

CHANGES TO THE OFFSITE DOSE CALCULATION MANUAL
FOR RADIOACTIVE LIQUID AND GASEOUS EFFLUENTS

Background

The Offsite Dose Calculation Manual (ODCM) is utilized for compliance with 10 CFR 20, 10 CFR 50 Appendix I, and the TMI-1 Technical Specifications. The copy attached is Revision 2 of this manual and includes the changes listed below.

1. Appendix A

Appendix A was added to include the MCP values from 10 CFR 20.

2. Appendix C

Appendix C was added to include the Dose Conversion Factors from Reg Guide 1.109, page 44.

3. Appendix D

Appendix D was added to include the Bioaccumulation Factors from Reg Guide 1.109, page 13.

4. Table 3.2

Table 3.2 was added to include the Site Related Ingestion Dose Commitment Factors for the Maximum Exposed Organ and Total Body.

5. Table 4.1

Table 4.1 was added to include the Site Specific Dose Factors for Determining Total Body Dose at the Site Boundary.

6. Table 4.2

Table 4.2 was added to include the Site Specific Dose Factors for Determining Total Skin Dose at the Site Boundary.

7. Table 4.1.2

Table 4.1.2 was added to include the Dose Conversion Factors Calculated for the Site Boundary.

8. Table 4.1.2(a)

Table 4.1.2(a) was added to include the Site Specific Dose Conversion Factors for Gamma Air Dose at the Site Boundary.

9. Table 4.2.1(b)

Table 4.2.1(b) was added to include the Site Dose Conversion Factors for Beta Air Dose at the Site Boundary.

10. Table 4.2.2b

Table 4.2.2b was added to include the Site Specific Dose Conversion Factor for Critical Locations (Vented Release).

11. Table 4.2.2c

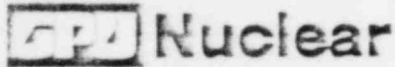
Table 4.2.2c was added to include the Site Specific Dose Conversion Factor for Critical Locations (Ground Level Release)

Changes 1 through 11 represent information added to the ODCM as enhancement for completeness and efficiency. They do not change any portion of the previous manual, but rather incorporate data from various documents and regulations so that the current ODCM is a self-contained, independent document.

12. Administrative Changes

Revision 2 of the ODCM represents a complete re-write, and many editing changes have been made which improve the quality of the manual, but do not change it technically or substantively. These changes include:

- .. Addition of an Introduction
- .. Addition of explanations to variable definitions
- .. Addition of a Reference Section
- .. Addition of pre-calculated tables
- .. Addition of new isotopes to some tables for use in calculations (i.e. Table 4.2.2a)



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Title
OFFSITE DOSE CALCULATION MANUAL

Revision No
2

Applicability Scope Calculate offsite doses due radioactive effluents
TMI 1 ONLY for demonstrating compliance with Tech Specs.,
100CFR20, and 100CFR50.

Responsible Office
Rad. Con TMI-1

This document is important to safety Yes No

Effective Date
12-31-82

List of Effective Pages

Page	Revision	Page	Revision	Page	Revision	Page	Revision
1.0	2	21.0	2	41.0	2	61.0	2
2.0	2	22.0	2	42.0	2	62.0	2
3.0	2	23.0	2	43.0	2	63.0	2
4.0	2	24.0	2	44.0	2	64.0	2
5.0	2	25.0	2	45.0	2	65.0	2
6.0	2	26.0	2	46.0	2	66.0	2
7.0	2	27.0	2	47.0	2	67.0	2
8.0	2	28.0	2	48.0	2	68.0	2
9.0	2	29.0	2	49.0	2	69.0	2
10.0	2	30.0	2	50.0	2	70.0	2
11.0	2	31.0	2	51.0	2	71.0	2
12.0	2	32.0	2	52.0	2	72.0	2
13.0	2	33.0	2	53.0	2	73.0	2
14.0	2	34.0	2	54.0	2	74.0	2
15.0	2	35.0	2	55.0	2	75.0	2
16.0	2	36.0	2	56.0	2	76.0	2
17.0	2	37.0	2	57.0	2	77.0	2
18.0	2	38.0	2	58.0	2		
19.0	2	39.0	2	59.0	2		
20.0	2	40.0	2	60.0	2		

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Offsite Dose Calculation Manual
For
Three Mile Island Nuclear Station
Unit 1

0004

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INTRODUCTION

This Offsite Dose Calculation Manual (ODCM) describes the methodology and parameters to be used in the calculation of offsite doses due to radioactive liquid and gaseous effluents, for purposes of demonstrating compliance with 10 CFR 20, 10 CFR 50 Appendix I, and the technical specifications. Additionally, it provides the calculational methodology for determining liquid and gaseous effluent monitoring instrumentation alarm/trip setpoints.

The operational Radiological Environmental Monitoring Program's (REMP) sampling locations and descriptions are also included to provide augmentation to the ODCM.

1.0 LIQUID EFFLUENTS

1.1 Liquid Effluent Monitor Setpoints

The liquid effluent line monitors are set such that the concentration(s) of isotope(s) in the liquid effluents will not exceed the concentration limits specified in 10 CFR 20, Appendix B Table II, Col 2 (See Appendix A to this manual).

To meet the above limit, the alarm/trip setpoints for liquid effluent monitors and flow measuring devices are set to assure that the following equation is satisfied:

$$\frac{cf}{F+f} \leq C \text{ (eq 1.1)}$$

where:

- C = the effluent concentration limit implementing 10 CFR 20 for the site, in uCi/ml.
- c = the setpoint, in uCi/ml, of the liquid effluent monitor measuring the radioactivity concentration in the effluent line prior to dilution and release. The setpoint is proportional to the volumetric flow of the effluent line and inversely proportional to the volumetric flow of the dilution stream plus the effluent stream. The setpoint value is such that if it were exceeded, it would result in concentrations exceeding the 10 CFR 20 limits for the unrestricted area.
- f = flow set point as measured at the radiation monitor location, in volume per unit time, but in the same units as F below.
- F = flow rate of dilution water measured prior to the release point, in volume per unit time.

The setpoint concentration is reduced such that concentration contributions from multiple release points would not combine to exceed 10 CFR 20 limits. The setpoint concentration is converted to setpoint scale units using appropriate calibration factors.

This section of the ODCM is implemented by Operations procedure 1101-2.1 Radiation Monitor System Setpoints and for batch releases Radiological Controls Procedure 1621- "Releasing Radioactive Liquid Waste".

2.0 GASEOUS EFFLUENT MONITORING SETPOINTS

2.1 Noble Gas Monitors

The gaseous effluent monitor setpoints are established to assure that concentrations of isotopes in gaseous effluents do not exceed the limits set in 10 CFR 20.

The setpoints are established so as to satisfy the more restrictive setpoint conc. in the following equations:

$$c \leq \frac{500}{(F_i) \times (K_i) \times (X/Q)} \quad (\text{eq. 2.1.1})$$

and

$$c \leq \frac{3000}{[(L_i) + (1.1 M_i) \times (X/Q) \times (F_i)]} \quad (\text{eq. 2.1.2})$$

where:

c = setpoint concentration, in uCi/cc.

F_i = effluent flow rate at the monitor, in cc/sec

K_i = total body dose factor, in mrem/yr per uCi/m³ from table 2-1

X/Q = highest sector annual average atmospheric dispersion factor at the unrestricted area boundary, in sec/m², from Appendix B Table B-1 for station vent releases and B-2 for all other releases.

L_i = skin dose factor due to beta emissions from isotope i , in mrem/yr per uCi/m² from Table 2-1.

M_i = air dose factor due to gamma emissions from isotope i , in mrad/yr per uCi/m² from Table 2-1.

1.1 = mrem skin dose per mrad air dose.

500 = annual whole body dose limit for unrestricted areas, in mrem/yr.

3000 = annual skin dose limit for unrestricted areas, in mrem/yr

The setpoint concentration is further reduced so that the concentration contributions from multiple release points would not combine to exceed 10 CFR 20 limits

The setpoint concentration is converted to setpoint scale units using appropriate calibration factors.

This section of the ODCM is implemented by Operations Procedure 1101-2.1 Radiation Monitor System Setpoints and Radiological Controls Procedure 1622- "Releasing Radioactive Gaseous Waste".

2.2 Other Isotopes

Setpoints for monitors which detect isotopes other than noble gases are also established to assure that concentrations of these isotopes in gaseous effluents do not exceed the limits in 10 CFR 20.

Setpoints are established so as to satisfy the following equations:

$$c \leq \frac{1500}{(F) \times (F_i) \times (D)} \quad (\text{ec. 2.2})$$

where:

c = setpoint concentration, in uCi/cc

F = effluent flow rate at the monitor, in cc/sec.

F_i = pathway dose parameter, in mrem/yr per uCi/m³ for the inhalation pathway and $\frac{\text{m}^2\text{-mrem}}{\text{yr}}$ per uCi/sec for the food and ground pathway from Table 2-2.

1500 = annual dose limit to any organ from particulates and iodines and radionuclides (other than noble gases) with half lives greater than eight days.

D = the controlling sector annual average atmospheric dispersion factor; maximum X/Q for the inhalation pathway at the unrestricted area, and maximum D/Q for the food and ground pathway at the nearest existing food and ground pathway locations. Use Table B-1 (Appendix B) for releases from the station vent and Table B-2 (Appendix B) for all other releases.

The setpoint concentration is further reduced such that concentration contributions from multiple release points would not combine to exceed 10 CFR 20 limits.

The setpoint concentration is converted to setpoint scale units using appropriate calibration factors.

This section of the ODCM is implemented by Operations Procedure 1101.21 Radiation Monitor Systems Setpoints and Radiological Controls Procedure - 1622- "Releasing Radioactive Gaseous Waste".

3.0 DOSE ASSESSMENT (LIQUID EFFLUENTS)

3.1 Liquid Effluents - 10 CFR 20 Limits

For purposes of demonstrating compliance with 10 CFR 20 the following equation must be satisfied:

$$\sum_i (C_i \div MPC_i) \leq 1 \quad (\text{ec 3.1})$$

where:

C_i = the concentration of isotope, i , in the liquid effluent after dilution, in uCi/ml.

MPC_i = the maximum permissible concentration of isotope i in liquid effluent in an unrestricted area per 10 CFR 20, Appendix B, Table II, Col 2 (See Appendix B to this manual)

3.2 Liquid Effluents - 10 CFR 50 Appendix I

The dose from liquid effluents results from the consumption of fish and drinking water. Other pathways contribute negligibly at Three Mile Island. The dose contribution from all radionuclides in liquid effluents released to the unrestricted area is calculated using the following expression:

$$\text{Dose } j = \sum_i \sum_k (\Delta t_k) \times (C_{ik}) \times \left[(AW_{ij}) \times \frac{FW_k}{FR_k} + (AF_{ij}) \times \frac{FW_k}{FP_k} \times 0.2 \right] \quad (\text{eq. 3.2})$$

where:

Dose j = the cumulative dose commitment to the total body or any organ, j , from the liquid effluents for the total time period, in mrem.

Δt_k = the length of the k th time period over which C_{ik} and F_k are averaged for all liquid releases, in hours.

C_i = the average concentration of radionuclide, i , in undiluted liquid effluent during time period Δt_k from any liquid release, in uCi/ml.

NOTE: For Sr-89, Sr-90, conservative concentration values will be used in the dose calculation based on similar past plant conditions < LLD values are not used in dose calculations.

FW_k = undiluted liquid waste flow, in gpm.

FP_k = plant dilution water flow rate, in gpm

FR_k = river flow rate, in gpm.

DF = dilution factor as a result of mixing effects in the near field of the discharge structure, taken to be 5. (0.2 = inverse of the DF value)

AW_{ij} and AF_{ij} = the site-related ingestion dose commitment factor to the total body or any organ, j , for each identified principle gamma and beta emitter, in mrem/hr per uCi/ml. AW is the factor for the water pathway and AF is the factor for the fish pathway.

values for AW_{ij} are determined by the following equation:

$$AW_{ij} = (1.14E5) \times (U_w) \times (DF_{ij}) \quad (\text{eq. 3.2.1})$$

where:

$$1.14E5 = (1.0E6 \text{ pCi/uCi}) \times (1.0E3 \text{ ml/Kg}) \div (8760 \text{ hr/yr})$$

U_w = water consumption rate for adult from Reg. Guide 1.109 (Rev. 1), taken to be 730 Kg/yr.

DF_{ij} = dose conversion factor for nuclide, i , for adults for "worst case" organ, j , in mrem/pCi, from Appendix C Table C-1 (Reg. Guide 1.109 (Rev. 1))

The values for AW_{ij} are precalculated for each isotope using the above equation. Precalculated values for AW_{ij} are obtained from Table 3.2.

Values for AF_{ij} are determined by the following equation:

$$AF_{ij} = (1.14E5) \times (U_f) \times (DF_{ij}) \times (BF_i) \quad (\text{eq. 3.2.2})$$

where:

1.14E5 = defined above

U_f = adult fish consumption, assumed to be 21 Kg/yr from Reg. Guide 1.109.

DF_{ij} = dose conversion factor for nuclide, i , for adult for "worst case" organ, i , in mrem/pCi, from Appendix C Table C-1 (from Reg. Guide 1.109 (Rev. 1)).

BF_i = Bioaccumulation factor for nuclide, i , in fish, in pCi/Kg per pCi/l from Appendix D, Table D-1 (Reg. Guide 1.109 (Rev. 1)).

Values for AF_{ij} are precalculated for each isotope using the equation. Precalculated values for AF_{ij} are obtained from Table 3.2.

3.3 Alternative Dose Calculation Methodology for Liquid Effluents

As an alternative, models in, or based upon, those presented in Regulatory Guide 1.109 (Rev. 1) may be used to make a comprehensive dose assessment. Default parameter values from Reg. Guide 1.109 (Rev. 1) and/or actual site specific data would be used where applicable.

4.0 DOSE ASSESSMENT (GASEOUS EFFLUENTS)4.1 Gaseous Effluents - 10 CFR 20 Limits

4.1.1 Noble Gases

For noble gases, the following equations apply for total body and skin dose rate at the unrestricted area boundary:

4.1.1.1 Total Body

$$\text{Dose Rate}_{\text{tb}} = \sum_i (K_i) \times (\overline{X/Q}) \times (Q_i) \quad (\text{ec. 4.1.1.1})$$

where:

$\text{Dose Rate}_{\text{tb}}$ = average total body dose rate in current year (mrem/year).

K_i = total body dose factor due to gamma emissions for each identified noble gas radionuclide, in mrem/yr per uCi/m^3 from Table 2-1.

$\overline{X/Q}$ = average annual dispersion value at the site boundary for worst case sector, in sec/m^3 . Values are obtained from Table B-1 for releases from station vent, and Table B-2 for all others.

Q_i = Release rate of radionuclide, i , in uCi/sec .

The equation above may be modified by precalculating the site specific Dose Factors for Total Body (DF_{TB}) equal to the $(\overline{X/Q}) \times (K_i)$ portion of the equation. These precalculated values for releases from the station vent and for all other releases are presented in Table 4-1.

4.1.1.2 Skin

$$\text{Dose Rate}_{\text{sk}} = \sum_i (L_i + 1.1 M_i) \times (\overline{X/Q}) \times (Q_i) \quad (\text{ec. 4.1.1.2})$$

where:

$\text{Dose Rate}_{\text{sk}}$ = average skin dose rate in current year (mrem/year)

L_i = skin dose factor due to beta emissions for each identified noble gas radionuclide, in mrem/yr per uCi/m^3 from Table 2-1.

M_i = air dose factor due to gamma emissions for each identified noble gas radionuclide, in mrad/yr per uCi/m^3 from Table 2-1.

1.1 = mrem skin dose per mrad air dose. Converts air dose to skin dose.

Q_i = release rate of radionuclide, i , in uCi/sec.

The above equation may be modified by precalculating the site specific Dose Factors for skin (DF_s) equal to the $(L_i - 1.1 M_i) X (X/Q)$ portion of the equation. These precalculated values for releases from the station vent and for all other releases are presented in Table 4-2.

4.1.2 Iodines and Particulates

For iodine and particulate isotopes, the following equation applies:

$$\text{Dose Rate}_{IP} = \sum_i P_i D_V Q_i \quad (\text{eq 4.1.2})$$

where:

Dose Rate IP = average organ dose rate in the current year (mrem/year).

P_i = dose parameter for radionuclides other than noble gases for the inhalation pathway, in mrem/yr per uCi/ m^3 , and for the food and ground plane pathways, in m^2 - mrem/yr per uCi/sec from Table 2-2. The dose factors are based on the critical individual organ and most restrictive age group.

D_V = highest calculated annual average dispersion parameter for estimating the dose to the critical receptor; X/Q for the inhalation pathway, in sec/m^3 , and D/Q for the food and ground plane pathways, in m^2 . For H-3, only X/Q 's are used for all pathways. Table B-1 from Appendix B are used for reactor building releases and B-2 for all other releases.

Q_i = release rate of radionuclide, i , in uCi/sec.

The equation above may be modified by the use of precalculated values obtained by solving the following portion of the equation for each isotope listed in Table 4.1.2.

$(P_i) \times (D_V)$ = dose conversion factors, (DCF_{VI} = dose conversion factor for station vent, inhalation pathway, DCF_{VFG} = dose conversion factor station vent, food and ground pathway, DCF_{GI} = dose conversion factor, ground release, inhalation pathway, DCF_{GFG} = dose conversion factor, ground release, food and ground pathway.)

The precalculated values are given in Table 4.1.2. for releases that occur from the station vent and for all other releases (ground).

4.2 Gaseous Effluents - 10 CFR 50 Appendix I

4.2.1 Noble Gases

The air dose in an unrestricted area due to noble gases released in gaseous effluents from the site is determined using the following expressions:

$$\text{Dose } \Gamma = (3.17\text{E}-8) \times \sum_i (M_i) \times (\overline{X/Q}) \times \tilde{Q}_i \quad (\text{eq. 4.2.1.1})$$

and

$$\text{Dose } \beta = (3.17\text{E}-8) \times \sum_i (N_i) \times (\overline{X/Q}) \times \tilde{Q}_i \quad (\text{eq. 4.2.1.2})$$

where:

$\text{Dose } \Gamma =$ mrad gamma dose during any specified time period.

$\text{Dose } \beta =$ mrad beta dose during any specified time period.

$M_i =$ air dose factor due to gamma emissions for each identified noble gas radionuclide, in mrad/yr per uCi/m³, from Table 2-1.

$N_i =$ air dose factor due to beta emissions for each identified noble gas radionuclide, in mrad/yr per uCi/m³, from Table 2-1.

$\overline{X/Q} =$ highest annual average relative concentration for any area at or beyond the unrestricted area boundary, in sec/m³, from table A-1 for releases from the reactor building and Table B-2 for all other releases.

$\tilde{Q}_i =$ release of noble gas radionuclide, i, in uCi, over the specified time period.

3.17E-8 = inverse of the number of seconds in a year.

The equation above may be modified by the use of precalculated values obtained by solving the following portion of the equations for each isotope listed in Table 2-1.

$$(3.17\text{E}-8) \times (M_i) \times (\overline{X/Q}) = \text{modified air dose factor-gamma}$$

$$(3.17\text{E}-8) \times (N_i) \times (\overline{X/Q}) = \text{modified air dose factor-beta}$$

The precalculated values are given in Table 4.2.1(a) for modified air dose conversion factors-gamma, for releases that occur from the station vent, ($\text{DCF}_{V\Gamma}$) or from ground level, ($\text{DCF}_{G\Gamma}$) and in table 4.2.1(b) for modified air dose conversion factors-beta, for releases that occur from the station vent, ($\text{DCF}_{V\beta}$) or from ground level, ($\text{DCF}_{G\beta}$).

4.2.2 Iodines and Particulates

The dose to an individual from radioiodines and radioactive materials in particulate form with half-lives greater than 8 days in gaseous effluents released from the site to an unrestricted area is determined by solving the following expression:

$$\text{Dose}_0 = (3.17\text{E}-8) \times \sum_i R_i D_v Q_i \quad (\text{eq. 4.2.2})$$

where:

Dose_0 = dose to an individual from radioiodines and radionuclides in particulate form, with half-lives greater than 8 days, in mrem, during any desired time period.

R_i = the dose factor for each identified radionuclide, i , in, mrem/yr per uCi/m³ for the inhalation pathway and m²·mrem/yr per uCi/sec for other pathways, from Table 4-2.2a.

D_v = annual average dispersion parameter for estimating the dose to an individual at the critical location; X/Q , in sec/m³, for the inhalation pathway, and D/Q , in m⁻², for other pathways. In the case of H-3 only X/Q 's are used for all pathways.

Q_i = release of radioiodines, and radioactive materials in particulate form in gaseous effluents, i , with half-lives greater than 8 days, in uCi, cumulative over the specified time period.

$3.17\text{E}-8$ = inverse of the number of seconds in a year.

The equation above may be modified by the use of precalculated values obtained by solving the following portion of the equation for each isotope listed in Table 4-2.2a.

$$(3.17\text{E}-8) \times (R_i) \times (D_v) = \text{corrected dose conversion factor}$$

where:

$3.17\text{E}-8$ = inverse of the number of seconds in a year, in yr/sec.

R_i = the dose factor for each identified radionuclide, i , in mrem/yr per uCi/m³ for the inhalation pathway and m²·mrem/yr per uCi/sec for other pathways, from Table 4-2.2a.

D. = the average annual dispersion parameter for the "worst case" sector for the critical receptor location, X/Q for the inhalation pathway and D/Q for other pathways, except for H-3 as noted above.

The above expression is solved for each isotope and each pathway, using dispersion parameters for the case where the release occurs via the station vent listed in Table 4-2.2b and for ground level releases listed in Table 4-2.2c.

4.2.3 Alternative Computational Methodologies

As an alternative to the methods described above, the models in/or based upon, those presented in Regulatory Guide 1.109 (Rev. 1) may be used to make a comprehensive dose assessment. Default parameters values from Reg. Guide 1.109 (Rev. 1) and/or actual site specific data can be used where applicable. Dispersion parameter values for such analyses may be drawn from Table B-1 and B-2 or may be computed from site meteorological data for the specified time period using acceptable models such as those presented in Regulatory Guide 1.111.

References

Boegli, J.S., W.L. Britz, R.R. Bellamy, and R.L. Waterfield, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants". NUREG-0133. October 1976.

"Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR 50, Appendix I". U.S. NRC Regulatory Guide 1.109 (Rev 1). October 1977.

"Evaluation of the Three Mile Island Nuclear Station Unit 1 to Demonstrate Conformance to the Design Objectives of 10 CFR 50, Appendix I"... Nuclear Safety Associates. May 1976.

Technical Specification for the Three Mile Island Nuclear Generating Station Unit 1, Appendment No. 72, Operating License No. DPR-50, Docket No. 50-289. August 1981.

TABLE 2-1

DOSE FACTORS FOR NOBLE GASES AND DAUGHTERS*

Radionuclide	Total Body Dose Factor K_i (mRem/yr per $\mu\text{Ci}/\text{m}^3$)	Skin Dose Factor L_i (mRem/yr per $\mu\text{Ci}/\text{m}^3$)	Gamma Air Dose Factor M_i (mRad/yr per $\mu\text{Ci}/\text{m}^3$)	Beta Air Dose Factor N_i (mRad/yr per $\mu\text{Ci}/\text{m}^3$)
Kr-83m	7.56E-02**	---	1.93E+01	2.88E+02
Kr-85m	1.17E+03	1.46E+03	1.23E+03	1.97E+03
Kr-85	1.61E+01	1.34E+03	1.72E+01	1.95E+03
Kr-87	5.92E+03	9.73E+03	6.17E+03	1.03E+04
Kr-88	1.47E+04	2.37E+03	1.52E+04	2.93E+03
Kr-89	1.66E+04	1.01E+04	1.73E+04	1.06E+04
Kr-90	1.56E+04	7.29E+03	1.63E+04	7.83E+03
Xe-131m	9.15E+01	4.76E+02	1.56E+02	1.11E+03
Xe-133m	2.51E+02	9.94E+02	3.27E+02	1.48E+03
Xe-133	2.94E+02	3.06E+02	3.53E+02	1.05E+03
Xe-135m	3.12E+03	7.11E+02	3.36E+03	7.39E+02
Xe-135	1.81E+03	1.86E+03	1.92E+03	2.46E+03
Xe-137	1.42E+03	1.22E+04	1.51E+03	1.27E+04
Xe-138	8.83E+03	4.13E+03	9.21E+03	4.75E+03
Ar-41	8.84E+03	2.69E+03	9.30E+03	3.28E+03

*The listed dose factors are for radionuclides that may be detected in gaseous effluents.

**7.56E-02 = 7.56×10^{-2} .

Table 2-2
DOSE PARAMETERS FOR RADIOIODINES AND RADIOACTIVE
PARTICULATE, GASEOUS, EFFLUENTS*

Radio- nuclide	P_i Inhalation Pathway (mRem/yr per $\mu\text{Ci}/\text{m}^3$)	P_i Food & Ground Pathways ($\text{m}^2\text{-mRem}/\text{yr per } \mu\text{Ci}/\text{sec}$)	Radio- nuclide	P_i Inhalation Pathway (mRem/yr per $\mu\text{Ci}/\text{m}^3$)	P_i Food & Ground Pathways ($\text{m}^2\text{-mRem}/\text{yr per } \mu\text{Ci}/\text{yr}$)
H-3	6.5E+02	2.4E+03	Cd-115m	7.0E+04	4.8E+07
Cr-51	3.6E+02	1.1E+07	Sr-126	1.2E+06	1.1E+09
Mn-54	2.5E+04	1.1E+09	Sb-125	1.5E+04	1.1E+09
Fe-59	2.4E+04	7.0E+08	Te-127m	3.8E+04	7.4E+10
Co-58	1.1E+04	5.7E+08	Te-129m	3.2E+04	1.3E+09
Co-60	3.2E+04	4.6E+09	Te-132	1.0E+03	7.2E+07
Zn-65	6.3E+04	1.7E+10	Cs-134	7.0E+05	5.3E+10
Pb-86	1.9E+05	1.6E+10	Cs-136	1.3E+05	5.4E+09
Sr-89	4.0E+05	1.0E+10	Cs-137	6.1E+05	4.7E+10
Sr-90	4.1E+07	9.5E+10	Ba-140	5.6E+04	2.4E+08
Y-91	7.0E+04	1.9E+09	Ce-141	2.2E+04	8.7E+07
Zr-95	2.2E+04	3.5E+08	Ce-144	1.5E+05	6.5E+08
Pb-95	1.3E+04	3.6E+08	Np-239	2.5E+04	2.5E+06
Po-99	2.6E+02	3.3E+08	I-131	1.5E+07	1.1E+12**
Pu-103	1.6E+04	3.4E+10	I-133	3.6E+06	9.6E+09
Po-106	1.6E+05	4.4E+11	Unident.	4.1E+07	9.5E+10
Po-110m	3.3E+04	1.5E+10			

*The listed dose parameters are for radionuclides that may be detected in gaseous effluents. Additional dose parameters or isotopes not included in Table 1 may be calculated using the methodology described in NUREG-0133.

**These values may be further reduced by a factor as large as 2.0 to allow for the half-year growing season and a second factor as large as 2.0, to allow for 50% of the iodine effluent in organic form. These reductions conform to Reg. Guide 1.109 (Rev. 1).

TABLE 3.2

Site Related Ingestion Dose Commitment Factors
for the Maximum Exposed Organ and Total Body

Nuclide	Maximum Organ		ORGAN	Total Body	
	Water AF _{ij}	Fish AF _{ij}		Water AF _{ij}	Fish AF _{ij}
H ₃	8.74E00	2.26E-01	All	8.74E00	2.26E-01
C 14	2.36E02	3.13E04	Bone	4.75E01	6.26E03
Na 24	1.41E02	4.07E02	All	1.41E02	4.07E02
P 32	1.61E04	4.62E07	Bone	1.42E02	1.78E06
Cr 51	5.57E01	3.20E02	GI-LLI	2.22E-01	1.27E00
Mn 54	1.17E03	1.34E04	GI-LLI	7.29E01	8.35E02
Mn 56	3.05E02	3.51E03	GI-LLI	1.71E00	1.95E01
Fe 55	2.29E02	6.58E02	Bone	3.70E01	1.06E02
Fe 59	2.83E03	8.14E03	GI-LLI	3.27E02	9.36E02
Co 58	1.26E03	1.91E03	GI-LLI	1.40E02	2.00E02
Co 60	3.35E03	4.81E03	GI-LLI	3.95E02	5.65E02
Ni 63	1.08E04	3.11E04	Bone	3.64E02	1.04E03
Ni 65	1.45E02	4.17E02	GI-LLI	2.62E00	7.49E00
Cu 64	5.91E02	8.50E02	GI-LLI	3.27E00	4.68E00
Zn 65	1.28E03	7.37E04	Liver	5.82E02	3.33E04
Zn 69	1.64E00	9.43E01	Liver	1.15E-01	6.56E00
Bt 83	4.82E00	5.82E01	GI-LLI	3.36E00	4.04E01
Bt 84	3.40E-05	4.11E-04	GI-LLI	4.34E00	5.24E01
Bt 85	8.36E-17	1.00E-15	GI-LLI	1.78E-01	2.15E00
Rd 86	1.76E03	1.01E05	Liver	8.22E02	4.71E04
Rd 88	5.03E00	2.90E02	Liver	2.68E00	1.54E02
Rd 89	3.34E00	1.92E02	Liver	2.36E00	1.35E02

TABLE 3.2 (Cont'd)

Site Related Ingestion Dose Commitment Factors
for the Maximum Exposed Organ and Total Body

Nuclide	Maximum Organ		ORGAN	Total Body	
	Water A_{Wij}	Fish A_{Fij}		Water A_{Wij}	Fish A_{Fij}
Sr 89	2.56E04	2.21E04	Bone	7.39E02	6.35E02
Sr 90	6.31E05	5.44E05	Bone	1.55E05	1.34E05
Sr 91	2.25E03	1.94E03	GI-LLI	1.91E01	1.64E01
Sr 92	3.55E03	3.06E03	GI-LLI	7.77E00	6.66E00
Y 90	8.49E03	6.10E03	GI-LLI	2.16E-02	1.54E-02
Y 91M	2.22E-02	1.60E-02	GI-LLI	2.94E-04	2.11E-04
Y 91	6.46E03	4.64E03	GI-LLI	3.15E-01	2.26E-01
Y 92	1.23E03	8.86E02	GI-LLI	2.06E-03	1.48E-03
Y 93	7.07E03	5.09E03	GI-LLI	6.19E-03	4.43E-03
Zr 95	2.57E03	2.44E02	GI-LLI	5.52E-01	5.21E-02
Zr 97	8.74E03	8.30E02	GI-LLI	1.30E-02	1.22E-03
Nd 95	1.75E03	1.51E06	GI-LLI	1.55E-01	1.34E02
Mo 99	8.31E02	2.39E02	GI-LLI	6.85E01	1.96E01
Tc 99M	3.44E01	1.48E01	GI-LLI	7.43E-01	3.19E-01
Tc 101	5.48E-01	2.37E-01	Kidney	3.00E-01	1.29E-01
Ru 103	1.80E03	5.17E02	GI-LLI	6.66E00	1.91E00
Ru 105	7.84E02	2.26E02	GI-LLI	5.08E-01	1.46E-01
Ru 106	1.48E04	4.26E03	GI-LLI	2.91E01	8.33E00
Ag 110M	5.03E03	-	GI-LLI	7.35E00	-
Te 125M	8.90E02	1.02E04	GI-LLI	3.00E01	3.44E02
Te 127M	2.29E03	2.63E04	Kidney	6.90E01	7.90E02
Te 127	7.22E02	8.31E03	GI-LLI	1.99E00	2.28E01

TABLE 3.2 (Cont'd)

Site Related Ingestion Dose Commitment Factors
for the Maximum Exposed Organ and Total Body

Nuclide	Maximum Organ		ORGAN	Total Body	
	Water AW _{ij}	Fish AF _{ij}		Water AW _{ij}	Fish AF _{ij}
Te 129M	4.82E03	5.54E04	GI-LLI	1.52E02	1.74E03
Te 129	1.10E01	1.26E02	Kidney	6.39E-01	7.33E00
Te 131M	6.99E03	8.04E04	GI-LLI	5.89E01	6.75E02
Te 131	7.18E00	8.26E01	Kidney	5.20E-01	5.96E00
Te 132	6.42E03	7.38E04	GI-LLI	1.28E02	5.49E01
I-130	1.57E04	6.79E03	Thyroid	7.36E01	3.16E01
I-131	1.62E05	7.00E04	Thyroid	2.85E02	1.22E02
I-132	1.58E03	6.82E02	Thyroid	1.59E01	6.82E00
I-133	3.02E04	1.30E04	Thyroid	6.29E01	2.70E01
I-134	4.15E02	1.79E02	Thyroid	8.61E00	3.70E00
I-135	6.37E03	2.75E03	Thyroid	3.58E01	1.54E01
Cs-134	1.23E04	7.09E05	Liver	1.01E04	5.79E05
Cs-136	2.44E03	1.23E05	Liver	1.55E03	8.86E04
Cs-137	9.07E03	5.22E05	Liver	5.97E03	3.42E05
Cs-138	9.07E00	5.22E02	Liver	4.51E00	2.59E02
Ba-139	1.43E01	1.65E00	GI-LLI	2.37E-01	2.72E-02
Ba-140	3.48E03	4.00E02	GI-LLI	1.11E02	1.27E01
Ba-141	3.92E00	4.51E-01	Bone	1.33E-01	1.52E-02
Ba-142	1.77E00	2.04E-01	Bone	1.21E-01	1.28E-02
La-140	7.70E03	5.54E03	GI-LLI	2.78E-02	1.99E-02
La-142	3.54E01	2.54E01	GI-LLI	1.21E-03	8.68E-04

Table 4-1

Site Specific Dose Factors for Determining Total
 Body Dose At The Site Boundary
 $(DF_{TB}) = (X/Q) \times (K_i)$

<u>Radionuclide</u>	<u>Vent Release</u>	<u>Ground Level Release</u>
Kr-83M	1.72E-7	4.21E-6
Kr-85M	2.66E-3	6.52E-2
Kr-85	3.65E-5	8.97E-4
Kr-87	1.34E-2	3.30E-1
Kr-88	3.34E-2	8.19E-1
Kr-89	3.77E-2	9.25E-1
Kr-90	3.54E-2	8.69E-1
Xe 131M	2.08E-4	5.10E-3
Xe 133M	5.7E-4	1.40E-2
Xe 133	6.67E-4	1.64E-2
Xe 135M	7.08E-3	1.74E-1
Xe 135	4.11E-3	1.01E-1
Xe 137	3.22E-3	7.91E-2
Xe 138	2.00E-2	4.92E-1
At 41	2.01E-2	4.92E-1

Table 4-2

Site Specific Dose Factors for Determining Total Skin
Dose At Site Boundary

$$(DF_s) = (L_i + 1.1 M_i) \times (X/Q)$$

<u>Radionuclide</u>	<u>Vent Release</u>	<u>Ground Level Release</u>
Kr-83M	4.82E-5	1.18E-3
Kr-85M	6.39E-3	1.57E-1
Kr-85	3.08E-3	7.57E-2
Kr-87	3.75E-2	9.20E-1
Kr-88	4.33E-2	1.06E00
Kr-89	6.61E-2	1.62E00
Kr-90	5.72E-2	1.40E00
Xe 131M	1.47E-3	3.61E-2
Xe 133M	3.07E-3	7.54E-2
Xe 133	1.58E-3	3.87E-2
Xe 135M	1.00E-2	2.45E-1
Xe 135	9.02E-3	2.21E-1
Xe 137	3.15E-2	7.72E-1
Xe 138	3.24E-2	7.94E-1
Ar 41	2.93E-2	7.20E-1

Table 4.1.2

Dose Conversion Factors Calculated for Site Boundary

Radionuclide	Inhalation Pathway (DCF _I)		Food and Ground Pathway (DCF _{FG})	
	Vent (DCF _{VI})	Ground (DCF _{GI})	Vent (DCF _{VFG})	Ground (DCF _{GFG})
H ₃	1.48E-3	1.48E-3	5.45E-3	1.34E-1
Cr 51	8.17E-4	2.01E-2	7.12E-1	2.47E00
Mn-54	5.68E-2	1.39E0	7.12E01	2.47E02
Fe 59	5.45E-2	1.34E00	4.53E01	1.57E02
Co 58	2.50E-2	6.13E-1	3.69E01	1.28E02
Co 60	7.26E-2	1.78E00	2.98E02	1.03E03
Zn 65	1.43E-1	3.51E00	1.10E03	3.82E03
Rb 86	4.31E-1	1.06E01	1.04E03	3.6E03
Sr 89	9.08E-1	2.23E01	6.47E02	2.25E03
Sr 90	9.31E01	2.28E03	6.15E03	2.14E04
Y 91	1.59E-1	3.90E00	1.23E02	4.27E02
Zr 95	4.99E-2	1.23E00	2.26E01	7.87E01
Nb 95	2.95E-2	7.24E-1	2.33E01	8.1E01
Mo 99	5.90E-4	1.45E-2	2.14E01	7.42E01
Ru 103	3.63E-2	8.91E-1	2.20E03	7.65E03
Ru 106	3.63E-1	8.91E00	2.85E04	9.9E04
Ag 110M	7.49E-2	1.84E00	9.70E-2	3.37E03
Co 115M	1.59E-1	3.90E00	3.11E00	1.08E01
Sn 126	2.72E00	6.68E01	7.12E01	2.47E02
Sb 125	7.40E-2	8.35E-1	7.12E01	2.47E02
Te 127M	8.63E-2	2.12E00	4.79E03	1.66E04
Te 129	7.26E-2	1.78E00	8.41E01	2.92E02
Te 132	2.27E-3	5.57E-2	4.66E00	1.62E01
Cs 134	1.59E00	3.90E01	3.43E03	1.19E04
Cs 136	2.95E-1	7.24E00	3.49E02	1.21E03
Cs 137	1.38E00	3.40E01	3.04E03	1.06E04
Ba 140	1.27E-1	3.12E00	1.55E01	5.4E01
Ce 141	4.99E-2	1.23E00	5.63E00	1.96E01
Ce 144	3.40E-1	8.35E00	4.21E01	1.46E02
Nd 239	5.67E-2	1.39E00	1.62E-1	5.62E-1
I 131	3.40E1	8.35E02	7.12E04	2.47E05
I 133	8.17E00	2.01E02	6.21E02	2.16E03
Unidentified	9.31E01	2.28E03	6.15E03	2.14E04

Table 4.2.1(a)

Site Specific Dose Conversion Factors for Gamma
Air Dose at the Site Boundary

<u>Radionuclide</u>	<u>Vent (DCF_{Vr})</u>	<u>Ground Level (DCF_{Gr})</u>
Kr 83m	1.39E-12	3.41E-11
Kr 85m	8.85E-11	2.17E-9
Kr 85	1.24E-12	3.04E-11
Kr 87	4.44E-10	1.09E-8
Kr 88	1.09E-9	2.68E-8
Kr 89	1.24E-9	3.05E-8
Kr 90	1.17E-9	2.88E-8
Xe 131m	1.12E-11	2.75E-10
Xe 133m	2.35E-11	5.77E-10
Xe 133	2.54E-11	6.23E-10
Xe 135m	2.42E-10	5.93E-9
Xe 135	1.38E-10	3.39E-9
Xe 137	1.09E-10	2.67E-9
Xe 138	6.63E-10	1.63E-8
Ar 41	6.69E-10	1.64E-8

Table 4.2.1(b)

Site Specific Dose Conversion Factors for
Beta Air Dose at the Site Boundary

<u>Radionuclide</u>	<u>Vent (DCF_{VE})</u>	<u>Ground (DCF_{GE})</u>
Kr 83m	2.07E-11	5.09E-10
Kr 85m	1.42E-11	3.48E-9
Kr 85	1.40E-10	3.44E-9
Kr 87	7.41E-10	1.82E-8
Kr 88	2.11E-10	5.17E-9
Kr 89	7.63E-10	1.87E-8
Kr 90	5.63E-10	1.38E-8
Xe 131m	7.99E-11	1.96E-9
Xe 133m	1.06E-10	2.61E-9
Xe 133	7.56E-11	1.85E-9
Xe 135m	5.32E-11	1.30E-9
Xe 135	1.77E-10	4.34E-9
Xe 137	9.14E-10	2.24E-8
Xe 138	3.42E-10	8.39E-9
Ar 41	2.36E-10	5.79E-9

Table 4-2.2a
 Pathway Dose Factors Due to Radionuclides Other Than Noble Gases

Radionuclide	Inhalation Pathway R_i ($mRem/yr$) per $\mu Ci/m^3$	Meat Pathway R_i ($m^2 \cdot mRem/yr$) per $\mu Ci/sec$	Ground Plane Pathway R_i ($m^2 \cdot mRem/yr$) per $\mu Ci/sec$	Cow-Milk-Infant Pathway R_i ($m^2 \cdot mRem/yr$) per $\mu Ci/sec$	All Vegetation Pathway R_i ($m^2 \cdot mRem/yr$) per $\mu Ci/sec$
H-3	1.12E03	2.33E02	0	2.38E03	3.97E03
C-14	3.58E04	5.28E05	0	3.22E06	3.50E06
Na-24	1.61E04	2.14E-03	1.33E07	1.86E07	4.47E05
P-32	2.60E06	8.64E09	0	1.86E11	4.31E09
Cr-51	1.70E04	4.98E05	5.31E06	5.75E06	7.33E06
Mn-54	1.57E06	7.60E06	1.56E09	3.70E07	7.71E08
Mn-56	1.23E05	0	1.03E06	3.45E00	3.16E05
Fe-55	1.11E05	4.24E08	0	1.25E08	9.04E08
Fe-59	1.27E06	6.49E08	3.09E08	4.01E08	7.79E08
Co-58	1.10E06	9.49E07	4.27E08	7.01E07	4.56E08
Co-60	7.06E06	3.61E08	2.44E10	2.25E08	2.45E09
Ni-63	8.20E05	2.88E10	0	3.46E10	5.21E10
Ni-65	8.39E04	0	3.32E05	3.70E01	1.42E03
Cd-64	3.67E04	1.71E-05	6.62E05	4.59E06	6.19E05
Zn-65	9.94E05	1.05E09	8.28E08	1.99E10	3.10E09
Zn-69	1.32E04	0	0	9.07E-09	1.53E-03
Br-83	4.73E02	0	6.81E03	0	6.26E00
Br-84	5.47E02	0	2.27E05	0	3.77E-11
Br-85	2.39E01	0	0	0	0
Rb-86	1.98E05	6.39E08	9.87E06	2.47E10	5.39E08
Rb-88	5.62E02	0	3.63E04	0	0
Rb-89	3.45E02	0	1.40E05	0	0
Sr-89	2.15E06	5.20E08	2.42E04	1.56E10	4.31E10
Sr-90	1.01E08	4.27E10	0	4.99E11	3.66E12
Y-91	1.74E05	6.59E-10	2.42E06	3.92E05	1.39E06
Y-92	2.42E05	0	8.30E05	6.11E01	1.61E04
Y-90	2.68E05	5.93E05	5.12E03	1.13E06	7.88E07
Y-91M	2.81E03	0	1.12E05	2.34E-15	1.89E-05
Y-91	2.62E06	2.41E08	1.16E06	5.27E06	2.87E09
Y-92	2.39E05	0	2.06E05	1.24E01	5.36E04
Y-93	3.88E05	1.40E-07	2.42E05	2.06E04	5.27E06
Zr-95	2.23E06	6.09E08	2.75E08	8.76E05	1.02E09
Zr-97	3.51E05	8.69E-1	3.52E06	5.36E04	1.69E07
Hf-95	6.13E05	2.33E09	1.54E08	2.39E08	3.74E08
Pb-99	1.35E05	2.97E05	4.45E06	3.74E08	1.98E07

Table 4-2.2a (Cont'd)
 Pathway Dose Factors Due to Radionuclides Other Than Noble Gases

Radionuclide	Inhalation Pathway R_I (mRem/yr) per $\mu\text{Ci}/\text{m}^3$	Meat Pathway R_I ($\text{m}^2 \cdot \text{mRem}/\text{yr}$) per $\mu\text{Ci}/\text{sec}$	Ground Plane Pathway R_I ($\text{m}^2 \cdot \text{mRem}/\text{yr}$) per $\mu\text{Ci}/\text{sec}$	Cow-Milk-Infant Pathway R_I ($\text{m}^2 \cdot \text{mRem}/\text{yr}$) per $\mu\text{Ci}/\text{sec}$	All Vegetation Pathway R_I ($\text{m}^2 \cdot \text{mRem}/\text{yr}$) per $\mu\text{Ci}/\text{sec}$
Tc-99M	4.80E03	0	2.03E05	2.01E04	6.32E03
Tc-101	8.43E02	0	2.18E04	0	0
Ru-103	6.61E05	4.15E09	1.22E08	1.15E05	4.66E08
Ru-105	9.94E04	0	6.95E05	3.91E0	7.11E04
Ru-106	1.43E07	6.60E10	4.88E08	1.38E06	1.38E10
Ag-110M	5.47E06	6.63E08	3.88E09	1.65E10	3.22E09
Cd-115M	2.17E06	2.52E07	0	6.13E07	2.34E09
Sn-126	1.12E07	2.53E10	2.78E10	1.06E10	2.82E10
Sb-125	2.32E06	6.38E07	2.51E09	1.95E08	1.38E09
Te-125M	4.77E05	6.24E08	2.05E06	1.65E08	5.00E08
Te-127M	1.48E06	5.71E09	1.04E05	1.17E09	6.04E09
Te-127	5.62E04	1.71E-08	3.15E03	1.63E05	4.80E05
Te-129M	1.76E06	5.83E09	2.22E07	1.54E09	3.33E09
Te-129	2.63E04	0	2.99E04	2.82E-07	9.80E-02
Te-131M	3.07E05	1.22E04	9.11E06	2.80E07	2.72E07
Te-131	8.21E03	0	3.33E07	0	1.54E-14
Te-132	3.77E05	1.16E07	4.80E06	7.99E07	3.94E07
I-130	1.84E06	3.32E-04	3.22E06	4.22E08	6.55E07
I-131	1.62E07	2.60E09	1.01E07	4.95E11	2.27E10
I-132	1.93E05	0	7.06E05	6.79E01	3.69E03
I-133	3.84E06	6.46E01	1.44E06	4.63E09	3.89E08
I-134	5.06E04	0	2.56E05	4.37E-10	2.97E-03
I-135	7.91E05	0	1.42E06	9.61E06	4.72E06
Cs-134	1.10E06	1.43E09	7.70E09	6.42E10	3.08E10
Cs-136	1.71E05	5.07E07	1.64E08	6.61E09	2.69E08
Cs-137	9.05E05	1.32E09	1.15E10	5.94E10	3.13E10
Cs-138	8.75E02	0	3.95E05	0	9.91E-11
Ba-139	5.76E04	0	1.14E05	2.95E-05	3.05E00
Ba-140	1.74E06	5.00E07	2.26E07	2.75E08	3.29E08
Ba-141	4.74E03	0	4.57E04	0	0
Ba-142	1.64E03	0	4.92E04	0	0
La-140	2.25E05	6.72E02	2.10E07	2.28E05	3.80E07
La-142	7.57E04	0	8.52E05	6.78E-06	1.73E01
Ce-141	5.43E05	1.45E07	1.48E07	1.43E07	4.78E08
Ce-143	1.27E05	3.07E02	2.53E06	1.85E06	1.63E07

TABLE 4-2.2b

Revision 2
1 of 4Site Specific Dose Conversion Factor for Critical Locations
(Vented Release)

Radionuclide	Inhalation	Meat	Ground	Cow-Milk	All Veg.
H ₃	4.90E-11	1.02E-11	0	1.04E-10	1.74E-10
C14	1.57E-9	3.46E-11	0	3.58E-9	4.87E-9
Na24	7.04E-10	1.40E-19	1.85E-8	2.07E-8	6.22E-10
P32	1.14E-7	5.67E-7	0	2.07E-4	5.60E-6
Cr51	7.44E-10	3.27E-11	7.39E-9	6.40E-9	1.02E-8
Mn54	6.87E-8	4.99E-10	2.17E-6	4.12E-8	1.07E-6
Mn56	5.38E-9	0	1.43E-9	3.84E-15	4.40E-12
Fe55	4.86E-9	2.78E-8	0	1.39E-7	1.26E-6
Fe59	5.56E-8	4.26E-8	4.30E-7	4.46E-7	1.08E-6
Cc58	4.81E-8	6.23E-9	5.94E-7	7.80E-8	6.04E-7
Co60	3.09E-7	2.37E-8	3.40E-5	2.50E-7	3.41E-6
Ni63	3.59E-8	1.89E-6	0	3.85E-5	7.25E-5
Ni65	3.67E-9	0	4.62E-10	4.12E-14	1.98E-12
Cu64	1.61E-9	1.12E-21	9.21E-10	5.11E-9	8.61E-10
Zn65	4.35E-8	6.89E-8	1.15E-6	2.21E-5	4.31E-6
Zn69	5.77E-10	0	0	1.01E-23	2.13E-18
Br83	2.07E-11	0	9.48E-12	0	8.71E-15
Br84	2.39E-11	0	3.16E-10	0	5.25E-16
Br85	1.05E-12	0	0	0	0
Rb86	8.66E-9	4.19E-8	1.37E-8	2.75E-5	7.50E-7
Rb88	2.46E-11	0	5.05E-11	0	0
Rb89	1.51E-11	0	1.95E-10	0	0

TABLE 4-2.2b (Cont'd)

Revision 2
2 of 4Site Specific Dose Conversion Factor for Critical Locations
(Vented Release)

Radionuclide	Inhalation	Meat	Ground	Cow-Milk	All Veg.
Sr89	9.41E-8	3.41E-8	3.37E-11	1.51E-5	6.00E-5
Sr90	4.42E-6	2.80E-6	0	5.55E-4	5.09E-3
Sr91	7.61E-9	4.32E-26	3.37E-9	4.36E-10	1.93E-9
Sr92	1.06E-8	0	1.16E-9	6.80E-14	2.24E-11
Y90	1.17E-8	3.89E-11	7.13E-12	1.26E-9	1.10E-7
Y91M	1.23E-10	0	1.56E-10	2.60E-30	2.63E-20
Y91	1.15E-7	1.58E-8	1.61E-9	5.86E-9	3.99E-6
Y92	1.05E-8	0	2.87E-10	1.38E-14	7.46E-11
Y93	1.70E-8	9.19E-24	3.37E-10	2.29E-11	7.26E-9
Zr95	9.76E-8	4.00E-8	3.80E-7	9.75E-10	1.42E-6
Zr97	1.54E-8	5.70E-17	4.62E-9	5.96E-11	2.07E-8
Nb95	2.68E-8	1.53E-7	2.16E-7	2.66E-7	4.83E-7
Mo-99	5.91E-9	1.95E-11	6.19E-9	4.16E-7	2.76E-8
Tc99M	2.10E-10	0	2.83E-10	2.24E-11	4.80E-12
Tc101	3.69E-11	0	3.03E-11	0	0
Ru103	2.89E-8	2.72E-7	1.70E-7	1.28E-10	6.48E-7
Ru105	4.35E-9	0	9.67E-10	4.35E-15	9.89E-11
Ru106	6.26E-7	4.33E-6	6.79E-7	1.53E-9	1.92E-5
Ac110M	2.39E-7	4.35E-8	5.40E-6	1.84E-5	4.48E-6
Co115M	9.49E-8	1.65E-9	0	6.82E-8	3.26E-6
Sn126	4.90E-7	1.66E-6	3.87E-5	1.16E-5	3.92E-5
Sb125	1.01E-7	4.19E-9	3.49E-6	2.17E-7	1.92E-6

TABLE 4-2.2c (Cont'd)

Revision 2
3 of 4Site Specific Dose Conversion Factor for Critical Locations
(Ventec Release)

Radionuclide	Inhalation	Meat	Ground	Cow-Milk	All Veg.
Tel25M	2.09E-8	2.85E-9	2.85E-9	1.84E-7	6.96E-7
Tel27M	6.47E-8	3.75E-7	1.45E-10	1.30E-6	8.41E-6
Tel27	2.46E-9	1.12E-24	4.38E-12	1.81E-10	6.68E-10
Tel29M	7.70E-8	3.83E-7	3.09E-8	1.71E-6	4.64E-6
Tel29	1.15E-9	0	4.16E-11	3.14E-22	1.36E-16
Tel31M	1.34E-8	8.00E-13	1.27E-8	2.11E-8	3.79E-8
Tel31	3.59E-10	0	4.63E-8	0	2.14E-29
Tel32	1.65E-8	7.61E-10	6.68E-9	8.89E-8	5.48E-8
Tel30	8.05E-8	2.18E-20	4.48E-9	4.70E-7	9.12E-8
I-131	7.09E-7	1.71E-7	1.41E-8	5.51E-4	3.16E-5
I-132	8.44E-9	0	9.82E-10	7.56E-14	5.14E-12
I-133	1.68E-7	4.24E-15	2.00E-9	5.15E-6	5.41E-12
I-134	2.21E-9	0	3.56E-10	4.86E-25	4.13E-18
I-135	3.46E-8	0	1.98E-9	1.07E-8	6.57E-9
Cs134	4.42E-8	9.38E-8	1.07E-5	7.14E-5	4.29E-5
Cs136	7.48E-9	3.33E-9	2.28E-7	7.35E-6	3.74E-7
Cs137	3.96E-8	8.66E-8	1.60E-5	6.61E-5	4.36E-5
Cs138	3.83E-11	0	5.50E-10	0	1.38E-25
Ba139	2.52E-9	0	1.59E-10	3.28E-20	4.24E-15
Ba140	7.61E-8	3.28E-9	3.15E-8	3.06E-7	4.58E-7
Ba141	2.07E-10	0	6.36E-11	0	0
Ba142	7.17E-11	0	6.85E-11	0	0

TABLE 4-2.2c

Revision 2
1 of 4Site Specific Dose Conversion Factor for Critical Locations
(Ground Level Release)

Radionuclide	Inhalation	Meat	Ground	Cow-Milk	All Veg.
H3	1.33E-9	2.78E-10	0	2.84E-9	4.73E-9
Cl4	4.27E-8	9.71E-11	0	1.28E-8	1.86E-8
Na24	1.92E-8	3.93E-19	7.08E-8	7.37E-8	2.38E-9
P34	3.10E-6	1.59E-6	0	7.37E-4	3.30E-5
Cr51	2.03E-8	9.16E-11	2.83E-8	2.28E-8	3.90E-8
Mn54	1.87E-6	1.40E-9	8.31E-6	1.47E-7	4.11E-6
Mn56	1.47E-7	0	5.49E-9	1.37E-14	1.68E-11
Fe55	1.32E-7	7.80E-8	0	4.95E-7	4.81E-6
Fe59	1.51E-6	1.19E-7	1.65E-6	1.59E-6	4.15E-6
Co58	1.31E-6	1.74E-8	2.27E-6	2.78E-7	2.31E-6
Co60	8.41E-6	6.64E-8	1.30E-4	8.92E-7	1.30E-5
Ni63	9.77E-7	5.30E-6	0	1.37E-4	2.77E-4
Ni65	1.00E-7	0	1.77E-9	1.47E-13	7.56E-12
Cu64	4.37E-8	3.14E-21	3.53E-9	1.82E-8	3.30E-9
Zn65	1.18E-6	1.93E-7	4.41E-6	7.89E-5	1.65E-5
Zn69	1.57E-8	0	0	3.60E-23	8.15E-18
Br83	5.64E-10	0	3.63E-11	0	3.33E-14
Br84	6.52E-10	0	1.21E-9	0	2.01E-25
Br85	2.85E-11	0	0	0	0
Rb86	2.36E-7	1.17E-7	5.26E-8	9.79E-5	2.87E-6
Rb88	6.70E-10	0	1.93E-10	0	0
Rb89	4.11E-10	0	7.46E-10	0	0

TABLE 4-2.2c (Cont'd)

Revision 2
2 of 4Site Specific Dose Conversion Factor for Critical Locations
(Ground Level Release)

Radionuclide	Inhalation	Meat	Ground	Cow-Milk	All Veg.
Sr89	2.56E-6	9.56E-8	1.29E-10	5.39E-5	2.30E-4
Sr-90	1.20E-4	7.85E-6	0	1.98E-3	1.95E-2
Sr91	2.07E-7	1.21E-25	1.29E-8	1.55E-9	1.95E-2
Sr92	2.88E-7	0	4.42E-9	2.42E-13	8.57E-11
Y90	7.19E-7	1.09E-10	2.73E-11	4.48E-9	4.20E-7
Y91M	3.35E-9	0	5.96E-10	9.27E-30	1.10E-19
Y91	3.12E-6	4.43E-8	6.18E-9	2.09E-8	1.53E-5
Y92	2.85E-7	0	1.10E-9	4.91E-14	2.85E-10
Y93	4.62E-7	2.57E-23	1.29E-9	8.16E-11	2.78E-8
Zr95	2.66E-6	1.12E-7	1.45E-6	3.47E-9	5.43E-6
Zr97	4.18E-7	1.59E-16	1.77E-8	2.12E-10	7.49E-8
Nd95	7.31E-7	4.28E-7	8.25E-7	9.47E-7	1.85E-6
Mo99	1.61E-7	5.46E-11	2.37E-8	1.48E-6	1.05E-7
Tc99M	5.72E-9	0	1.08E-9	7.96E-11	3.37E-11
Tc101	1.00E-9	0	1.16E-10	0	0
Ru103	7.83E-7	7.63E-7	6.50E-7	4.56E-10	2.48E-6
Ru105	1.18E-7	0	3.70E-9	1.55E-14	3.79E-10
Ru106	1.70E-5	1.21E-5	2.60E-6	5.47E-9	7.35E-5
Ac110M	6.52E-6	1.22E-7	2.07E-5	6.54E-5	1.71E-5
Ce115M	2.59E-6	4.63E-9	0	2.43E-7	1.25E-5
Sn126	1.33E-5	4.65E-6	1.48E-4	4.20E-5	1.50E-4
Sb125	2.77E-6	1.17E-8	1.34E-5	7.73E-7	7.35E-6

TABLE 4-2.2c (Cont'd)

Revision 2
3 of 4Site Specific Dose Conversion Factor for Critical Locations
(Ground Level Release)

Radionuclide	Inhalation	Meat	Ground	Cow-Milk	All Veg.
Tel25M	5.69E-7	1.15E-7	1.09E-8	6.54E-7	2.66E-6
Tel27M	1.76E-6	1.05E-6	5.54E-10	4.64E-6	3.22E-5
Tel27	6.70E-8	3.14E-24	1.68E-11	6.46E-10	2.56E-9
Tel29M	2.10E-6	1.08E-6	1.18E-7	6.10E-6	1.77E-5
Tel29	3.13E-8	0	1.59E-10	1.12E-21	5.22E-16
Tel31M	3.66E-7	2.24E-12	4.85E-8	1.11E-7	1.45E-7
Tel31	9.79E-9	0	1.77E-7	0	8.20E-29
Tel32	4.49E-7	2.13E-9	2.56E-8	3.17E-7	2.10E-7
I-130	2.19E-6	6.10E-20	1.71E-8	1.67E-6	3.49E-7
I-131	1.93E-5	4.78E-7	5.38E-8	1.96E-3	1.21E-4
I-132	2.30E-7	0	3.76E-9	2.69E-13	1.97E-11
I 133	4.58E-6	1.19E-14	7.67E-9	1.83E-5	2.07E-6
I 134	6.03E-8	0	1.36E-9	1.73E-24	1.58E-17
I 135	9.43E-7	0	7.56E-9	3.81E-8	2.51E-8
Cs 134	1.20E-6	2.63E-7	4.10E-5	2.54E-4	1.64E-4
Cs 136	2.04E-7	9.32E-9	8.73E-7	2.62E-5	1.43E-6
Cs 137	1.08E-6	2.43E-7	6.12E-5	2.35E-4	1.67E-4
Cs 138	1.04E-9	0	2.10E-9	0	5.28E-25
Ba139	6.87E-8	0	6.07E-10	1.17E-19	1.62E-14
Ba140	2.07E-6	9.19E-9	1.20E-7	1.09E-6	1.75E-6
Ba141	5.65E-9	0	2.43E-10	0	0
Ba142	1.95E-9	0	2.62E-10	0	0

Appendix A
10 CFR 20 MPC Values

APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND

(See notes at end of appendix)

Element (atomic number)	Isotope	Table 1		Table 2	
		Conc. 1—Air (pCi/m ³)	Conc. 2—Water (pCi/ml)	Conc. 1—Air (pCi/m ³)	Conc. 2—Water (pCi/ml)
Actinium (89)	Ac 227	2 × 10 ⁻¹¹	6 × 10 ⁻¹¹	8 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Ac 228	3 × 10 ⁻¹¹	9 × 10 ⁻¹¹	9 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Americium (95)	Am 241	2 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	9 × 10 ⁻¹¹
	Am 242m	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	Am 242	6 × 10 ⁻¹¹	1 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	Am 243	1 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	Am 244	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Am 245	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Antimony	Sb 122	2 × 10 ⁻¹⁰	8 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	Sb 124	1 × 10 ⁻¹⁰	8 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
Argon (18)	Ar 37	2 × 10 ⁻¹⁰	7 × 10 ⁻¹⁰	7 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰
	Ar 41	5 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Arsenic (33)	As 73	6 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	As 75	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	5 × 10 ⁻¹¹
Astatine (85)	At 210	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	At 211	4 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰
	At 212	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	At 213	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	At 214	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	At 215	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Barium (56)	Ba 131	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Ba 140	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Berkelium (97)	Bk 248	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Bk 250	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Beryllium (4)	Be 7	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Be 9	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Bismuth (83)	Bi 206	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Bi 207	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Boron (5)	B 10	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	B 11	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Bromine (35)	Br 82	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Br 81	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Cadmium (48)	Cd 109	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cd 115m	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Cadmium (48)	Cd 115	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cd 116	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰

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APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

(See notes at end of appendix)

Element (atomic number)	Isotope	Table 1		Table 2	
		Conc. 1—Air (pCi/m ³)	Conc. 2—Water (pCi/ml)	Conc. 1—Air (pCi/m ³)	Conc. 2—Water (pCi/ml)
Calcium (20)	Ca 45	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	Ca 47	1 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
Calcium (98)	Ca 248	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Ca 250	1 × 10 ⁻¹⁰	7 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	7 × 10 ⁻¹⁰
	Ca 251	1 × 10 ⁻¹⁰	7 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	7 × 10 ⁻¹⁰
	Ca 252	1 × 10 ⁻¹⁰	8 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	8 × 10 ⁻¹⁰
	Ca 253	1 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰
	Ca 254	1 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
Carbon (6)	C 14	5 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰
	C (CO ₂)	5 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰
Cesium (58)	Cs 143	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cs 144	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Cesium (55)	Cs 131	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cs 134m	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cs 134	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cs 135	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cs 136	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cs 137	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Chlorine (17)	Cl 36	2 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰	2 × 10 ⁻¹⁰
	Cl 38	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Chromium (24)	Cr 51	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cr 57	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Cobalt (27)	Co 58m	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Co 58	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Copper (29)	Co 60	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Co 64	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Curium (96)	Cur 242	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cur 243	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Curium (96)	Cur 244	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cur 245	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Curium (96)	Cur 246	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
	Cur 247	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰
Curium (96)	Cur 248	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰	1 × 10 ⁻¹⁰

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APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

(See notes at end of appendix)

Element (atomic number)	Isotope	Table I		Table II	
		Col. 1—Air (pCi/ml)	Col. 2—Water (pCi/ml)	Col. 1—Air (pCi/ml)	Col. 2—Water (pCi/ml)
Niobium (41)	Nb 83	6 × 10 ⁻¹¹	8 × 10 ⁻¹¹	2 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Nb 85	9 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	7 × 10 ⁻¹¹
	Nb 91m	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Nb 95	5 × 10 ⁻¹¹	1 × 10 ⁻¹¹	2 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Nb 97	1 × 10 ⁻¹¹	3 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹
Osmium (76)	Os 185	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Os 187m	5 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	7 × 10 ⁻¹¹
	Os 188	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Os 191	1 × 10 ⁻¹¹	7 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Os 193	4 × 10 ⁻¹¹	5 × 10 ⁻¹¹	1 × 10 ⁻¹¹	6 × 10 ⁻¹¹
Palladium (46)	Pd 103	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Pd 105	7 × 10 ⁻¹¹	8 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Pd 109	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	9 × 10 ⁻¹¹
	P 32	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	7 × 10 ⁻¹¹
	Pt 191	8 × 10 ⁻¹¹	7 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹
Platinum (78)	Pt 193m	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Pt 193	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Pt 197m	3 × 10 ⁻¹¹	5 × 10 ⁻¹¹	1 × 10 ⁻¹¹	9 × 10 ⁻¹¹
	Pt 197	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Pt 208	3 × 10 ⁻¹¹	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
Plutonium (94)	Pu 238	3 × 10 ⁻¹¹	1 × 10 ⁻¹¹	7 × 10 ⁻¹¹	5 × 10 ⁻¹¹
	Pu 239	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Pu 240	4 × 10 ⁻¹¹	8 × 10 ⁻¹¹	6 × 10 ⁻¹¹	5 × 10 ⁻¹¹
	Pu 241	9 × 10 ⁻¹¹	7 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Pu 242	4 × 10 ⁻¹¹	4 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹
Potassium (19)	K 42	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹	1 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Pt 142	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Pt 143	3 × 10 ⁻¹¹	9 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Pm 147	6 × 10 ⁻¹¹	5 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Pm 149	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹
Protactinium (91)	Pa 230	8 × 10 ⁻¹¹	7 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Pa 231	1 × 10 ⁻¹¹	7 × 10 ⁻¹¹	7 × 10 ⁻¹¹	9 × 10 ⁻¹¹
	Pa 233	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Pa 233	6 × 10 ⁻¹¹	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹

APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

(See notes at end of appendix)

Element (atomic number)	Isotope	Table I		Table II	
		Col. 1—Air (pCi/ml)	Col. 2—Water (pCi/ml)	Col. 1—Air (pCi/ml)	Col. 2—Water (pCi/ml)
Radium (88)	Ra 223	2 × 10 ⁻¹¹	3 × 10 ⁻¹¹	6 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Ra 224	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	7 × 10 ⁻¹¹
	Ra 226	5 × 10 ⁻¹¹	7 × 10 ⁻¹¹	2 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Ra 228	3 × 10 ⁻¹¹	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Ra 228	5 × 10 ⁻¹¹	8 × 10 ⁻¹¹	2 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Radium (86)	Rn 220	4 × 10 ⁻¹¹	7 × 10 ⁻¹¹	1 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Rn 222	3 × 10 ⁻¹¹	3 × 10 ⁻¹¹	3 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Rn 223	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Rn 226	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Rn 228	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Radium (85)	Rh 103m	2 × 10 ⁻¹¹	9 × 10 ⁻¹¹	6 × 10 ⁻¹¹	7 × 10 ⁻¹¹
	Rh 105	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Rh 106	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Rh 107	7 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Rh 108	7 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
Radium (84)	Ru 97	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Ru 98	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Ru 100	8 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Ru 101	5 × 10 ⁻¹¹	2 × 10 ⁻¹¹	3 × 10 ⁻¹¹	6 × 10 ⁻¹¹
	Ru 102	8 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
Radium (82)	Ru 105	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Ru 106	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Ru 107	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Ru 108	7 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Ru 109	3 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹
Samarium (62)	Sm 147	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	9 × 10 ⁻¹¹	7 × 10 ⁻¹¹
	Sm 151	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	5 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Sm 153	5 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Sm 154	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Sm 155	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹
Scandium (21)	Sc 46	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Sc 47	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Sc 48	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Sc 49	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Sc 50	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Selenium (34)	Se 75	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Se 76	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Se 77	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Se 78	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Se 80	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Silver (47)	Ag 105	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	8 × 10 ⁻¹¹
	Ag 106m	8 × 10 ⁻¹¹	4 × 10 ⁻¹¹	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Ag 107	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	6 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Ag 108	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Ag 109	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Sodium (11)	Na 22	9 × 10 ⁻¹¹	1 × 10 ⁻¹¹	6 × 10 ⁻¹¹	4 × 10 ⁻¹¹
	Na 23	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Na 24	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
	Na 26	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Na 28	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹
Strontium (38)	Sr 85m	4 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Sr 87	3 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹	2 × 10 ⁻¹¹
	Sr 88	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Sr 90	2 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹	1 × 10 ⁻¹¹
	Sr 92	1 × 10 ⁻¹¹	8 × 10 ⁻¹¹	5 × 10 ⁻¹¹	3 × 10 ⁻¹¹

APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

(See notes at end of Appendix)

Element (atomic number)	Table I			Table II		
	Col 1—Air (pCi/ml)	Col 2— Water (pCi/ml)	Col 3—Air (pCi/ml)	Col 1—Air (pCi/ml)	Col 2— Water (pCi/ml)	Col 3—Air (pCi/ml)
Tin (50)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Tungsten (Wolfram) (74)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Uranium (92)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Vanadium (23)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Xenon (54)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Ytterbium (70)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Yttrium (39)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Zinc (30)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Zirconium (40)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰

Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life less than 2 hours

APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

(See notes at end of appendix)

Element (atomic number)	Table I			Table II		
	Col 1—Air (pCi/ml)	Col 2— Water (pCi/ml)	Col 3—Air (pCi/ml)	Col 1—Air (pCi/ml)	Col 2— Water (pCi/ml)	Col 3—Air (pCi/ml)
Strontium (38)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Sulfur (16)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Tellurium (52)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Thallium (81)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Thorium (90)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰
Thulium (69)	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰	3 × 10 ⁻¹⁰
	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰	4 × 10 ⁻¹⁰
	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰	5 × 10 ⁻¹⁰
	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰	6 × 10 ⁻¹⁰

APPENDIX B—CONCENTRATIONS IN AIR AND WATER ABOVE NATURAL BACKGROUND—Continued

[See notes at end of appendix.]

Element (atomic number) ^a	Isotope ^b	
	Table I Col 1—Air ($\mu\text{Ci/ml}$)	Table II Col 1—Air ($\mu\text{Ci/ml}$)
Any single radionuclide not listed above with decay mode other than alpha emission or spontaneous fission and with radioactive half-life greater than 2 hours.	Col 2—Water ($\mu\text{Ci/ml}$)	Col 2—Water ($\mu\text{Ci/ml}$)
	Col 2—Air ($\mu\text{Ci/ml}$)	Col 2—Air ($\mu\text{Ci/ml}$)
Any single radionuclide not listed above, which decays by alpha emission or spontaneous fission.		

^aSoluble (S); insoluble (I).
^bCol 1 means that values given are for submission in a semiquantitative initial cloud of airborne material.

^cThese radon concentrations are appropriate for protection from radon-222 combined with its short-lived daughters. Alternatively, the value in Table I may be replaced by one third (1/3) "working level" (A "working level" is defined as any combination of short-lived radon-222 daughters, polonium-218, bismuth-214, and polonium-214 in one liter of air, without regard to the degree of equilibrium, that will result in the ultimate emission of 1.3×10^5 MeV of alpha particle energy). The Table II value may be replaced by one-third (1/3) of a "working level". The limit on radon-222 concentrations in restricted areas may be based on an annual average.

^dFor soluble mixtures of U-238, U-234 and U-235 in air chemical toxicity may be the limiting factor. If the percent by weight (mixture) of U-235 is less than 5, the concentration value for a 40-hour workweek, Table I is 0.2 micrograms uranium per cubic meter of air average. For any mixture, the product of the average concentration and time of exposure during a 40-hour workweek shall not exceed 8×10^{-4} SA ($\mu\text{Ci}\cdot\text{hr}/\text{m}^3$) where SA is the specific activity of the uranium inhaled. The concentration value for Table II is 0.007 micrograms uranium per cubic meter of air. The specific activity for natural uranium is 6.77 $\times 10^{-4}$ curies per gram U. The specific activity for other mixtures of U-238, U-235 and U-234, if not known, shall be $\text{SA} = 3.6 \times 10^{-4} \text{ curies/gram U} - \text{U-depleted}$
 $\text{SA} = (0.4 + 0.38 \text{ E} - 0.0034 \text{ E}^2) \times 10^{-4}$ E 0.72
where E is the percentage by weight of U-235, expressed as percent.

^eNOTE: In A, B, C, and D, where there is a mixture in air or water of more than one radionuclide, the limiting values for purposes of this Appendix should be determined as follows:

1. If the identity and concentration of each radionuclide in the mixture are known, the limiting values should be derived as follows. Determine for each radionuclide in the mixture the ratio between the quantity present in the mixture and the limit otherwise established in Appendix B for the specific radionuclide when not in a mixture. The sum of such ratios for all the radionuclides in the mixture may not exceed "1" (i.e., "unity").

2. Example: If radionuclides A, B, and C are present in concentrations C_A , C_B , and C_C , and if the applicable MPC's are MPC_A, MPC_B, and MPC_C, and MPC_A and MPC_B , respectively, then the concentrations shall be limited so that the following relationship exists:

$$\frac{C_A}{\text{MPC}_A} + \frac{C_B}{\text{MPC}_B} + \frac{C_C}{\text{MPC}_C} \leq 1$$

3. If either the identity or the concentration of any radionuclide in the mixture is not known, the limiting values for purposes of Appendix B shall be:

a. For purposes of Table I, Col 1— 6×10^{-10}

b. For purposes of Table I, Col 2— 4×10^{-4}

c. For purposes of Table II, Col 1— 2×10^{-10}

d. For purposes of Table II, Col 2— 2×10^{-4}

3. If any of the conditions specified below are met, the corresponding values specified below may be used in lieu of those specified in paragraph 2 above:

a. If the identity of each radionuclide in the mixture is known but the concentration of one or more of the radionuclides in the mixture is not known, the concentration limit for the mixture is the limit specified in Appendix B for the radionuclide in the mixture having the lowest concentration limit, or

b. If the identity of each radionuclide in the mixture is not known, but it is known that certain radionuclides specified in Appendix B are not present in the mixture, the concentration limit for the mixture is the lowest concentration limit specified in Appendix B for any radionuclide which is not known to be absent from the mixture, or

c. Element (atomic number) and isotope

If it is known that Sr-90, I-125, I-126, I-131, I-133, I-134, I-135, I-137, I-138, I-139, I-140, I-141, I-142, I-143, I-144, I-145, I-146, I-147, I-148, I-149, I-150, I-151, I-152, I-153, I-154, I-155, I-156, I-157, I-158, I-159, I-160, I-161, I-162, I-163, I-164, I-165, I-166, I-167, I-168, I-169, I-170, I-171, I-172, I-173, I-174, I-175, I-176, I-177, I-178, I-179, I-180, I-181, I-182, I-183, I-184, I-185, I-186, I-187, I-188, I-189, I-190, I-191, I-192, I-193, I-194, I-195, I-196, I-197, I-198, I-199, I-200, I-201, I-202, I-203, I-204, I-205, I-206, I-207, I-208, I-209, I-210, I-211, I-212, I-213, I-214, I-215, I-216, I-217, I-218, I-219, I-220, I-221, I-222, I-223, I-224, I-225, I-226, I-227, I-228, I-229, I-230, I-231, I-232, I-233, I-234, I-235, I-236, I-237, I-238, I-239, I-240, I-241, I-242, I-243, I-244, I-245, I-246, I-247, I-248, I-249, I-250, I-251, I-252, I-253, I-254, I-255, I-256, I-257, I-258, I-259, I-260, I-261, I-262, I-263, I-264, I-265, I-266, I-267, I-268, I-269, 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I-1612, I-1613, I-1614, I-1615, I-1616, I-1617, I-1618, I-1619, I-1620, I-1621, I-1622, I-1623, I-1624, I-1625, I-1626, I-1627, I-1628, I-1629, I-1630, I-1631, I-1632, I-1633, I-1634, I-1635, I-1636, I-1637, I-1638, I-1639, I-1640, I-1641, I-1642, I-1643, I-1644, I-1645, I-1646, I-1647, I-1648, I-1649, I-1650, I-1651, I-1652, I-1653, I-1654, I-1655, I-1656, I-1657, I-1658, I-1659, I-1660, I-1661, I-1662, I-1663, I-1664, I-1665, I-1666, I-1667, I-1668, I-1669, I-1670, I-1671, I-1672, I-1673, I-1674, I-1675, I-1676, I-1677, I-1678, I-1679, I-1680, I-1681, I-1682, I-1683, I-1684, I-1685, I-1686, I-1687, I-1688, I-1689, I-1690, I-1691, I-1692, I-1693, I-1694, I-

Appendix B
Site Specific Dispersion Values

Atmospheric Dispersion Factors For Three Mile Island Unit 1

Release - Station Vent

Season - Annual

 $X/Q - \text{sec}/\text{m}^3$ Distance¹ (Meters)

Sector	610	2413	4022	5631	7240	12067	24135	40225	56315	72405
N	9.06E-07	4.66E-07	2.43E-07	8.52E-08	6.83E-08	5.33E-08	1.88E-08	8.87E-09	5.90E-09	4.33E-09
NNE	8.06E-07	1.46E-06	4.55E-07	2.45E-07	2.05E-07	8.81E-08	2.78E-08	1.22E-08	7.99E-09	5.81E-09
NE	7.93E-07	7.14E-07	2.90E-07	2.79E-07	1.92E-07	8.75E-08	2.73E-08	1.20E-08	7.76E-09	5.61E-09
ENE	9.60E-07	5.71E-07	2.81E-07	1.70E-07	1.51E-07	8.30E-08	2.63E-08	1.17E-08	7.59E-09	5.50E-09
E	1.59E-06	7.39E-07	2.87E-07	3.10E-07	2.10E-07	9.24E-08	2.95E-08	1.29E-08	8.31E-09	5.97E-09
ESE	1.83E-06	1.04E-06	5.70E-07	2.96E-07	2.01E-07	8.80E-08	2.78E-08	1.23E-08	8.00E-09	5.77E-09
SE	2.27E-06	1.30E-06	5.94E-07	3.08E-07	2.09E-07	9.02E-08	2.82E-08	1.24E-08	8.00E-09	5.73E-09
SSE	1.42E-06	4.54E-07	3.82E-07	2.20E-07	1.59E-07	1.02E-07	3.17E-08	1.39E-08	8.99E-09	6.47E-09
S	7.76E-07	4.66E-07	5.10E-07	2.33E-07	1.59E-07	7.02E-08	2.21E-08	9.79E-09	6.36E-09	4.60E-09
SSW	3.15E-07	1.77E-07	1.10E-07	9.85E-08	7.18E-08	4.31E-08	1.37E-08	6.07E-09	3.93E-09	2.83E-09
SW	4.34E-07	2.24E-07	2.50E-07	2.10E-07	1.42E-07	6.04E-08	1.87E-08	8.17E-09	5.29E-09	3.81E-09
WSW	6.88E-07	4.79E-07	4.81E-07	2.49E-07	1.69E-07	7.78E-08	2.43E-08	1.06E-08	6.88E-09	4.26E-09
W	1.05E-06	4.51E-07	3.66E-07	2.78E-07	2.21E-07	9.94E-08	3.06E-08	1.34E-08	8.64E-09	6.22E-09
WNW	1.00E-06	4.01E-07	4.36E-07	2.74E-07	2.33E-07	9.95E-08	3.12E-08	1.37E-08	8.88E-09	6.42E-09
NW	8.54E-07	8.08E-07	8.55E-07	5.99E-07	4.54E-07	2.48E-07	6.28E-08	1.11E-08	7.38E-09	5.42E-09
NNW	7.41E-07	4.06E-07	2.13E-07	8.62E-08	9.30E-08	7.20E-08	2.31E-08	1.03E-08	6.70E-09	4.88E-09

D/Q (m⁻²)

N	2.11E-08	3.98E-09	1.17E-09	2.94E-10	1.89E-10	7.87E-11	2.12E-11	8.97E-12	5.89E-12	4.08E-12
NNE	2.06E-08	3.57E-09	9.13E-10	4.82E-10	4.59E-10	1.74E-10	3.97E-11	1.30E-11	6.57E-12	4.08E-12
NE	1.86E-08	2.99E-09	7.18E-10	5.55E-10	3.83E-10	1.74E-10	3.97E-11	1.30E-11	6.57E-12	4.08E-12
ENE	1.98E-08	3.03E-09	7.43E-10	3.46E-10	2.83E-10	1.72E-10	4.48E-11	1.50E-11	7.78E-12	4.78E-12
E	3.43E-08	5.22E-09	1.26E-09	9.42E-10	6.11E-10	2.60E-10	6.14E-11	2.01E-11	1.02E-11	6.32E-12
ESE	4.18E-08	6.77E-09	2.19E-09	1.08E-09	6.93E-10	2.86E-10	7.10E-11	2.36E-11	1.22E-11	7.53E-12
SE	6.47E-08	9.49E-09	2.78E-09	1.37E-09	8.72E-10	3.56E-10	8.81E-11	2.94E-11	1.53E-11	9.45E-12
SSE	4.09E-08	5.11E-09	1.36E-09	6.29E-10	3.96E-10	2.78E-10	6.38E-11	2.09E-11	1.06E-11	6.57E-12
S	1.90E-08	3.72E-09	1.35E-09	4.53E-10	3.05E-10	1.36E-10	3.57E-11	1.20E-11	6.25E-12	3.84E-12
SSW	6.81E-09	1.15E-09	3.18E-10	1.52E-10	9.63E-11	7.26E-10	2.16E-11	7.43E-12	3.96E-12	2.41E-12
SW	1.04E-09	1.68E-09	4.95E-10	4.76E-10	2.79E-10	1.13E-10	2.58E-11	8.42E-12	4.27E-12	2.65E-12
WSW	1.57E-08	2.80E-09	1.01E-09	5.21E-10	3.46E-10	1.61E-10	3.68E-11	1.20E-11	6.09E-12	3.78E-12
W	2.56E-08	3.91E-09	1.09E-09	6.18E-10	5.37E-10	2.48E-10	5.66E-11	1.85E-11	9.37E-12	5.82E-12
WNW	2.22E-08	3.37E-09	9.95E-10	5.68E-10	5.89E-10	2.23E-10	5.10E-11	1.66E-11	8.44E-12	5.24E-12
NW	1.94E-08	4.41E-09	1.95E-09	1.07E-09	6.95E-10	3.08E-10	5.99E-11	9.59E-12	6.34E-12	4.38E-12
NNW	1.71E-08	3.32E-09	9.76E-10	2.48E-10	1.63E-10	1.33E-10	3.52E-11	1.18E-11	6.13E-12	3.76E-12

Atmospheric Dispersion Factors For Three Mile Island Unit 1

Release - Ground
X/Q - sec/m³

Season - Annual

Distance (Meters)

Sector	610	2413	4022	5631	7240	12067	24135	40225	56315	72405
N	4.23E-05	5.65E-06	2.72E-06	1.69E-06	1.19E-06	5.71E-07	1.31E-07	2.20E-08	1.44E-08	1.04E-08
NNE	4.46E-05	5.91E-06	2.85E-06	1.78E-06	1.25E-06	6.06E-07	1.40E-07	2.35E-08	1.54E-08	1.12E-08
NE	3.75E-05	3.74E-06	1.05E-06	5.48E-07	3.75E-07	1.66E-07	5.33E-08	2.37E-08	1.55E-08	1.12E-08
ENE	3.60E-05	3.63E-06	1.02E-06	5.33E-07	3.65E-07	1.62E-07	5.16E-08	2.30E-08	1.50E-08	1.09E-08
E	4.08E-05	4.12E-06	1.14E-06	5.96E-07	4.06E-07	1.78E-07	5.64E-08	2.50E-08	1.62E-08	1.17E-08
ESE	3.96E-05	3.95E-06	1.09E-06	5.70E-07	3.89E-07	1.71E-07	5.41E-08	2.40E-08	1.56E-08	1.12E-08
SE	4.12E-05	4.12E-06	1.13E-06	5.88E-07	4.00E-07	1.74E-07	5.48E-08	2.42E-08	1.56E-08	1.12E-08
SSE	5.57E-05	7.49E-06	3.56E-06	2.19E-06	1.53E-06	7.27E-07	1.64E-07	2.73E-08	1.77E-08	1.28E-08
S	3.89E-05	5.21E-06	2.49E-06	1.54E-06	1.08E-06	5.12E-07	1.16E-07	1.93E-08	1.26E-08	9.10E-09
SSW	2.50E-05	3.41E-06	1.62E-06	9.93E-07	6.93E-07	3.28E-07	7.40E-08	1.22E-08	7.93E-09	5.71E-09
SW	2.60E-05	2.63E-06	7.32E-07	3.82E-07	2.61E-07	1.15E-07	3.64E-08	1.62E-08	1.05E-08	7.59E-09
WSW	3.36E-05	3.35E-06	9.34E-07	4.89E-07	3.34E-07	1.48E-07	4.74E-08	2.11E-08	1.38E-08	9.96E-09
W	4.38E-05	4.43E-06	1.23E-06	6.41E-07	4.37E-07	1.92E-07	6.06E-08	2.68E-08	1.74E-08	1.26E-08
WNW	4.37E-05	4.35E-06	1.22E-06	6.40E-07	4.39E-07	1.95E-07	6.28E-08	2.80E-08	1.83E-08	1.33E-08
NW	4.16E-05	4.16E-06	1.17E-06	6.18E-07	4.24E-07	1.89E-07	6.10E-08	2.73E-08	1.78E-08	1.30E-08
NNW	4.04E-05	5.35E-06	2.59E-06	1.61E-06	1.14E-06	5.49E-07	1.27E-07	2.13E-08	1.39E-08	1.02E-08

D/Q (m⁻²)

N	1.26E-07	1.16E-08	4.49E-09	2.46E-09	1.52E-09	6.23E-10	1.02E-10	1.24E-11	6.31E-12	3.92E-12
NNE	1.31E-07	1.21E-08	4.67E-09	2.56E-09	1.59E-09	6.49E-10	1.06E-10	1.30E-11	6.57E-12	4.08E-12
NE	1.05E-07	7.24E-09	1.64E-09	7.58E-10	4.59E-10	1.74E-10	3.97E-11	1.30E-11	6.57E-12	4.08E-12
ENE	1.10E-07	7.60E-09	1.71E-09	7.96E-10	4.82E-10	1.83E-10	4.17E-11	1.36E-11	6.90E-12	4.28E-12
E	1.63E-07	1.12E-08	2.54E-09	1.17E-09	7.11E-10	2.69E-10	6.14E-11	2.01E-11	1.02E-11	6.32E-12
ESE	1.80E-07	1.24E-08	2.82E-09	1.30E-09	7.87E-10	2.98E-10	6.81E-11	2.22E-11	1.13E-11	7.00E-12
SE	2.25E-07	1.55E-08	3.52E-09	1.62E-09	9.83E-10	3.72E-10	8.50E-11	2.78E-11	1.41E-11	8.74E-12
SSE	2.10E-07	1.93E-08	7.50E-09	4.10E-09	2.54E-09	1.04E-09	1.70E-10	2.08E-11	1.05E-11	6.54E-12
S	1.10E-07	1.01E-08	3.81E-09	2.14E-09	1.33E-09	5.43E-10	8.87E-11	1.08E-11	5.50E-12	3.41E-12
SSW	6.32E-08	5.81E-09	2.25E-09	1.23E-09	7.64E-10	3.13E-10	5.10E-11	6.24E-12	3.16E-12	1.97E-12
SW	6.82E-08	4.71E-09	1.07E-09	4.93E-10	2.98E-10	1.13E-10	2.58E-11	8.42E-12	4.27E-12	2.65E-12
WSW	9.73E-08	6.71E-09	1.52E-09	7.03E-10	4.25E-10	1.61E-10	3.68E-11	1.20E-11	6.09E-12	3.78E-12
W	1.50E-07	1.03E-09	2.34E-09	1.08E-09	6.55E-10	2.48E-10	5.66E-11	1.85E-11	9.37E-12	5.82E-12
WNW	1.35E-07	9.30E-09	2.11E-09	9.74E-10	5.90E-10	2.23E-10	5.10E-11	1.66E-11	8.44E-12	5.24E-12
NW	1.09E-07	7.53E-09	1.71E-09	7.88E-10	4.77E-10	1.81E-10	4.13E-11	1.35E-11	6.83E-12	4.24E-12
NNW	1.07E-07	9.87E-09	3.83E-09	2.09E-09	1.30E-09	5.32E-10	8.68E-11	1.06E-11	5.38E-12	3.34E-12

Appendix C
Dose Conversion Factors

C-1a

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INHALATION DOSE FACTORS FOR ADULTS
(MREM PER PCI INHALED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H 3	NO DATA	1.58E-07	1.58E-07	1.58E-07	1.58E-07	1.58E-07	1.58E-07
C 14	2.27E-06	4.26E-07	4.26E-07	4.26E-07	4.26E-07	4.26E-07	4.26E-07
NA 24	1.28E-06	1.28E-06	1.28E-06	1.28E-06	1.28E-06	1.28E-06	1.28E-06
P 32	1.65E-04	9.64E-06	6.26E-06	NO DATA	NO DATA	NO DATA	1.08E-05
CR 51	NO DATA	NO DATA	1.25E-08	7.44E-09	2.85E-09	1.80E-06	4.15E-07
MN 54	NO DATA	4.95E-06	7.87E-07	NO DATA	1.23E-06	1.75E-04	9.67E-06
MN 56	NO DATA	1.55E-10	2.29E-11	NO DATA	1.63E-10	1.18E-06	2.53E-06
FE 55	3.07E-06	2.12E-06	4.93E-07	NO DATA	NO DATA	9.01E-06	7.54E-07
FE 59	1.47E-06	3.47E-06	1.32E-06	NO DATA	NO DATA	1.27E-04	2.35E-05
CO 58	NO DATA	1.98E-07	2.59E-07	NO DATA	NO DATA	1.16E-04	1.33E-05
CO 60	NO DATA	1.44E-06	1.85E-06	NO DATA	NO DATA	7.46E-04	3.56E-05
NI 63	5.40E-05	3.93E-06	1.81E-06	NO DATA	NO DATA	2.23E-05	1.67E-06
NT 65	1.92E-10	2.62E-11	1.14E-11	NO DATA	NO DATA	7.00E-07	1.54E-06
64	NO DATA	1.83E-10	7.69E-11	NO DATA	5.78E-10	8.48E-07	6.12E-06
ZN 65	4.05E-06	1.29E-05	5.82E-06	NO DATA	8.62E-06	1.08E-04	6.68E-06
ZN 69	4.23E-12	8.14E-12	5.65E-13	NO DATA	5.27E-12	1.15E-07	2.04E-09
BR 83	NO DATA	NO DATA	3.01E-08	NO DATA	NO DATA	NO DATA	2.90E-06
BR 84	NO DATA	NO DATA	3.91E-08	NO DATA	NO DATA	NO DATA	2.05E-13
BR 85	NO DATA	NO DATA	1.60E-09	NO DATA	NO DATA	NO DATA	LT E-24
RB 86	NO DATA	1.69E-05	7.37E-06	NO DATA	NO DATA	NO DATA	2.08E-06
RB 88	NO DATA	4.84E-08	2.41E-08	NO DATA	NO DATA	NO DATA	4.18E-19
RE 89	NO DATA	3.20E-08	2.12E-08	NO DATA	NO DATA	NO DATA	1.16E-21
SR 89	3.80E-05	NO DATA	1.09E-06	NO DATA	NO DATA	1.75E-04	4.37E-05
SR 90	1.24E-02	NO DATA	7.62E-04	NO DATA	NO DATA	1.20E-03	9.02E-05
SR 91	7.74E-09	NO DATA	3.13E-10	NO DATA	NO DATA	4.56E-06	2.39E-05
SR 92	8.43E-10	NO DATA	3.64E-11	NO DATA	NO DATA	2.06E-06	5.38E-06
Y 90	2.61E-07	NO DATA	7.01E-09	NO DATA	NO DATA	2.12E-05	6.32E-05
Y 91M	3.26E-11	NO DATA	1.27E-12	NO DATA	NO DATA	2.40E-07	1.66E-10
Y 91	5.78E-05	NO DATA	1.55E-06	NO DATA	NO DATA	2.13E-04	4.81E-05
Y 92	1.29E-09	NO DATA	3.77E-11	NO DATA	NO DATA	1.96E-06	9.19E-06

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 INHALATION DOSE FACTORS FOR ADULTS
 (MREM PER PCI INHALED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LL7
Y 93	1.18E-08	NO DATA	3.26E-10	NO DATA	NO DATA	6.06E-06	5.27E-05
ZR 95	1.34E-05	4.30E-06	2.91E-06	NO DATA	6.77E-06	2.21E-04	1.38E-05
ZR 97	1.21E-08	2.45E-09	1.13E-09	NO DATA	3.71E-09	9.84E-06	6.54E-05
NB 95	1.76E-06	9.77E-07	5.26E-07	NO DATA	9.67E-07	6.31E-05	1.30E-05
MO 99	NO DATA	1.51E-08	2.87E-09	NO DATA	3.64E-08	1.14E-05	3.10E-05
TC 99M	1.29E-13	3.64E-13	4.63E-12	NO DATA	5.52E-12	9.55E-08	5.20E-07
TC 101	5.22E-15	7.52E-15	7.38E-14	NO DATA	1.35E-13	4.99E-08	1.36E-21
RU 103	1.91E-07	NO DATA	8.23E-08	NO DATA	7.29E-07	6.31E-05	1.38E-05
RU 105	9.88E-11	NO DATA	3.89E-11	NO DATA	1.27E-10	1.37E-06	6.02E-06
RU 106	8.64E-06	NO DATA	1.09E-06	NO DATA	1.67E-05	1.17E-03	1.14E-04
AG 110M	1.35E-06	1.25E-06	7.43E-07	NO DATA	2.46E-06	5.79E-04	3.78E-05
TE 125M	4.27E-07	1.98E-07	5.84E-08	1.31E-07	1.55E-06	3.92E-05	8.83E-06
TE 127M	1.58E-06	7.21E-07	1.96E-07	4.11E-07	5.72E-06	1.20E-04	1.87E-05
TE 127	1.75E-10	8.03E-11	3.87E-11	1.32E-10	6.37E-10	8.14E-07	7.17E-06
TE 129M	1.22E-06	5.84E-07	1.98E-07	4.30E-07	4.57E-06	1.45E-04	4.79E-05
TE 129	6.22E-12	2.99E-12	1.55E-12	4.87E-12	2.34E-11	2.42E-07	1.96E-08
TE 131M	8.74E-09	5.45E-09	3.63E-09	6.88E-09	3.86E-08	1.82E-05	6.95E-05
TE 131	1.39E-12	7.44E-13	4.49E-13	1.17E-12	5.46E-12	1.74E-07	2.30E-09
TE 132	3.25E-08	2.69E-08	2.02E-08	2.37E-08	1.82E-07	3.60E-05	6.37E-05
I 130	5.72E-07	1.68E-06	6.60E-07	1.42E-04	2.61E-06	NO DATA	9.61E-07
I 131	3.15E-06	4.47E-06	2.56E-06	1.49E-03	7.66E-06	NO DATA	7.85E-07
I 132	1.45E-07	4.07E-07	1.45E-07	1.43E-05	6.48E-07	NO DATA	5.08E-08
I 133	1.08E-06	1.85E-06	5.65E-07	2.69E-04	3.23E-06	NO DATA	1.11E-06
I 134	8.05E-08	2.16E-07	7.69E-08	3.73E-06	3.44E-07	NO DATA	1.26E-10
I 135	3.35E-07	8.73E-07	3.21E-07	5.60E-05	1.39E-06	NO DATA	6.56E-07
CS 134	4.66E-05	1.06E-04	9.10E-05	NO DATA	3.59E-05	1.22E-05	1.30E-06
CS 136	4.88E-06	1.83E-05	1.38E-05	NO DATA	1.07E-05	1.50E-06	1.46E-06
CS 137	5.98E-05	7.76E-05	5.35E-05	NO DATA	2.78E-05	9.40E-06	1.05E-06
CS 138	4.14E-08	7.76E-08	4.05E-08	NO DATA	6.00E-08	6.07E-09	2.33E-13
BA 139	1.17E-10	8.32E-14	3.42E-12	NO DATA	7.78E-14	4.70E-07	1.12E-07

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 INHALATION DOSE FACTORS FOR ADULTS
 (MREM PER PCI INHALED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	4.86E-06	6.13E-09	3.21E-07	NO DATA	2.09E-09	1.59E-04	2.73E-05
BA 141	1.25E-11	9.41E-15	4.20E-13	NO DATA	8.75E-15	2.42E-07	1.45E-17
BA 142	3.29E-12	3.38E-15	2.07E-13	NO DATA	2.86E-15	1.49E-07	1.96E-26
LA 140	4.30E-08	2.17E-08	5.73E-09	NO DATA	NO DATA	1.70E-05	5.73E-05
LA 142	8.54E-11	3.88E-11	9.66E-12	NO DATA	NO DATA	7.91E-07	2.64E-07
CE 141	2.49E-06	1.69E-06	1.91E-07	NO DATA	7.83E-07	4.52E-05	1.50E-05
CE 143	2.33E-08	1.72E-08	1.91E-09	NO DATA	7.60E-09	9.97E-06	2.83E-05
CE 144	4.29E-04	1.79E-04	2.30E-05	NO DATA	1.06E-04	9.72E-04	1.02E-04
PR 143	1.17E-06	4.69E-07	5.80E-08	NO DATA	2.70E-07	3.51E-05	2.50E-05
PR 144	3.76E-12	1.56E-12	1.91E-13	NO DATA	8.81E-13	1.27E-07	2.69E-16
ND 147	6.59E-07	7.62E-07	4.56E-08	NO DATA	4.45E-07	2.76E-05	2.16E-05
W 187	1.06E-09	8.85E-10	3.10E-10	NO DATA	NO DATA	3.63E-06	1.94E-05
NP 239	2.87E-08	2.82E-09	1.55E-09	NO DATA	8.75E-09	4.70E-09	1.49E-05

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INHALATION DOSE FACTORS FOR TEENAGER
(MREM PER PCI INHALED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H 3	NO DATA	1.59E-07	1.59E-07	1.59E-07	1.59E-07	1.59E-07	1.59E-07
C 14	3.25E-06	6.09E-07	6.09E-07	6.09E-07	6.09E-07	6.09E-07	6.09E-07
NA 24	1.72E-06	1.72E-06	1.72E-06	1.72E-06	1.72E-06	1.72E-06	1.72E-06
P 32	2.36E-04	1.37E-05	8.95E-06	NO DATA	NO DATA	NO DATA	1.16E-05
CR 51	NO DATA	NO DATA	1.69E-08	9.37E-09	3.84E-09	2.62E-06	3.75E-07
MN 54	NO DATA	6.30E-06	1.05E-06	NO DATA	1.59E-06	2.48E-04	8.35E-06
MN 56	NO DATA	2.12E-10	3.15E-11	NO DATA	2.24E-10	1.90E-06	7.18E-06
FE 55	4.18E-06	2.98E-06	6.93E-07	NO DATA	NO DATA	1.55E-05	7.99E-07
FE 59	1.09E-06	4.62E-06	1.79E-06	NO DATA	NO DATA	1.91E-04	2.23E-05
CO 58	NO DATA	2.59E-07	3.47E-07	NO DATA	NO DATA	1.68E-04	1.77E-06
CO 60	NO DATA	1.89E-06	2.48E-06	NO DATA	NO DATA	1.09E-03	3.24E-05
NI 63	7.25E-05	5.43E-06	2.47E-06	NO DATA	NO DATA	3.84E-05	1.77E-06
NI 65	2.73E-10	3.66E-11	1.59E-11	NO DATA	NO DATA	1.17E-06	4.59E-06
64	NO DATA	2.54E-10	1.06E-10	NO DATA	8.01E-10	1.39E-06	7.68E-06
Zn 65	4.82E-06	1.67E-05	7.80E-06	NO DATA	1.08E-05	1.55E-04	5.83E-06
ZN 69	6.04E-12	1.15E-11	8.07E-13	NO DATA	7.53E-12	1.98E-07	3.56E-08
BR 83	NO DATA	NO DATA	4.30E-08	NO DATA	NO DATA	NO DATA	LT E-24
BR 84	NO DATA	NO DATA	5.41E-08	NO DATA	NO DATA	NO DATA	LT E-24
BR 85	NO DATA	NO DATA	2.29E-09	NO DATA	NO DATA	NO DATA	LT E-24
BR 86	NO DATA	2.38E-05	1.05E-05	NO DATA	NO DATA	NO DATA	2.21E-06
RB 88	NO DATA	6.82E-08	3.40E-08	NO DATA	NO DATA	NO DATA	3.65E-15
RB 89	NO DATA	4.40E-08	2.91E-08	NO DATA	NO DATA	NO DATA	4.22E-17
SR 89	5.43E-05	NO DATA	1.56E-06	NO DATA	NO DATA	3.02E-04	4.64E-05
SR 90	1.35E-02	NO DATA	8.35E-04	NO DATA	NO DATA	2.06E-03	9.56E-05
SR 91	1.10E-08	NO DATA	4.39E-10	NO DATA	NO DATA	7.59E-06	3.24E-05
SR 92	1.19E-09	NO DATA	5.08E-11	NO DATA	NO DATA	3.43E-06	1.49E-05
Y 90	3.73E-07	NO DATA	1.00E-08	NO DATA	NO DATA	3.66E-05	6.99E-05
Y 91M	4.63E-11	NO DATA	1.77E-12	NO DATA	NO DATA	4.00E-07	3.77E-09
Y 91	8.26E-05	NO DATA	2.21E-06	NO DATA	NO DATA	3.67E-04	5.11E-05
Y 92	1.84E-09	NO DATA	5.36E-11	NO DATA	NO DATA	3.35E-06	2.06E-05

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INHALATION DOSE FACTORS FOR TEENAGER
(MREM PER PCI INHALED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	1.69E-06	NO DATA	4.65E-10	NO DATA	NO DATA	1.04E-05	7.24E-05
ZR 95	1.82E-05	5.73E-06	3.94E-06	NO DATA	8.42E-06	3.36E-04	1.86E-05
ZR 97	1.72E-06	3.40E-09	1.57E-09	NO DATA	5.15E-09	1.62E-05	7.88E-05
NB 95	2.32E-06	1.29E-06	7.08E-07	NO DATA	1.25E-06	9.39E-05	1.21E-05
MO 99	NO DATA	2.11E-08	4.03E-09	NO DATA	5.14E-08	1.92E-05	3.36E-05
TC 99M	1.73E-13	4.83E-13	6.24E-12	NO DATA	7.20E-12	1.44E-07	7.66E-07
TC 101	7.40E-15	1.05E-14	1.03E-13	NO DATA	1.90E-13	8.34E-08	1.09E-16
RU 103	2.63E-07	NO DATA	1.12E-07	NO DATA	9.29E-07	9.79E-05	1.36E-05
RU 105	1.40E-10	NO DATA	5.42E-11	NO DATA	1.76E-10	2.27E-06	1.13E-05
RU 106	1.23E-05	NO DATA	1.55E-06	NO DATA	2.38E-05	2.01E-03	1.20E-04
AG 110M	1.73E-06	1.64E-06	9.99E-07	NO DATA	3.13E-06	8.44E-04	3.41E-05
TE 125M	6.10E-07	2.80E-07	8.34E-08	1.75E-07	NO DATA	6.70E-05	9.38E-05
TE 127M	2.25E-06	1.02E-06	2.73E-07	5.48E-07	8.17E-06	2.07E-04	1.99E-05
TE 127	2.51E-10	1.14E-10	5.52E-11	1.77E-10	9.10E-10	1.40E-06	1.01E-05
TE 129M	1.74E-06	8.23E-07	2.81E-07	5.72E-07	6.49E-06	2.47E-04	5.06E-05
TE 129	8.87E-12	4.22E-12	2.20E-12	6.48E-12	3.32E-11	4.12E-07	2.02E-07
TE 131M	1.23E-08	7.51E-09	5.03E-09	9.06E-09	5.49E-08	2.97E-05	7.76E-05
TE 131	1.97E-12	1.04E-12	6.30E-13	1.55E-12	7.72E-12	2.92E-07	1.89E-05
TE 132	4.50E-08	3.63E-08	2.74E-08	3.07E-08	2.44E-07	5.61E-05	5.79E-05
I 130	7.80E-07	2.24E-06	8.96E-07	1.86E-04	3.44E-06	NO DATA	1.14E-06
I 131	4.43E-06	6.14E-06	3.30E-06	1.83E-03	1.05E-05	NO DATA	8.11E-07
I 132	1.99E-07	5.47E-07	1.97E-07	1.89E-05	8.65E-07	NO DATA	1.59E-07
I 133	1.52E-06	2.56E-06	7.78E-07	3.65E-04	4.49E-06	NO DATA	1.29E-06
I 134	1.11E-07	2.90E-07	1.05E-07	4.94E-06	4.58E-07	NO DATA	2.55E-09
I 135	4.62E-07	1.18E-06	4.36E-07	7.76E-05	1.86E-06	NO DATA	8.69E-07
CS 134	6.28E-05	1.41E-04	6.86E-05	NO DATA	4.69E-05	1.83E-05	1.22E-06
CS 136	6.44E-06	2.42E-05	1.71E-05	NO DATA	1.38E-05	2.22E-06	1.36E-06
CS 137	8.38E-05	1.06E-04	3.89E-05	NO DATA	3.80E-05	1.51E-05	1.06E-06
CS 138	5.82E-08	1.07E-07	5.58E-08	NO DATA	8.28E-08	9.84E-09	3.38E-11
BA 139	1.57E-10	1.18E-13	4.87E-12	NO DATA	1.11E-13	8.08E-07	8.06E-07

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 INHALATION DOSE FACTORS FOR TEENAGER
 (MREM PER PCI INHALED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	6.64E-06	6.58E-09	4.40E-07	NO DATA	2.85E-09	2.54E-04	2.86E-05
BA 141	1.76E-11	1.62E-14	5.93E-13	NO DATA	1.23E-14	4.11E-07	9.33E-14
BA 142	4.62E-12	4.63E-15	2.84E-13	NO DATA	3.92E-15	2.39E-07	5.99E-20
LA 140	5.99E-08	2.95E-08	7.82E-09	NO DATA	NO DATA	2.68E-05	6.09E-05
LA 142	1.20E-10	5.31E-11	1.32E-11	NO DATA	NO DATA	1.27E-06	1.50E-06
CE 141	3.55E-06	2.37E-06	2.71E-07	NO DATA	1.11E-06	7.67E-05	1.58E-05
CE 143	3.32E-08	2.42E-08	2.70E-09	NO DATA	1.08E-08	1.63E-05	3.19E-05
CE 144	6.11E-04	2.53E-04	3.28E-05	NO DATA	1.51E-04	1.67E-03	1.08E-04
PR 143	1.67E-06	6.64E-07	8.28E-08	NO DATA	3.86E-07	6.04E-05	2.67E-05
PR 144	5.37E-12	2.20E-12	2.72E-13	NO DATA	1.26E-12	2.19E-07	2.94E-14
NO 147	9.83E-07	1.07E-06	6.41E-08	NO DATA	6.28E-07	4.65E-05	2.28E-05
W 167	1.50E-09	1.22E-09	4.29E-10	NO DATA	NO DATA	5.92E-06	2.21E-05
WP 239	4.23E-08	3.99E-09	2.21E-09	NO DATA	1.25E-08	8.11E-06	1.65E-05

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INHALATION DOSE FACTORS FOR CHILD
(MREM PER PCI INHALED)

NUCLIDE		BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H	3	NO DATA	3.04E-07	3.04E-07	3.04E-07	3.04E-07	3.04E-07	3.04E-07
C	14	9.70E-06	1.82E-06	1.82E-06	1.82E-06	1.82E-06	1.82E-06	1.82E-06
NA	24	4.35E-06	4.35E-06	4.35E-06	4.35E-06	4.35E-06	4.35E-06	4.35E-06
P	32	7.04E-04	3.09E-05	2.67E-05	NO DATA	NO DATA	NO DATA	1.14E-05
CR	51	NO DATA	NO DATA	4.17E-08	2.31E-08	6.57E-09	4.59E-06	2.93E-07
MN	54	NO DATA	1.16E-05	2.57E-06	NO DATA	2.71E-06	4.26E-04	6.19E-04
MN	56	NO DATA	4.48E-10	8.43E-11	NO DATA	4.52E-10	3.55E-06	3.33E-05
FE	55	1.28E-05	6.80E-06	2.10E-06	NO DATA	NO DATA	3.00E-05	7.75E-07
FE	59	5.59E-06	9.04E-06	4.51E-06	NO DATA	NO DATA	3.43E-04	1.91E-05
CO	58	NO DATA	4.79E-07	8.55E-07	NO DATA	NO DATA	2.99E-04	9.29E-06
CO	60	NO DATA	3.55E-06	6.12E-06	NO DATA	NO DATA	1.91E-03	2.60E-05
NI	63	2.22E-04	1.25E-05	7.56E-06	NO DATA	NO DATA	7.43E-05	1.71E-06
NI	65	8.08E-10	7.99E-11	4.44E-11	NO DATA	NO DATA	2.21E-06	2.27E-05
	64	NO DATA	5.39E-10	2.90E-10	NO DATA	1.63E-09	2.59E-06	9.92E-06
Zn	65	1.15E-05	3.06E-05	1.90E-05	NO DATA	1.93E-05	2.69E-04	4.41E-06
ZN	69	1.81E-11	2.61E-11	2.41E-12	NO DATA	1.58E-11	3.84E-07	2.75E-06
BR	83	NO DATA	NO DATA	1.28E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR	84	NO DATA	NO DATA	1.48E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR	85	NO DATA	NO DATA	6.84E-09	NO DATA	NO DATA	NO DATA	LT E-24
RB	86	NO DATA	5.36E-05	3.09E-05	NO DATA	NO DATA	NO DATA	2.16E-06
RB	88	NO DATA	1.52E-07	9.90E-08	NO DATA	NO DATA	NO DATA	4.66E-09
RB	89	NO DATA	9.33E-08	7.83E-08	NO DATA	NO DATA	NO DATA	5.11E-10
SR	89	1.62E-04	NO DATA	4.66E-06	NO DATA	NO DATA	5.83E-04	4.52E-05
SR	90	2.73E-02	NO DATA	1.74E-03	NO DATA	NO DATA	3.99E-03	9.28E-05
SR	91	3.28E-08	NO DATA	1.24E-09	NO DATA	NO DATA	1.44E-05	4.70E-05
SR	92	3.54E-09	NO DATA	1.42E-10	NO DATA	NO DATA	6.49E-06	6.55E-05
Y	90	1.11E-06	NO DATA	2.99E-08	NO DATA	NO DATA	7.07E-05	7.24E-05
Y	91M	1.37E-10	NO DATA	4.98E-12	NO DATA	NO DATA	7.60E-07	4.64E-07
Y	91	2.47E-04	NO DATA	6.59E-06	NO DATA	NO DATA	7.10E-04	4.97E-05
Y	92	5.50E-09	NO DATA	1.57E-10	NO DATA	NO DATA	6.46E-06	6.46E-05

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INHALATION DOSE FACTORS FOR CHILD
(MREM PER PCI INHALED)

NUCLIDE	BONE	LIVFR	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	5.04E-08	NO DATA	1.38E-09	NO DATA	NO DATA	2.01E-05	1.05E-04
ZR 95	5.13E-05	1.13E-05	1.00E-05	NO DATA	1.61E-05	6.03E-04	1.65E-05
ZR 97	5.07E-06	7.34E-09	4.32E-09	NO DATA	1.05E-06	3.06E-05	9.49E-05
NB 95	6.35D-06	2.48E-06	1.77E-06	NO DATA	2.33E-06	1.66E-04	1.00E-05
MO 99	NO DATA	4.66E-08	1.15E-08	NO DATA	1.06E-07	3.66E-05	3.42E-05
TC 99M	4.81E-13	9.41E-13	1.56E-11	NO DATA	1.37E-11	2.57E-07	1.30E-06
TC 101	2.19E-14	2.30E-14	2.91E-13	NO DATA	3.92E-13	1.58E-07	4.41E-09
RU 103	7.55E-07	NO DATA	2.90E-07	NO DATA	1.90E-06	1.79E-04	1.21E-05
RU 105	4.13E-10	NO DATA	1.50E-10	NO DATA	3.63E-10	4.30E-06	2.69E-05
RU 106	3.68E-05	NO DATA	4.57E-06	NO DATA	4.97E-05	3.87E-03	1.16E-04
AG 110M	4.56E-06	3.08E-06	2.47E-06	NO DATA	5.74E-06	1.48E-03	2.71E-05
TE 125M	1.82E-06	6.29E-07	2.47E-07	5.20E-07	NO DATA	1.29E-04	9.13E-06
TE 127M	6.72E-06	2.31E-06	8.16E-06	1.64E-06	1.72E-05	4.00E-04	1.93E-05
TE 127	7.49E-10	2.57E-10	1.65E-10	5.30E-10	1.91E-09	2.71E-06	1.52E-05
TE 129M	5.19E-06	1.85E-06	8.22E-07	1.71E-06	1.36E-05	4.76E-04	4.91E-05
TE 129	2.64E-11	9.45E-12	6.44E-12	1.93E-11	6.94E-11	7.93E-07	6.89E-06
TE 131M	3.63E-08	1.60E-08	1.37E-08	2.64E-08	1.08E-07	5.56E-05	8.32E-05
TE 131	5.87E-12	2.28E-12	1.78E-12	4.59E-12	1.59E-11	5.55E-07	3.60E-07
TE 132	1.30E-07	7.36E-08	7.12E-08	8.58E-08	4.79E-07	1.02E-04	3.72E-05
I 130	2.21E-06	4.43E-06	2.28E-06	4.99E-04	6.61E-06	NO DATA	1.38E-06
I 131	1.30E-05	1.30E-05	7.37E-06	4.39E-03	2.13E-05	NO DATA	7.68E-07
I 132	5.72E-07	1.10E-06	5.07E-07	5.23E-05	1.69E-06	NO DATA	3.65E-07
I 133	4.48E-06	5.49E-06	2.08E-06	1.04E-03	9.13E-06	NO DATA	1.48E-06
I 134	3.17E-07	5.84E-07	2.69E-07	1.37E-05	8.92E-07	NO DATA	2.58E-07
I 135	1.33E-06	2.36E-06	1.12E-06	2.14E-04	3.62E-06	NO DATA	1.20E-06
CS 134	1.76E-04	2.74E-04	6.07E-05	NO DATA	8.93E-05	3.27E-05	1.04E-06
CS 136	1.76E-05	4.62E-05	3.14E-05	NO DATA	2.58E-05	3.93E-06	1.13E-06
CS 137	2.45E-04	2.23E-04	3.47E-05	NO DATA	7.63E-05	2.81E-05	9.78E-07
CS 138	1.71E-07	2.27E-07	1.50E-07	NO DATA	1.66E-07	1.84E-08	7.29E-06
BA 139	4.98E-10	2.66E-13	1.45E-11	NO DATA	2.33E-13	1.56E-06	1.56E-05

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INHALATION DOSE FACTORS FOR CHILD
(MREM PER PCI INHALED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	2.00E-05	1.75E-08	1.17E-06	NO DATA	5.71E-09	4.71E-04	2.75E-05
BA 141	5.29E-11	2.95E-14	1.72E-12	NO DATA	2.56E-14	7.89E-07	7.44E-06
BA 142	1.35E-11	9.73E-15	7.54E-13	NO DATA	7.87E-15	4.44E-07	7.41E-10
LA 140	1.74E-07	6.08E-08	2.04E-08	NO DATA	NO DATA	4.94E-05	6.10E-05
LA 142	3.50E-10	1.11E-10	3.49E-11	NO DATA	NO DATA	2.35E-06	2.05E-05
CE 141	1.06E-05	5.28E-06	7.83E-07	NO DATA	2.31E-06	1.47E-04	1.53E-05
CE 143	9.89E-08	5.37E-08	7.77E-09	NO DATA	2.26E-08	3.12E-05	3.44E-05
CE 144	1.83E-03	5.72E-04	9.77E-05	NO DATA	3.17E-04	3.23E-03	1.05E-04
PR 143	4.99E-06	1.50E-06	2.47E-07	NO DATA	8.11E-07	1.17E-04	2.63E-05
PR 144	1.61E-11	4.99E-12	8.10E-13	NO DATA	2.64E-12	4.23E-07	5.32E-06
ND 147	2.92E-06	2.36E-06	1.84E-07	NO DATA	1.30E-06	8.87E-05	2.22E-05
N 187	4.41E-09	2.61E-09	1.17E-09	NO DATA	NO DATA	1.11E-05	2.46E-05
NP 239	1.26E-07	9.04E-09	6.35E-09	NO DATA	2.63E-08	1.57E-05	1.73E-05

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INHALATION DOSE FACTORS FOR INFANT
(MREM PER PCI INHALED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H 3	NO DATA	4.62E-07	4.62E-07	4.62E-07	4.62E-07	4.62E-07	4.62E-07
C 14	1.89E-05	3.79E-06	3.79E-06	3.79E-06	3.79E-06	3.79E-06	3.79E-06
NA 24	7.54E-06	7.54E-06	7.54E-06	7.54E-06	7.54E-06	7.54E-06	7.54E-06
P 32	1.45E-03	8.03E-05	5.53E-05	NO DATA	NO DATA	NO DATA	1.15E-05
CR 51	NO DATA	NO DATA	6.39E-08	4.11E-08	9.45E-09	9.17E-06	2.55E-07
MN 54	NO DATA	1.81E-05	3.56E-06	NO DATA	3.56E-06	7.14E-04	5.04E-06
MN 56	NO DATA	1.10E-09	1.58E-10	NO DATA	7.86E-10	8.95E-06	5.12E-05
FE 55	1.41E-05	8.39E-06	2.38E-06	NO DATA	NO DATA	6.21E-05	7.82E-07
FE 59	9.69E-06	1.68E-05	6.77E-06	NO DATA	NO DATA	7.25E-04	1.77E-05
CO 56	NO DATA	8.71E-07	1.30E-06	NO DATA	NO DATA	5.55E-04	7.95E-06
CO 60	NO DATA	5.73E-06	8.41E-06	NO DATA	NO DATA	3.22E-03	2.28E-05
NI 63	2.42E-04	1.46E-05	8.29E-06	NO DATA	NO DATA	1.49E-04	1.73E-06
NI 65	1.71E-09	2.03E-10	8.79E-11	NO DATA	NO DATA	5.80E-06	3.56E-05
64	NO DATA	1.34E-09	5.53E-10	NO DATA	2.84E-09	6.64E-06	1.07E-05
65	1.38E-05	4.47E-05	2.22E-05	NO DATA	2.32E-05	4.62E-04	3.67E-05
ZN 69	3.85E-11	6.91E-11	5.13E-12	NO DATA	2.87E-11	1.05E-06	9.44E-06
BR 83	NO DATA	NO DATA	2.72E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR 84	NO DATA	NO DATA	2.86E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR 85	NO DATA	NO DATA	1.46E-08	NO DATA	NO DATA	NO DATA	LT E-24
RB 86	NO DATA	1.36E-04	6.30E-05	NO DATA	NO DATA	NO DATA	2.17E-06
RB 88	NO DATA	3.98E-07	2.05E-07	NO DATA	NO DATA	NO DATA	2.42E-07
RB 89	NO DATA	2.29E-07	1.47E-07	NO DATA	NO DATA	NO DATA	4.87E-06
SR 89	2.84E-04	NO DATA	8.15E-06	NO DATA	NO DATA	1.45E-03	4.57E-05
SR 90	2.92E-02	NO DATA	1.85E-03	NO DATA	NO DATA	8.03E-03	9.36E-05
SR 91	6.83E-08	NO DATA	2.47E-09	NO DATA	NO DATA	3.76E-05	5.24E-05
SR 92	7.50E-09	NO DATA	2.79E-10	NO DATA	NO DATA	1.70E-05	1.00E-04
Y 90	2.35E-06	NO DATA	6.30E-08	NO DATA	NO DATA	1.92E-04	7.43E-05
Y 91M	2.91E-10	NO DATA	9.90E-12	NO DATA	NO DATA	1.99E-06	1.68E-06
Y 91	4.20E-04	NO DATA	1.12E-05	NO DATA	NO DATA	1.75E-03	5.02E-05
Y 92	1.17E-08	NO DATA	3.29E-10	NO DATA	NO DATA	1.75E-05	9.04E-05

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 INHALATION DOSE FACTORS FOR INFANT
 (MREM PER PCI INHALED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	1.07E-07	NO DATA	2.91E-09	NO DATA	NO DATA	5.46E-05	1.19E-04
ZR 95	8.24E-05	1.99E-05	1.45E-05	NO DATA	2.22E-05	1.25E-03	1.55E-05
ZR 97	1.07E-07	1.83E-08	8.36E-09	NO DATA	1.85E-08	7.88E-05	1.00E-04
NB 95	1.12E-05	4.59E-06	2.70E-06	NO DATA	3.37E-06	3.42E-04	9.05E-06
MO 99	NO DATA	1.18E-07	2.31E-08	NO DATA	1.89E-07	9.63E-05	3.48E-05
TC 99M	9.98E-13	2.06E-12	2.66E-11	NO DATA	2.22E-11	5.79E-07	1.45E-06
TC 101	4.65E-14	5.88E-14	5.80E-13	NO DATA	6.99E-13	4.17E-07	6.03E-07
RU 103	1.44E-06	NO DATA	4.85E-07	NO DATA	3.03E-06	3.94E-04	1.15E-05
RU 105	8.74E-10	NO DATA	2.93E-10	NO DATA	6.42E-10	1.12E-05	3.46E-05
RU 106	6.20E-05	NO DATA	7.77E-06	NO DATA	7.61E-05	8.26E-03	1.17E-04
AG 110M	7.13E-06	5.16E-06	3.57E-06	NO DATA	7.80E-06	2.62E-03	2.36E-05
TE 125M	3.40E-06	1.42E-06	4.70E-07	1.16E-06	NO DATA	3.19E-04	9.22E-06
TE 127M	1.19E-05	4.93E-06	1.48E-06	3.48E-06	2.68E-05	9.37E-04	1.95E-05
TE 127	1.59E-09	6.81E-10	3.49E-10	1.32E-09	3.47E-09	7.39E-06	1.74E-05
TE 129M	1.01E-05	4.35E-06	1.59E-06	3.91E-06	2.27E-05	1.20E-03	4.93E-05
TE 129	5.63E-11	2.48E-11	1.34E-11	4.82E-11	1.25E-10	2.14E-06	1.88E-05
TE 131M	7.62E-08	3.93E-08	2.59E-08	6.38E-08	1.89E-07	1.42E-04	8.51E-05
TE 131	1.24E-11	5.87E-12	3.57E-12	1.13E-11	2.85E-11	1.47E-06	5.87E-06
TE 132	2.66E-07	1.69E-07	1.26E-07	1.99E-07	7.39E-07	2.43E-04	3.15E-05
I 130	4.54E-06	9.91E-06	3.98E-06	1.14E-03	1.09E-05	NO DATA	1.42E-06
I 131	2.71E-05	3.17E-05	1.40E-05	1.06E-02	3.70E-05	NO DATA	7.56E-07
I 132	1.21E-06	2.53E-06	8.99E-07	1.21E-04	2.82E-06	NO DATA	1.36E-06
I 133	9.46E-06	1.37E-05	4.00E-06	2.54E-03	1.60E-05	NO DATA	1.54E-06
I 134	6.58E-07	1.34E-06	4.75E-07	3.18E-05	1.49E-06	NO DATA	9.21E-07
I 135	2.76E-06	5.43E-06	1.98E-06	4.97E-04	6.05E-06	NO DATA	1.31E-06
CS 134	2.83E-04	5.02E-04	5.32E-05	NO DATA	1.36E-04	5.69E-05	9.53E-07
CS 136	3.45E-05	9.61E-05	3.78E-05	NO DATA	4.03E-05	8.40E-06	1.02E-06
CS 137	3.92E-04	4.37E-04	3.25E-05	NO DATA	1.23E-04	5.09E-05	9.53E-07
CS 138	3.61E-07	5.58E-07	2.84E-07	NO DATA	2.93E-07	4.67E-08	6.26E-07
BA 139	1.06E-09	7.03E-13	3.07E-11	NO DATA	4.23E-13	4.25E-06	3.64E-05

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INHALATION DOSE FACTORS FOR INFANT
(MREM PER PCI INHALED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	4.00E-05	4.00E-08	2.07E-06	NO DATA	9.59E-09	1.14E-03	2.74E-05
BA 141	1.12E-10	7.70E-14	3.55E-12	NO DATA	4.64E-14	2.12E-06	3.39E-06
BA 142	2.84E-11	2.36E-14	1.40E-12	NO DATA	1.36E-14	1.11E-06	4.95E-07
LA 140	3.61E-07	1.43E-07	3.68E-08	NO DATA	NO DATA	1.20E-04	6.06E-05
LA 142	7.36E-10	2.69E-10	6.46E-11	NO DATA	NO DATA	5.87E-06	4.25E-05
CE 141	1.98E-05	1.19E-05	1.42E-06	NO DATA	3.75E-06	3.69E-04	1.54E-05
CE 143	2.09E-07	1.38E-07	1.58E-08	NO DATA	4.03E-08	8.30E-05	3.55E-05
CE 144	2.28E-03	8.65E-04	1.26E-04	NO DATA	3.84E-04	7.03E-03	1.06E-04
PR 143	1.00E-05	3.74E-06	4.99E-07	NO DATA	1.41E-06	3.09E-04	2.66E-05
PR 144	3.42E-11	1.32E-11	1.72E-12	NO DATA	4.80E-12	1.15E-06	3.06E-06
ND 147	5.67E-06	5.81E-06	3.57E-07	NO DATA	2.25E-06	2.30E-04	2.23E-05
W 187	9.26E-09	6.44E-09	2.23E-09	NO DATA	NO DATA	2.83E-05	2.54E-05
NP 239	2.65E-07	2.37E-08	1.34E-08	NO DATA	4.73E-08	4.25E-05	1.78E-05

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INGESTION DOSE FACTORS FOR ADULTS
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H 3	NO DATA	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07	1.05E-07
C 14	2.84E-06	5.68E-07	5.68E-07	5.68E-07	5.68E-07	5.68E-07	5.68E-07
NA 24	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06	1.70E-06
P 32	1.93E-04	1.20E-05	7.46E-06	NO DATA	NO DATA	NO DATA	2.17E-05
CR 51	NO DATA	NO DATA	2.66E-09	1.59E-09	5.86E-10	3.53E-09	6.69E-07
MN 54	NO DATA	4.57E-06	8.72E-07	NO DATA	1.36E-06	NO DATA	1.40E-05
MN 56	NO DATA	1.15E-07	2.04E-08	NO DATA	1.46E-07	NO DATA	3.67E-06
FE 55	2.75E-06	1.90E-06	4.43E-07	NO DATA	NO DATA	1.06E-06	1.09E-06
FE 59	4.34E-06	1.02E-05	3.91E-06	NO DATA	NO DATA	2.85E-06	3.40E-05
CO 58	NO DATA	7.45E-07	1.67E-06	NO DATA	NO DATA	NO DATA	1.51E-05
CO 60	NO DATA	2.14E-06	4.72E-06	NO DATA	NO DATA	NO DATA	4.02E-05
NI 63	1.30E-04	9.01E-06	4.36E-06	NO DATA	NO DATA	NO DATA	1.88E-06
NI 65	5.28E-07	6.86E-08	3.13E-08	NO DATA	NO DATA	NO DATA	1.74E-06
NI 64	NO DATA	8.33E-08	3.91E-08	NO DATA	2.10E-07	NO DATA	7.10E-06
NI 65	4.84E-06	1.54E-05	6.96E-06	NO DATA	1.03E-05	NO DATA	9.70E-06
ZN 69	1.03E-08	1.97E-08	1.37E-09	NO DATA	1.28E-08	NO DATA	2.96E-09
BR 83	NO DATA	NO DATA	4.02E-08	NO DATA	NO DATA	NO DATA	5.79E-08
BR 84	NO DATA	NO DATA	5.21E-08	NO DATA	NO DATA	NO DATA	4.09E-13
BR 85	NO DATA	NO DATA	2.14E-09	NO DATA	NO DATA	NO DATA	LT E-24
RB 86	NO DATA	2.11E-05	9.83E-06	NO DATA	NO DATA	NO DATA	4.16E-06
RB 88	NO DATA	6.05E-08	3.21E-08	NO DATA	NO DATA	NO DATA	8.36E-19
RB 89	NO DATA	4.01E-08	2.82E-08	NO DATA	NO DATA	NO DATA	2.33E-21
SR 89	3.08E-04	NO DATA	8.84E-06	NO DATA	NO DATA	NO DATA	4.94E-05
SR 90	7.58E-03	NO DATA	1.86E-03	NO DATA	NO DATA	NO DATA	2.19E-04
SR 91	5.67E-06	NO DATA	2.29E-07	NO DATA	NO DATA	NO DATA	2.70E-05
SR 92	2.15E-06	NO DATA	9.30E-08	NO DATA	NO DATA	NO DATA	4.26E-05
Y 90	9.62E-09	NO DATA	2.58E-10	NO DATA	NO DATA	NO DATA	1.02E-04
Y 91M	9.09E-11	NO DATA	3.52E-12	NO DATA	NO DATA	NO DATA	2.67E-10
Y 91	1.41E-07	NO DATA	3.77E-09	NO DATA	NO DATA	NO DATA	7.76E-05
Y 92	8.45E-10	NO DATA	2.47E-11	NO DATA	NO DATA	NO DATA	1.48E-05

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INGESTION DOSE FACTORS FOR ADULTS
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	2.68E-09	NO DATA	7.40E-11	NO DATA	NO DATA	NO DATA	8.50E-05
ZR 95	3.04E-08	9.75E-09	6.60E-09	NO DATA	1.53E-08	NO DATA	3.09E-05
ZR 97	1.68E-09	3.39E-10	1.55E-10	NO DATA	5.12E-10	NO DATA	1.05E-04
NB 95	6.22E-09	3.46E-09	1.86E-09	NO DATA	3.42E-09	NO DATA	2.10E-05
MO 99	NO DATA	4.31E-06	8.20E-07	NO DATA	9.76E-06	NO DATA	9.99E-06
TC 99M	2.47E-10	6.98E-10	8.89E-09	NO DATA	1.06E-08	3.42E-10	4.13E-07
TC 101	2.54E-10	3.66E-10	3.59E-09	NO DATA	6.59E-09	1.87E-10	1.10E-21
RU 103	1.85E-07	NO DATA	7.97E-08	NO DATA	7.06E-07	NO DATA	2.16E-05
RU 105	1.54E-08	NO DATA	6.08E-09	NO DATA	1.99E-07	NO DATA	9.42E-06
RU 106	2.75E-06	NO DATA	3.48E-07	NO DATA	5.31E-06	NO DATA	1.78E-04
AG 110M	1.60E-07	1.48E-07	8.79E-08	NO DATA	2.91E-07	NO DATA	6.04E-05
TE 125M	2.68E-06	9.71E-07	3.59E-07	8.06E-07	1.09E-05	NO DATA	1.07E-05
TE 127M	6.77E-06	2.42E-06	8.25E-07	1.73E-06	2.75E-05	NO DATA	2.27E-05
TE 127	1.10E-07	3.95E-08	2.38E-08	8.15E-08	4.48E-07	NO DATA	8.68E-06
TE 129M	1.15E-05	4.29E-06	1.82E-06	3.95E-06	4.80E-03	NO DATA	5.79E-05
TE 129	3.14E-08	1.18E-08	7.65E-09	2.41E-08	1.32E-07	NO DATA	2.37E-08
TE 131M	1.73E-06	8.46E-07	7.05E-07	1.34E-06	8.57E-06	NO DATA	8.40E-05
TE 131	1.97E-06	8.23E-09	6.22E-09	1.62E-08	8.63E-08	NO DATA	2.79E-09
TE 132	2.52E-06	1.63E-06	1.53E-06	1.80E-06	1.57E-05	NO DATA	7.71E-05
I 130	7.56E-07	2.23E-06	8.80E-07	1.89E-04	3.48E-06	NO DATA	1.92E-06
I 131	4.16E-06	5.95E-06	3.41E-06	1.95E-03	1.02E-05	NO DATA	1.57E-06
I 132	2.03E-07	5.43E-07	1.90E-07	1.90E-05	8.65E-07	NO DATA	1.02E-07
I 133	1.42E-06	2.47E-06	7.53E-07	3.63E-04	4.31E-06	NO DATA	2.22E-06
I 134	1.06E-07	2.88E-07	1.03E-07	4.99E-06	4.58E-07	NO DATA	2.51E-10
I 135	4.43E-07	1.16E-06	4.28E-07	7.65E-05	1.86E-06	NO DATA	1.31E-06
CS 134	6.22E-05	1.48E-04	1.21E-04	NO DATA	4.79E-05	1.59E-05	2.59E-06
CS 136	6.51E-06	2.57E-05	1.85E-05	NO DATA	1.43E-05	1.96E-06	2.92E-06
CS 137	7.97E-05	1.09E-04	7.14E-05	NO DATA	3.70E-05	1.23E-05	2.11E-06
CS 138	5.52E-08	1.09E-07	5.40E-08	NO DATA	8.01E-08	7.91E-09	4.65E-13
BA 139	9.70E-08	6.91E-11	2.84E-09	NO DATA	6.46E-11	3.92E-11	1.72E-07

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INGESTION DOSE FACTORS FOR ADULTS
(MREM PER PCI INGESTED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	2.03E-05	2.55E-08	1.33E-06	NO DATA	8.67E-09	1.46E-08	4.18E-05
BA 141	4.71E-08	3.56E-11	1.59E-09	NO DATA	3.31E-11	2.02E-11	2.22E-17
BA 142	2.13E-08	2.19E-11	1.34E-09	NO DATA	1.85E-11	1.24E-11	3.00E-26
LA 140	2.50E-09	1.26E-09	3.33E-10	NO DATA	NO DATA	NO DATA	9.25E-05
LA 142	1.28E-10	5.82E-11	1.45E-11	NO DATA	NO DATA	NO DATA	4.25E-07
CE 141	9.36E-09	6.33E-09	7.18E-10	NO DATA	2.94E-09	NO DATA	2.42E-05
CE 143	1.65E-09	1.22E-06	1.35E-10	NO DATA	5.37E-10	NO DATA	4.56E-05
CE 144	4.88E-07	2.04E-07	2.62E-08	NO DATA	1.21E-07	NO DATA	1.65E-04
PR 143	9.20E-09	3.69E-09	4.56E-10	NO DATA	2.13E-09	NO DATA	4.03E-05
PR 144	3.01E-11	1.25E-11	1.53E-12	NO DATA	7.05E-12	NO DATA	4.33E-16
ND 147	6.29E-09	7.27E-09	4.35E-10	NO DATA	4.25E-09	NO DATA	3.49E-05
W 187	1.03E-07	8.61E-08	3.01E-08	NO DATA	NO DATA	NO DATA	2.82E-05
NP 239	1.19E-09	1.17E-10	6.45E-11	NO DATA	3.65E-10	NO DATA	2.40E-05

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INGESTION DOSE FACTORS FOR TEENAGER
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H 3	NO DATA	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07	1.06E-07
C 14	4.06E-06	6.12E-07	6.12E-07	6.12E-07	6.12E-07	6.12E-07	6.12E-07
NA 24	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06	2.30E-06
P 32	2.76E-04	1.71E-05	1.07E-05	NO DATA	NO DATA	NO DATA	2.32E-05
CR 51	NO DATA	NO DATA	3.60E-09	2.00E-09	7.89E-10	5.14E-09	6.05E-07
MN 54	NO DATA	5.90E-06	1.17E-06	NO DATA	1.76E-06	NO DATA	1.21E-05
MN 56	NO DATA	1.58E-07	2.81E-08	NO DATA	2.00E-07	NO DATA	1.04E-05
FE 55	3.78E-06	2.68E-06	6.25E-07	NO DATA	NO DATA	1.70E-06	1.16E-06
FE 59	5.67E-06	1.37E-05	5.29E-06	NO DATA	NO DATA	4.32E-06	3.24E-05
CO 58	NO DATA	9.72E-07	2.24E-06	NO DATA	NO DATA	NO DATA	1.34E-05
CO 60	NO DATA	2.81E-06	6.33E-06	NO DATA	NO DATA	NO DATA	3.66E-05
NI 63	1.77E-04	1.25E-05	6.00E-06	NO DATA	NO DATA	NO DATA	1.99E-06
NI 65	7.49E-07	9.57E-08	4.36E-08	NO DATA	NO DATA	NO DATA	5.19E-06
64	NO DATA	1.15E-07	5.41E-08	NO DATA	2.91E-07	NO DATA	8.92E-06
ZN 65	5.76E-06	2.00E-05	9.33E-06	NO DATA	1.28E-05	NO DATA	6.47E-06
ZN 69	1.47E-08	2.80E-08	1.96E-09	NO DATA	1.83E-08	NO DATA	5.16E-08
BR 83	NO DATA	NO DATA	5.74E-08	NO DATA	NO DATA	NO DATA	LT E-24
BR 84	NO DATA	NO DATA	7.22E-08	NO DATA	NO DATA	NO DATA	LT E-24
BR 85	NO DATA	NO DATA	3.05E-09	NO DATA	NO DATA	NO DATA	LT E-24
RE 86	NO DATA	2.98E-05	1.40E-05	NO DATA	NO DATA	NO DATA	4.41E-06
RE 88	NO DATA	8.52E-08	4.54E-08	NO DATA	NO DATA	NO DATA	7.30E-15
RB 89	NO DATA	5.50E-08	3.89E-08	NO DATA	NO DATA	NO DATA	8.43E-17
SR 89	4.40E-04	NO DATA	1.26E-05	NO DATA	NO DATA	NO DATA	5.24E-05
SR 90	8.30E-03	NO DATA	2.05E-03	NO DATA	NO DATA	NO DATA	2.33E-04
SR 91	8.07E-06	NO DATA	3.21E-07	NO DATA	NO DATA	NO DATA	3.66E-05
SR 92	3.05E-06	NO DATA	1.30E-07	NO DATA	NO DATA	NO DATA	7.77E-05
Y 90	1.37E-08	NO DATA	3.69E-10	NO DATA	NO DATA	NO DATA	1.13E-04
Y 91M	1.29E-10	NO DATA	4.93E-12	NO DATA	NO DATA	NO DATA	6.09E-09
Y 91	2.01E-07	NO DATA	5.39E-09	NO DATA	NO DATA	NO DATA	8.24E-05
Y 92	1.21E-09	NO DATA	3.50E-11	NO DATA	NO DATA	NO DATA	3.32E-05

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INGESTION DOSE FACTORS FOR TEENAGER
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	3.83E-09	NO DATA	1.05E-10	NO DATA	NO DATA	NO DATA	1.17E-04
ZR 95	4.12E-08	1.30E-08	8.94E-09	NO DATA	1.91E-08	NO DATA	3.00E-05
ZR 97	2.37E-09	4.69E-10	2.16E-10	NO DATA	7.11E-10	NO DATA	1.27E-04
MN 95	8.22E-09	4.56E-09	2.51E-09	NO DATA	4.42E-09	NO DATA	1.95E-05
MO 99	NO DATA	6.03E-06	1.15E-06	NO DATA	1.38E-05	NO DATA	1.08E-05
TC 99M	3.32E-10	9.26E-10	1.20E-08	NO DATA	1.38E-08	5.14E-10	6.08E-07
TC 101	3.60E-10	5.12E-10	5.03E-09	NO DATA	9.26E-09	3.12E-10	8.75E-17
RU 103	2.55E-07	NO DATA	1.09E-07	NO DATA	8.99E-07	NO DATA	2.13E-05
RU 105	2.18E-08	NO DATA	8.46E-09	NO DATA	2.75E-07	NO DATA	1.76E-05
RU 106	3.92E-06	NO DATA	4.94E-07	NO DATA	7.56E-06	NO DATA	1.88E-04
AG 110M	2.05E-07	1.94E-07	1.18E-07	NO DATA	3.70E-07	NO DATA	5.45E-05
TE 125M	3.83E-06	1.38E-06	5.12E-07	1.07E-06	NO DATA	NO DATA	1.13E-05
TE 127M	9.67E-06	3.43E-06	1.15E-06	2.30E-06	3.92E-05	NO DATA	2.41E-05
TE 127	1.58E-07	5.60E-08	3.40E-08	1.09E-07	6.40E-07	NO DATA	1.22E-05
TE 129M	1.63E-05	6.05E-06	2.58E-06	5.26E-06	6.82E-05	NO DATA	6.12E-05
TE 129	4.48E-08	1.67E-08	1.09E-08	3.20E-08	1.88E-07	NO DATA	2.45E-07
TE 131M	2.44E-06	1.17E-06	9.76E-07	1.76E-06	1.22E-05	NO DATA	9.39E-05
TE 131	2.79E-08	1.15E-08	8.72E-09	2.15E-08	1.22E-07	NO DATA	2.29E-09
TE 132	3.49E-06	2.21E-06	2.08E-06	2.33E-06	2.12E-05	NO DATA	7.00E-05
I 130	1.03E-06	2.98E-06	1.19E-06	2.43E-04	4.59E-06	NO DATA	2.29E-06
I 131	5.85E-06	8.19E-06	4.40E-06	2.39E-03	1.41E-05	NO DATA	1.62E-06
I 132	2.79E-07	7.30E-07	2.62E-07	2.46E-05	1.15E-06	NO DATA	3.18E-07
I 133	2.01E-06	3.41E-06	1.04E-06	4.76E-04	5.98E-06	NO DATA	2.58E-06
I 134	1.46E-07	3.87E-07	1.39E-07	6.45E-06	6.10E-07	NO DATA	5.10E-09
I 135	6.10E-07	1.57E-06	5.82E-07	1.01E-04	2.48E-06	NO DATA	1.74E-06
CS 134	8.37E-05	1.97E-04	9.14E-05	NO DATA	6.26E-05	2.39E-05	2.45E-06
CS 136	8.59E-06	3.38E-05	2.27E-05	NO DATA	1.84E-05	2.90E-06	2.72E-06
CS 137	1.12E-04	1.49E-04	5.19E-05	NO DATA	5.07E-05	1.97E-05	2.12E-06
CS 138	7.76E-08	1.49E-07	7.45E-08	NO DATA	1.10E-07	1.28E-08	6.76E-11
BA 139	1.39E-07	9.78E-11	4.05E-09	NO DATA	9.22E-11	6.74E-11	1.24E-06

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INGESTION DOSE FACTORS FOR TEENAGER
(MREM PER PCI INGESTED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	2.64E-05	3.48E-08	1.83E-06	NO DATA	1.18E-08	2.34E-08	4.38E-05
BA 141	6.71E-08	5.01E-11	2.24E-09	NO DATA	4.65E-11	3.43E-11	1.43E-13
BA 142	2.99E-08	2.99E-11	1.64E-09	NO DATA	2.53E-11	1.99E-11	9.18E-20
LA 140	3.48E-09	1.71E-09	4.55E-10	NO DATA	NO DATA	NO DATA	9.82E-05
LA 142	1.79E-10	7.95E-11	1.98E-11	NO DATA	NO DATA	NO DATA	2.42E-06
CE 141	1.33E-08	8.88E-09	1.02E-09	NO DATA	4.18E-09	NO DATA	2.54E-05
CE 143	2.35E-09	1.71E-06	1.91E-10	NO DATA	7.67E-10	NO DATA	5.14E-05
CE 144	6.96E-07	2.88E-07	3.74E-08	NO DATA	1.72E-07	NO DATA	1.75E-04
PR 143	1.31E-08	5.23E-09	6.52E-10	NO DATA	3.04E-09	NO DATA	4.31E-05
PR 144	4.30E-11	1.76E-11	2.18E-12	NO DATA	1.01E-11	NO DATA	4.74E-14
ND 147	9.38E-09	1.02E-08	6.11E-10	NO DATA	5.99E-09	NO DATA	3.68E-05
W 187	1.46E-07	1.19E-07	4.17E-08	NO DATA	NO DATA	NO DATA	3.22E-05
NP 239	1.76E-09	1.66E-10	9.22E-11	NO DATA	5.21E-10	NO DATA	2.67E-05

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INGESTION DOSE FACTORS FOR CHILD
(MREM PER PCI INGESTED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
H 3	NO DATA	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07	2.03E-07
C 14	1.21E-05	2.42E-06	2.42E-06	2.42E-06	2.42E-06	2.42E-06	2.42E-06
NA 24	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06	5.80E-06
P 32	8.25E-04	3.86E-05	3.18E-05	NO DATA	NO DATA	NO DATA	2.28E-05
CR 51	NO DATA	NO DATA	8.90E-09	4.94E-09	1.35E-09	9.02E-09	4.72E-07
MN 54	NO DATA	1.07E-05	2.85E-06	NO DATA	3.00E-06	NO DATA	8.98E-06
MN 56	NO DATA	3.34E-07	7.54E-08	NO DATA	4.04E-07	NO DATA	4.84E-05
FE 55	1.15E-05	6.10E-06	1.89E-06	NO DATA	NO DATA	3.45E-06	1.13E-06
FE 59	1.65E-05	2.67E-05	1.33E-05	NO DATA	NO DATA	7.74E-06	2.78E-05
CC 58	NO DATA	1.80E-06	5.51E-06	NO DATA	NO DATA	NO DATA	1.05E-05
CO 60	NO DATA	5.29E-06	1.56E-05	NO DATA	NO DATA	NO DATA	2.93E-05
NI 63	5.38E-04	2.88E-05	1.83E-05	NO DATA	NO DATA	NO DATA	1.94E-06
NI 65	2.22E-06	2.09E-07	1.22E-07	NO DATA	NO DATA	NO DATA	2.56E-05
64	NO DATA	2.45E-07	1.48E-07	NO DATA	5.92E-07	NO DATA	1.15E-05
ZN 65	1.37E-05	3.85E-05	2.27E-05	NO DATA	2.30E-05	NO DATA	6.41E-06
ZN 69	4.38E-08	6.33E-08	5.85E-09	NO DATA	3.84E-08	NO DATA	3.99E-06
BR 83	NO DATA	NO DATA	1.71E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR 84	NO DATA	NO DATA	1.98E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR 85	NO DATA	NO DATA	9.12E-09	NO DATA	NO DATA	NO DATA	LT E-24
RB 86	NO DATA	6.70E-05	4.12E-05	NO DATA	NO DATA	NO DATA	4.31E-06
RB 88	NO DATA	1.90E-07	1.32E-07	NO DATA	NO DATA	NO DATA	9.32E-09
RB 89	NO DATA	1.17E-07	1.04E-07	NO DATA	NO DATA	NO DATA	1.02E-09
SR 89	1.32E-03	NO DATA	3.77E-05	NO DATA	NO DATA	NO DATA	5.11E-05
SR 90	1.70E-02	NO DATA	4.31E-03	NO DATA	NO DATA	NO DATA	2.29E-04
SR 91	2.40E-05	NO DATA	9.06E-07	NO DATA	NO DATA	NO DATA	5.30E-05
SR 92	9.03E-06	NO DATA	3.62E-07	NO DATA	NO DATA	NO DATA	1.71E-04
Y 90	4.11E-08	NO DATA	1.10E-09	NO DATA	NO DATA	NO DATA	1.17E-04
Y 91M	3.82E-10	NO DATA	1.30E-11	NO DATA	NO DATA	NO DATA	7.48E-07
Y 91	6.02E-07	NO DATA	1.61E-08	NO DATA	NO DATA	NO DATA	8.02E-05
Y 92	3.60E-09	NO DATA	1.03E-10	NO DATA	NO DATA	NO DATA	1.04E-04

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INGESTION DOSE FACTORS FOR CHILD
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	1.14E-08	NO DATA	3.13E-10	NO DATA	NO DATA	NO DATA	1.70E-04
ZR 95	1.16E-07	2.55E-08	2.27E-08	NO DATA	3.65E-08	NO DATA	2.66E-05
ZR 97	6.99E-09	1.01E-09	5.96E-10	NO DATA	1.45E-09	NO DATA	1.53E-04
NB 95	2.25E-08	8.76E-09	6.26E-09	NO DATA	8.23E-09	NO DATA	1.62E-05
MO 99	NO DATA	1.33E-05	3.29E-06	NO DATA	2.84E-05	NO DATA	1.10E-05
TO 99M	9.23E-10	1.81E-09	3.00E-08	NO DATA	2.63E-05	9.19E-10	1.03E-06
TO 101	1.07E-09	1.12E-09	1.42E-08	NO DATA	1.91E-08	5.92E-10	3.56E-09
RU 103	7.31E-07	NO DATA	2.81E-07	NO DATA	1.84E-06	NO DATA	1.89E-05
RU 105	6.45E-08	NO DATA	2.34E-08	NO DATA	5.67E-07	NO DATA	4.21E-05
RU 106	1.17E-05	NO DATA	1.46E-06	NO DATA	1.58E-05	NO DATA	1.82E-04
AG 110M	5.39E-07	3.64E-07	2.91E-07	NO DATA	6.78E-07	NO DATA	4.33E-05
TE 125M	1.14E-05	3.09E-06	1.52E-07	3.20E-06	NO DATA	NO DATA	1.10E-05
TE 127M	2.89E-05	7.78E-06	3.43E-06	6.91E-06	8.24E-05	NO DATA	2.34E-05
TE 127	4.71E-07	1.27E-07	1.01E-07	3.26E-07	1.34E-06	NO DATA	1.84E-05
TE 129M	4.87E-05	1.36E-05	7.56E-06	1.57E-05	1.43E-04	NO DATA	5.94E-05
TE 129	1.34E-07	3.74E-08	3.18E-08	9.56E-08	3.92E-07	NO DATA	8.34E-06
TE 131M	7.20E-07	2.49E-06	2.65E-06	5.12E-06	2.41E-05	NO DATA	1.01E-04
TE 131	8.30E-08	2.53E-08	2.47E-08	6.35E-08	2.51E-07	NO DATA	4.36E-07
TE 132	1.01E-05	4.47E-06	5.40E-06	6.51E-06	4.15E-05	NO DATA	4.50E-05
I 130	2.92E-06	5.90E-06	3.04E-07	6.50E-04	8.82E-07	NO DATA	2.76E-06
I 131	1.72E-05	1.73E-05	9.83E-06	5.72E-03	2.84E-05	NO DATA	1.54E-06
I 132	8.00E-07	1.47E-06	6.76E-07	6.82E-05	2.25E-06	NO DATA	1.73E-06
I 133	5.92E-06	7.32E-06	2.77E-06	1.36E-03	1.22E-05	NO DATA	2.95E-06
I 134	4.19E-07	7.78E-07	7.58E-07	1.79E-05	1.19E-06	NO DATA	5.16E-07
I 135	1.75E-06	3.15E-06	1.49E-06	2.79E-04	4.83E-06	NO DATA	2.40E-06
CS 134	2.34E-04	3.84E-04	8.10E-05	NO DATA	1.19E-04	4.27E-05	2.07E-06
CS 136	2.35E-05	6.46E-05	4.18E-05	NO DATA	3.44E-05	5.13E-06	2.27E-06
CS 137	3.27E-04	3.13E-04	4.62E-05	NO DATA	1.02E-04	3.67E-05	1.96E-06
CS 138	2.28E-07	3.17E-07	2.01E-07	NO DATA	2.23E-07	2.40E-08	1.46E-07
BA 139	4.14E-07	2.21E-10	1.20E-08	NO DATA	1.93E-10	1.30E-10	2.39E-05

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INGESTION DOSE FACTORS FOR CHILD
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
BA 140	6.31E-05	7.26E-06	4.65E-06	NO DATA	2.37E-08	4.34E-08	4.21E-05
BA 141	2.00E-07	1.12E-10	6.51E-09	NO DATA	9.69E-11	6.58E-10	1.14E-07
BA 142	6.74E-06	6.29E-11	4.68E-09	NO DATA	5.09E-11	3.70E-11	1.14E-09
LA 140	1.01E-06	3.53E-09	1.19E-09	NO DATA	NO DATA	NO DATA	9.64E-05
LA 142	5.24E-10	1.67E-10	5.23E-11	NO DATA	NO DATA	NO DATA	3.31E-05
CE 141	3.97E-06	1.98E-06	2.94E-09	NO DATA	6.68E-09	NO DATA	2.47E-05
CE 143	6.99E-09	3.79E-06	5.49E-10	NO DATA	1.59E-09	NO DATA	5.55E-05
CE 144	2.08E-06	6.52E-07	1.11E-07	NO DATA	3.61E-07	NO DATA	1.70E-04
PR 143	3.93E-06	1.18E-06	1.95E-09	NO DATA	6.39E-09	NO DATA	4.24E-05
PR 144	1.29E-10	3.99E-11	6.49E-12	NO DATA	2.11E-11	NO DATA	6.59E-06
ND 147	2.79E-06	2.26E-06	1.75E-09	NO DATA	1.24E-06	NO DATA	3.56E-05
W 187	4.29E-07	2.54E-07	1.14E-07	NO DATA	NO DATA	NO DATA	3.57E-05
NP 239	5.25E-09	3.77E-10	2.65E-10	NO DATA	1.09E-09	NO DATA	2.79E-05

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INGESTION DOSE FACTORS FOR INFANT
(MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
H 3	NO DATA	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07	3.08E-07
C 14	2.37E-05	5.06E-06	5.06E-06	5.06E-06	5.06E-06	5.06E-06	5.06E-06
NA 24	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05	1.01E-05
P 32	1.70E-03	1.00E-04	6.59E-05	NO DATA	NO DATA	NO DATA	2.30E-05
CR 51	NO DATA	NO DATA	1.41E-08	9.20E-09	2.01E-09	1.79E-08	4.11E-07
MN 54	NO DATA	1.99E-05	4.51E-06	NO DATA	4.41E-06	NO DATA	7.31E-06
MN 56	NO DATA	8.18E-07	1.41E-07	NO DATA	7.03E-07	NO DATA	7.43E-05
FE 55	1.39E-05	8.98E-06	2.40E-06	NO DATA	NO DATA	4.39E-06	1.14E-06
FE 59	3.08E-05	5.38E-05	2.12E-05	NO DATA	NO DATA	1.59E-05	2.57E-05
CO 58	NO DATA	3.60E-06	8.98E-06	NO DATA	NO DATA	NO DATA	8.97E-06
CO 60	NO DATA	1.08E-05	2.55E-05	NO DATA	NO DATA	NO DATA	2.57E-05
NI 63	6.34E-04	3.92E-05	2.20E-05	NO DATA	NO DATA	NO DATA	1.95E-06
NT 65	4.70E-06	5.32E-07	2.42E-07	NO DATA	NO DATA	NO DATA	4.05E-05
U 64	NO DATA	6.09E-07	2.82E-07	NO DATA	1.03E-06	NO DATA	1.25E-05
ZN 65	1.84E-05	6.31E-05	2.91E-05	NO DATA	3.06E-05	NO DATA	5.33E-05
ZN 69	9.33E-08	1.68E-07	1.25E-08	NO DATA	6.98E-08	NO DATA	1.37E-05
BR 83	NO DATA	NO DATA	3.63E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR 84	NO DATA	NO DATA	3.82E-07	NO DATA	NO DATA	NO DATA	LT E-24
BR 85	NO DATA	NO DATA	1.94E-08	NO DATA	NO DATA	NO DATA	LT E-24
RE 86	NO DATA	1.70E-04	8.40E-05	NO DATA	NO DATA	NO DATA	4.35E-06
RE 88	NO DATA	4.98E-07	2.73E-07	NO DATA	NO DATA	NO DATA	4.85E-07
RE 89	NO DATA	2.86E-07	1.97E-07	NO DATA	NO DATA	NO DATA	9.74E-06
SR 89	2.51E-03	NO DATA	7.20E-05	NO DATA	NO DATA	NO DATA	5.16E-05
SR 90	1.85E-02	NO DATA	4.71E-03	NO DATA	NO DATA	NO DATA	2.31E-04
SR 91	5.00E-05	NO DATA	1.81E-06	NO DATA	NO DATA	NO DATA	5.92E-05
SR 92	1.92E-05	NO DATA	7.13E-07	NO DATA	NO DATA	NO DATA	2.07E-04
Y 90	8.69E-08	NO DATA	2.33E-09	NO DATA	NO DATA	NO DATA	1.20E-04
Y 91M	8.10E-10	NO DATA	2.76E-11	NO DATA	NO DATA	NO DATA	2.70E-06
Y 91	1.13E-06	NO DATA	3.01E-08	NO DATA	NO DATA	NO DATA	8.10E-05
Y 92	7.65E-09	NO DATA	2.15E-10	NO DATA	NO DATA	NO DATA	1.46E-04

C-1h, (continued)

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 INGESTION DOSE FACTORS FOR INFANT
 (MREM PER PCI INGESTED)

NUCLIDE	BONE	LIVER	T. BODY	THYROID	KIDNEY	LUNG	GI-LLI
Y 93	2.43E-08	NO DATA	6.62E-10	NO DATA	NO DATA	NO DATA	1.92E-04
ZR 95	2.06E-07	5.02E-08	3.56E-08	NO DATA	5.41E-08	NO DATA	2.50E-05
ZR 97	1.48E-08	2.54E-09	1.16E-09	NO DATA	2.56E-09	NO DATA	1.62E-04
NB 95	4.20E-08	1.73E-08	1.00E-08	NO DATA	1.24E-08	NO DATA	1.46E-05
MO 99	NO DATA	3.40E-05	6.63E-06	NO DATA	5.08E-05	NO DATA	1.12E-05
TC 99M	1.92E-09	3.96E-09	5.10E-08	NO DATA	4.26E-08	2.07E-09	1.15E-06
IC 101	2.27E-09	2.86E-09	2.83E-08	NO DATA	3.40E-08	1.56E-09	4.86E-07
RU 103	1.48E-06	NO DATA	4.95E-07	NO DATA	3.08E-06	NO DATA	1.80E-05
RU 105	1.36E-07	NO DATA	4.58E-08	NO DATA	1.00E-06	NO DATA	5.41E-05
RU 106	2.41E-05	NO DATA	3.01E-06	NO DATA	2.85E-05	NO DATA	1.83E-04
AG 110M	9.96E-07	7.27E-07	4.81E-07	NO DATA	1.04E-06	NO DATA	3.77E-05
TE 125M	2.33E-05	7.79E-06	3.15E-06	7.84E-06	NO DATA	NO DATA	1.11E-05
TE 127M	5.85E-05	1.94E-05	7.08E-06	1.69E-05	1.44E-04	NO DATA	2.36E-05
TE 127	1.00E-06	3.35E-07	2.15E-07	8.14E-07	2.44E-06	NO DATA	2.10E-05
TE 129M	1.00E-04	3.43E-05	1.54E-05	3.84E-05	2.50E-04	NO DATA	5.97E-05
TE 129	2.84E-07	9.79E-08	6.63E-08	2.38E-07	7.07E-07	NO DATA	2.27E-05
TE 131M	1.52E-05	6.12E-06	5.05E-06	1.24E-05	4.21E-05	NO DATA	1.03E-04
TE 131	1.76E-07	6.50E-08	4.94E-08	1.57E-07	4.50E-07	NO DATA	7.11E-06
TE 132	2.08E-05	1.03E-05	9.61E-06	1.52E-05	6.44E-05	NO DATA	3.81E-05
I 130	6.00E-06	1.32E-05	5.30E-06	1.48E-03	1.45E-05	NO DATA	2.83E-06
I 131	3.59E-05	4.23E-05	1.86E-05	1.39E-05	4.94E-05	NO DATA	1.51E-06
I 132	1.66E-06	3.37E-06	1.20E-06	1.58E-04	3.76E-06	NO DATA	2.73E-06
I 133	1.25E-05	1.82E-05	5.33E-06	3.31E-03	2.14E-05	NO DATA	3.08E-06
I 134	8.69E-07	1.78E-06	6.33E-07	4.15E-05	1.99E-06	NO DATA	1.84E-06
I 135	3.64E-06	7.24E-06	2.64E-06	6.49E-04	8.07E-06	NO DATA	2.62E-06
CS 134	3.77E-04	7.03E-04	7.10E-05	NO DATA	1.81E-04	7.42E-05	1.91E-06
CS 136	4.59E-05	1.35E-04	5.04E-05	NO DATA	5.38E-05	1.10E-05	2.05E-06
CS 137	5.22E-04	6.11E-04	4.33E-05	NO DATA	1.64E-04	6.64E-05	1.91E-06
CS 138	4.81E-07	7.82E-07	3.79E-07	NO DATA	3.90E-07	6.09E-08	1.25E-06
BA 139	6.81E-07	5.84E-10	2.55E-08	NO DATA	3.51E-10	3.54E-10	5.56E-05

C-1h, (continued)

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INGESTION DOSE FACTORS FOR INFANT
(MREM PER PCI INGESTED)

<u>NUCLIDE</u>	<u>BONE</u>	<u>LIVER</u>	<u>T. BODY</u>	<u>THYROID</u>	<u>KIDNEY</u>	<u>LUNG</u>	<u>GI-LLI</u>
BA 140	1.71E-04	1.71E-07	8.81E-06	NO DATA	4.06E-08	1.05E-07	4.20E-05
BA 141	4.25E-07	2.91E-10	1.34E-08	NO DATA	1.75E-10	1.77E-10	5.19E-06
BA 142	1.84E-07	1.53E-10	9.06E-09	NO DATA	8.81E-11	9.26E-11	7.59E-07
LA 140	2.11E-08	8.32E-09	2.14E-09	NO DATA	NO DATA	NO DATA	9.77E-05
LA 142	1.10E-09	4.04E-10	9.67E-11	NO DATA	NO DATA	NO DATA	6.86E-05
CE 141	7.87E-08	4.80E-08	5.65E-09	NO DATA	1.48E-08	NO DATA	2.48E-05
CE 143	1.48E-08	9.82E-06	1.12E-09	NO DATA	2.86E-09	NO DATA	5.73E-05
CE 144	2.98E-06	1.22E-06	1.67E-07	NO DATA	4.93E-07	NO DATA	1.71E-04
PR 143	8.13E-08	3.04E-08	4.03E-09	NO DATA	1.13E-08	NO DATA	4.29E-05
PR 144	2.74E-10	1.06E-10	1.38E-11	NO DATA	3.84E-11	NO DATA	4.93E-06
ND 147	5.53E-08	5.68E-08	3.48E-09	NO DATA	2.19E-08	NO DATA	3.60E-05
W 187	9.03E-07	6.28E-07	2.17E-07	NO DATA	NO DATA	NO DATA	3.69E-05
NP 239	1.11E-08	9.93E-10	5.61E-10	NO DATA	1.98E-09	NO DATA	2.87E-05

Appendix D
Bioaccumulation Factors

D-1

BIOACCUMULATION FACTORS TO BE USED IN THE ABSENCE OF SITE-SPECIFIC DATA
(pCi/kg per pCi/liter)*

ELEMENT	FRESHWATER		SALTWATER	
	FISH	INVERTEBRATE	FISH	INVERTEBRATE
H	9.0E-01	9.0E-01	9.0E-01	9.3E-01
C	4.6E+03	9.1E+03	1.8E+03	1.4E+03
NI	1.0E+02	2.0E+02	6.7E+02	1.9E+01
F	1.0E+05	2.0E+04	2.9E+04	3.0E+04
CR	2.0E+02	2.0E+03	4.0E+02	2.0E+03
MN	4.0E+02	9.0E+04	5.5E+02	4.0E+02
FE	1.0E+02	3.2E+03	3.0E+03	2.0E+04
CO	5.0E+01	2.0E+02	1.0E+02	1.0E+03
NI	1.0E+02	1.0E+02	1.0E+02	2.5E+02
CU	5.0E+01	4.0E+02	6.7E+02	1.7E+03
ZN	2.0E+03	1.0E+04	2.0E+03	5.0E+04
BR	4.2E+02	3.3E+02	1.5E+02	3.1E+00
RE	2.0E+03	1.0E+03	8.3E+00	1.7E+01
SR	3.0E+01	1.0E+02	2.0E+00	2.0E+01
Y	2.5E+01	1.0E+03	2.5E+01	1.0E+03
ZR	3.3E+00	6.7E+00	2.0E+02	8.0E+01
NE	3.0E+04	1.0E+02	3.0E+04	1.0E+02
MO	1.0E+01	1.0E+01	1.0E+01	1.0E+01
TC	1.5E+01	5.0E+00	1.0E+01	5.0E+01
RU	1.0E+01	3.0E+02	3.0E+00	1.0E+03
RH	1.0E+01	3.0E+02	1.0E+01	2.0E+03
TE**	4.0E+02	6.1E+03	1.0E+01	1.0E+02
I	1.5E+01	5.0E+00	1.0E+01	5.0E+01
CS	2.0E+03	1.0E+03***	4.0E+01	2.5E+01
BA	4.0E+00	2.0E+02	1.0E+01	1.0E+02
LA	2.5E+01	1.0E+03	2.5E+01	1.0E+03
CE	1.0E+00	1.0E+03	1.0E+01	6.0E+02
PR	2.5E+01	1.0E+03	2.5E+01	1.0E+03
ND	2.5E+01	1.0E+03	2.5E+01	1.0E+03
W	1.2E+03	1.0E+01	3.0E+01	3.0E+01
NP	1.0E+01	4.0E+02	1.0E+01	1.0E+01

*Values in Table A-1 are taken from Reference 6 unless otherwise indicated.

**Data taken from Reference 8.

***Data taken from Reference 7.

5.0 LIQUID WASTE TREATMENT SYSTEM

5.1 Operability

The Liquid Waste Treatment System as described in Section 11 of the Final Safety Analysis Report is considered to be operable when one of each of the following pieces of equipment is available to perform its intended function:

- a) Miscellaneous Waste Evaporator (WDL-21B) or Reactor Coolant Evaporator (WDL-Z1A)
- b) Waste Evaporator Condensate Demineralizer (WDL-K3 A or B)
- c) Waste Evaporator Condensate Storage Tank (WDL-T 11 A or B)
- d) Evaporator Condensate Pumps (WDL-P 14 A or B)

5.2 Representative Sampling Prior to Discharge

All liquid releases from the Liquid Waste Treatment System are made through the Waste Evaporator Condensate Storage Tanks. To provide thorough mixing and a representative sample, the contents of the tank are recirculated using one of the Waste Evaporator Condensate Transfer Pumps.

6.0 GASEOUS WASTE TREATMENT SYSTEM

6.1 Operability

Operability of the Gaseous Waste Treatment System is defined as the ability to remove gas from the vent header/tank gas spaces and store it under a higher pressure in the Waste Gas Decay Tanks for subsequent release.

7.0 SOLID WASTE MANAGEMENT SYSTEM - PROCESS CONTROL PROGRAM

(The Process Control Program is available as a separate document, see LIL 133, dated June 24, 1981.)

8.0 ENVIRONMENTAL MONITORING INFORMATION

The Radiological Environmental Monitoring Program shall be conducted as outlined in Section 3.23, Table 3.23.1 of Amendment 72 to the TMINS Unit 1 Technical Specifications. Sampling locations will be as indicated in Tables A-1, A-3 and Map A-1, A-2, A-3.

TABLE A-1

TMINS REMP STATION LOCATIONS

AIR PARTICULATE & AIR IODINE

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-AP/AI- 1S2	A1-1	0.4 mi.	0°
5A1	E1-2	0.4	90
12B1	M2-1	1.3	255
1C1	A3-1	2.6	355
8C1	H3-1	2.3	159
7F1	G10-1	9.8	127
9G1	J15-1	12.6	180
15G1	Q15-1	13.5	305

SOIL

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-E- 1C1	A3-3	2.5 mi	354°
1F1	A9-1	9.2	0
1F2	A9-2	9.3	357
4B1	D2-2	1.1	65
5A1	E1-2	0.4	90
5B1	E2-1	1.1	80
7B2	G2-2	1.3	133
7B3	G2-3	1.6	130
7C1	G3-1	2.5	131
7F1	G10-1	9.8	127
15G1	Q15-1	13.5	305

TABLE A-1 (Cont'd)

SURFACE WATER

<u>Station Code</u>	<u>NUREG Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-SW-13S2A	N1-2A	0.1 mi.	270°
13S2B	N1-2B	0.1	270
9A2	J1-2	0.5	188
9B1	J2-1	1.5	182
1C3	A3-2	2.5	352
8C2	H3-2	2.9	165
8E2	H5-2	4.2	156
15F1	Q9-1	8.5	308
7G1	G15-1	14.4	124
7G2	G15-2	13.6	128
7G3	G15-3	14.8	124
9G2	J15-2	14.7	178
6G3	F15-1	12.6	122

EFFLUENT WATER

<u>Station Code</u>	<u>NUREG Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-EW-10S1	K1-1	0.2 mi.	200°

CRYOGENIC AIR

<u>Station Code</u>	<u>NUREG Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-CR-1C1	A3-1	2.6 mi.	355°
5A1	E1-2	0.4	90
8C1	H3-1	2.3	159
12B1	M2-1	1.3	253

TABLE A-1 (Cont'd)

GREEN LEAFY VEGETABLES

<u>Station Code</u>	<u>NUREG Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-FPL- 4B1	D2-1	1.1 mi.	65°
Q 7B3	G2-1	1.6	130
Q 1F2	A9-2	9.3	357
14C1	P3-1	2.6	293
1G1	A15-1	10.5	10
5A3	E1-3	0.7	90
5B1	E2-1	1.1	80
8A1	H1-2	0.9	150

MILK

<u>Station Code</u>	<u>NUREG Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-MG- 1B1	A2-1	1.2 mi.	5°
TM-MG- 4G2	D15-2	17.0	68
TM-M- 4B1	D2-1	1.1	65
7B3	G2-1	1.6	130
14F2	P7-1	6.7	293
1G1	A15-1	10.5	10
14D1	P4-1	3.6	295
	E2-2	1.1	93

TABLE A-1 (Cont'd)

PRECIPITATION

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-RW- 5A1	E1-2	0.4 mi.	90°
8C1	H3-1	2.3	159
7F1	G10-1	9.8	127
15G1	Q15-1	13.5	305
1C1	A3-1	2.6	355

AQUATIC SEDIMENT

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-AQS- 1A2	A1-3	0.7 mi.	0°
7A1	G1-1	0.3	137
10A1	K1-3	0.8	202
9B1	J2-1	1.5	182
10B2	K2-2	1.1	200
11A1	L1-2	0.5	225

AQUATIC PLANTS

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-AQP- 1A1	A1-2	0.7 mi.	1°
9A2	J1-2	0.5	188
9B1	J2-1	1.5	182

TABLE A-1 (Cont'd)

FISH

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-AQF- 9B1	J2-1	1.5 mi.	182°
16B1	R2-1	1.1	337

FRUITS

<u>Station Code</u>	NUREG <u>Station Code</u>	<u>Distance</u>	<u>Azimuth</u>
TM-FPF- 5F2	E6-1	5.9 mi.	100°
12G2	M15-2	13.6	239

TABLE A-2

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLE LOCATIONS

Sample Medium	Station Code	NUREG Station Code	Map Number	Distance	Azimuth	Description
AP, AI, ID	152	A1-1	1	0.4 mi	0°	N of site, North Weather Station
ID	252	B1-1	2	0.7	28	NNE of site on light pole in middle of North Bridge
ID	452	D1-1	3	0.3	71	ENE of site on top of dike, east fence
ID	552	E1-1	4	0.2	95	E of site on top of dike, east fence
ID	851	H1-1	5	0.4	167	SSE of site
ID	952	J1-1	6	0.8	184	S of site at south beach of THI
EW	1051	K1-1	7	0.2	235	On site, RML-7 station discharge
ID	1052	K1-2	8	0.4	200	SSW of site
ID	1151	L1-1	9	0.1	221	SW of site, west of mechanical draft towers on dike
ID	1351	N1-1	10	0.4	270	W of site on Shelley Island
SW	1352A&B	H1-2A&B	11	0.1	270	On site, station intakes (Units 1 & 2)
ID	1452	P1-1	12	0.4	293	WNW of site on Shelley Island
ID	1551	Q1-1	13	0.5	317	NW of site on Shelley Island
ID	1651	R1-1	14	0.2	340	NNW of site at gate in fence on W side of THI, north boat dock
AQP, AQS	1A1	A1-2	15	0.7	1	N of site
AQS	1A2	A1-3	16	0.7	0	N of site at north tip of THI
ID	3A1	C1-1	17	0.6	35	NE of site on Route 441
ID	4A1	D1-2	18	0.5	65	ENE of site on Laurel Road
AP, AI, BW, ID, CV, CR, E	5A1	E1-2	19	0.4	90	E of site on N side of Observation Center
ID	6A1	F1-1	20	0.5	117	ESE of site on light pole on Route 441
AQS	7A1	G1-1	21	0.3	137	SE of site
ID	7A3	G1-2	22	0.6	143	SE of site on Route 441
SW, AQP	9A2	J1-2	23	0.5	188	S of site below discharge pipe
AQS	10A1	K1-3	24	0.8	202	SSW of site
AQS	11A1	L1-2	25	0.5	225	SW of site
ID	11A2	L1-3	26	0.5	221	SW of site on Beech Island
ID	16A1	R1-2	27	0.4	332	NNW of site on Kohr Island
HC, PPL	1B1	A2-1	28	1.2	5	N of site, farm along Route 441
H, PPL, E	4B1	D2-1	29	1.1	45	ENE of site, farm on Gingrich Road
H, PPL, E	7B3	C2-1	30	1.6	130	SE of site, farm on the E side of Conevago Creek
SW, AQP, AQS, AQP	9B1	J2-1	31	1.5	182	S of site above York Haven Dam
ID	10B1	K2-1	32	1.1	200	SSW of site on S beach of Shelley Island
ID	11B1	L2-1	33	1.9	227	SW of site on Route 262
AP, AI, ID, CR	12B1	H2-1	34	1.3	253	WSW of site adjacent to Fishing Creek, Goldboro Air Station
ID, CV	13B1	N2-1	35	1.2	261	W of site at Goldboro Marina
ID	14B1	P2-1	36	1.4	290	WNW of site off of Old Goldboro Pike
ID	15B1	Q2-1	37	1.8	304	NW of site on access road along river

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLE LOCATIONS (Cont'd)

Sample Medium	Station Code	NUREG Station Code	Map Number	Distance	Azimuth	Description
AQF	16B1	R2-1	38	1.1 mi	337 ^o	NNW of site below Fall Island
AP, AI, ID, RW, CR	1C1	A3-1	39	2.6	355	N of site at Middletown Substation
SW	1C3	A3-2	40	2.5	347	N of site at Swatara Creek
AP, AI, RW, ID, CR	8C1	H3-1	41	2.3	159	SSE of site at Falmouth-Collins Substation
SW	8C2	H3-2	42	2.3	165	SSE of site, York Haven Hydro
Y, YPL	14D1	P4-1	43	3.7	203	W of site at Fisher's farm on Valley Road
ID	1E4	A5-1	44	4.3	3	N of site on Vine Street exit from Route 283
ID	2E1	B5-1	45	4.8	18	NNE of site, School House Lane and Miller Road
ID	3E3	C5-1	46	4.5	42	NE of site on Kennedy Lane
ID	4E5	D3-1	47	4.9	63	ENE of site on Beagle Road
ID	5E1	E5-1	48	4.6	81	E of site, North Market Street and Zaeger Road
ID	6E6	F5-1	49	4.6	107	ESE of site on Amosite Road
ID	7E6	G5-1	50	4.8	131	SE of site, Bainbridge and Risser Roads
SW	8E2	H5-2	51	4.1	160	SSE of site on Brunner Island
ID	8E1	H5-1	52	4.1	157	SSE of site at Guard Shack on Brunner Island
ID	9E1	J5-1	53	4.9	182	S of site on Canal Road, Concwago Heights
ID	10E3	K5-1	54	5.0	200	SSW of site on Concwago Creek Road, Strinestown
ID	11E3	L5-1	55	4.1	228	SW of site, Stevens and Wilson Roads
ID	12E4	M5-1	56	4.3	249	WSW of site, Lewisberry and Roxberry Roads, Newberrytown
ID	13E1	N5-1	57	4.9	268	W of site, Yocumtown and Old Trail Roads
ID	14E4	P5-1	58	4.9	281	WNW of site, Route 262 and Beinhover Road
ID	15E1	Q5-1	59	5.0	313	NW of site on Lumber Street, Highpire
ID	16E1	R5-1	60	4.9	339	NNW of site, Spring Garden Drive and Route 441
ID	2F1	B10-1	61	9.3	18	NNE of site, West Archs Avenue and Hill Street, Hershey
ID	3F1	C8-1	62	7.2	48	NE of site, Shenko Church on School House Road
ID	4F1	D9-1	63	8.5	72	ENE of site on Mt. Gretna Road, Bellaire
ID	5F1	E7-1	64	6.8	85	E of site on Hummelstown Street, Elizabethtown
FF	5F2	E6-1	65	5.9	100	E of site, orchard at Masonic Homes
ID	6F1	F10-1	66	9.4	112	ESE of site, Donegal Springs Road, Donegal Springs
AP, AI, RW, ID, E	7F1	G10-1	67	9.8	127	SE of site at farm off Engle's Tollgate Road
ID	8F1	H8-1	68	7.4	163	SSE of site on Saginaw Road, Starview
ID	9F1	J7-1	69	6.5	177	S of site on Maple Street, Manchester
ID	10F1	K8-1	70	7.4	196	SSW of site, Coppenhaffer Road and Route 295, Zion's View
ID	11F1	L8-1	71	8.0	225	SW of site on Andersontown Road, Andersontown

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLE LOCATIONS (Cont'd)

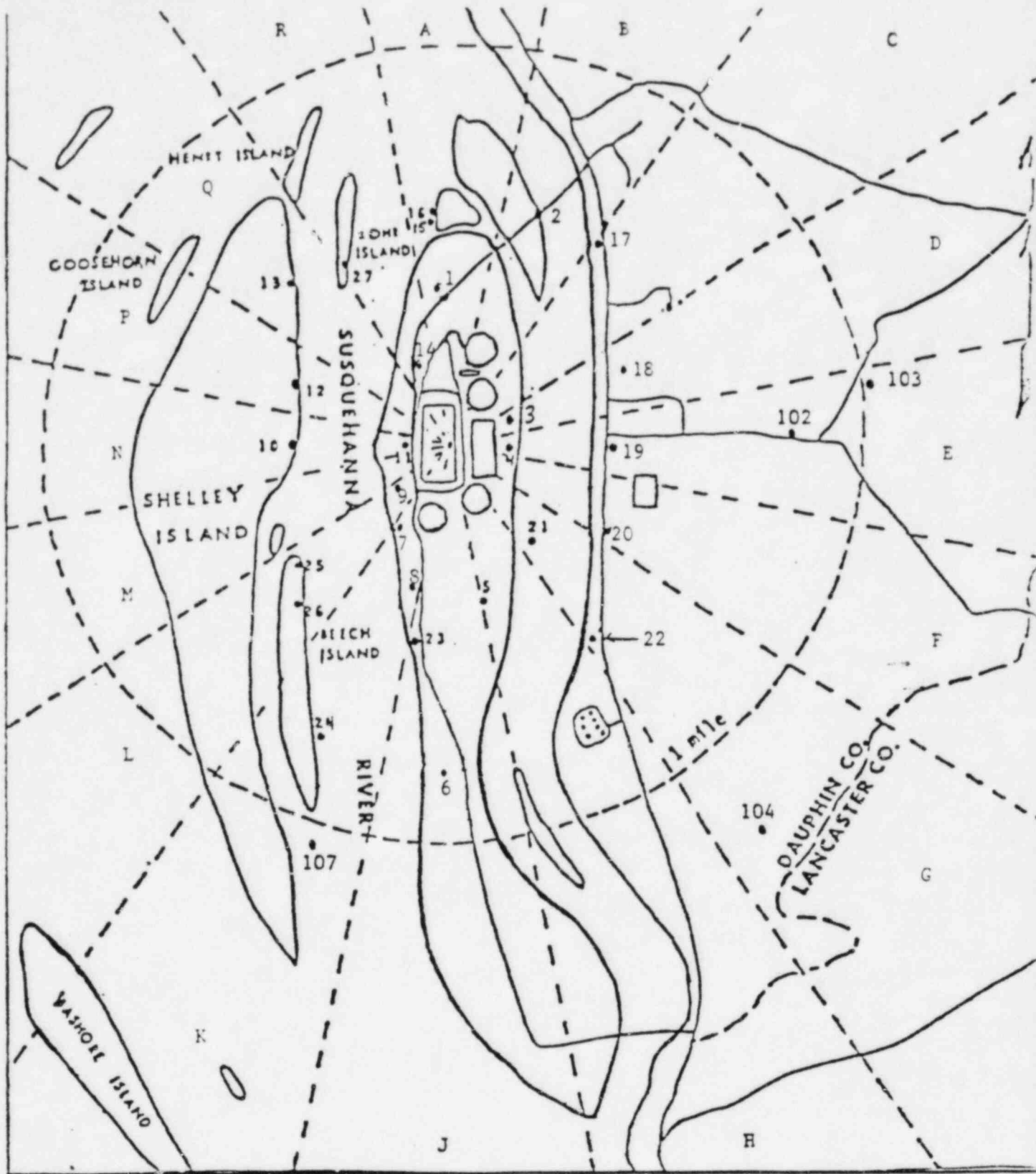
Sample Medium	Station Code	NUREG Station Code	Map Number	Distance	Azimuth	Description
ID	12F1	H9-1	72	8.6 mi.	242°	WSW of site on Alpine Road, Maytown
ID	13F1	H8-1	73	7.8	260	W of site on Route 382, 1/2 mile north of Lewisberry
ID	14F1	F8-1	74	8.0	292	WNW of site on Evergreen Road, Reaser's Summit
H, FPL	14F2	F7-1	75	6.7	296	WNW of site on Old York Road, New Cumberland
SW, ID	15F1	Q9-1	76	8.5	308	RII of site across from parking lot of Steelton Water Company
ID	16F1	K9-1	77	8.1	340	NNW of site on Derry Street, Rutherford Heights
H, FPL	1G1	A15-1	78	10.5	10	PNE of site, farm on Route 39, Hummelstown
ID	3G1	C20-1	79	19.6	47	NE of site on Cumberland Street, Lebanon
ID	4G1	D15-1	80	10.7	63	EHE of site, Route 241, Lawn, PA
HG, FPL	4G2	D15-2	81	10.0	68	ENE of site, Route 241, 200 meters South of PA Turnpike, Davidhizer Farm
ID	6G1	F25-1	82	21.1	113	ESE of site, Steel Way and Loop Roads, Lancaster
SW	6G3	F15-1	83	12.6	122	ESE of site, Chickies Creek
SW, ID	7G1	G15-1	84	14.4	124	SE of site at Columbia Water Treatment Plant
SW	7G2	G15-2	85	13.6	128	SE of site, Wrightsville Water Treatment Plant
SW	7G3	G15-3	86	14.8	124	SE of site, Lancaster Water Treatment Plant
ID	8G1	H15-1	87	13.2	157	SSE of site, Orchard and Stonewood Roads, Wilshire Hills
AP, AI, ID	9G1	J15-1	88	12.6	180	S of site in Met-Ed York Load Dispatch Station
SW	9G2	J15-2	89	14.7	178	S of site at York Water Company
ID	10G1	F15-1	90	12.7	204	SSW of site, Alta Vista Road, Weiglestown at Dover Township Fire Dept. Bldg.
ID	11G1	L15-1	91	11.7	225	SW of site on West side of Route 74, Mt. Royal
ID	12G1	M15-1	92	11.9	237	WSW of site, West side of Route 74, in front of Earth Crafts, Rossville
FFF	12G2	M15-2	93	13.6	239	WSW of site on W side of Route 74, Larew's orchard
ID	13G1	N15-1	94	13.2	276	W of site, Orchard Lane and Hertzler Road, Mt. Allen
ID	13G2	N15-2	95	10.4	274	W of site, Lisburn Road and Main Street, Lisburn
ID	14G1	P15-1	96	12.2	300	WNW of site on Erford Road in front of Penn Harris Hotel, Camp Hill
AP, AI, RW, ID, E	15G1	Q15-1	97	13.5	305	NW of site at West Fairview Substation
ID	15G2	Q15-2	98	11.5	310	NW of site, Penn and Forster Streets, Harrisburg
ID	16G1	R15-1	99	11.2	330	NNW of site, Route 22 and Colonial Road, Colonial Park
E	1F1	A9-1	100	9.2	0	N of site off of Union Deposit Road
FPL, E	1F2	A9-2	101	9.3	357	N of site on Union Deposit Road, W of Hoernerstown
FPL	5A3	E1-3	102	0.7	90	E of site, 100 W of Peck Road and Zion Road intersection
FPL, E	5B1	E2-1	103	1.1	80	E of site on Zion Road
E	7B2	G2-2	104	1.3	133	SE of site on Engle Road

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLE LOCATIONS (Cont'd)

Sample Medium	Station Code	NUREG Station Code	Map Number	Distance	Azimuth	Description
E	7C1	G3-1	105	2.5 mi.	131°	SE of site on Governor's Stable Road
FPL	14C1	P3-1	106	2.6	295	WNW of site on Route 392 (Yocumtown Road)
AQF	Indicator	-	-	-	-	All locations where fish were caught below the discharge were grouped together and referred to as "indicator" (i.e., sectors 11 and geographically below)
AQF	Indicator	-	-	-	-	All locations where fish were caught above the discharge were grouped together and referred to as "control" (i.e., sectors 12 and geographically above)
AQS	10B2	K2-2	107	1.1	197	SSW of site E of Shelly Island
E	1C1	A3-3	108	2.5	354	N of site at junction of Svanara Creek and Route 44
M	-	E2-2	109	1.1	93	E of site on Peck Road

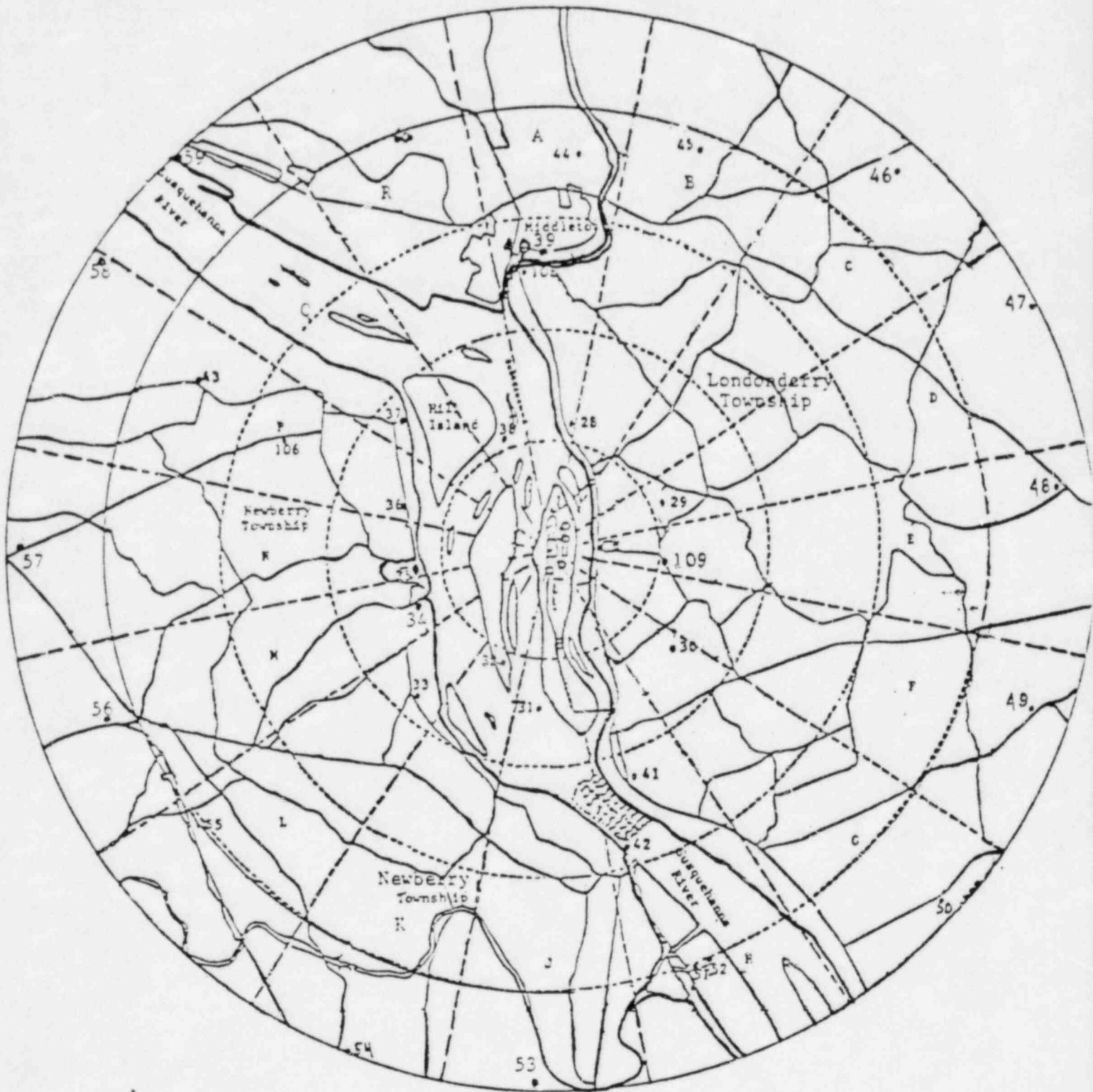
IDENTIFICATION KEY

ID - Immersion Dose (TLD)	CR - Cryogenic Air Sample	AQF - Fish
SW - Surface Water	RW - Rain Water	AQP - Aquatic Plants
AI - Air Iodine	M - Milk (cow)	AQS - Aquatic Sediment
AP - Air Particulate	MG - Milk (goat)	FPL - Green Leafy Vegetables
E - Soil	EW - Effluent Water	FPF - Fruit



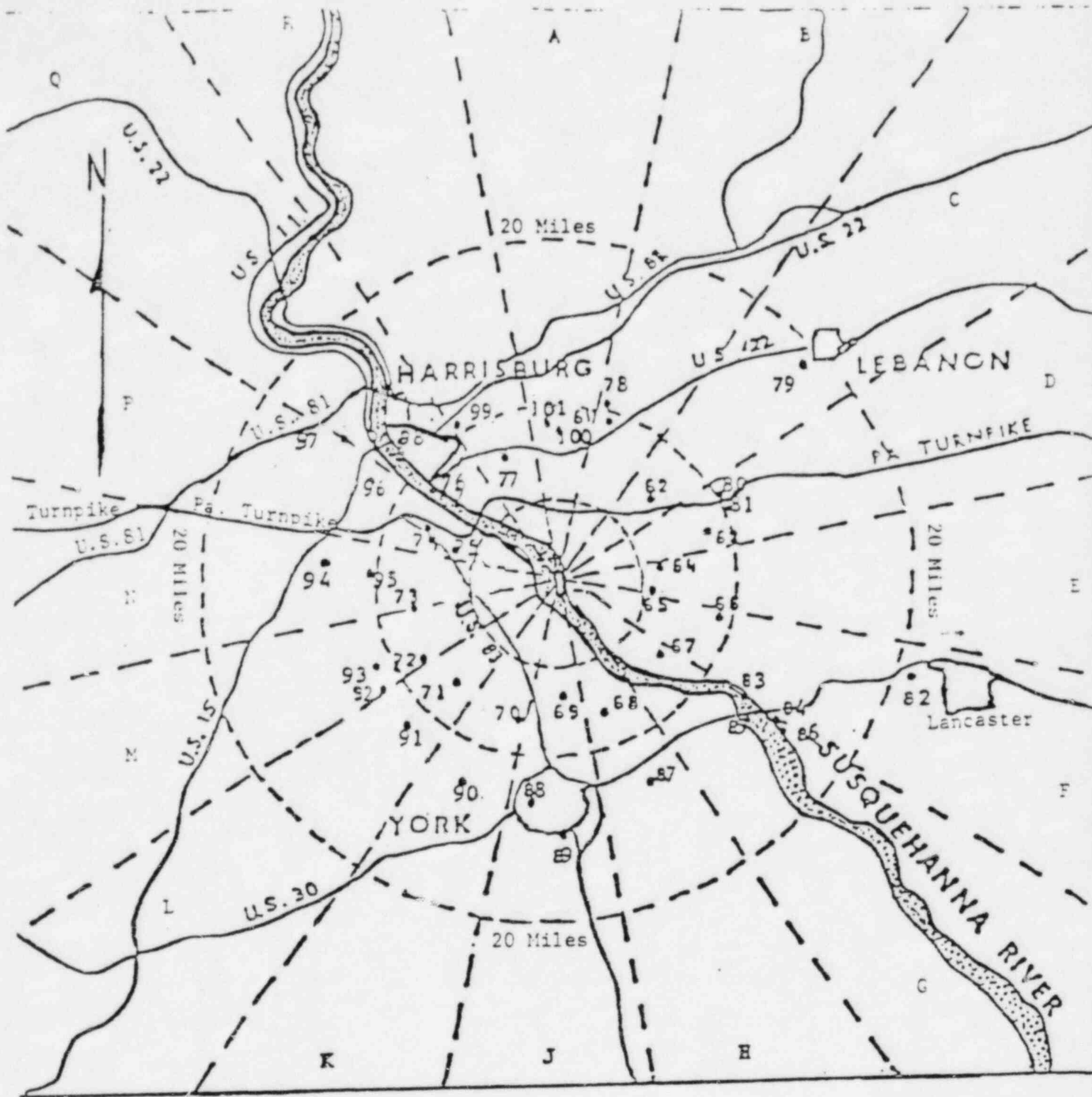
MAP A-1

THREE MILE ISLAND NUCLEAR STATION
 LOCATION OF RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
 STATIONS WITHIN 1 MILE OF THE SITE



MAP A-2

THREE MILE ISLAND NUCLEAR STATION
 LOCATION OF
 RADIOLOGICAL ENVIRONMENTAL
 MONITORING STATIONS WITHIN
 5 MILES OF THE SITE



MAP A-3

THREE MILE ISLAND NUCLEAR STATION
 LOCATION OF RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
 STATIONS GREATER THAN 5 MILES FROM THE SITE BOUNDARIES