1.11E-03	0.	9.34E+01	0.	2.77E-04
CE-144	2.73E+00	1.14E+00	0.	6.75E-01	0.	9.21E+02	0.	1.46E-01
NP-239	3.28E-05	3.29E-06	0.	9.64E-06	0.	6.22E-01	0.	1.71E-05

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF C-14 ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	3.08E+05	1.93E+04	0.	0.	0.	3.47E+04	0.	1.19E+04
CR--51	0.	0.	2.73E-02	1.01E-02	6.05E-02	1.15E+01	0.	4.50E-02
MN--54	0.	1.16E+01	0.	3.44E+00	0.	3.54E+01	0.	2.21E+00
FE--55	8.22E+00	3.70E+01	0.	0.	4.28E+01	1.44E+01	0.	9.71E+00
FE--59	4.87E+00	1.16E+01	0.	0.	3.21E+00	3.81E+01	0.	4.46E+00
CO--58	0.	6.86E+00	0.	0.	0.	1.39E+02	0.	1.54E+01
CO--60	0.	2.24E+01	0.	0.	0.	4.19E+02	0.	4.92E+01
ZN--65	2.10E+03	6.66E+03	0.	4.46E+03	0.	4.20E+03	0.	3.02E+03
RB--86	0.	4.39E+03	0.	0.	0.	8.66E+02	0.	2.05E+03
SR--89	3.81E+04	0.	0.	0.	0.	6.09E+03	0.	1.09E+03
SR--90	1.16E+06	0.	0.	0.	0.	1.56E+04	0.	2.84E+05
Y---91	1.27E-02	0.	0.	0.	0.	0.97E+00	0.	3.40E-04
ZR--95	3.05E-02	1.66E-02	0.	1.67E-02	0.	9.94E+01	0.	6.65E-03
ZR--97	5.86E-05	1.47E-05	0.	1.73E-05	0.	2.58E-01	0.	5.40E-06
NB--95	1.28E-01	7.12E-02	0.	7.06E-02	0.	4.32E+02	0.	2.80E-02
MO--99	1.16E-02	6.32E+01	0.	1.43E+02	1.60E-02	1.66E+02	0.	1.24E+01
RU-103	1.57E-03	0.	0.	5.99E-03	0.	1.83E-01	0.	6.70E-04
RU-106	2.82E-02	0.	0.	5.46E-02	0.	1.83E+00	0.	3.57E-03
AG110M	8.34E+01	7.72E+01	0.	1.52E+02	0.	3.15E+04	0.	4.59E+01
SB-124	3.80E+01	7.16E-01	9.18E-02	0.	2.95E+01	1.08E+03	0.	1.50E+01
SB-125	4.36E+01	3.66E+00	2.76E+00	3.69E+01	3.61E+03	3.41E+02	0.	8.15E+00
TE125M	2.64E+01	9.58E+00	7.95E+00	1.07E+02	0.	1.05E+02	0.	3.54E+00
TE127M	7.67E+01	2.68E+01	2.02E+01	3.11E+02	0.	3.47E+02	0.	9.46E+00
TE129M	1.00E+02	3.75E+01	3.45E+01	4.18E+02	0.	5.03E+02	0.	1.59E+01
TE131M	1.67E+02	2.38E+02	7.76E+04	4.13E+02	0.	1.30E+02	0.	1.37E+02
TE-132	8.69E+01	8.07E+01	1.01E+04	1.59E+02	0.	1.92E+02	0.	3.08E+01
I--131	1.14E+03	1.64E+03	5.35E+05	2.80E+03	0.	4.31E+02	0.	9.35E+02
I--133	4.52E+01	7.83E+01	1.51E+04	1.37E+02	0.	6.88E+01	0.	2.39E+01
CS-134	1.92E+05	4.56E+05	0.	1.48E+05	4.90E+04	7.98E+03	0.	3.73E+05
CS-136	1.16E+04	4.59E+04	0.	2.55E+04	3.50E+03	5.21E+03	0.	3.30E+04
CS-137	2.55E+05	3.48E+05	0.	1.19E+05	3.93E+04	6.71E+03	0.	2.29E+05
BA-140	4.79E+01	6.02E-02	0.	2.05E-02	3.45E-02	1.01E+02	0.	3.17E+00
LA-140	1.44E-05	7.28E-06	0.	0.	0.	5.34E-01	0.	1.93E-06
CE-141	4.55E-02	3.08E-02	0.	1.43E-02	0.	1.18E+02	0.	3.49E-03
CE-143	9.42E-04	6.76E-01	0.	3.04E-04	0.	2.54E+01	0.	7.61E-05
CE-144	2.93E+00	1.22E+00	0.	7.26E-01	0.	9.90E+02	0.	1.57E-01
NP-239	1.34E-05	1.45E-06	0.	3.37E-06	0.	1.98E-01	0.	6.19E-07

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	1.26E+03	7.87E+01	0.	0.	0.	1.41E+02	0.	4.80E+01
CR--51	0.	0.	9.64E-03	3.55E-03	2.14E-02	4.06E+00	0.	1.01E-02
MN--54	0.	3.62E+01	0.	1.08E+01	0.	1.11E+02	0.	6.92E+00
FE--55	2.69E+02	1.21E+03	0.	0.	1.40E+03	4.74E+02	0.	3.19E+02
FE--59	3.92E+01	9.30E+01	0.	0.	2.58E+01	3.07E+02	0.	3.54E+01
CO--58	0.	1.03E+01	0.	0.	0.	2.08E+02	0.	2.30E+01
CO--60	0.	8.47E+01	0.	0.	0.	1.58E+03	0.	1.86E+02
ZN--65	6.87E+03	2.18E+04	0.	1.46E+04	0.	1.37E+04	0.	9.87E+03
RB--86	0.	4.99E+02	0.	0.	0.	9.84E+01	0.	2.35E+02
SR--89	2.24E+03	0.	0.	0.	0.	3.57E+02	0.	6.40E+01
SR--90	2.71E+05	0.	0.	0.	0.	3.67E+03	0.	6.62E+04
Y---91	1.57E-02	0.	0.	0.	0.	8.02E+00	0.	4.20E-04
ZR--95	2.64E-01	1.47E-01	0.	1.45E-01	0.	8.85E+02	0.	5.76E-02
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	7.36E-02	4.09E-02	0.	4.05E-02	0.	2.48E+02	0.	1.61E-02
MO--99	1.53E-05	2.26E-05	0.	2.84E-04	1.92E-06	7.37E-04	0.	6.80E-02
RU-103	1.14E-03	0.	0.	4.37E-03	0.	1.33E-01	0.	4.93E-04
RU-106	9.23E-02	0.	0.	1.79E-01	0.	5.98E+00	0.	1.17E-02
AG110M	2.60E+02	2.41E+02	0.	4.73E+02	0.	9.82E+04	0.	1.43E+02
SB-124	4.81E+01	9.07E-01	1.16E-01	0.	3.73E+01	1.36E+03	0.	1.90E+01
SB-125	2.07E+02	3.11E+01	2.48E+01	3.33E+02	1.31E+04	1.44E+03	0.	3.62E+01
TE125M	3.58E+01	1.30E+01	1.08E+01	1.46E+02	0.	1.43E+02	0.	4.79E+00
TE127M	1.84E+02	6.41E+01	4.83E+01	7.49E+02	0.	8.34E+02	0.	2.25E+01
TE129M	5.90E+01	2.21E+01	2.03E+01	2.46E+02	0.	2.96E+02	0.	9.34E+00
TE131M	2.41E-02	3.45E-02	1.13E+01	5.91E-02	0.	9.09E-03	0.	1.97E-02
TE-132	6.59E-07	1.24E-07	1.10E-05	5.25E-07	0.	1.93E-06	0.	6.76E-08
I--131	1.37E-01	1.97E-01	6.44E+01	3.37E-01	0.	5.19E-02	0.	1.13E-01
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.72E+04	6.47E+04	0.	2.10E+04	6.95E+03	1.13E+03	0.	5.29E+04
CS-136	1.16E+01	4.56E+01	0.	2.54E+01	3.48E+00	5.18E+00	0.	3.28E+01
CS-137	4.05E+04	5.53E+04	0.	1.88E+04	6.24E+03	1.07E+03	0.	3.63E+04
BA-140	1.10E+00	1.39E-03	0.	4.72E-04	7.94E-04	2.34E+00	0.	7.20E-02
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	2.26E-02	1.53E-02	0.	7.10E-03	0.	5.84E+01	0.	1.73E-03
CE-143	1.00E-06	4.03E-07	0.	2.32E-07	0.	4.39E-03	0.	4.97E-08
CE-144	8.89E+00	3.71E+00	0.	2.20E+00	0.	3.00E+03	0.	4.77E-01
NP-239	1.98E-05	2.17E-06	0.	1.66E-06	0.	1.39E-06	0.	3.92E-07

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - POTABLE WATER

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.72E+01	2.72E+01	3.44E+01	2.72E+01	2.72E+01	0.	2.72E+01
P---32	4.83E+04	3.03E+03	0.	0.	0.	5.43E+03	0.	1.87E+03
CR--51	0.	0.	4.03E-01	1.49E-01	8.94E-01	1.69E+02	0.	6.75E-01
MN--54	0.	1.17E+03	0.	3.48E+02	0.	3.59E+03	0.	2.24E+02
FE--55	1.59E+03	7.15E+03	0.	0.	8.28E+03	2.79E+03	0.	1.88E+03
FE--59	1.10E+03	2.62E+03	0.	0.	7.28E+02	8.65E+03	0.	9.97E+02
CO--58	0.	2.53E+02	0.	0.	0.	3.42E+03	0.	5.77E+02
CO--60	0.	7.07E+02	0.	0.	0.	8.48E+03	0.	1.62E+03
ZN--65	1.24E+03	3.94E+03	0.	2.64E+03	0.	2.48E+03	0.	1.78E+03
RB--86	0.	5.31E+03	0.	0.	0.	1.05E+03	0.	2.48E+03
SR--89	1.17E+05	0.	0.	0.	0.	1.27E+04	0.	3.35E+03
SR--90	2.67E+06	0.	0.	0.	1.17E+03	5.98E+04	0.	6.59E+05
Y---91	5.00E+01	0.	0.	0.	0.	1.92E+04	0.	1.33E+00
ZR--95	9.51E+00	3.17E+00	0.	3.96E+00	0.	6.87E+03	0.	2.22E+00
ZR--97	2.73E-01	5.55E-02	0.	8.31E-02	0.	1.65E+04	0.	2.53E-02
NB--95	1.84E+00	1.11E+00	0.	8.71E-01	0.	4.52E+03	0.	6.24E-01
MO--99	3.96E-02	9.76E+02	0.	2.21E+03	5.49E-02	2.53E+03	0.	1.87E+02
RU-103	6.02E+01	0.	0.	1.80E+02	0.	4.70E+03	0.	2.69E+01
RU-105	1.02E+03	0.	0.	1.36E+03	0.	4.64E+04	0.	1.29E+02
AG110M	4.10E+01	3.79E+01	0.	7.45E+01	0.	1.55E+04	0.	2.25E+01
SB-124	7.16E+02	1.35E+01	1.73E+00	0.	5.50E+02	2.03E+04	0.	2.83E+02
SB-125	5.72E+02	6.59E+00	8.53E-01	3.50E+00	5.97E+04	5.05E+03	0.	1.15E+02
TE125M	9.76E+02	3.49E+02	2.75E+02	2.78E+03	0.	2.73E+03	0.	1.29E+02
TE127M	1.75E+03	6.14E+02	4.57E+02	7.10E+03	0.	7.62E+03	0.	2.16E+02
TE129M	4.22E+03	1.56E+03	1.36E+03	1.22E+04	0.	1.47E+04	0.	6.64E+02
TE131M	3.87E+02	2.37E+02	2.14E+04	1.75E+03	0.	1.61E+04	0.	1.80E+02
TE-132	8.65E+02	6.37E+02	1.70E+04	3.84E+03	0.	1.84E+04	0.	5.29E+02
I--131	1.37E+03	1.93E+03	5.57E+05	2.50E+03	0.	3.06E+02	0.	1.15E+03
I--133	3.50E+02	5.93E+02	1.08E+05	7.47E+02	0.	4.31E+02	0.	1.83E+02
CS-134	2.06E+04	4.97E+04	0.	1.23E+04	6.02E+03	5.74E+02	0.	2.32E+04
CS-136	1.63E+03	6.41E+03	0.	3.57E+03	4.89E+02	7.29E+02	0.	4.62E+03
CS-137	2.74E+04	3.69E+04	0.	9.51E+03	4.30E+03	4.92E+02	0.	1.29E+04
BA-140	7.06E+03	8.76E+00	0.	2.17E+00	5.81E+00	5.51E+03	0.	4.54E+02
LA-140	7.25E-01	3.59E-01	0.	0.	0.	1.98E+04	0.	9.48E-02
CE-141	3.20E+00	2.15E+00	0.	7.40E-01	0.	5.81E+03	0.	2.40E-01
CE-143	3.81E-01	2.43E+02	0.	1.19E-01	0.	9.31E+03	0.	2.95E-02
CE-144	1.85E+02	7.58E+01	0.	3.10E+01	0.	4.35E+04	0.	9.81E+00
NP-239	2.74E-01	2.73E-02	0.	8.14E-02	0.	5.31E+03	0.	1.45E-02

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - FRESH WATER FISH

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	7.67E-01	7.67E-01	9.70E-01	7.67E-01	7.67E-01	0.	7.67E-01
P---32	1.48E+08	9.27E+06	0.	0.	0.	1.60E+07	0.	9.72E+05
CR--51	0.	0.	2.49E+00	9.21E-01	5.54E+00	1.05E+03	0.	4.17E+00
MN--54	0.	1.47E+04	0.	4.37E+03	0.	4.49E+04	0.	2.80E+03
FE--55	4.98E+03	2.24E+04	0.	0.	2.60E+04	8.76E+03	0.	5.89E+03
FE--59	3.44E+03	8.16E+03	0.	0.	2.27E+03	2.69E+04	0.	3.10E+03
CO--58	0.	3.95E+02	0.	0.	0.	5.34E+03	0.	9.00E+02
CO--60	0.	1.11E+03	0.	0.	0.	1.33E+04	0.	2.53E+03
ZN--65	7.78E+04	2.47E+05	0.	1.65E+05	0.	1.56E+05	0.	1.12E+05
RB--86	0.	3.27E+05	0.	0.	0.	6.45E+04	0.	1.53E+05
SR--89	1.10E+05	0.	0.	0.	0.	1.19E+04	0.	3.14E+03
SR--90	2.51E+06	0.	0.	0.	1.72E+03	9.81E+04	0.	6.20E+05
Y---91	3.89E+01	0.	0.	0.	0.	1.50E+04	0.	1.04E+00
ZR--95	3.45E+01	2.04E+01	0.	1.63E+01	0.	8.29E+04	0.	1.10E+01
ZR--97	5.13E+00	1.29E+00	0.	1.51E+00	0.	5.81E+03	0.	4.73E-01
NB--95	1.71E+03	1.03E+03	0.	8.11E+02	0.	4.21E+06	0.	5.82E+02
MO--99	2.11E-02	2.70E+02	0.	6.14E+02	2.93E-02	6.62E+02	0.	5.22E+01
RU-103	1.87E+01	0.	0.	5.59E+01	0.	1.46E+03	0.	8.38E+00
RU-106	3.21E+02	0.	0.	4.27E+02	0.	1.45E+04	0.	4.04E+01
AG110M	2.95E+00	2.73E+00	0.	5.37E+00	0.	1.11E+03	0.	1.02E+00
SB-124	2.23E+01	4.21E-01	5.40E-02	0.	1.73E+01	6.32E+02	0.	8.82E+00
SB-125	4.86E+01	1.12E+01	8.68E+00	8.74E+01	1.87E+03	2.44E+02	0.	7.68E+00
TE125M	1.22E+04	4.36E+03	3.43E+03	3.47E+04	0.	3.40E+04	0.	1.62E+03
TE127M	2.21E+04	7.71E+03	5.80E+03	8.91E+04	0.	1.05E+05	0.	2.72E+03
TE129M	5.24E+04	1.94E+04	1.68E+04	1.51E+05	0.	1.83E+05	0.	8.25E+03
TE131M	3.19E+03	1.59E+03	1.94E+04	1.56E+04	0.	1.52E+05	0.	1.32E+03
TE-132	9.25E+03	5.82E+03	1.33E+04	4.12E+04	0.	2.08E+05	0.	5.48E+03
I--131	6.17E+02	8.71E+02	2.51E+05	1.13E+03	0.	1.65E+02	0.	5.19E+02
I--133	1.11E+02	1.88E+02	3.41E+04	2.37E+02	0.	1.37E+02	0.	5.79E+01
CS-134	1.29E+06	3.12E+06	0.	7.71E+05	3.78E+05	3.60E+04	0.	1.48E+05
CS-136	9.93E+04	3.92E+05	0.	2.18E+05	2.99E+04	4.45E+04	0.	2.82E+05
CS-137	1.72E+06	2.32E+06	0.	5.97E+05	3.07E+05	3.09E+04	0.	8.12E+05
BA-140	8.62E+02	1.17E+00	0.	2.65E-01	7.10E-01	6.41E+03	0.	5.55E+01
LA-140	4.63E-01	2.29E-01	0.	0.	0.	1.20E+04	0.	6.05E-02
CE-141	9.92E-02	6.66E-02	0.	2.31E-02	0.	1.80E+02	0.	7.64E-03
CE-143	7.96E-02	5.96E+00	0.	1.92E-02	0.	5.35E+02	0.	4.21E-03
CE-144	5.80E+00	2.38E+00	0.	9.72E-01	0.	1.30E+03	0.	3.07E-01
NP-239	7.37E-02	7.32E-03	0.	2.21E-02	0.	1.44E+03	0.	3.91E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - FRESH FRUITS AND VEGETABLES

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	1.12E+04	7.02E+02	0.	0.	0.	1.26E+03	0.	4.34E+02
CR--51	0.	0.	1.15E-01	4.24E-02	2.55E-01	4.83E+01	0.	1.92E-01
MN--54	0.	4.80E+02	0.	1.43E+02	0.	1.47E+03	0.	9.17E+01
FE--55	6.54E+02	2.94E+03	0.	0.	3.41E+03	1.15E+03	0.	7.73E+02
FE--59	3.60E+02	8.53E+02	0.	0.	2.37E+02	2.82E+03	0.	3.25E+02
CO--58	0.	8.99E+01	0.	0.	0.	1.21E+03	0.	2.05E+02
CO--60	0.	3.04E+02	0.	0.	0.	3.65E+03	0.	6.95E+02
ZN--65	6.19E+02	1.96E+03	0.	1.31E+03	0.	1.24E+03	0.	8.89E+02
RB--86	0.	1.32E+03	0.	0.	0.	2.59E+02	0.	6.13E+02
SR--89	3.92E+04	0.	0.	0.	0.	4.25E+03	0.	1.13E+03
SR--90	1.26E+06	0.	0.	0.	3.56E+03	3.71E+04	0.	3.11E+05
Y---91	1.72E+01	0.	0.	0.	0.	6.64E+03	0.	4.59E-01
ZR--95	3.50E+00	1.22E+00	0.	1.46E+00	0.	2.84E+03	0.	8.34E-01
ZR--97	3.54E-03	7.20E-04	0.	1.07E-03	0.	2.14E+02	0.	3.29E-04
NB--95	5.62E-01	3.39E-01	0.	2.65E-01	0.	1.38E+03	0.	1.91E-01
MO--99	3.57E-03	6.32E+01	0.	1.43E+02	4.94E-03	1.53E+02	0.	1.21E+01
RU-103	1.92E+01	0.	0.	5.73E+01	0.	1.50E+03	0.	8.59E+00
RU-106	4.33E+02	0.	0.	5.75E+02	0.	1.90E+04	0.	5.44E+01
AG110M	1.80E+01	1.66E+01	0.	3.27E+01	0.	6.78E+03	0.	9.88E+00
SB-124	2.48E+02	4.67E+00	5.98E-01	0.	1.92E+02	7.61E+03	0.	9.78E+01
SB-125	5.28E+02	1.05E+02	8.07E+01	8.13E+02	2.52E+04	2.93E+03	0.	8.64E+01
TE125M	4.11E+02	1.47E+02	1.16E+02	1.17E+03	0.	1.15E+03	0.	5.45E+01
TE127M	9.12E+02	3.19E+02	2.41E+02	3.68E+03	0.	4.57E+03	0.	1.13E+02
TE129M	1.47E+03	5.46E+02	4.71E+02	4.20E+03	0.	5.14E+03	0.	2.32E+02
TE131M	4.11E+01	4.95E+01	1.30E+04	1.03E+02	0.	4.48E+02	0.	3.06E+01
TE-132	6.77E+01	4.97E+01	1.30E+03	3.00E+02	0.	1.44E+03	0.	4.13E+01
I--131	2.10E+02	2.97E+02	8.27E+04	3.85E+02	0.	5.62E+01	0.	1.77E+02
I--133	6.09E+00	1.03E+01	1.88E+03	1.30E+01	0.	7.50E+00	0.	3.18E+00
CS-134	8.62E+03	2.08E+04	0.	5.14E+03	2.52E+03	2.40E+02	0.	9.71E+03
CS-136	3.34E+02	1.32E+03	0.	7.34E+02	1.01E+02	1.50E+02	0.	9.49E+02
CS-137	1.23E+04	1.66E+04	0.	4.28E+03	2.20E+03	2.21E+02	0.	5.82E+03
BA-140	1.44E+03	1.85E+00	0.	4.41E-01	1.19E+00	4.89E+03	0.	9.25E+01
LA-140	2.77E-02	1.37E-02	0.	0.	0.	7.54E+02	0.	3.62E-03
CE-141	9.57E-01	6.42E-01	0.	2.23E-01	0.	1.74E+03	0.	7.37E-02
CE-143	5.80E-02	7.44E+00	0.	1.44E-02	0.	4.87E+02	0.	3.20E-03
CE-144	7.40E+01	3.03E+01	0.	1.24E+01	0.	1.74E+04	0.	3.93E+00
NP-239	3.77E-02	4.65E-03	0.	6.39E-03	0.	2.89E+02	0.	1.35E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - STORED FRUITS AND VEGETABLES

AGE GROUP - TEENAGER

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	9.63E+03	6.04E+02	0.	0.	0.	1.08E+03	0.	3.73E+02
CR--51	0.	0.	3.95E-01	1.46E-01	8.78E-01	1.00E+02	0.	6.62E-01
MN--54	0.	6.32E+03	0.	1.88E+03	0.	1.94E+04	0.	1.21E+03
FE--55	9.36E+03	4.21E+04	0.	0.	4.88E+04	1.65E+04	0.	1.11E+04
FE--59	2.17E+03	5.16E+03	0.	0.	1.43E+03	1.70E+04	0.	1.96E+03
CO--58	0.	7.58E+02	0.	0.	0.	1.02E+04	0.	1.73E+03
CO--60	0.	4.47E+03	0.	0.	0.	5.36E+04	0.	1.02E+04
ZN--65	7.84E+03	2.49E+04	0.	1.67E+04	0.	1.57E+04	0.	1.13E+04
RB--86	0.	2.21E+03	0.	0.	0.	4.37E+02	0.	1.03E+03
SR--89	2.62E+05	0.	0.	0.	0.	2.84E+04	0.	7.52E+03
SR--90	1.88E+07	0.	0.	0.	6.13E+04	5.75E+05	0.	4.65E+05
Y---91	1.29E+02	0.	0.	0.	0.	4.95E+04	0.	3.44E+00
ZR--95	3.20E+01	1.22E+01	0.	1.35E+01	0.	3.27E+04	0.	8.05E+00
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	2.62E+00	1.58E+00	0.	1.24E+00	0.	6.45E+03	0.	8.91E-01
MO--99	2.48E-05	4.49E-04	0.	1.40E-03	3.14E-06	2.19E-03	0.	1.11E-01
RU-103	1.04E+02	0.	0.	3.09E+02	0.	8.09E+03	0.	4.03E+01
RU-106	5.80E+03	0.	0.	7.72E+03	0.	2.63E+05	0.	7.30E+02
AG110M	2.30E+02	2.13E+02	0.	4.19E+02	0.	8.69E+04	0.	1.27E+02
SB-124	1.88E+03	3.55E+01	4.55E+00	0.	1.40E+03	5.33E+04	0.	7.44E+02
SB-125	8.23E+03	1.74E+03	1.34E+03	1.35E+04	3.63E+05	4.40E+04	0.	1.33E+03
TE125M	3.05E+03	1.09E+03	8.53E+02	8.67E+03	0.	8.51E+03	0.	4.04E+02
TE127M	9.27E+03	3.24E+03	2.45E+03	3.74E+04	0.	4.65E+04	0.	1.15E+03
TE129M	6.63E+03	2.45E+03	2.12E+03	1.93E+04	0.	2.31E+04	0.	1.04E+03
TE131M	3.44E+00	4.85E+00	1.40E+03	6.29E+00	0.	9.19E-01	0.	2.89E+00
TE-132	3.49E-03	2.55E-03	6.72E-02	1.55E-02	0.	7.44E-02	0.	2.13E-03
I--131	1.96E+01	2.77E+01	7.99E+03	3.59E+01	0.	5.24E+00	0.	1.65E+01
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.23E+05	2.96E+05	0.	7.31E+04	3.58E+04	3.41E+03	0.	1.38E+05
CS-136	2.16E+02	8.51E+02	0.	4.74E+02	6.43E+01	9.67E+01	0.	6.13E+02
CS-137	1.84E+05	2.48E+05	0.	6.39E+04	3.29E+04	3.31E+03	0.	8.70E+04
BA-140	8.84E+02	1.15E+00	0.	2.71E-01	7.28E-01	3.54E+03	0.	5.69E+01
LA-140	0.	0.	0.	0.	0.	2.82E-07	0.	0.
CE-141	4.08E+00	2.74E+00	0.	9.51E-01	0.	7.41E+03	0.	3.14E-01
CE-143	4.11E-02	1.65E-02	0.	9.51E-03	0.	1.80E+02	0.	2.04E-03
CE-144	9.62E+02	3.94E+02	0.	1.61E+02	0.	2.26E+05	0.	5.10E+01
NP-239	3.92E-01	5.46E-02	0.	3.37E-02	0.	2.83E-02	0.	9.70E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.28E+01	1.28E+01	1.62E+01	1.28E+01	1.28E+01	0.	1.28E+01
P---32	5.28E+04	3.31E+03	0.	0.	0.	5.94E+03	0.	2.05E+03
CR--51	0.	0.	4.01E-02	1.48E-02	8.91E-02	1.69E+01	0.	6.72E-02
MN--54	0.	1.37E+01	0.	4.08E+00	0.	4.20E+01	0.	2.62E+00
FE--55	8.96E+01	4.03E+02	0.	0.	4.07E+02	1.58E+02	0.	1.06E+02
FE--59	6.09E+01	1.45E+02	0.	0.	4.01E+01	4.77E+02	0.	5.50E+01
CO--58	0.	1.17E+01	0.	0.	0.	1.59E+02	0.	2.67E+01
CO--60	0.	3.33E+01	0.	0.	0.	3.99E+02	0.	7.59E+01
ZN--65	2.27E+03	7.20E+03	0.	4.82E+03	0.	4.54E+03	0.	3.20E+03
RB--86	0.	7.09E+03	0.	0.	0.	1.40E+03	0.	3.31E+03
SR--89	4.32E+03	0.	0.	0.	0.	4.69E+02	0.	1.24E+02
SR--90	1.00E+05	0.	0.	0.	1.83E+00	2.13E+03	0.	2.48E+04
Y---91	2.31E-02	0.	0.	0.	0.	8.87E+00	0.	6.16E-04
ZR--95	1.05E-02	5.70E-03	0.	4.82E-03	0.	2.19E+01	0.	3.31E-03
ZR--97	2.54E-04	6.35E-05	0.	7.51E-05	0.	1.12E+00	0.	2.34E-05
NB--95	2.10E-01	1.26E-01	0.	9.94E-02	0.	5.16E+02	0.	7.15E-02
MO--99	4.45E-02	2.37E+02	0.	5.40E+02	6.17E-02	6.25E+02	0.	4.68E+01
RU-103	2.76E-03	0.	0.	8.24E-03	0.	2.16E-01	0.	1.24E-03
RU-106	4.81E-02	0.	0.	6.39E-02	0.	2.18E+00	0.	6.05E-03
AG110M	9.60E+01	8.88E+01	0.	1.75E+02	0.	3.62E+04	0.	5.28E+01
SB-124	4.97E+01	9.37E-01	1.20E-01	0.	3.86E+01	1.41E+03	0.	1.96E+01
SB-125	4.05E+01	5.16E-01	1.00E-01	6.52E-01	4.21E+03	3.57E+02	0.	8.13E+01
TE125M	4.51E+01	1.61E+01	1.27E+01	1.28E+02	0.	1.26E+02	0.	5.98E+00
TE127M	8.24E+01	2.88E+01	2.18E+01	3.32E+02	0.	4.10E+02	0.	1.02E+01
TE129M	1.92E+02	7.13E+01	6.17E+01	5.58E+02	0.	6.72E+02	0.	3.03E+01
TE131M	4.38E+01	5.57E+01	1.52E+04	1.01E+02	0.	3.29E+02	0.	3.40E+01
TE-132	3.79E+01	4.39E+01	3.50E+03	1.66E+02	0.	8.35E+02	0.	2.59E+01
I--131	3.39E+02	4.80E+02	1.38E+05	6.21E+02	0.	9.08E+01	0.	2.85E+02
I--133	3.01E+01	5.11E+01	9.28E+03	6.43E+01	0.	3.71E+01	0.	1.57E+01
CS-134	1.16E+04	2.80E+04	0.	6.94E+03	3.40E+03	3.24E+02	0.	1.31E+04
CS-136	8.47E+02	3.34E+03	0.	1.86E+03	2.55E+02	3.80E+02	0.	2.41E+03
CS-137	1.55E+04	2.08E+04	0.	5.37E+03	2.73E+03	2.78E+02	0.	7.31E+03
BA-140	1.23E+02	1.51E-01	0.	3.76E-02	1.01E-01	2.09E+01	0.	7.88E+01
LA-140	9.17E-05	4.53E-05	0.	0.	0.	2.50E+00	0.	1.20E-05
CE-141	8.74E-02	5.87E-02	0.	2.04E-02	0.	1.59E+02	0.	6.73E-03
CE-143	4.39E-03	3.22E+00	0.	1.43E-03	0.	1.20E+02	0.	3.59E-04
CE-144	5.20E+00	2.13E+00	0.	8.72E-01	0.	1.22E+03	0.	2.76E-01
NP-239	4.27E-05	4.32E-06	0.	1.24E-05	0.	8.03E-01	0.	2.22E-05

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	1.28E+01	1.28E+01	1.62E+01	1.28E+01	1.28E+01	0.	1.28E+01
P---32	5.28E+04	3.31E+03	0.	0.	0.	5.94E+03	0.	2.05E+03
CR--51	0.	0.	4.01E-02	1.48E-02	8.91E-02	1.69E+01	0.	6.72E-02
MN--54	0.	1.37E+01	0.	4.08E+00	0.	4.20E+01	0.	2.06E+00
FE--55	8.96E+01	4.03E+02	0.	0.	4.07E+02	1.58E+02	0.	1.06E+02
FE--59	6.09E+01	1.45E+02	0.	0.	4.01E+01	4.77E+02	0.	5.50E+01
CO--58	0.	1.17E+01	0.	0.	0.	1.59E+02	0.	2.67E+01
CO--60	0.	3.33E+01	0.	0.	0.	3.99E+02	0.	7.59E+01
ZN--65	2.27E+03	7.20E+03	0.	4.82E+03	0.	4.54E+03	0.	3.26E+03
RB--86	0.	7.09E+03	0.	0.	0.	1.40E+03	0.	3.31E+03
SR--89	4.32E+03	0.	0.	0.	0.	4.69E+02	0.	1.24E+02
SR--90	1.00E+05	0.	0.	0.	1.83E+00	2.13E+03	0.	2.48E+04
Y---91	2.31E-02	0.	0.	0.	0.	8.87E+00	0.	6.16E-04
ZR--95	1.05E-02	5.70E-03	0.	4.82E-03	0.	2.19E+01	0.	3.31E-03
ZR--97	2.54E-04	6.35E-05	0.	7.51E-05	0.	1.12E+00	0.	2.34E-05
NB--95	2.10E-01	1.26E-01	0.	9.94E-02	0.	5.16E+02	0.	7.15E-02
MO--99	4.45E-02	2.37E+02	0.	5.40E+02	6.17E-02	6.25E+02	0.	4.68E+01
RU-103	2.76E-03	0.	0.	8.24E-03	0.	2.16E-01	0.	1.24E-03
RU-106	4.81E-02	0.	0.	6.39E-02	0.	2.18E+00	0.	6.05E-03
AG110M	9.60E+01	8.88E+01	0.	1.75E+02	0.	3.62E+04	0.	5.28E+01
SB-124	4.97E+01	9.37E-01	1.20E-01	0.	3.86E+01	1.41E+03	0.	1.96E+01
SB-125	4.05E+01	5.16E-01	1.00E-01	6.52E-01	4.21E+03	3.57E+02	0.	8.13E+03
TE125M	4.51E+01	1.61E+01	1.27E+01	1.28E+02	0.	1.26E+02	0.	5.98E+00
TE127M	8.24E+01	2.88E+01	2.18E+01	3.32E+02	0.	4.10E+02	0.	1.02E+01
TE129M	1.92E+02	7.13E+01	6.17E+01	5.58E+02	0.	6.72E+02	0.	3.03E+01
TE131M	4.38E+01	5.57E+01	1.52E+04	1.01E+02	0.	3.29E+02	0.	3.40E+01
TE-132	3.79E+01	4.39E+01	3.50E+03	1.66E+02	0.	0.35E+02	0.	2.59E+01
I--131	3.39E+02	4.80E+02	1.38E+05	6.21E+02	0.	9.08E+01	0.	2.85E+02
I--133	3.01E+01	5.11E+01	9.28E+03	6.43E+01	0.	3.71E+01	0.	1.57E+01
CS-134	1.16E+04	2.80E+04	0.	6.94E+03	3.40E+03	3.24E+02	0.	1.31E+04
CS-136	8.47E+02	3.34E+03	0.	1.86E+03	2.55E+02	3.00E+02	0.	2.41E+03
CS-137	1.55E+04	2.08E+04	0.	5.37E+03	2.73E+03	2.78E+02	0.	7.31E+03
BA-140	1.23E+02	1.51E-01	0.	3.76E-02	1.01E-01	2.09E+01	0.	7.88E+01
LA-140	9.17E-05	4.53E-05	0.	0.	0.	2.50E+00	0.	1.20E-03
CE-141	8.74E+02	5.87E-02	0.	2.04E-02	0.	1.59E+02	0.	0.73E-03
CE-143	4.39E-03	3.22E+00	0.	1.43E-03	0.	1.20E+02	0.	3.59E-04
CE-144	5.20E+00	2.13E+00	0.	8.72E-01	0.	1.22E+03	0.	2.76E-01
NP-239	4.27E-05	4.32E-06	0.	1.24E-05	0.	8.03E-01	0.	2.22E-05

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	1.62E+03	1.02E+02	0.	0.	0.	1.82E+02	0.	6.27E+01
CR--51	0.	0.	1.24E-02	4.59E-03	2.70E-02	5.23E+00	0.	2.00E-02
MN--54	0.	4.67E+01	0.	1.39E+01	0.	1.43E+02	0.	6.92E+00
FE--55	3.48E+02	1.56E+03	0.	0.	1.81E+03	6.11E+02	0.	4.11E+02
FE--59	5.06E+01	1.20E+02	0.	0.	3.33E+01	3.96E+02	0.	4.57E+01
CO--58	0.	1.76E+01	0.	0.	0.	2.38E+02	0.	4.01E+01
CO--60	0.	1.40E+02	0.	0.	0.	1.68E+03	0.	3.20E+02
ZN--65	8.86E+03	2.81E+04	0.	1.88E+04	0.	1.77E+04	0.	1.27E+04
RB--86	0.	6.44E+02	0.	0.	0.	1.27E+02	0.	3.00E+02
SR--89	4.29E+03	0.	0.	0.	0.	4.66E+02	0.	1.23E+02
SR--90	4.77E+05	0.	0.	0.	2.02E+01	1.02E+04	0.	1.18E+03
Y---91	2.81E-02	0.	0.	0.	0.	1.08E+01	0.	7.50E-04
ZR--95	3.96E-01	2.38E-01	0.	1.87E-01	0.	9.68E+02	0.	1.35E-01
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	1.10E-01	6.65E-02	0.	5.23E-02	0.	2.72E+02	0.	3.75E-02
MO--99	1.97E-05	2.91E-05	0.	3.66E-04	2.47E-06	9.51E-04	0.	8.78E-02
RU-103	1.89E-03	0.	0.	5.63E-03	0.	1.47E-01	0.	8.43E-04
RU-106	1.73E-01	0.	0.	2.31E-01	0.	7.84E+00	0.	2.18E-02
AG110M	3.36E+02	3.11E+02	0.	6.10E+02	0.	1.27E+05	0.	1.85E+02
SB-124	6.20E+01	1.17E+00	1.50E-01	0.	4.81E+01	1.76E+03	0.	2.43E+01
SB-125	3.13E+02	5.57E+01	4.27E+01	4.30E+02	1.09E+04	1.85E+03	0.	5.25E+01
TE125M	6.60E+01	2.36E+01	1.86E+01	1.88E+02	0.	1.84E+02	0.	8.73E+00
TE127M	2.38E+02	8.33E+01	6.30E+01	9.60E+02	0.	1.20E+03	0.	2.95E+01
TE129M	1.10E+02	4.07E+01	3.52E+01	3.18E+02	0.	3.83E+02	0.	1.73E+01
TE131M	4.16E-02	5.88E-02	1.70E+01	7.62E-02	0.	1.11E-02	0.	3.50E-02
TE-132	1.54E-07	1.79E-07	1.43E-05	6.77E-07	0.	2.58E-06	0.	1.05E-07
I--131	2.37E-01	3.36E-01	9.68E+01	4.35E-01	0.	6.35E-02	0.	2.00E-01
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	4.54E+04	1.09E+05	0.	2.71E+04	1.33E+04	1.26E+03	0.	5.11E+04
CS-136	1.49E+01	5.89E+01	0.	3.28E+01	4.49E+00	6.69E+00	0.	4.24E+01
CS-137	7.01E+04	9.43E+04	0.	2.43E+04	1.25E+04	1.20E+03	0.	3.31E+04
BA-140	1.99E+00	2.44E-03	0.	6.09E-04	1.63E-03	3.86E-01	0.	1.28E+01
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	3.93E-02	2.64E-02	0.	9.15E-03	0.	7.13E+01	0.	3.02E-03
CE-143	1.29E-06	5.20E-07	0.	2.99E-07	0.	5.00E-03	0.	6.42E-08
CE-144	1.69E+01	6.95E+00	0.	2.84E+00	0.	3.99E+03	0.	8.99E-01
NP-239	2.49E-05	3.47E-06	0.	2.14E-06	0.	1.79E-06	0.	6.26E-07

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - POTABLE WATER AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	5.20E+01	5.20E+01	3.44E+01	5.20E+01	5.20E+01	0.	5.20E+01
P---32	4.83E+04	3.03E+03	0.	0.	0.	5.43E+03	0.	1.87E+03
CR--51	0.	0.	4.03E-01	1.49E-01	8.94E-01	1.69E+02	0.	6.73E-01
MN--54	0.	1.17E+03	0.	3.48E+02	0.	3.59E+03	0.	2.24E+02
FE--55	1.59E+03	7.15E+03	0.	0.	8.28E+03	2.79E+03	0.	1.86E+03
FE--59	1.10E+03	2.62E+03	0.	0.	7.28E+02	8.65E+03	0.	9.97E+02
CO--58	0.	4.72E+02	0.	0.	0.	2.81E+03	0.	1.42E+03
CO--60	0.	1.33E+03	0.	0.	0.	7.33E+03	0.	3.97E+03
ZN--65	1.24E+03	3.94E+03	0.	2.64E+03	0.	2.48E+03	0.	1.78E+03
RB--86	0.	5.31E+03	0.	0.	0.	1.05E+03	0.	2.48E+03
SR--89	3.51E+05	0.	0.	0.	0.	1.31E+04	0.	1.01E+04
SR--90	4.41E+06	0.	0.	0.	0.	6.24E+04	0.	1.12E+06
Y---91	1.49E+02	0.	0.	0.	0.	1.98E+04	0.	3.98E+00
ZR--95	2.65E+01	6.19E+00	0.	3.94E+00	0.	6.41E+03	0.	5.03E+00
ZR--97	2.73E-01	5.55E-02	0.	8.31E-02	0.	1.65E+04	0.	2.55E-02
NB--95	4.95E+00	2.11E+00	0.	8.71E-01	0.	3.66E+03	0.	1.55E+00
MO--99	3.96E-02	9.76E+02	0.	2.21E+03	5.49E-02	2.33E+03	0.	1.87E+02
RU-103	1.72E+02	0.	0.	1.80E+02	0.	4.52E+03	0.	6.96E+01
RU-106	3.05E+03	0.	0.	1.36E+03	0.	4.74E+04	0.	3.79E+02
AG110M	4.10E+01	3.79E+01	0.	7.45E+01	0.	1.55E+04	0.	2.25E+01
SB-124	7.16E+02	1.35E+01	1.73E+00	0.	5.50E+02	2.03E+04	0.	2.83E+02
SB-125	5.75E+02	7.14E+00	1.54E+00	3.50E+00	5.97E+04	5.05E+03	0.	1.15E+02
TE125M	2.91E+03	7.87E+02	8.15E+02	2.78E+03	0.	2.80E+03	0.	3.87E+02
TE127M	1.80E+03	6.24E+02	4.88E+02	7.10E+03	0.	8.66E+03	0.	2.25E+02
TE129M	1.26E+04	3.50E+03	4.02E+03	1.22E+04	0.	1.51E+04	0.	1.94E+03
TE131M	4.87E+02	3.18E+02	5.08E+04	1.75E+03	0.	1.61E+04	0.	2.53E+02
TE-132	2.40E+03	1.17E+03	1.80E+04	3.84E+03	0.	1.82E+04	0.	1.29E+03
I--131	4.00E+03	4.10E+03	1.33E+06	2.50E+03	0.	3.51E+02	0.	3.09E+03
I--133	1.03E+03	1.27E+03	3.07E+05	7.47E+02	0.	5.10E+02	0.	5.00E+02
CS-134	5.74E+04	9.66E+04	0.	1.23E+04	1.07E+04	5.23E+02	0.	2.06E+04
CS-135	1.63E+03	6.41E+03	0.	3.57E+03	4.83E+02	7.29E+02	0.	4.02E+03
CS-137	8.00E+04	7.74E+04	0.	9.51E+03	9.07E+03	4.72E+02	0.	1.15E+04
BA-140	2.00E+04	1.83E+01	0.	2.17E+00	1.08E+01	5.78E+03	0.	1.21E+03
LA-140	2.11E+00	7.34E-01	0.	0.	0.	2.08E+04	0.	2.48E-01
CE-141	9.54E+00	4.77E+00	0.	7.45E-01	0.	5.99E+03	0.	7.10E-01
CE-143	3.81E-01	2.43E+02	0.	1.19E-01	0.	9.31E+03	0.	2.95E-02
CE-144	5.48E+02	1.72E+02	0.	3.10E+01	0.	4.40E+04	0.	2.92E+01
NP-239	2.77E-01	2.76E-02	0.	8.14E-02	0.	5.31E+03	0.	1.40E-02

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - FRESH WATER FISH

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	6.34E-01	6.34E-01	4.18E-01	6.34E-01	6.34E-01	0.	6.34E-01
P---32	6.38E+07	4.05E+06	0.	0.	0.	7.17E+06	0.	2.47E+05
CR--51	0.	0.	1.08E+00	3.97E-01	2.39E+00	4.53E+02	0.	1.80E+00
MN--54	0.	6.33E+03	0.	1.88E+03	0.	1.94E+04	0.	1.21E+03
FE--55	2.15E+03	9.67E+03	0.	0.	1.12E+04	3.78E+03	0.	2.54E+03
FE--59	1.48E+03	3.52E+03	0.	0.	9.77E+02	1.16E+04	0.	1.34E+03
CO--58	0.	3.18E+02	0.	0.	0.	1.89E+03	0.	9.50E+02
CO--60	0.	8.96E+02	0.	0.	0.	4.96E+03	0.	2.69E+03
ZN--65	3.35E+04	1.07E+05	0.	7.12E+04	0.	6.71E+04	0.	4.82E+04
RB--86	0.	1.41E+05	0.	0.	0.	2.78E+04	0.	6.58E+04
SR--89	1.42E+05	0.	0.	0.	0.	5.29E+03	0.	4.05E+03
SR--90	1.79E+06	0.	0.	0.	0.	2.62E+04	0.	4.54E+05
Y---91	5.01E+01	0.	0.	0.	0.	6.66E+03	0.	1.34E+00
ZR--95	4.01E+01	1.69E+01	0.	7.00E+00	0.	2.90E+04	0.	1.24E+01
ZR--97	2.21E+00	5.57E-01	0.	6.51E-01	0.	2.50E+03	0.	2.04E-01
NB--95	1.99E+03	8.49E+02	0.	3.50E+02	0.	1.47E+06	0.	6.23E+02
MO--99	9.12E-03	1.17E+02	0.	2.64E+02	1.25E-02	2.85E+02	0.	2.25E+01
RU-103	2.31E+01	0.	0.	2.41E+01	0.	6.07E+02	0.	9.34E+00
RU-106	4.12E+02	0.	0.	1.84E+02	0.	6.40E+03	0.	5.12E+01
AG110M	1.27E+00	1.18E+00	0.	2.32E+00	0.	4.81E+02	0.	7.00E-01
SB-124	9.63E+00	1.82E-01	2.33E-02	0.	7.47E+00	2.73E+02	0.	3.81E+03
SB-125	4.71E+01	1.08E+01	1.11E+01	3.77E+01	8.08E+02	1.06E+02	0.	6.81E+00
TE125M	1.56E+04	4.24E+03	4.39E+03	1.49E+04	0.	1.51E+04	0.	2.08E+03
TE127M	3.85E+03	3.41E+03	2.73E+03	3.84E+04	0.	5.31E+04	0.	1.25E+03
TE129M	6.73E+04	1.88E+04	2.15E+04	6.54E+04	0.	8.10E+04	0.	1.04E+04
TE131M	1.42E+03	7.14E+02	1.86E+04	6.73E+03	0.	6.54E+04	0.	5.92E+02
TE-132	1.14E+04	5.06E+03	1.05E+04	1.77E+04	0.	8.84E+04	0.	6.09E+03
I--131	7.78E+02	7.97E+02	2.59E+05	4.87E+02	0.	6.83E+01	0.	6.01E+02
I--133	1.41E+02	1.74E+02	4.19E+04	1.02E+02	0.	7.04E+01	0.	6.83E+01
CS-134	1.55E+06	2.61E+06	0.	3.33E+05	2.90E+05	1.41E+04	0.	5.56E+05
CS-136	4.28E+04	1.69E+05	0.	9.40E+04	1.29E+04	1.92E+04	0.	1.22E+05
CS-137	2.16E+06	2.10E+06	0.	2.57E+05	2.40E+05	1.28E+04	0.	3.12E+05
BA-140	1.09E+03	1.05E+00	0.	1.14E-01	5.68E-01	2.92E+03	0.	6.37E+01
LA-140	5.79E-01	2.02E-01	0.	0.	0.	5.73E+03	0.	6.82E-02
CE-141	1.28E-01	6.38E-02	0.	9.98E-03	0.	8.01E+01	0.	9.51E-03
CE-143	3.44E-02	2.57E+00	0.	8.27E-03	0.	2.31E+02	0.	1.81E-03
CE-144	7.40E+00	2.32E+00	0.	4.20E-01	0.	6.02E+02	0.	3.94E-01
NP-239	3.21E-02	3.18E-03	0.	9.50E-03	0.	6.20E+02	0.	1.70E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - FRESH FRUITS AND VEGETABLES — AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	0.94E+03	4.35E+02	0.	0.	0.	7.80E+02	0.	2.60E+02
CR--51	0.	0.	7.11E-02	2.62E-02	1.58E-01	2.99E+01	0.	1.19E-01
MN--54	0.	2.97E+02	0.	8.85E+01	0.	9.11E+02	0.	5.66E+01
FE--55	4.05E+02	1.82E+03	0.	0.	2.11E+03	7.12E+02	0.	4.79E+02
FE--59	2.23E+02	5.28E+02	0.	0.	1.47E+02	1.74E+03	0.	2.01E+02
CO--58	0.	1.04E+02	0.	0.	0.	6.17E+02	0.	3.13E+02
CO--60	0.	3.53E+02	0.	0.	0.	1.95E+03	0.	1.06E+03
ZN--65	3.83E+02	1.22E+03	0.	8.13E+02	0.	7.00E+02	0.	5.50E+02
RB--86	0.	8.14E+02	0.	0.	0.	1.81E+02	0.	3.00E+02
SR--89	7.28E+04	0.	0.	0.	0.	2.72E+03	0.	2.08E+03
SR--90	1.29E+06	0.	0.	0.	0.	2.43E+04	0.	3.27E+05
Y---91	3.18E+01	0.	0.	0.	0.	4.22E+03	0.	8.47E-01
ZR--95	6.04E+00	1.47E+00	0.	9.03E-01	0.	1.00E+03	0.	1.30E+00
ZR--97	2.19E-03	4.46E-04	0.	6.07E-04	0.	1.32E+02	0.	2.04E-04
NB--95	9.38E-01	4.00E-01	0.	1.63E-01	0.	6.92E+02	0.	2.94E-01
MO--99	2.21E-03	3.91E+01	0.	8.88E+01	3.06E-03	9.44E+01	0.	7.53E+00
RU-103	3.40E+01	0.	0.	3.55E+01	0.	6.92E+02	0.	1.37E+01
RU-106	7.97E+02	0.	0.	3.56E+02	0.	1.24E+04	0.	9.91E+01
AG110M	1.11E+01	1.03E+01	0.	2.02E+01	0.	4.20E+03	0.	6.12E+00
SB-124	1.53E+02	2.89E+00	3.71E-01	0.	1.19E+02	4.34E+03	0.	6.06E+01
SB-125	6.76E+02	1.45E+02	1.48E+02	5.03E+02	1.50E+04	1.83E+03	0.	1.00E+02
TE125M	7.57E+02	2.05E+02	2.13E+02	7.24E+02	0.	7.31E+02	0.	1.01E+02
TE127M	5.88E+02	2.03E+02	1.00E+02	2.28E+03	0.	3.39E+03	0.	7.50E+01
TE129M	2.71E+03	7.58E+02	8.67E+02	2.64E+03	0.	3.27E+03	0.	4.19E+02
TE131M	6.35E+01	6.20E+01	1.93E+04	6.40E+01	0.	2.77E+02	0.	4.70E+01
TE-132	1.16E+02	5.62E+01	8.56E+02	1.86E+02	0.	8.83E+02	0.	6.27E+01
I--131	3.81E+02	3.90E+02	1.27E+05	2.38E+02	0.	3.34E+01	0.	2.94E+02
I--133	1.11E+01	1.37E+01	3.31E+03	8.04E+00	0.	5.55E+00	0.	5.39E+00
CS-134	1.49E+04	2.50E+04	0.	3.18E+03	2.78E+03	1.35E+02	0.	5.32E+03
CS-135	2.07E+02	8.16E+02	0.	4.54E+02	6.23E+01	9.27E+01	0.	5.88E+02
CS-137	2.23E+04	2.16E+04	0.	2.65E+03	2.53E+03	1.31E+02	0.	3.21E+03
BA-140	2.60E+03	2.39E+00	0.	2.73E-01	1.53E+00	3.18E+03	0.	1.55E+02
LA-140	4.97E-02	1.73E-02	0.	0.	0.	4.92E+02	0.	5.00E-03
CE-141	1.77E+00	8.84E-01	0.	1.38E-01	0.	1.11E+03	0.	1.32E-01
CE-143	3.59E-02	4.00E+00	0.	8.90E-03	0.	3.02E+02	0.	1.99E-03
CE-144	1.36E+02	4.25E+01	0.	7.68E+00	0.	1.10E+04	0.	7.23E+00
NP-239	2.95E-02	3.39E-03	0.	3.95E-03	0.	1.79E+02	0.	9.69E-04

DOSE FAC[illegible] FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE O[illegible]H ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITION[illegible]LUTION

PATHWAY - STORED FRUITS AND VEGETABLES — AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	7.95E+03	4.98E+02	0.	0.	0.	8.93E+02	0.	3.08E+02
CR--51	0.	0.	3.26E-01	1.21E-01	7.25E-01	1.37E+02	0.	5.40E-01
MN--54	0.	5.22E+03	0.	1.55E+03	0.	1.60E+04	0.	9.96E+02
FE--55	7.73E+03	3.48E+04	0.	0.	4.03E+04	1.36E+04	0.	9.15E+03
FE--59	1.79E+03	4.26E+03	0.	0.	1.18E+03	1.41E+04	0.	1.62E+03
CO--58	0.	1.17E+03	0.	0.	0.	6.94E+03	0.	3.52E+03
CO--60	0.	6.91E+03	0.	0.	0.	3.82E+04	0.	2.07E+04
ZN--65	6.47E+03	2.06E+04	0.	1.37E+04	0.	1.29E+04	0.	9.30E+03
RB--86	0.	1.83E+03	0.	0.	0.	3.60E+02	0.	8.52E+02
SR--89	6.49E+05	0.	0.	0.	0.	2.42E+04	0.	1.86E+04
SR--90	2.57E+07	0.	0.	0.	0.	5.03E+05	0.	6.52E+06
Y---91	3.18E+02	0.	0.	0.	0.	4.22E+04	0.	8.47E+00
ZR--95	7.35E+01	1.94E+01	0.	1.12E+01	0.	2.38E+04	0.	1.68E+01
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	5.83E+00	2.49E+00	0.	1.03E+00	0.	4.31E+03	0.	1.85E+00
MO--99	2.05E-05	3.70E-04	0.	1.15E-03	2.60E-06	1.81E-03	0.	9.14E-06
RU-103	2.45E+02	0.	0.	2.95E+02	0.	6.42E+03	0.	9.88E+01
RU-106	1.42E+04	0.	0.	6.37E+03	0.	2.21E+05	0.	1.77E+03
AG110M	1.90E+02	1.76E+02	0.	3.46E+02	0.	7.18E+04	0.	1.05E+02
SB-124	1.55E+03	2.93E+01	3.76E+00	0.	1.21E+03	4.40E+04	0.	6.14E+02
SB-125	1.46E+04	3.19E+03	3.28E+03	1.12E+04	3.00E+05	3.66E+04	0.	2.14E+03
TE125M	7.48E+03	2.03E+03	2.10E+03	7.16E+03	0.	7.22E+03	0.	9.98E+02
TE127M	7.97E+03	2.75E+03	2.25E+03	3.09E+04	0.	4.61E+04	0.	1.02E+03
TE129M	1.63E+04	4.54E+03	5.21E+03	1.58E+04	0.	1.90E+04	0.	2.52E+03
TE131M	8.30E+00	8.50E+00	2.77E+03	5.19E+00	0.	7.28E-01	0.	6.42E+00
TE-132	7.96E-03	5.86E-03	5.87E-02	1.28E-02	0.	6.06E-02	0.	4.30E-03
I--131	4.74E+01	4.85E+01	1.58E+04	2.96E+01	0.	4.15E+00	0.	3.60E+01
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.82E+05	4.74E+05	0.	6.04E+04	5.27E+04	2.57E+03	0.	1.01E+05
CS-136	1.78E+02	7.03E+02	0.	3.91E+02	5.36E+01	7.98E+01	0.	5.06E+02
CS-137	4.44E+05	4.29E+05	0.	5.28E+04	5.03E+04	2.62E+03	0.	6.40E+04
BA-140	2.13E+03	1.97E+00	0.	2.24E-01	1.11E+00	3.08E+03	0.	1.25E+02
LA-140	0.	0.	0.	0.	0.	2.45E-07	0.	0.
CE-141	1.00E+01	5.02E+00	0.	7.85E-01	0.	6.30E+03	0.	7.48E-01
CE-143	3.39E-02	1.36E-02	0.	7.85E-03	0.	1.49E+02	0.	1.68E-03
CE-144	2.35E+03	7.36E+02	0.	1.33E+02	0.	1.91E+05	0.	1.25E+02
NP-239	4.61E-01	5.66E-02	0.	2.78E-02	0.	2.40E-02	0.	1.14E-02

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - COWS MILK (CONTAMINATED) WATER

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	2.02E+01	2.02E+01	1.33E+01	2.02E+01	2.02E+01	0.	2.02E+01
P---32	4.36E+04	2.73E+03	0.	0.	0.	4.90E+03	0.	1.69E+03
CR--51	0.	0.	3.31E-02	1.22E-02	7.35E-02	1.39E+01	0.	5.54E-02
MN--54	0.	1.13E+01	0.	3.37E+00	0.	3.47E+01	0.	2.10E+00
FE--55	7.39E+01	3.33E+02	0.	0.	3.85E+02	1.30E+02	0.	8.74E+01
FE--59	5.03E+01	1.19E+02	0.	0.	3.31E+01	3.94E+02	0.	4.54E+01
CO--58	0.	1.81E+01	0.	0.	0.	1.07E+02	0.	5.45E+01
CO--60	0.	5.14E+01	0.	0.	0.	2.84E+02	0.	1.54E+02
ZN--65	1.87E+03	5.94E+03	0.	3.98E+03	0.	3.74E+03	0.	2.69E+03
RB--86	0.	5.85E+03	0.	0.	0.	1.15E+03	0.	2.73E+03
SR--89	1.07E+04	0.	0.	0.	0.	3.99E+02	0.	3.06E+02
SR--90	1.37E+05	0.	0.	0.	0.	1.82E+03	0.	3.47E+04
Y---91	5.69E-02	0.	0.	0.	0.	7.55E+00	0.	1.52E-03
ZR--95	2.34E-02	9.60E-03	0.	3.97E-03	0.	1.47E+01	0.	6.81E-03
ZR--97	2.10E-04	5.24E-05	0.	6.19E-05	0.	9.22E-01	0.	1.93E-05
NB--95	4.06E-01	1.99E-01	0.	8.20E-02	0.	3.44E+02	0.	1.46E-01
MO--99	3.67E-02	1.96E+02	0.	4.46E+02	5.09E-02	5.15E+02	0.	3.80E+01
RU-103	6.52E-03	0.	0.	0.80E-03	0.	1.71E-01	0.	2.63E-03
RU-106	1.18E-01	0.	0.	5.27E-02	0.	1.83E+00	0.	1.47E-02
AG110M	7.92E+01	7.33E+01	0.	1.44E+02	0.	2.99E+04	0.	4.30E+01
SB-124	4.10E+01	7.73E-01	9.91E-02	0.	3.18E+01	1.10E+03	0.	1.02E+01
SB-125	3.38E+01	5.10E-01	1.88E-01	5.38E-01	3.47E+03	2.95E+02	0.	6.76E+00
TE125M	1.11E+02	3.00E+01	3.11E+01	1.06E+02	0.	1.07E+02	0.	1.48E+01
TE127M	7.09E+01	2.44E+01	1.99E+01	2.74E+02	0.	4.04E+02	0.	9.02E+00
TE129M	4.73E+02	1.32E+02	1.51E+02	4.60E+02	0.	5.69E+02	0.	7.32E+01
TE131M	9.52E+01	9.46E+01	2.99E+04	8.32E+01	0.	2.71E+02	0.	7.16E+01
TE-132	7.45E+01	5.10E+01	2.91E+03	1.38E+02	0.	5.17E+02	0.	4.30E+01
I--131	8.19E+02	8.39E+02	2.73E+05	5.13E+02	0.	7.19E+01	0.	6.33E+02
I--133	7.32E+01	9.04E+01	2.18E+04	5.30E+01	0.	3.66E+01	0.	3.55E+01
CS-134	2.07E+04	4.49E+04	0.	5.72E+03	5.00E+03	2.43E+02	0.	9.50E+03
CS-136	6.99E+02	2.76E+03	0.	1.54E+03	2.10E+02	3.13E+02	0.	1.99E+03
CS-137	3.73E+04	3.01E+04	0.	4.43E+03	4.23E+03	2.20E+02	0.	5.37E+03
BA-140	2.95E+02	2.59E-01	0.	3.10E-02	1.54E-01	1.70E+01	0.	1.73E+01
LA-140	2.20E-04	7.66E-05	0.	0.	0.	2.18E+00	0.	2.59E-05
CE-141	2.15E-01	1.08E-01	0.	1.68E-02	0.	1.35E+02	0.	1.60E-02
CE-143	3.63E-03	2.06E+00	0.	1.18E-03	0.	9.95E+01	0.	2.95E-04
CE-144	1.27E+01	3.98E+00	0.	7.19E-01	0.	1.03E+03	0.	6.77E-01
NP-239	3.62E-05	3.64E-06	0.	1.03E-05	0.	6.62E-01	0.	1.86E-06

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	2.54E+05	1.60E+04	0.	0.	0.	2.86E+04	0.	9.85E+03
CR--51	0.	0.	2.33E-01	8.60E-02	5.17E-01	9.80E+01	0.	3.90E-01
MN--54	0.	1.02E+02	0.	3.04E+01	0.	3.13E+02	0.	1.95E+01
FE--55	6.72E+02	3.02E+03	0.	0.	3.50E+03	1.18E+03	0.	7.94E+02
FE--59	3.89E+02	9.24E+02	0.	0.	2.57E+02	3.05E+03	0.	3.52E+02
CO--58	0.	1.49E+02	0.	0.	0.	8.84E+02	0.	4.48E+02
CO--60	0.	4.78E+02	0.	0.	0.	2.64E+03	0.	1.43E+03
ZN--65	1.85E+04	5.89E+04	0.	3.94E+04	0.	3.71E+04	0.	2.66E+04
RB--86	0.	3.68E+04	0.	0.	0.	7.26E+03	0.	1.72E+04
SR--89	8.44E+04	0.	0.	0.	0.	3.15E+03	0.	2.42E+03
SR--90	1.33E+06	0.	0.	0.	0.	1.78E+04	0.	3.38E+05
Y---91	4.58E-01	0.	0.	0.	0.	6.08E+01	0.	1.22E-02
ZR--95	9.38E-01	3.93E-01	0.	1.64E-01	0.	6.73E+02	0.	2.90E-01
ZR--97	1.20E-04	2.99E-05	0.	3.54E-05	0.	5.26E-01	0.	1.10E-03
NB--95	3.46E+00	1.47E+00	0.	6.08E-01	0.	2.55E+03	0.	1.08E+00
MO--99	7.29E-02	3.86E+02	0.	8.79E+02	1.01E-01	1.02E+03	0.	7.62E+01
RU-103	4.96E-02	0.	0.	5.18E-02	0.	1.30E+00	0.	2.01E-02
RU-106	1.08E+00	0.	0.	4.83E-01	0.	1.68E+01	0.	1.35E-01
AG110M	7.37E+02	6.82E+02	0.	1.34E+03	0.	2.78E+05	0.	4.05E+02
SB-124	3.31E+02	6.25E+00	8.00E-01	0.	2.57E+02	9.37E+03	0.	1.31E+02
SB-125	6.46E+02	9.54E+01	9.57E+01	3.25E+02	3.20E+04	3.03E+03	0.	1.07E+02
TE125M	9.78E+02	2.65E+02	2.75E+02	9.36E+02	0.	9.44E+02	0.	1.31E+02
TE127M	7.07E+02	2.44E+02	1.99E+02	2.73E+03	0.	4.08E+03	0.	9.01E+01
TE129M	3.70E+03	1.03E+03	1.18E+03	3.60E+03	0.	4.46E+03	0.	5.73E+02
TE131M	5.67E+02	5.79E+02	1.87E+05	3.78E+02	0.	3.00E+02	0.	4.36E+02
TE-132	1.70E+02	1.16E+02	6.04E+03	3.13E+02	0.	1.18E+03	0.	9.78E+01
I--131	3.49E+03	3.57E+03	1.16E+06	2.18E+03	0.	3.06E+02	0.	2.69E+03
I--133	5.11E+01	6.30E+01	1.52E+04	3.70E+01	0.	2.55E+01	0.	2.48E+01
CS-134	2.44E+05	4.11E+05	0.	5.24E+04	4.57E+04	2.23E+03	0.	8.73E+04
CS-136	3.81E+03	1.50E+04	0.	8.36E+03	1.15E+03	1.71E+03	0.	1.08E+04
CS-137	3.54E+05	3.43E+05	0.	4.21E+04	4.02E+04	2.09E+03	0.	5.10E+04
BA-140	1.60E+03	1.40E+00	0.	1.68E-01	8.35E-01	1.06E+02	0.	9.37E+01
LA-140	2.78E-04	9.69E-05	0.	0.	0.	2.75E+00	0.	3.28E-03
CE-141	1.57E+00	7.85E-01	0.	1.23E-01	0.	9.85E+02	0.	1.17E-01
CE-143	4.05E-03	2.82E+00	0.	1.30E-03	0.	1.06E+02	0.	3.24E-04
CE-144	1.14E+02	3.55E+01	0.	6.42E+00	0.	9.23E+03	0.	6.65E+00
NP-239	1.13E-04	1.25E-05	0.	2.06E-05	0.	1.13E+00	0.	4.45E-03

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - COWS MILK (CONTAMINATED FEED)

AGE GROUP - CHILD

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P----32	1.34E+03	8.38E+01	0.	0.	0.	1.50E+02	0.	5.17E+01
CR--51	0.	0.	1.03E-02	3.79E-03	2.28E-02	4.32E+00	0.	1.72E-02
MN--54	0.	3.85E+01	0.	1.15E+01	0.	1.18E+02	0.	7.35E+00
FE--55	2.87E+02	1.29E+03	0.	0.	1.49E+03	5.04E+02	0.	3.39E+02
FE--59	4.17E+01	9.90E+01	0.	0.	2.75E+01	3.27E+02	0.	3.77E+01
CO--58	0.	2.71E+01	0.	0.	0.	1.61E+02	0.	8.17E+01
CO--60	0.	2.17E+02	0.	0.	0.	1.20E+03	0.	6.50E+02
ZN--65	7.31E+03	2.32E+04	0.	1.55E+04	0.	1.40E+04	0.	1.05E+04
RB--86	0.	5.31E+02	0.	0.	0.	1.05E+02	0.	2.48E+02
SR--89	1.36E+04	0.	0.	0.	0.	3.97E+02	0.	3.84E+02
SR--90	6.51E+05	0.	0.	0.	0.	8.72E+03	0.	1.05E+05
Y---91	6.92E-02	0.	0.	0.	0.	9.19E+00	0.	1.85E-03
ZR--95	8.60E-01	3.75E-01	0.	1.55E-01	0.	6.47E+02	0.	2.79E-01
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	2.45E-01	1.05E-01	0.	4.32E-02	0.	1.81E+02	0.	7.89E-02
MO--99	1.63E-05	2.40E-05	0.	3.02E-04	2.04E-06	7.85E-04	0.	7.24E-02
RU-103	4.46E-03	0.	0.	4.65E-03	0.	1.17E-01	0.	1.85E-03
RU-106	4.25E-01	0.	0.	1.90E-01	0.	6.61E+00	0.	5.29E-02
AG110M	2.77E+02	2.56E+02	0.	5.04E+02	0.	1.05E+05	0.	1.52E+02
SB-124	5.12E+01	9.05E-01	1.24E-01	0.	3.97E+01	1.45E+03	0.	2.02E+01
SB-125	5.05E+02	1.02E+02	1.04E+02	3.55E+02	1.40E+04	1.54E+03	0.	7.62E+01
TE125M	1.62E+02	4.39E+01	4.55E+01	1.55E+02	0.	1.50E+02	0.	2.15E+01
TE127M	2.05E+02	7.06E+01	5.78E+01	7.93E+02	0.	1.18E+03	0.	2.61E+01
TE129M	2.69E+02	7.52E+01	8.62E+01	2.62E+02	0.	3.24E+02	0.	4.16E+01
TE131M	1.01E-01	1.03E-01	3.35E+01	6.29E-02	0.	8.81E-03	0.	7.77E-02
TE-132	3.02E-07	2.08E-07	1.19E-05	5.58E-07	0.	2.10E-06	0.	1.75E-07
I--131	5.73E-01	5.87E-01	1.91E+02	3.59E-01	0.	5.03E-02	0.	4.43E-01
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	1.04E+05	1.75E+05	0.	2.23E+04	1.95E+04	9.49E+02	0.	3.73E+04
CS-136	1.23E+01	4.86E+01	0.	2.70E+01	3.70E+00	5.52E+00	0.	3.50E+01
CS-137	1.69E+05	1.63E+05	0.	2.00E+04	1.91E+04	9.94E+02	0.	2.43E+04
BA-140	4.78E+00	4.20E-03	0.	5.02E-04	2.50E-03	3.27E-01	0.	2.81E-01
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	9.06E-02	4.83E-02	0.	7.50E-03	0.	6.07E+01	0.	7.20E-03
CE-143	1.07E-06	4.29E-07	0.	2.47E-07	0.	4.67E-03	0.	5.29E-03
CE-144	4.14E+01	1.30E+01	0.	2.34E+00	0.	3.37E+03	0.	2.21E+00
NP-239	2.93E-05	3.59E-06	0.	1.77E-06	0.	1.52E-06	0.	7.25E-07

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - POTABLE WATER

AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	7.87E+01	7.87E+01	3.44E+01	7.87E+01	7.87E+01	0.	7.87E+01
P---32	4.83E+04	3.03E+03	0.	0.	0.	5.43E+03	0.	1.67E+03
CR--51	0.	0.	4.03E-01	1.49E-01	8.94E-01	1.69E+02	0.	8.73E-01
MN--54	0.	1.17E+03	0.	3.48E+02	0.	3.59E+03	0.	2.24E+02
FE--55	1.59E+03	7.15E+03	0.	0.	8.28E+03	2.79E+03	0.	1.88E+03
FE--59	1.10E+03	2.02E+03	0.	0.	7.28E+02	8.05E+03	0.	9.97E+02
CO--58	0.	9.64E+02	0.	0.	0.	2.50E+03	0.	2.30E+03
CO--60	0.	2.74E+03	0.	0.	0.	8.77E+03	0.	8.50E+03
ZN--65	1.24E+03	3.94E+03	0.	2.64E+03	0.	2.48E+03	0.	1.78E+03
RB--86	0.	5.31E+03	0.	0.	0.	1.05E+03	0.	2.48E+03
SR--89	7.46E+05	0.	0.	0.	0.	1.40E+04	0.	2.14E+04
SR--90	8.43E+06	0.	0.	0.	0.	8.63E+04	0.	1.64E+03
Y---91	3.19E+02	0.	0.	0.	0.	2.11E+04	0.	8.49E+00
ZR--95	5.39E+01	1.36E+01	0.	3.94E+00	0.	8.10E+03	0.	9.67E+00
ZR--97	2.73E-01	5.55E-02	0.	8.31E-02	0.	1.65E+04	0.	2.53E-02
NB--95	9.87E+00	4.44E+00	0.	8.71E-01	0.	3.55E+03	0.	2.61E+00
MO--99	3.96E-02	9.76E+02	0.	2.21E+03	5.49E-02	2.33E+03	0.	1.87E+02
RU-103	3.58E+02	0.	0.	1.80E+02	0.	4.47E+03	0.	1.23E+02
RU-106	6.51E+03	0.	0.	1.35E+03	0.	5.05E+04	0.	7.99E+02
AG110M	4.10E+01	3.79E+01	0.	7.45E+01	0.	1.55E+04	0.	2.25E+01
SB-124	7.16E+02	1.35E+01	1.73E+00	0.	5.56E+02	2.03E+04	0.	2.83E+02
SB-125	5.79E+02	8.78E+00	3.08E+00	3.50E+00	5.97E+04	5.05E+03	0.	1.16E+02
TE125M	6.19E+03	2.09E+03	2.04E+03	2.78E+03	0.	2.98E+03	0.	8.26E+02
TE127M	1.87E+03	6.54E+02	5.58E+02	7.10E+03	0.	9.18E+03	0.	2.42E+02
TE129M	2.66E+04	9.16E+03	1.00E+04	1.22E+04	0.	1.61E+04	0.	4.00E+03
TE131M	6.53E+02	5.41E+02	1.22E+05	1.75E+03	0.	1.61E+04	0.	3.57E+02
TE-132	4.96E+03	2.55E+03	2.01E+04	3.84E+03	0.	1.86E+04	0.	2.29E+03
I--131	8.40E+03	9.99E+03	3.22E+06	2.50E+03	0.	3.76E+02	0.	5.84E+03
I--133	2.17E+03	3.17E+03	7.50E+05	7.47E+02	0.	5.64E+02	0.	9.63E+02
CS-134	1.17E+05	2.11E+05	0.	1.23E+04	2.41E+04	5.02E+02	0.	1.79E+04
CS-136	1.63E+03	6.41E+03	0.	3.57E+03	4.89E+02	7.29E+02	0.	4.62E+03
CS-137	1.67E+05	1.87E+05	0.	9.51E+03	2.20E+04	4.85E+02	0.	1.08E+04
BA-140	4.34E+04	4.41E+01	0.	2.17E+00	2.67E+01	6.02E+03	0.	2.24E+03
LA-140	4.42E+00	1.74E+00	0.	0.	0.	2.17E+04	0.	4.50E-01
CE-141	2.03E+01	1.25E+01	0.	7.45E-01	0.	6.04E+03	0.	1.40E+00
CE-143	3.81E-01	2.43E+02	0.	1.19E-01	0.	9.31E+03	0.	2.95E-02
CE-144	1.15E+03	4.53E+02	0.	3.10E+01	0.	4.74E+04	0.	6.20E+01
NP-239	2.82E-01	2.82E-02	0.	8.14E-02	0.	5.31E+03	0.	1.47E-02

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

PATHWAY - COWS MILK (CONTAMINATE) WATER AGE GROUP - INFANT

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	3.06E+01	3.06E+01	1.33E+01	3.06E+01	3.06E+01	0.	3.06E+01
P---32	4.36E+04	2.73E+03	0.	0.	0.	4.90E+03	0.	1.69E+03
CR--51	0.	0.	3.31E-02	1.22E-02	7.35E-02	1.39E+01	0.	5.54E-02
MN--54	0.	1.13E+01	0.	3.37E+00	0.	3.47E+01	0.	2.10E+00
FE--55	7.39E+01	3.33E+02	0.	0.	3.85E+02	1.30E+02	0.	8.74E+01
FE--59	5.03E+01	1.19E+02	0.	0.	3.31E+01	3.94E+02	0.	4.54E+01
CO--58	0.	3.69E+01	0.	0.	0.	9.55E+01	0.	9.04E+01
CO--60	0.	1.06E+02	0.	0.	0.	2.03E+02	0.	2.55E+02
ZN--65	1.87E+03	5.94E+03	0.	3.98E+03	0.	3.74E+03	0.	2.69E+03
RB--86	0.	5.85E+03	0.	0.	0.	1.15E+03	0.	2.73E+03
SR--89	2.27E+04	0.	0.	0.	0.	4.25E+02	0.	6.52E+02
SR--90	2.00E+05	0.	0.	0.	0.	1.94E+03	0.	5.10E+04
Y---91	1.22E-01	0.	0.	0.	0.	8.04E+00	0.	3.24E-03
ZR--95	4.69E-02	1.91E-02	0.	3.97E-03	0.	1.44E+01	0.	1.15E-02
ZR--97	2.10E-04	5.24E-05	0.	6.19E-05	0.	9.22E-01	0.	1.93E-05
NB--95	9.30E-01	4.19E-01	0.	8.20E-02	0.	3.35E+02	0.	2.45E-01
MO--99	3.67E-02	1.96E+02	0.	4.46E+02	5.09E-02	5.15E+02	0.	3.80E+01
RU-103	1.36E-02	0.	0.	6.80E-03	0.	1.69E-01	0.	4.00E-03
RU-106	2.52E-01	0.	0.	5.27E-02	0.	1.95E+00	0.	3.09E-02
AG110M	7.92E+01	7.33E+01	0.	1.44E+02	0.	2.99E+04	0.	4.30E+01
SB-124	4.10E+01	7.73E-01	9.91E-02	0.	3.18E+01	1.10E+03	0.	1.62E+01
SB-125	3.44E+01	7.62E-01	4.25E-01	5.38E-01	3.47E+03	2.95E+02	0.	6.84E+00
TE125M	2.36E+02	7.96E+01	7.77E+01	1.06E+02	0.	1.14E+02	0.	3.15E+01
TE127M	7.56E+01	2.63E+01	2.43E+01	2.74E+02	0.	4.37E+02	0.	1.01E+01
TE129M	1.00E+03	3.45E+02	3.77E+02	4.00E+02	0.	6.05E+02	0.	1.53E+02
TE131M	1.93E+02	2.27E+02	7.21E+04	8.32E+01	0.	2.71E+02	0.	1.33E+02
TE-132	1.46E+02	9.00E+01	2.97E+03	1.38E+02	0.	5.29E+02	0.	7.12E+01
I--131	1.72E+03	2.05E+03	6.59E+05	5.13E+02	0.	7.69E+01	0.	1.20E+03
I--133	1.54E+02	2.25E+02	5.33E+04	5.30E+01	0.	4.00E+01	0.	6.83E+01
CS-134	5.46E+04	9.82E+04	0.	5.72E+03	1.12E+04	2.34E+02	0.	8.31E+03
CS-136	6.99E+02	2.76E+03	0.	1.54E+03	2.10E+02	3.13E+02	0.	1.99E+03
CS-137	7.80E+04	8.73E+04	0.	4.43E+03	1.05E+04	2.26E+02	0.	3.02E+03
BA-140	6.22E+02	6.25E-01	0.	3.10E-02	3.82E-01	1.85E+01	0.	3.21E+01
LA-140	4.61E-04	1.82E-04	0.	0.	0.	2.26E+00	0.	4.70E-05
CE-141	4.58E-01	2.81E-01	0.	1.68E-02	0.	1.36E+02	0.	3.29E-02
CE-143	3.63E-03	2.66E+00	0.	1.18E-03	0.	9.95E+01	0.	2.95E-04
CE-144	2.67E+01	1.05E+01	0.	7.19E-01	0.	1.10E+03	0.	1.44E+00
NP-239	3.73E-05	3.79E-06	0.	1.03E-05	0.	6.62E-01	0.	1.80E-05

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	2.54E+05	1.60E+04	0.	0.	0.	2.86E+04	0.	9.65E+03
CR--51	0.	0.	2.33E-01	8.60E-02	5.17E-01	9.60E+01	0.	3.90E-01
MN--54	0.	1.02E+02	0.	3.04E+01	0.	3.13E+02	0.	1.95E+01
FE--55	6.72E+02	3.02E+03	0.	0.	3.50E+03	1.18E+03	0.	7.94E+02
FE--59	3.69E+02	9.24E+02	0.	0.	2.57E+02	3.05E+03	0.	3.52E+02
CO--58	0.	3.04E+02	0.	0.	0.	7.87E+02	0.	7.44E+02
CO--60	0.	9.89E+02	0.	0.	0.	2.44E+03	0.	2.37E+03
ZN--65	1.85E+04	5.89E+04	0.	3.96E+04	0.	3.71E+04	0.	2.66E+04
RB--86	0.	3.68E+04	0.	0.	0.	7.26E+03	0.	1.72E+04
SR--89	1.79E+05	0.	0.	0.	0.	3.35E+03	0.	5.15E+03
SR--90	1.95E+06	0.	0.	0.	0.	1.89E+04	0.	4.96E+05
Y---91	9.79E-01	0.	0.	0.	0.	6.48E+01	0.	2.61E-02
ZR--95	1.87E+00	8.26E-01	0.	1.64E-01	0.	6.53E+02	0.	4.89E-01
ZR--97	1.20E-04	2.99E-05	0.	3.54E-05	0.	5.26E-01	0.	1.10E-05
NB--95	6.89E+00	3.10E+00	0.	6.08E-01	0.	2.48E+03	0.	1.83E+00
MO--99	7.29E-02	3.86E+02	0.	8.79E+02	1.01E-01	1.02E+03	0.	7.62E+01
RU-103	1.03E-01	0.	0.	5.18E-02	0.	1.29E+00	0.	3.55E-02
RU-106	2.31E+00	0.	0.	4.83E-01	0.	1.79E+01	0.	2.84E-01
AG110M	7.37E+02	6.82E+02	0.	1.34E+03	0.	2.78E+05	0.	4.05E+02
SB-124	3.31E+02	6.25E+00	8.00E-01	0.	2.57E+02	9.37E+03	0.	1.31E+02
SB-125	1.03E+03	2.47E+02	2.38E+02	3.25E+02	3.20E+04	3.05E+03	0.	1.58E+02
TE125M	2.09E+03	7.03E+02	6.87E+02	9.36E+02	0.	1.06E+03	0.	2.78E+02
TE127M	7.56E+02	2.63E+02	2.44E+02	2.73E+03	0.	4.41E+03	0.	1.01E+02
TE129M	7.86E+03	2.70E+03	2.96E+03	3.60E+03	0.	4.74E+03	0.	1.20E+03
TE131M	1.19E+03	1.40E+03	4.52E+05	3.78E+02	0.	3.04E+02	0.	8.22E+02
TE-132	3.34E+02	2.05E+02	6.77E+03	3.13E+02	0.	1.21E+03	0.	1.62E+02
I--131	7.31E+03	8.70E+03	2.80E+06	2.18E+03	0.	3.27E+02	0.	5.09E+03
I--133	1.08E+02	1.57E+02	3.71E+04	3.70E+01	0.	2.79E+01	0.	4.70E+01
CS-134	5.00E+05	8.99E+05	0.	5.24E+04	1.03E+05	2.14E+03	0.	7.61E+04
CS-136	3.81E+03	1.50E+04	0.	8.36E+03	1.15E+03	1.71E+03	0.	1.08E+04
CS-137	7.41E+05	8.29E+05	0.	4.21E+04	9.99E+04	2.14E+03	0.	4.76E+04
BA-140	3.36E+03	3.38E+00	0.	1.68E-01	2.07E+00	1.11E+02	0.	1.74E+02
LA-140	5.84E-04	2.31E-04	0.	0.	0.	2.86E+00	0.	5.95E-05
CE-141	3.34E+00	2.05E+00	0.	1.23E-01	0.	9.93E+02	0.	2.40E-01
CE-143	4.05E-03	2.82E+00	0.	1.30E-03	0.	1.06E+02	0.	3.24E-04
CE-144	2.38E+02	9.59E+01	0.	6.42E+03	0.	9.81E+03	0.	1.28E+01
NP-239	1.33E-04	1.53E-05	0.	2.06E-05	0.	1.13E+00	0.	4.95E-05

DOSE FACTORS FOR LIQUID DISCHARGES BASED ON 1 CI/YR RELEASE OF EACH ISOTOPE IN DISCHARGE FLOW OF 1 GPM WITH NO ADDITIONAL DILUTION

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

NUCLIDE	ORGAN DOSE (MREM)							
	BONE	LIVER	THYROID	KIDNEY	LUNG	GI-LLI	SKIN	TOTAL BODY
H----3	0.	0.	0.	0.	0.	0.	0.	0.
P---32	1.34E+03	8.38E+01	0.	0.	0.	1.50E+02	0.	5.17E+01
CR--51	0.	0.	1.03E-02	3.79E-03	2.28E-02	4.32E+00	0.	1.72E-02
MN--54	0.	3.85E+01	0.	1.15E+01	0.	1.18E+02	0.	7.36E+00
FE--55	2.87E+02	1.29E+03	0.	0.	1.49E+03	5.04E+02	0.	3.39E+02
FE--59	4.17E+01	9.90E+01	0.	0.	2.75E+01	3.27E+02	0.	3.77E+01
CO--58	0.	5.54E+01	0.	0.	0.	1.43E+02	0.	1.36E+02
CO--60	0.	4.48E+02	0.	0.	0.	1.11E+03	0.	1.07E+03
ZN--65	7.31E+03	2.32E+04	0.	1.55E+04	0.	1.46E+04	0.	1.05E+04
RB--86	0.	5.31E+02	0.	0.	0.	1.05E+02	0.	2.48E+02
SR--89	2.26E+04	0.	0.	0.	0.	4.22E+02	0.	6.48E+02
SR--90	9.50E+05	0.	0.	0.	0.	9.26E+03	0.	2.42E+05
Y---91	1.48E-01	0.	0.	0.	0.	9.78E+00	0.	3.94E-03
ZR--95	1.75E+00	7.88E-01	0.	1.55E-01	0.	6.29E+02	0.	4.64E-01
ZR--97	0.	0.	0.	0.	0.	0.	0.	0.
NB--95	4.90E-01	2.20E-01	0.	4.32E-02	0.	1.76E+02	0.	1.30E-01
MO--99	1.63E-05	2.40E-05	0.	3.02E-04	2.04E-06	7.85E-04	0.	7.24E-02
RU-103	9.27E-03	0.	0.	4.65E-03	0.	1.16E-01	0.	3.19E-03
RU-106	9.08E-01	0.	0.	1.90E-01	0.	7.04E+00	0.	1.12E-01
AG110M	2.77E+02	2.56E+02	0.	5.04E+02	0.	1.05E+05	0.	1.52E+02
SB-124	5.12E+01	9.65E-01	1.24E-01	0.	3.97E+01	1.45E+03	0.	2.02E+01
SB-125	9.24E+02	2.67E+02	2.60E+02	3.55E+02	1.40E+04	1.56E+03	0.	1.32E+02
TE125M	3.45E+02	1.16E+02	1.14E+02	1.55E+02	0.	1.66E+02	0.	4.00E+01
TE127M	2.19E+02	7.61E+01	7.08E+01	7.93E+02	0.	1.28E+03	0.	2.92E+01
TE129M	5.71E+02	1.90E+02	2.15E+02	2.62E+02	0.	3.44E+02	0.	8.71E+01
TE131M	2.11E-01	2.51E-01	8.07E+01	6.29E-02	0.	9.43E-03	0.	1.47E-01
TE-132	5.96E-07	3.66E-07	1.21E-05	5.58E-07	0.	2.15E-06	0.	2.90E-07
I--131	1.20E+00	1.43E+00	4.61E+02	3.59E-01	0.	5.38E-02	0.	8.37E-01
I--133	0.	0.	0.	0.	0.	0.	0.	0.
CS-134	2.13E+05	3.83E+05	0.	2.23E+04	4.38E+04	9.12E+02	0.	3.24E+04
CS-136	1.23E+01	4.80E+01	0.	2.70E+01	3.70E+00	5.52E+00	0.	3.50E+01
CS-137	3.53E+05	3.95E+05	0.	2.00E+04	4.70E+04	1.02E+03	0.	2.27E+04
BA-140	1.01E+01	1.01E-02	0.	5.02E-04	6.19E-03	3.43E-01	0.	5.20E-01
LA-140	0.	0.	0.	0.	0.	0.	0.	0.
CE-141	2.06E-01	1.26E-01	0.	7.55E-03	0.	6.12E+01	0.	1.48E-02
CE-143	1.07E-06	4.29E-07	0.	2.47E-07	0.	4.07E-03	0.	5.29E-08
CE-144	8.69E+01	3.43E+01	0.	2.34E+00	0.	3.58E+03	0.	4.09E+00
NP-239	3.95E-05	5.01E-06	0.	1.77E-05	0.	1.01E-06	0.	9.70E-07

APPENDIX B

TECHNICAL BASES FOR EFFECTIVE DOSE FACTORS

Overview

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 total radioactivity released to approximate the dose in the environment, ie, instead of having to sum the isotopic distribution multiplied by the isotope specific dose factor only a single multiplication 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.

$$A\gamma_{s\ eff} = \sum_i A\gamma_i \cdot f_i$$

where $A\gamma_{s\ eff}$ = the effective gamma-air dose factor due to stack releases of noble gases (mrad/μCi)

$A\gamma_i$ = the gamma-air dose factor due to stack releases of each noble gas radionuclide i (mrad/μCi)

f_i = the fraction of noble gas radioactivity constituted by radionuclide i

$$A\gamma_{v\ eff} = \sum_i A\gamma_{vi} \cdot f_i$$

where A_{veff} = the effective gamma-air dose factor due to vent releases of all noble gases $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$

$A_{\gamma vi}$ = the gamma-air dose factor due to vent releases of each noble gas radionuclide i (mrad/μCi) $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$

$$A_{\beta eff} = \sum_i A_{\beta i} \cdot f_i$$

where $A_{\beta eff}$ = the effective beta-air dose factor due to either vent or stack releases of all noble gases $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$

$A_{\beta i}$ = the beta air dose factor due to either vent or stack releases of each noble gas radionuclide i $\left(\frac{\text{mrad}}{\mu\text{Ci sec/m}^3}\right)$

To determine the appropriate effective factors to be used and to evaluate the degree of variability, the atmospheric radioactive effluents for the past 3 years have been evaluated.

Table B-1 presents the radionuclide distribution for stack and vent releases as measured by isotopic analysis of periodic grab samples from the respective effluent release points. Table B-2 presents the effective dose factors (gamma-air and beta-air) derived on the basis of the radionuclide distribution.

Except for the year 1981, the variability of the effective factors is minor. For 1981, Xe-138 contributes significantly to the derivation of the effective factors for stack releases. The Xe-138 contribution for the years

1979 and 1980 is not so significant. This increase in Xe-138 from 1981 results in a larger variability of the yearly values from the average than what is considered typical. Therefore, in order to assure adequate conservatism, the effective dose factors for stack releases will be based on the radionuclide distribution for the year 1981. Because this is considered an atypical distribution resulting in higher doses, use of the data will provide dose estimates which are conservative. As more data become available to further establish a typical radionuclide distribution, the effective dose factors for stack releases may be reevaluated.

To provide an additional degree of conservatism, a factor of 0.8 is introduced into the dose calculational 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.

By evaluating doses using these effective dose factors, maximum allowable releases of noble gases for any calendar quarter may be determined. As discussed in Section 3.5.1, the maximum allowable releases based on the gamma-air effective dose factor have been determined to be 250,000 Ci/quarter for stack releases and 12,700 Ci/quarter for vent releases.

For the beta air effective dose factors, the releases of noble gases corresponding to the quarterly limit of 10 mrads corresponds to 307,000 Ci/quarter for stack releases and 29,600 Ci/quarter for vent releases. Comparing these values for allowable releases with the values based on the gamma-air effective dose factors, it is demonstrated that the gamma-air doses are more restrictive than the beta-air doses. In other words, the doses calculated by using the gamma-air effective dose factors represent a larger fraction of the allowable dose than does the dose calculated by using the beta-air effective dose factors. Therefore, when using the effective dose factors for evaluating compliance with the quarterly dose limits of

Technical Specification 3.15.3, only the gamma-air dose need be evaluated; compliance with the gamma-air dose limit represents a de facto compliance with the beta-air dose limit.

Reevaluation

The doses due to the gaseous effluents are evaluated by the more detailed calculational methods (i.e., use of nuclide specific dose factors) on a yearly basis. At that time, a comparison can be made between the simplified method and the detailed method to assure the overall reasonableness of this limited analysis approach. If the comparison indicates that the radionuclide distribution has changed significantly, thereby causing the simplified method to underestimate the doses, the value of the effective factors will need to be reexamined to assure the overall acceptability of this approach. However, this reexamination will only be needed if the doses as calculated by the detailed analysis exceed 50% of the design bases doses (i.e., greater than 50% of the 10 mrad gamma air dose or 20 mrad beta air dose).

Table B-1

RADIONUCLIDE DISTRIBUTION OF STACK AND VENT RELEASES

Radionuclide	Fraction of Total Releases					
	Stack			Vent		
	1979	1980	1981	1979	1980	1981
Kr-85m	.11	.05	.09	.02	--	--
Kr-87	.01	--	.02	--	.01	--
Kr-88	.07	.04	.08	--	--	--
Xe-133	.76	.82	.45	.24	.24	.14
Xe-135	.01	.02	.03	.72	.50	.59
Xe-135m	--	.02	.08	.02	.22	.21
Xe-138	.02	.06	.25	--	.03	.05

Table B-2

EFFECTIVE DOSE FACTORS NOBLE GASES - AIR DOSES

Year	Stack Releases		Vent Releases	
	Gamma-Air Effective Dose Factor $A_{\gamma}{}_{seff}$ (mrad/μCi)	Beta-Air Effective Dose Factor $A_{\beta}{}_{seff}$ $(\frac{mrad}{\mu Ci\ sec/m^3})$	Gamma-Air Effective Dose Factor $A_{\gamma}{}_{veff}$ $(\frac{mrad}{\mu Ci\ sec/m^3})$	Beta-Air Effective Dose Factor $A_{\beta}{}_{veff}$ $(\frac{mrad}{\mu Ci\ sec/m^3})$
1979	7.0×10^{-12}	5.9×10^{-5}	5.0×10^{-5}	6.5×10^{-5}
1980	6.7×10^{-12}	5.3×10^{-5}	6.7×10^{-5}	6.0×10^{-5}
1981	1.6×10^{-11}	9.3×10^{-5}	6.4×10^{-5}	6.3×10^{-5}
Avg.	9.9×10^{-12}	6.8×10^{-5}	6.4×10^{-5}	6.3×10^{-5}