

# **SUSQUEHANNA STEAM ELECTRIC STATION**

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## **APPENDIX A**

### **REVISIONS TO SSES ODCM**

### **AE&WD REPORT**

### **2000**

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**PPL Susquehanna, LLC**  
**Two North Ninth Street**  
**Allentown, Pennsylvania 18101-1179**

**April 2001**

## SSES MANUAL

Manual Name: ODCM

Manual Title: OFFSITE DOSE CALCULATION MANUAL

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Issue Date: 03/26/2001

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ODCM-QA-003 EFFLUENT MONITOR SETPOINTS	0	08/14/1998		
ODCM-QA-004 AIRBORNE EFFLUENT DOSE CALCULATIONS	1	10/12/2000		
ODCM-QA-005 WATERBORNE EFFLUENT DOSE CALCULATIONS	1	10/21/1998		
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ODCM-QA-008 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM	2	02/28/2000		
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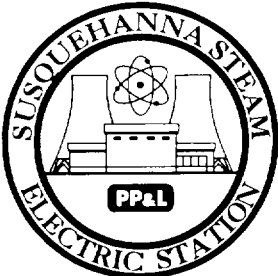
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SSS OFFSITE DOSE CALCULATION MANUAL CHANGE REQUEST			



# PROCEDURE COVER SHEET

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<u>QUALITY CLASSIFICATION:</u> <input checked="" type="checkbox"/> QA Program <input type="checkbox"/> Non-QA Program	<u>APPROVAL CLASSIFICATION:</u> <input checked="" type="checkbox"/> Plant <input type="checkbox"/> Non-Plant <input type="checkbox"/> Instruction	
<div style="text-align: right;">EFFECTIVE DATE: <u>8/14/98</u></div> <div style="text-align: right;">PERIODIC REVIEW FREQUENCY: <u>N/A</u></div> <div style="text-align: right;">PERIODIC REVIEW DUE DATE: <u>N/A</u></div>		
<u>RECOMMENDED REVIEWS:</u>		
<div style="margin-bottom: 10px;"> Procedure Owner: <u>R. K. Barclay</u> </div> <div style="margin-bottom: 10px;"> Responsible Supervisor: <u>Supervisor - Operations Technology</u> </div> <div style="margin-bottom: 10px;"> Responsible FUM: <u>Manager - Nuclear Technology</u> </div> <div style="margin-bottom: 10px;"> Responsible Approver: <u>General Manager - SSES</u> </div>		

## PROCEDURE REVISION SUMMARY

**TITLE: ODCM INTRODUCTION**

### **EVALUATION OF THE IMPACT OF REV. 0 TO ODCM-QA-001 ON THE LEVEL OF EFFLUENT CONTROL AND THE OVERALL ACCURACY AND RELIABILITY OF CALCULATIONS**

Revision 0 to the ODCM in procedure format is being made as part of the conversion from Current Technical Specifications (CTS) to Improved Technical Specifications (ITS). In addition, 10CFR20.1001 to .2402 are being incorporated as applicable.

The revision moves elements of the Radioactive Effluent Control Program (RECP) (formerly called the Radioactive Effluent Technical Specifications) and the Radiological Environmental Monitoring Program (REMP) from Technical Specifications to the Technical Requirements Manual. In addition, administrative and reporting requirements formerly contained in Technical Specifications were moved to the appropriate sections of the ODCM procedures which implement them. Requirements formerly contained in the ODCM (e.g., dose calculation formulae, dose conversion factors and setpoint calculation formulae) were maintained in this revision of the ODCM.

The revisions described below are editorial in nature, changing only the format of the ODCM and/or location of the required elements of the RECP and the REMP without any change in the actual limits. Thus, Revision 0 of ODCM-QA-001 maintains the level of radioactive effluent control required pursuant to 10CFR20.1302, 40CFR190, 10CFR50.36a and Appendix I to 10CFR50 and does not impact the accuracy or reliability of effluent, dose, or setpoint calculations.

1. Initial Issue in procedural format.
2. Section 1 of ODCM Revision 7 is reorganized in the format established by NDAP-QA-0002. No revision bars are used since the change was to the entire section.
3. Cover sheet, Revision Summary, and Table of Contents are added.
4. Description of all ODCM sections is provided.
5. Table 1 of ODCM Revision 7 is deleted because there are no requirements to present this information in the ODCM.

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6. Section 3 of ODCM Revision 7 is deleted. It essentially duplicates Technical Specification 3.11.1.1 and there are no requirements to present this information in the ODCM.
7. Incorporated Radiological Effluent and Environmental responsibilities appropriate to the ODCM from NEPM-QA-1010 in Section 4. Changed responsibilities formerly assigned to Manager - Nuclear Engineering to Manager - Nuclear Modifications.

Information required by ITS/TRM has been added in Section 2.

8. Document titles (TS, LCOs, 10CFR20 App B) were changed to agree with ITS/TRM terminology.
9. Expanded the purpose (Section 1) of the ODCM to include requirements added to the ODCM under ITS/TRM.
10. MPCs were changed to ECLs to agree with the new 10CFR20 nomenclature.
11. Added sections 2.3, 2.4, 2.5 on required reporting.
12. Attachment A was added to specify the contents of the Annual Effluent and Waste Disposal Report.
13. Referenced ST-099-002 as the procedure for preparing the Annual Effluent and Waste Disposal Report.
14. Added NDAP-QA-0646, Solid Waste PCP as one of the documents for which changes must be reported in the Annual Effluent and Waste Disposal Report.
15. Expanded the description of ODCM-QA-007 to include system changes and reporting requirements.
16. Added reference 3.6 for ITS/TRM.

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## 1.0 PURPOSE

The purpose of this procedure is to describe the overall purpose and organization of the SSES Offsite Dose Calculation Manual (ODCM).

## 2.0 POLICY/DISCUSSION

The SSES Offsite Dose Calculation Manual (ODCM) is a licensing basis document required by Technical Specifications. It provides the methodology and parameters to be used in calculating offsite doses and effluent monitor setpoints for the Susquehanna Steam Electric Station, Units 1 and 2. Methods are included for determining maximum individual, whole body, and organ doses due to waterborne and airborne effluents to ensure compliance with the dose limitations in the Technical Specifications. Methods are included for performing dose calculations to ensure compliance with the waterborne and airborne treatment system operability sections of the Technical Specifications. This manual includes the methods used for determining quarterly individual doses for inclusion in Annual Effluent and Waste Disposal Reports.

The purpose of the ODCM is to provide the parameters and methodology to be used in calculating offsite doses and effluent monitoring setpoints for the Susquehanna Steam Electric Station, Units 1 and 2. The ODCM contains the requirements of the Radiological Effluent Control Program (RECP) as described in Section 2.2 and the Radiological Environmental Monitoring Program (REMP) as defined in TR 3.11.4. Remedial actions to be taken when program limits (TROs) are exceeded are specified in the Technical Requirements Manual (TRM). The ODCM includes methods for determining maximum individual, whole body, and organ doses due to waterborne and airborne effluents to ensure compliance with the dose limitations in the Technical Requirements (TR). Methods are also included for performing dose calculations to ensure compliance with the waterborne and airborne treatment system operability sections of the Technical Requirements. This manual includes the required inputs for inclusion in the Annual Effluent and Waste Disposal Report and the Annual Radiological Environmental Operating Report.

### 2.1 Derived Release Concentrations and Dose Rates

The ODCM uses 10 times the limits of Appendix B, Table 2, Column 2 of 10CFR20.1001-20.2402 as concentration limits for liquid releases and the instantaneous release rates which are no longer referenced in 10CFR20 but come directly from TR 3.11.2 for gaseous releases as confirmed in the 6/93 NRC response to NUMARC.

### 2.2 Radioactive Effluent Control Program (RECP)

The Radioactive Effluent Control Program (RECP) is a comprehensive program as detailed in TS 5.5.4 which provides control of radioactive effluent for maintaining the dose to members of the public from radioactive effluent as low

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as reasonably achievable. The RECP is defined in TR's 3.6.1, 3.11.1, 3.11.2, and 3.11.3.

### 2.3 Annual Effluent and Waste Disposal Report

The radioactive effluent release report is titled, "Annual Effluent and Waste Disposal Report."

It covers the operation of the station during the previous year and must be submitted prior to May 1 of each year in accordance with TS 5.6.3. The report is prepared in accordance with Procedure ST-099-002 and the required topics for the report are provided in Attachment A.

### 2.4 Annual Radiological Environmental Operating Report

This report, submitted prior to May 15 of each year, contains the summaries, interpretations and analyses of the results of the Radiological Environmental Monitoring Program as spelled out in ODCM-QA-008 (TR's 3.11.4.1, 3.11.4.2, 3.11.4.3).

### 2.5 Special Reports

These reports are required to be submitted to the NRC when the limits of TR's 3.11.1.2, 3.11.1.3, 3.11.2.2, 3.11.2.3, 3.11.2.4, 3.11.2.5, 3.11.3, and 3.11.4.1 (Condition B, C, or D) are exceeded. Special reports shall be submitted within 30 days and shall address the actions required in the TRM.

## 3.0 REFERENCES

- 3.1 TS 6.14, Offsite Dose Calculation Manual (ODCM)
- 3.1 TS 5.5.1, Offsite Dose Calculation Manual (ODCM)
- 3.2 TR 3.6.1, Containment Venting or Purging
- 3.3 TR 3.11, Radioactive Effluents
- 3.4 NDAP-QA-0152, Quality Assurance for Radiological Environmental Monitoring, Radioactive Effluents, Meteorology, The Environmental Protection Plan, and The Offsite Dose Calculation Manual
- 3.5 ST-099-002, Radioactive Effluent Release Report
- 3.6 10CFR20 Appendix B, Annual Limits on Intake and Derived Air Concentrations of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage

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- 3.7 NDAP-QA-0646, Solid Radwaste Process Control Program
- 3.8 Letter from T. Murley, Director, Office of Nuclear Reactor Regulations, to T. Tipton, Vice President and Director of Operations, NUMARC, 6/93
- 3.9 ODCM-QA-008, Radiological Environmental Monitoring Program
- 3.10 NDAP-00-1203, Modification Identification and Scoping Process

#### 4.0 **RESPONSIBILITIES**

##### 4.1 General Manager - SSES

4.1.1 Ensures that the ODCM is used in performance of the surveillance requirements and for compliance with the limiting conditions of operation stated in the Technical Specifications relative to radioactive effluent.

4.1.1 Ensures that the ODCM is used in performance of the surveillance requirements and for compliance with the TROs stated in the TRM relative to radioactive effluent.

4.1.2 Approves revisions to the ODCM.

##### 4.2 Manager - Nuclear Modifications

4.2.1 Provides modification engineering and support in accordance with NDAP-00-1203 for equipment and systems involved with the conduct of the effluent and environmental monitoring programs at SSES.

##### 4.3 Manager - Nuclear Technology

4.3.1 Manages the programs for the assessment of the radiological environmental impact of SSES.

##### 4.4 Manager - Nuclear Assessment Services

4.4.1 Periodically assesses the SSES effluent and environmental programs (including meteorological data) for compliance with the requirements of the Technical Specifications and the ODCM.

4.4.1 Periodically assesses the SSES effluent, environmental and meteorological programs for compliance with the requirements of the TRM and the ODCM.

##### 4.5 Supervisor - Operations Technology

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4.5.1 Ensures the adequacy and correctness of methodologies described in the ODCM.

4.5.2 Is responsible for reviewing revisions to the ODCM.

4.5.3 Approves both the Annual Effluent and Waste Disposal and the Annual Radiological Environmental Operating Reports submitted to the NRC.

4.6 Supervisor - Nuclear Licensing

4.6.1 Submits the required radiological effluent and environmental reports to the NRC.

4.6.2 Notifies the appropriate groups of NRC licensing requirements.

4.7 Environmental Services - Health Physicist (Effluent)

4.7.1 Develops methodologies used in performance of effluent dose calculations and establishment of setpoints.

4.7.2 Performs dose calculations necessary for fulfillment of SSES Technical Specification Surveillance Requirements.

**4.7.2 Performs dose calculations necessary for fulfillment of SSES Technical Requirements Surveillance.**

4.7.3 Prepares and submits the Annual Effluent and Waste Disposal Report to Nuclear Licensing for submittal to the NRC.

4.8 Environmental Services - Health Physicist (REMP)

4.8.1 Prepares and submits the Annual Radiological Environmental Operating Report to Nuclear Licensing for submittal to the NRC.

5.0 **DEFINITIONS**

5.1 **ECL - Effluent Concentration Limit as defined in 10CFR20, Appendix B.**

5.2. Site Boundary - Is that line beyond which the land is not owned, leased or otherwise controlled by the licensee. (PPL Drawing C243786, SH1, Rev. 1, "U-1&2 Site Facilities and Boundary Map."

5.3 Unrestricted Area - The area at or beyond the site boundary access to which is neither limited nor controlled by the licensee for purposes of protection of individuals from exposure to radiation and radioactive materials, or any area within the site boundary used for residential quarters or for industrial, commercial, institutional and/or recreational purposes.

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## 6.0 PROCEDURE

### 6.1 Organization

Environmental Services shall develop and maintain a set of procedures as described in the following sub-sections.

#### 6.1.1 ODCM-QA-001 - ODCM Introduction

This procedure describes the overall purpose and organization of the ODCM.

#### 6.1.2 ODCM-QA-002 - ODCM Review And Revision Control

This procedure describes the initiation, review and processing of revisions to the ODCM and establishes responsibility for the ODCM.

#### 6.1.3 ODCM-QA-003 - Effluent Monitor Setpoints

This procedure describes the policies pertaining to and the methodology used in establishing effluent monitor setpoints.

#### 6.1.4 ODCM-QA-004 - Airborne Effluent Dose Calculations

This procedure provides the methodology and parameters used in calculating air dose resulting from noble gas effluent and maximum individual, whole body, and organ doses due to airborne effluents to ensure compliance with the dose limitations in the Technical Specifications.

**This procedure provides the methodology and parameters used in calculating air dose resulting from noble gas effluent and maximum individual, whole body, and organ doses due to airborne effluents to ensure compliance with the dose limitations in the Technical Requirements Manual.**

#### 6.1.5 ODCM-QA-005 - Waterborne Effluent Dose Calculations

This procedure provides the methodology and parameters to be used in calculating maximum individual, whole body, and organ doses due to waterborne effluents to ensure compliance with the dose limitations in the Technical Specifications.

**This procedure provides the methodology and parameters to be used in calculating maximum individual, whole body, and organ doses due to**

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waterborne effluents to ensure compliance with the dose limitations in the Technical Requirements Manual.

#### 6.1.6 ODCM-QA-006 - Total Dose Calculations

This procedure provides the methodology and parameters to determine the total dose to a member of the public from the fuel cycle in the vicinity of the SSES site.

#### 6.1.7 ODCM-QA-007 - Radioactive Waste Treatment Systems

This procedure defines the operability requirements of the radioactive waste treatment systems.

**This procedure defines the operability requirements of the radioactive waste treatment systems and monitoring instruments. It also includes reporting requirements where changes are made to systems or when operability is not maintained in accordance with the TRM.**

#### 6.1.8 ODCM-QA-008 - Radiological Environmental Monitoring Program

This procedure provides the methodology and parameters used to determine doses to the public resulting from inhalation, ingestion, and direct shine from radiologically contaminated environmental sampling media based on measured activity concentrations in those media. This procedure also describes the Radiological Environmental Monitoring Program (REMP), which includes the annual land use census survey and interlaboratory comparison program.

#### 6.1.9 ODCM-QA-009- Dose Assessment Policy Statements

The purpose of this procedure is to state dose and effluent policy statements that are not directly associated with any other section of the ODCM.

## 7.0 RECORDS

Except for ODCM-QA-002, no records are specified by the ODCM. Records are generated in performance of other procedures that use the information contained in the ODCM. Control of these records is specified in the controlling procedures.

### **CONTENTS OF ANNUAL EFFLUENT AND WASTE DISPOSAL REPORT**

- A summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from each unit and/or the station.
- An annual summary of meteorological data collected over the previous year.
- An assessment of the radiation doses from radioactive liquid and gaseous effluents to members of the public due to their activities inside the site boundary as well as at or beyond the site boundary.
- An assessment of radiation doses to the most exposed member of the public from reactor releases and other nearby uranium fuel cycle sources to show conformance with 40CFR190.
- A list and description of unplanned releases from the site to unrestricted areas of radioactive materials in gaseous and liquid effluents during the reporting period.
- Any changes made during the reporting period to the ODCM, Section 3.11 of the TRM, and the Process Control Program (NDAP-QA-0646), as well as any major changes to liquid, gaseous or solid radwaste treatment systems.
- A listing of new locations for dose calculations and/or environmental monitoring identified by the land use census.
- An explanation as to why the inoperability of liquid or gaseous effluent monitoring instrumentation was not corrected within the time specified in the TRO (3.11.1.4, 3.11.1.5 or 3.11.2.6), if any.
- A report of the cause of the unavailability of REMP samples and the identity of new locations for taking replacement samples.





# PROCEDURE COVER SHEET

	NUCLEAR DEPARTMENT PROCEDURE	ODCM-QA-002 Revision 1 Page 1 of 8
	ODCM REVIEW AND REVISION CONTROL	
<u>QUALITY CLASSIFICATION:</u> <input checked="" type="checkbox"/> QA Program <input type="checkbox"/> Non-QA Program		<u>APPROVAL CLASSIFICATION:</u> <input checked="" type="checkbox"/> Plant <input type="checkbox"/> Non-Plant <input type="checkbox"/> Instruction
EFFECTIVE DATE: <u>3/16/00</u> PERIODIC REVIEW FREQUENCY: <u>N/A</u> PERIODIC REVIEW DUE DATE: <u>N/A</u>		
<u>RECOMMENDED REVIEWS:</u>		
Procedure Owner: <u>M. B. Detamore</u>  Responsible <u>Supervisor – Environmental Services</u>  Responsible FUM: <u>Manager – Nuclear Technology</u>  Responsible <u>General Manager - SSES</u>		

### PROCEDURE REVISION SUMMARY

**TITLE: ODCM REVIEW AND REVISION CONTROL**

1. Incorporate ITS related changes.
2. Change responsibilities to recognize Supervisor – Environmental Services position.
3. Revise Section 6.1 to state that changes tracked by other mechanisms (Condition Reports, Modifications) do not require use of Form ODCM-QA-002-1.
4. Add a Section 6.3.4 to include the revision control requirements of Technical Specifications 5.5.1.C.3.
5. Revise Section 6.6 to allow other members of Operations Technology to present ODCM revisions to PORC.

**The above changes to ODCM-QA-002 have been evaluated as to not decrease the level of effluent control or the accuracy and/or reliability of dose calculations or setpoint determinations as required by 10CFR20.1302, 40CFR190, 10CFR50.36a and 10CFR50, App. I.**

**In addition, these changes<sup>(1)</sup> do not alter the conduct of the radiological environmental monitoring program, <sup>(2)</sup> do not change the radioactive effluent controls and radiological environmental monitoring activities, and<sup>(3)</sup> do not change the information to be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports.**

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## 1.0 PURPOSE

The purpose of this procedure is to describe the initiation, review, and processing of revisions to the ODCM and to establish responsibility for the ODCM.

This procedure constitutes part of the SSES Offsite Dose Calculation Manual (ODCM), which is a licensing basis document.

## 2.0 POLICY/DISCUSSION

- 2.1 The ODCM is part of the Licensing Basis of SSES and is controlled by ITS 5.5.1, Offsite Dose Calculation Manual (ODCM).
- 2.2 The ODCM procedures are controlled as Plant Functional Unit Procedures in accordance with the requirements of NDAP-QA-0002, with the following additional guidance and controls:
  - 2.2.1 ODCM procedures shall be numbered as follows: ODCM-QA-nnn, where nnn is a sequential number starting with 001.
  - 2.2.2 ODCM procedures shall be reviewed and accepted by the Manager - Nuclear Technology prior to PORC review.
  - 2.2.3 ODCM procedures shall be approved by the General Manager - SSES.
  - 2.2.4 Changes to the procedures comprising the ODCM require PORC review prior to approval. Changes which are solely administrative corrections or an expedited review revision are excepted. PORC review will be indicated by recording the PORC meeting number on the Procedure Change Process Form (NDAP-QA-0002-8).
  - 2.2.5 ODCM procedures shall be issued and controlled by Nuclear Records Document Control Services (NR-DCS) in accordance with NR procedures. The distribution list shall be maintained by DCS.
- 2.3 Changes to the Radioactive Effluent Control Program (RECP) are controlled in accordance with NDAP-QA-0728, but are reported as changes to the ODCM in the Annual Effluent and Waste Disposal Report.

## 3.0 REFERENCES

- 3.1 TS 5.5.1, Offsite Dose Calculation Manual (ODCM)
- 3.2 NDAP-QA-0002, Nuclear Department Procedure Program
- 3.3 NDAP-QA-0101, Document Review

- 3.4 NDAP-QA-0152, Quality Assurance for Radiological Environmental Monitoring, Radioactive Effluents, Meteorology, The Environmental Protection Plan, and The Offsite Dose Calculation Manual
- 3.5 NDAP-QA-0728, SSES Technical Requirements Program
- 3.6 10CFR20.1302, Compliance with Dose Limits for Individual Members of the Public
- 3.7 40CFR190, Environmental Radiation Protection Standards for Nuclear Power Operation
- 3.8 10CFR50.36a, Technical Specifications on Effluents from Power Reactors
- 3.9 10CFR50, Appendix I, Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet "As Low As Is Reasonably Achievable" for Radioactive Material in Light-Water Cooled Nuclear Power Reactors

#### 4.0 **RESPONSIBILITIES**

##### 4.1 General Manager - SSES

- 4.1.1 Approves revisions to the ODCM.

##### 4.2 Manager - Nuclear Technology

- 4.2.1 Is the Responsible Functional Unit Manager (FUM)

##### 4.3 Supervisor – Environmental Services

- 4.3.1 Ensures the adequacy and correctness of methodologies described in the ODCM.
- 4.3.2 Is responsible for reviewing revisions to the ODCM.

##### 4.4 Environmental Services - Health Physicist (Effluent)

- 4.4.1 Maintains the ODCM.
- 4.4.2 Processes revisions to the ODCM.

##### 4.5 All Personnel

- 4.5.1 Submit comments on ODCM contents and proposed revisions to the Environmental Services- Health Physicist (Effluent).

## 5.0 DEFINITIONS

None.

## 6.0 PROCEDURE

- 6.1 Personnel shall submit proposed ODCM revisions on the SSES Offsite Dose Calculation Manual Change Request Form ODCM-QA-002-1. The submitter shall complete Sections 1 through 5 according to the directions on the form, including sufficient detail of the revision and technical basis of the change to support the rationale for the change and to enable the Environmental Services-Health Physicist (Effluent) to proceed. The submitter should provide at least one month lead time between the submittal date and the requested implementation date to permit preparation, review by interested parties, and approval of the ODCM revision. Changes tracked by other mechanisms (eg., Condition Reports and Modifications) do not require use of Form ODCM-QA-002-1.
- 6.2 The Environmental Services Health Physicist (Effluent) shall sign and date Form(s) ODCM-QA-002-1 on receipt, and retain the form(s) in a work file created for this ODCM revision. The Environmental Services - Health Physicist (Effluent) may contact the form submitter to discuss the details of the revision.
- 6.3 The Environmental Services Health Physicist (Effluent) or designee prepares a draft of the ODCM revision based on information in Form(s) ODCM-QA-002-1.
  - 6.3.1 The preparer shall ensure that the change does not reduce the level of effluent control or the accuracy and/or reliability of dose calculations or setpoint determinations as required by 10CFR20.1302, 40CFR190, 10CFR50.36a and 10CFR50, Appendix I.
  - 6.3.2 The preparer shall include a statement to this effect in the Procedure Revision Summary.
  - 6.3.3 If compliance to the criterion in §6.3.1 cannot be demonstrated, the preparer shall make appropriate changes to ensure compliance, else the proposed revision shall be dismissed.
  - 6.3.4 Each change shall be identified by markings in the margin of the affected pages, clearly indicating the area of the page that was changed. The date the change is implemented is indicated on the Procedure Cover sheet.
- 6.4 The Environmental Services Health Physicist (Effluent) follows the process described in NDAP-QA-0002, Section 7.0, for plant procedures.
  - 6.4.1 All review comments and resolutions shall be documented according to NDAP-QA-0101.

6.4.2 The review shall sustain that the change does not reduce the accuracy or reliability of dose calculations and/or setpoint determinations.

6.5 The Environmental Services Health Physicist (Effluent) schedules the proposed ODCM revision for PORC review in accordance with PORC procedures.

6.6 The Supervisor – Environmental Services or Environmental Services Health Physicist (Effluent) presents the ODCM revision to PORC, along with originating information (Form(s) ODCM-QA-002-1), review documentation (Form NDAP-QA-0101-1), 50.59/72.48 Determination (Form NDAP-QA-0726-5), Safety Evaluation (if required, Forms NDAP-QA-0726-1, -2, -4) any technical material (calculations, studies, etc.) necessary to support the ODCM revision, the evaluation required in Section 6.3.1 and appropriate signature approvals.

6.7 The Environmental Services Health Physicist (Effluent) shall submit to the NRC a complete, legible copy of the revised ODCM in the Annual Effluent and Waste Disposal Report for the period of the report in which any change in the ODCM was made.

## 7.0 **RECORDS**

The following shall be submitted to Nuclear Records in accordance with NR procedures:

7.1 Form(s) ODCM-QA-002-1, with attachments, if any.

7.2 Review package, assembled in accordance with the requirements of NDAP-QA-0002 and NDAP-QA-0101.

**SSES OFFSITE DOSE CALCULATION MANUAL**  
**CHANGE REQUEST**

1. ODCM-QA-\_\_\_\_ Submit a separate form for each ODCM procedure to be revised.
2. Describe proposed revisions to the SSES ODCM below. Include references to sections, figures, tables, parameters, and equations with sufficient detail to convey complete and correct information. If necessary, use additional pages. If proposed revision can be more clearly indicated on marked up copy(s) of the current ODCM, then attach these marked up pages to this form.
3. Reason for revision: include references to Condition Reports, Audit Services observations or findings, Licensing Issues, DCPs, etc., as applicable. If necessary, use additional pages.

4. Additional pages attached?                      No ☐      Yes ☐  
Number of additional pages                      \_\_\_\_\_

5. Requested date for implementation of revision: \_\_\_\_\_

Requested by: \_\_\_\_\_ Cost Area: \_\_\_\_\_ Date: \_\_\_\_\_

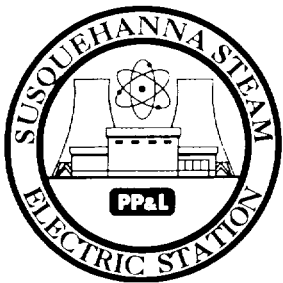
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# PROCEDURE COVER SHEET

	NUCLEAR DEPARTMENT PROCEDURE	ODCM-QA-003 Revision 0 Page 1 of 25
	EFFLUENT MONITOR SETPOINTS	
<u>QUALITY CLASSIFICATION:</u>	<u>APPROVAL CLASSIFICATION:</u>	
<input checked="" type="checkbox"/> QA Program <input type="checkbox"/> Non-QA Program	<input checked="" type="checkbox"/> Plant <input type="checkbox"/> Non-Plant <input type="checkbox"/> Instruction	
EFFECTIVE DATE: <u>8/14/98</u>		
PERIODIC REVIEW FREQUENCY: <u>N/A</u>		
PERIODIC REVIEW DUE DATE: <u>N/A</u>		
<u>RECOMMENDED REVIEWS:</u>		
Procedure Owner: <u>R. K. Barclay</u>		
Responsible Supervisor: <u>Supervisor - Operations Technology</u>		
Responsible FUM: <u>Manager - Nuclear Technology</u>		
Responsible Approver: <u>General Manager - SSES</u>		

## PROCEDURE REVISION SUMMARY

**TITLE: EFFLUENT MONITOR SETPOINTS**

### **EVALUATION OF THE IMPACT OF REV. 0 TO ODCM-QA-003 ON THE LEVEL OF EFFLUENT CONTROL AND THE OVERALL ACCURACY AND RELIABILITY OF CALCULATIONS**

Revision 0 to the ODCM in procedure format is being made as part of the conversion from Current Technical Specifications (CTS) to Improved Technical Specifications (ITS). In addition, 10CFR20.1001 to .2402 are being incorporated as applicable.

The revision moves elements of the Radioactive Effluent Control Program (RECP) (formerly called the Radioactive Effluent Technical Specifications) and the Radiological Environmental Monitoring Program (REMP) from Technical Specifications to the Technical Requirements Manual. In addition, administrative and reporting requirements formerly contained in Technical Specifications were moved to the appropriate sections of the ODCM procedures which implement them. Requirements formerly contained in the ODCM (e.g., dose calculation formulae, dose conversion factors and setpoint calculation formulae) were maintained in this revision of the ODCM.

Most of the revisions described below are editorial in nature, changing only the format of the ODCM and/or location of the required elements of the RECP associated with radioactive effluent setpoints. Editorial changes were made to clarify the methodology for liquid monitors; the methodology presented is mathematically the same as before except for replacement of MPCs by ECLs under ITS. Editorial changes were made to clarify the methodology for airborne monitors. For CTS, the methodology presented is mathematically the same as before and the parameters presented in Attachment A are those used to determine the existing setpoints. For ITS, apportionment of the site limiting release rate is changed from an equal release rate basis to an equal concentration basis. Attachment A.ITS presents parameters based on current design basis calculations that are to be used to determine setpoints implementing ITS. Incorporation of NRC imposed changes, use of an equal concentration basis for airborne effluent, and use of current design basis input do not impact the accuracy or reliability of the setpoints. Thus, Revision 0 of ODCM-QA-003 maintains the level of radioactive effluent control required pursuant to 10CFR20.1302, 40CFR190, 10CFR50.36a and Appendix I to 10CFR50 and does not impact the accuracy or reliability of effluent, dose, or setpoint calculations.

1. Section 2 of ODCM Revision 7 is reorganized in the format established by NDAP-QA-0002. No revision bars are used since the change was to the entire section.
2. Cover sheet, Revision Summary, and Table of Contents are added.

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3. Policy statement regarding noble gas activity monitor setpoints in Section 4.1 of ODCM Revision 7 is relocated to §2 of this procedure.
4. Policy statements provided in Section 10 of ODCM Revision 7 pertaining to setpoints are relocated to §2 (§10.5, and §10.8) and §6.4 (§10.7) of this procedure.
5. Sample calculations from Appendix A of ODCM Revision 7 for determining setpoints for waterborne and airborne effluent monitors are deleted. The description of the methodology has been clarified, eliminating the need for sample calculations.
6. Added parameters used for determination of airborne effluent monitor setpoints as Attachment A.
7. Procedural step addressing post-release evaluations for liquid releases has been added.
8. SDHR Service Water radiation monitor added to §6.1.4.
9. Terminology and references were revised to agree with ITS/TRM.
10. MPC values were changed to ECL values from the new 10CFR20.
11. Setpoint calculations were revised to reflect the new ECL values.
12. Iodine-133 was added to the airborne effluents section as required by ITS/TRM.
13. Changed the method of apportioning the site airborne limiting release rates from an equal release rate per vent to an equal concentration basis.
14. Added current design basis parameters used for determination of airborne effluent monitor setpoints as Attachment A.ITS.
15. Added policy stating liquid effluent monitor setpoints are "field set."

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## 1.0 PURPOSE

This procedure discusses the methodology to be used in determining effluent monitor alarm/trip setpoints to be used to ensure compliance with the instantaneous release rate limits in Technical Specifications 3.11.1.1 and 3.11.2.1 and provides operational flexibility while giving reasonable assurance of meeting the design objectives of 10CFR50, Appendix I.

This procedure discusses the methodology to be used in determining effluent monitor alarm/trip setpoints to be used to ensure compliance with the concentration and instantaneous release rate limits in the Technical Requirements Manual (sections 3.11.1.1 and 3.11.2.1) and provides operational flexibility while giving reasonable assurance of meeting the design objectives of 10CFR50, Appendix I.

This procedure constitutes part of the SSES Offsite Dose Calculation Manual which is a licensing basis document.

## 2.0 POLICY/DISCUSSION

### 2.1 ODCM Setpoints are Upper Limit Values

- 2.1.1 Effluent monitor alarm/trip setpoints calculated in accordance with the ODCM shall be considered upper limit values. Higher (less conservative) setpoints shall not be used, however lower (more conservative) setpoints may be used as required to maximize the utility of the monitor.

### 2.2 Waterborne Effluent Monitors

- 2.2.1 A gross radioactivity monitor providing automatic termination of liquid effluent releases is present on the liquid radwaste effluent line. Flow rate measurement devices are also present on the liquid radwaste effluent line and the discharge line (cooling tower blowdown).
- 2.2.2 Precautions, limitations, and setpoints applicable to the operation of the SSES liquid effluent monitors are provided in the applicable plant procedures.
- 2.2.3 The liquid effluent monitor setpoints are determined in accordance with the methodology and parameters described in Section 6.1 and controlled as "field set" in accordance with applicable plant procedures.
- 2.2.4 Setpoint values are to be calculated to ensure that alarm and trip actions occur upon approaching the MPC limits of 10 CFR 20, Appendix B, Table II, Column 2 at the release point to the unrestricted area.
- 2.2.4 Setpoint values are to be calculated to ensure that alarm and trip actions occur upon approaching 10 times the EC limits of 10 CFR 20, Appendix

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B, Table II, Column 2 or  $2E-4 \mu\text{Ci/ml}$  for total dissolved gases at the release point to the Unrestricted Area.

- 2.2.5 Setpoint values for monitors used for leak detection (if set more conservatively than the EC limits) should be based on X times background values provided such values do not result in concentrations greater than the EC limits at the Unrestricted Area. Chemistry establishes the setpoint based on operating experience.

## 2.3 Airborne Effluent Monitors

- 2.3.1 Noble gas activity monitors, iodine samplers and monitors, and particulate samplers and monitors are present on the reactor building ventilation system (Units 1 and 2), the turbine building ventilation system (Units 1 and 2), and the standby gas treatment system exhaust vents. Effluent system flow rate and sampler flow rate are measured on all of the systems allowing the vent monitor microprocessor to calculate release rates based on measured flow rates.
- 2.3.2 Precautions, limitations, and setpoints applicable to the operation of the SSES airborne effluent monitors are provided in the applicable plant procedures.
- 2.3.3 Setpoints are conservatively established for each effluent monitor so that the instantaneous dose rates from all sources corresponding to annual dose limits in 10 CFR 20.105 for unrestricted areas will not be exceeded.
- 2.3.3 Setpoints are conservatively established for each effluent monitor so that the instantaneous dose rates of TRO 3.11.2.1 will not be exceeded.
- 2.3.4 The general methodology for establishing plant ventilation airborne effluent monitor setpoints is based upon vent release rates derived from site-specific meteorological dispersion conditions, vent flow rates, and measured or expected radionuclide mixtures in the gaseous effluents. The vent release rate can then be converted to vent concentrations for input as setpoints for the applicable detectors. Since the vent monitors are programmed to calculate concentrations of iodine and particulate being released based on the rate of accumulation of activity on the filters, setpoints can be established for the iodine and particulate channels.
- 2.3.5 The main condenser offgas pre-treatment monitor provides indication of offgas activity prior to input to the holdup system. Alarm setpoints are based on the Technical Specification 3.11.2.7 noble gas release rate limit of 330 millicuries/second or less at the motive steam jet condenser discharge.

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2.3.5 The main condenser offgas pre-treatment monitor provides indication of offgas activity prior to input to the holdup system. Alarm setpoints are based on the Technical Specification 3.7.5 noble gas release rate limit of 330 millicuries/second or less at the motive steam jet condenser discharge.

2.3.6 Noble gas activity monitor setpoints are established at release rates which permit some margin for corrective action to be taken before exceeding offsite dose rates corresponding to the 10 CFR 20 annual dose limits as described herein.

2.3.6 Noble gas activity monitor setpoints are established at release rates which permit some margin for corrective action to be taken before exceeding the offsite instantaneous dose rates of TRO 3.11.2.1,

#### 2.4 Selection of Data for Determination of Dose Rate Compliance

2.4.1 Airborne effluent monitor setpoints are maintained in accordance with Section 2.3, to alarm before the dose rate limits of Technical Specification 3.11.2.1 are exceeded. Station alarm response procedures contain instructions for investigation and verification of monitor alarms. Because setpoint calculations must include assumptions about the composition of the monitored effluent, a monitor high alarm does not necessarily indicate that a dose rate limit has been exceeded.

2.4.1 Airborne effluent monitor setpoints are maintained in accordance with Section 2.3, to alarm before the dose rate limits of the Technical Requirements Manual 3.11.2.1 are exceeded. Station alarm response procedures contain instructions for investigation and verification of monitor alarms. Because setpoint calculations must include assumptions about the composition of the monitored effluent, a monitor high alarm does not necessarily indicate that a dose rate limit has been exceeded.

2.4.2 Valid 10-minute averaged data should be the primary information used to determine the compliance status of an incident. One-minute averaged data should also be reviewed if available, but they may or may not provide additional information depending on the magnitude of the release due to the manner in which the monitors update values to be stored and associated statistical considerations. Averages over a longer period should be used only when data with higher resolution is not available. Grab sample analyses should be performed whenever possible to confirm or disprove monitor data, and to provide indication of the nuclide specific composition of the effluent. When grab sample data are available which, based on vent monitor data, are indicative of the period of elevated release, dose rate calculations should be performed using the actual effluent mix. The determination of compliance status should not

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be based on monitor data alone when it is possible to collect and analyze a vent sample which will be representative of the period of elevated release.

## 2.5 Offgas Hydrogen Analyzers

The main condenser offgas treatment system explosive monitoring system (offgas hydrogen analyzers) have setpoints to alarm at 1% and 2% hydrogen with automatic isolation occurring at 2%.

## 2.5 Deleted

## 3.0 REFERENCES

3.1 TS 3.11.2.7, [Radioactive Effluents] Main Condenser

3.1 TS 3.7.5, [Radioactive Effluents] Main Condenser

3.2 TS 3.11.1.1, [Radioactive Effluents] Liquid Effluents Concentration

3.2 TR 3.11.1.1, [Radioactive Effluents] [Liquid Effluents] Concentration

3.3 TS 3.3.7.10, Radioactive Liquid Effluent Monitoring Instrumentation

3.3 TR 3.11.1.4, Liquid Radwaste Effluent Monitoring Instrumentation

3.4 TR 3.11.1.5, Radioactive Liquid Effluent Monitoring Instrumentation

3.5 TS 3.11.2.1, [Radioactive Effluents] Gaseous Effluents Dose Rate

3.5 TR 3.11.2.1, [Radioactive Effluents] [Gaseous Effluents] Dose Rate

3.6 TS 3.3.7.11, Radioactive Gaseous Effluent Monitoring Instrumentation

3.6 TR 3.11.2.6, Radioactive Gaseous Effluent Monitoring Instrumentation

3.7 10 CFR 20.105, Permissible Levels of Radiation in Unrestricted Areas

3.7 10 CFR 20.1301, Dose limits for individual members of the public

3.8 10 CFR 20 Appendix B, Concentrations in Air and Water Above Natural Background

3.8 10 CFR 20 Appendix B, Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure: Effluent Concentrations; Concentrations for Release to Sewerage

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- 3.9 40CFR190, Environmental radiation protection standards for nuclear power operations
- 3.10 10CFR50 Appendix I, Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion "As Low as is Reasonably Achievable" for Radioactive Material in Light-Water Cooled Nuclear Power Reactor Effluents
- 3.11 NUREG-0564, Final Environmental Statement related to the operation of SSES, Units 1 and 2
- 3.11 **EC-RADN-1041, SSES "Expected" Liquid and Gaseous Effluent Releases, Aquatic Doses, and Atmospheric Doses - Incorporates Condensate Filtration System and Hydrogen Water Chemistry**
- 3.12 EC-ENVR-1040, Evaluation of Setpoint Methodology for Airborne Iodine and Particulate Monitors
- 3.13 TS 3.11.2.6, [Radioactive Effluents] Explosive Mixture
- 3.13 Deleted**
- 3.14 1982 SSES Meteorology Report
- 3.14 Deleted**

#### 4.0 **RESPONSIBILITIES**

- 4.1 Supervisor - Chemistry
- 4.1.1 Is responsible for calibrating, functionally testing, and providing alarm responses for radiological effluent monitoring equipment.
- 4.2 Supervisor - Operations Technology
- 4.2.1 Ensures adequacy and correctness of methodology used to establish setpoints.
- 4.3 Environmental Services - Health Physicist
- 4.3.1 Is responsible for development of methodology and calculations used to establish setpoints.

#### 5.0 **DEFINITIONS**

- 5.1 Actual Tank Activity - The sum of the products of tank concentrations and volume for each isotope.

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5.2 Cs-137 Equivalent - Concentration equivalent of 2.00E-05  $\mu\text{Ci/ml}$  MPC for Cs-137.

5.2 Cs-137 Equivalent- Concentration equivalent of 1.00E-06  $\mu\text{Ci/ml}$  ECL for Cs-137.

5.3 MPC - Maximum Permissible Concentration as defined in 10CFR20, Appendix B.

5.3 ECL - Effluent Concentration Limits as defined in 10CFR20, Appendix B.

## 6.0 PROCEDURE

### 6.1 Liquid Effluent Monitoring

Chemistry shall develop procedures implementing the following requirements for Liquid Effluent Monitoring.

#### 6.1.1 Discharge Termination

Chemistry shall determine the setpoint concentration for the discharge termination, which limits the maximum concentration being released, as follows:

$$C_{\gamma} = X * \sum_n C_{\gamma n} \quad (\text{Eq. 6.1-1})$$

where:

$C_{\gamma}$  = The setpoint concentration at which the discharge would be terminated ( $\mu\text{Ci/ml}$ ).

$X$  = A unitless number greater than one that is chosen to prevent spurious alarms that might result from non-uniformity in the activity concentrations of the liquid discharges.

$C_{\gamma n}$  = The concentration of isotope  $n$  in the contents of the tank to be discharged as determined by pre-release sampling and analyses. The summation shall include gamma emitting isotopes only (including noble gases).

The setpoint concentration is based on the activity of the isotopes to which the monitor responds, i.e., gamma-emitting isotopes only. It is used to establish the radiation monitor setpoint (count rate) in units of cpm or cps.

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### 6.1.2 Radiation Monitor Setpoint

The radiation monitor setpoint is the sum of the background count rate and the count rate equivalent of the setpoint concentration. The count rate equivalent of the setpoint concentration in units of  $\mu\text{Ci/ml}$  is determined by dividing the setpoint concentration by the calibration factor ( $\mu\text{Ci/ml/cpm}$ ).

Chemistry shall determine the radiation monitor setpoint as follows:

$$S = \frac{C_y}{K} + B \quad (\text{Eq. 6.1-2})$$

where:

$S$  = the radiation monitor setpoint (cpm)

$C_y$  = the setpoint concentration at which the discharge would be terminated from Eq. 6.1-1 ( $\mu\text{Ci/ml}$ )

$K$  = the radiation monitor calibration factor ( $\mu\text{Ci/ml/cpm}$ )

$B$  = the background radiation level for the radiation monitor (cpm)

The alarm setpoint may be established at a suitable fraction of the setpoint for discharge termination.

### 6.1.3 Discharge Flow Rate Limit Determination

The flow rate below which tank discharges must be maintained depends on the magnitude of the dilution required to ensure compliance with the limits of TS 3.11.1.1.

Chemistry shall establish the maximum Discharge Flow Rate using the following equation:

$$f = \frac{F}{(Y * \sum_n C_n / MPC_n) - 1} \quad (\text{Eq. 6.1-3})$$

where:

$f$  = the maximum discharge rate from the tank (gpm).

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- F = the minimum dilution flow rate of 5000 gpm provided by the blowdown flow from the Cooling Towers and any overflow from the spray pond.
- Y = a unitless number greater than X used in §6.1.1 that is chosen to ensure that the dilution flow is conservatively determined.
- C<sub>n</sub> = The concentration of isotope n in the contents of the tank to be discharged as determined by pre-release sampling and analyses. The summation shall include previous composite sample results for non-gamma emitting radionuclides such as H-3, P-32, Fe-55, Sr-89, and Sr-90 (μCi/ml).
- MPC<sub>n</sub> = the maximum permissible concentration for isotope n per 10CFR20, Appendix B, Table II, column 2 for radionuclides other than noble gases and the values in TS Table 3.11.1.1-1 for dissolved and entrained noble gases.

The flow rate below which tank discharges must be maintained depends on the magnitude of the dilution required to ensure the dilution required to ensure compliance with the limits of TR 3.11.1.1:

Chemistry shall establish the maximum Discharge Flow Rate using the following equation:

$$f = \frac{F}{Y * \left( \sum_n C_n / L_n + \sum_{NGi} C_{NGi} / 2E - 4 \right) - 1} \quad (\text{Eq. 6.1-3})$$

where:

- f = the maximum discharge rate from the tank (gpm).
- F = the minimum dilution flow rate of 5000 gpm provided by the blowdown flow from the Cooling Towers and any overflow from the spray pond (gpm).
- Y = a unitless number that is chosen to ensure that the dilution flow is conservatively determined.
- C<sub>n</sub> = The concentration of isotope n in the contents of the tank to be discharged as determined by pre-release sampling and analyses. The summation shall include previous composite sample results for non-gamma emitting

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		radionuclides such as H-3, P-32, Fe-55, Sr-89, and Sr-90 ( $\mu\text{Ci/ml}$ ).
$L_n$	=	Ten (10) times the effluent concentration (EC) for isotope n per 10CFR20, Appendix B, Table 2, Column 2 for radionuclides other than noble gases. To maintain compatibility with other federal regulations, the maximum permissible concentration (MPC) value from 10CFR20, Appendix B, Table II, Column 2 (pre-1994 10CFR20) may be used for those isotopes for which the MPC is more restrictive than 10EC.
$C_{NGi}$	=	The concentration of noble gas isotope i in the contents of the tank to be discharged. The summation shall include all dissolved and entrained noble gases.

Selecting values of X and Y is a matter of experience and the expected margin needed between the activity concentration and the maximum permissible concentration.

Selecting values of X and Y is a matter of experience and the expected margin needed between the activity concentration and the maximum concentration limit (10 x ECL).

#### 6.1.4 Post-Release Evaluation

Chemistry shall perform post-release evaluations when the actual composite sample results for non-gamma-emitting radionuclides exceed pre-selected criteria.

#### 6.1.5 Service Water, SDHR Service Water, and RHR Service Water

The Service Water System provides screened water from the cooling tower basin for cooling plant systems and equipment. The supplemental Decay Heat Removal Service Water System (SDHR) provides decay heat removal during refueling outages when the Service Water System is shutdown. The Residual Heat Removal (RHR) Service Water System provides water from the Engineered Safeguard Service Water (ESSW) spray pond to the RHR heat exchangers. In post-accident conditions, RHR Service Water can supply water for vessel and containment flooding. The Service Water, SDHR Service Water, and RHR Service Water Systems are not normal pathways for liquid effluents. Radiation monitors are in place on these systems to provide indication of leaks across heat exchangers into the service water. The high radiation setpoints for these monitors are set at  $2\text{E-}5 \mu\text{Ci/ml}$  Cs-137 equivalent.

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Considering the gamma emitting radionuclides predominant in SSES liquid effluents. e.g., Zn-65, Co-58, Co-60, Fe-59, Mn-54 and Cr-51, use of a setpoint based on the Cs-137 MPC is conservative based on the following parameters:

- 1) photon abundance (85%), (0.662 MeV)
- 2) magnitude of applicable MPC ( $2E-5$   $\mu\text{Ci/ml}$ )

The high radiation setpoints for these monitors are set at  $1E-5$   $\mu\text{Ci/ml}$  (10 times the Cs-137 equivalent). Considering the radionuclides predominant in SSES liquid effluents e.g., Co-58, Co-60, Fe-59, Mn-54 and Cr-51, use of a setpoint based on the Cs-137 ECL is reasonable based on the following parameters:

- 1) photon abundance (85%), photon energy (0.662 MeV)
- 2) magnitude of applicable ECL ( $1E-6$   $\mu\text{Ci/ml}$ )

Because Service Water, SDHR Service Water, and RHR Service Water systems are not normal release pathways for liquid effluents, no credit should be taken for possible dilution scenarios. All service water should be maintained below  $2E-5$   $\mu\text{Ci/ml}$  Cs-137 equivalent.

Because Service Water, SDHR Service Water, and RHR Service Water systems are not normal release pathways for liquid effluents, no credit should be taken for possible dilution scenarios. All service water should be maintained below  $1E-5$   $\mu\text{Ci/ml}$  (10 times the Cs-137 equivalent ECL) or as established by Chemistry based on operating experience (Section 2.2.6).

In order to minimize the chance of a change in the background of a monitor masking a significant trend in monitored activity, the alarm setpoints for the Service Water, SDHR Service Water, and RHR Service Water monitors are determined as follows:

- a. When monitor background  $\leq (2E-5)/\text{Cal. Factor}$ :

HI RAD Setpoint =  $0.5 \text{ Background} + (2E-5)/\text{Cal. Factor}$

DOWNSCALE or LOW RAD Setpoint =  $0.5 \text{ Background}$

- a. When monitor background  $\leq (1E-5)/\text{Cal. Factor}$ :

HI RAD Setpoint =  $0.5 \text{ Background} + (1E-5)/\text{Cal. Factor}$

DOWNSCALE or LOW RAD Setpoint =  $0.5 \text{ Background}$

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b. When monitor background  $> (2E-5)/\text{Cal. Factor}$ :

HI RAD Setpoint = Background +  $0.5 (2E-5)/\text{Cal. Factor}$

DOWNSCALE or LOW RAD Setpoint = Background -  $0.5 (2E-5)/\text{Cal. Factor}$

Where:

Setpoint	=	alarm threshold value to be entered into monitor (cps for Service Water and SDHR Service Water, cpm for RHR Service Water)
Background	=	monitor background at most recent background determination (cps for Service Water and SDHR Service Water, cpm for RHR Service Water)
(2E-5)	=	Cs-137 Maximum Permissible Concentration ( $\mu\text{Ci/ml}$ )
Cal. Factor	=	monitor response factor per unit Cs-137 concentration determined during most recent calibration ( $\mu\text{Ci/ml}$ per cps for Service Water and SDHR Service Water, $\mu\text{Ci/ml}$ per cpm for RHR Service Water)

The ALERT RAD setpoints for the RHR Service Water monitors are maintained at 80% of the applicable HI RAD setpoint (cpm).

b. When monitor background  $> (1E-5)/\text{Cal. Factor}$ :

HI RAD Setpoint = Background +  $0.5 (1E-5)/\text{Cal. Factor}$

DOWNSCALE or LOW RAD Setpoint = Background -  $0.5 (1E-5)/\text{Cal. Factor}$

Where:

Setpoint	=	alarm threshold value to be entered into monitor (cps for Service Water and SDHR Service Water, cpm for RHR Service Water)
Background	=	monitor background at most recent background determination (cps for Service Water, and SDHR Service Water, cpm for RHR Service Water)

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(1E-5) = 10 times the Cs-137 ECL ( $\mu\text{Ci/ml}$ )

Cal. Factor = monitor response factor per unit Cs-137 concentration determined during most recent calibration ( $\mu\text{Ci/ml}$  per cps for Service Water and SDHR Service Water,  $\mu\text{Ci/ml}$  per cpm for RHR Service Water)

The ALERT RAD setpoints for the RHR Service Water monitors are maintained at 80% of the applicable HI RAD setpoint (cpm).

## 6.2 Airborne Effluent Monitoring - Noble Gas

Environmental Services shall prepare calculations implementing the following requirements for Airborne Effluent Monitoring of Noble Gas.

### 6.2.1 Site Limiting Release Rate - Noble Gas

- a. Environmental Services shall determine the limiting total body and skin release rates calculated as follows:

$$L_{TB} = \frac{Q_{NG} * DR_{TB} * k}{D_{TB}} \quad (\text{Eq. 6.2-1a})$$

$$L_S = \frac{Q_{NG} * DR_S * k}{D_S} \quad (\text{Eq. 6.2-1b})$$

where:

$L_{TB}$  = limiting release rate- noble gas total body ( $\mu\text{Ci/min}$ )

$L_S$  = limiting release rate- noble gas skin ( $\mu\text{Ci/min}$ )

$Q_{NG}$  = total noble gas source term (Ci)

$DR_{TB}$  = total body dose rate limit for the noble gas effluent (500 mrem/year) (ref. TS 3.11.2.1.a)

$DR_{TB}$  = total body dose rate limit for the noble gas effluent (500 mrem/year) (ref. TRO 3.11.2.1, I.A)

$DR_S$  = total skin dose rate limit for the noble gas effluent (3000 mrem/year) (ref. TS 3.11.2.1.a)

$DR_S$  = total skin dose rate limit for the noble gas effluent (3000 mrem/year) (ref. TRO 3.11.2.1, I.B)

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$D_{TB}$  = limiting total body offsite dose resulting from the noble gas source term  $Q_{NG}$  (mrem)

$D_S$  = limiting skin offsite dose resulting from the noble gas source term  $Q_{NG}$  (mrem)

$k$  = units conversion factor  
 $(1E6 \mu\text{Ci/Ci}) * (1 \text{ yr}/365 \text{ days}) * (1 \text{ day}/24 \text{ hours}) * (1 \text{ hour}/60 \text{ minutes})$

Environmental Services shall determine  $D_{TB}$  and  $D_S$  in accordance with ODCM-QA-004 using the noble gas source term and dispersion parameters provided in Attachment A.

Note,  $Q_{NG}$  is the sum of the noble gas activities provided in Attachment A. The ratio of the annual source term to the corresponding total body and skin dose is used in the above equations. Thus, either the total annual release per unit or the total annual release for the site may be used.

b. Environmental Services shall set the site limiting release rate for noble gas,  $L_{NG}$ , as the lesser of  $L_{TB}$  and  $L_S$  and the site limiting release rate for noble gas implemented in the Emergency Plan. The Emergency Plan may be revised to implement the lesser of  $L_{TB}$  and  $L_S$  to provide additional flexibility in plant operations.

#### 6.2.2 Monitor Limiting Concentration - Noble Gas

Environmental Services shall determine the limiting noble gas release rate for each vent as follows.

$$L_V = 0.2 L_{NG} \quad (\text{Eq. 6.2-2})$$

Where:

$L_V$  = limiting noble gas release rate per vent ( $\mu\text{Ci}/\text{min}$ )

$L_{NG}$  = lesser of  $L_{TB}$  and  $L_S$  from §6.2.1 ( $\mu\text{Ci}/\text{min}$ )

Environmental Services shall determine the Noble Gas Monitor Limiting Concentration for each monitor as follows:

$$C_{NG-max-V} = \frac{L_V}{F_V} \quad (\text{Eq. 6.2-3})$$

Approval	MWS
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where:

$C_{NG-max-V}$  = limiting noble gas concentration for vent V ( $\mu\text{Ci/cc}$ )

$L_V$  = limiting noble gas release rate per vent from Equation 6.2-2 ( $\mu\text{Ci/min}$ )

$F_V$  = vent flow high limit for vent V ( $\text{cc/min}$ )

### 6.2.2 Monitor Limiting Concentration - Noble Gas

Environmental Services shall determine the limiting noble gas concentration as follows:

$$C_{NG} = \frac{L_{NG}}{\sum F_V} \quad (\text{Eq. 6.2-2})$$

Where:

$C_{NG}$  = limiting noble gas concentration ( $\mu\text{Ci/cc}$ )

$L_{NG}$  = site limiting release rate - noble gas from §6.2.1 ( $\mu\text{Ci/min}$ )

$F_V$  = vent flow high limit for vent V ( $\text{cc/min}$ )

### 6.3 Airborne Effluent Monitoring - Iodine and Particulate

Environmental Services shall prepare calculations implementing the following requirements for Airborne Effluent Monitoring of iodine and particulates. Note, the methodology for determining the limiting release rate and concentration for airborne iodine and particulates is evaluated in EC-ENVR-1040.

#### 6.3.1 Site Limiting Release Rate - Iodine

- a. Environmental Services shall determine the limiting I-131 release rate as follows:

$$L'_I = \frac{Q_I * DR_{IP} * k}{D_{IP}} \quad (\text{Eq. 6.3-1})$$

where:

$L'_I$  = provisional limiting release rate- I-131 ( $\mu\text{Ci/min}$ )

$Q_I$  = total I-131 source term (Ci)

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$DR_{IP}$  = dose rate limit for I-131, tritium, and particulate effluent (1500 mrem/year maximum organ, inhalation) (ref. TS 3.11.2.1.b)

$DR_{IP}$  = dose rate limit for I-131, I-133, tritium, and particulate effluent (1500 mrem/year maximum organ, inhalation) (ref. TRO 3.11.2.1, II.A)

$D_{IP}$  = limiting (maximum) organ dose for all age groups resulting from the I-131 source term (mrem)

$D_{IP}$  = limiting (maximum) organ dose for all age groups resulting from the total I-131 and I-133 source term (mrem)

$k$  = units conversion factor  
(1E6  $\mu$ Ci/Ci) \* (1 yr/365 days) \* (1 day/ 24 hours)  
\* (1 hour/ 60 minutes)

Environmental Services shall determine  $D_{IP}$  in accordance with ODCM-QA-004 using the iodine source term and dispersion parameters provided in Attachment A.

Note,  $Q_i$  is the I-131 activity provided in Attachment A. The ratio of the annual source term to the corresponding organ dose is used in the above equations. Thus, either the total annual release per unit or the total annual release for the site may be used.

b. Environmental Services shall set the site limiting release rate for I-131,  $L_i$ , as the lesser of  $L'_i$  and the site limiting release rate for I-131 implemented in the Emergency Plan. The Emergency Plan may be revised to implement  $L'_i$  to provide additional flexibility in plant operations.

### 6.3.2 Monitor Limiting Concentration - Iodine

Environmental Services shall determine the limiting I-131 release rate for each vent as follows:

$$L_{I-V} = 0.2L'_i \quad (\text{Eq. 6.3-2})$$

where:

$L_{I-V}$  = limiting I-131 release rate per vent ( $\mu$ Ci/min)

$L'_i$  = limiting I-131 release rate from §6.3.1 ( $\mu$ Ci/min)

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Environmental Services shall determine the I-131 Limiting Concentration for each monitor as follows:

$$C_{I-max-V} = \frac{L_{I-V}}{F_V} \quad (\text{Eq. 6.3-3})$$

where:

$C_{I-max-V}$  = limiting I-131 concentration for vent V ( $\mu\text{Ci/cc}$ )

$L_{I-V}$  = limiting I-131 release rate per vent from Equation 6.3-2 ( $\mu\text{Ci/min}$ )

$F_V$  = vent flow high limit for vent V ( $\text{cc/min}$ )

### 6.3.2 Monitor Limiting Concentration Iodine

Environmental Services shall determine the limiting I-131 concentration as follows:

$$C_I = \frac{L_I}{\sum F_V} \quad (\text{Eq. 6.3-2})$$

Where:

$C_I$  = limiting I-131 concentration ( $\mu\text{Ci/cc}$ )

$L_I$  = limiting I-131 release rate from §6.3.1 ( $\mu\text{Ci/min}$ )

$F_V$  = vent flow high limit for vent V ( $\text{cc/min}$ )

### 6.3.3 Site Limiting Release Rate - Particulates

- a. Environmental Service shall determine the limiting release rate for particulates as follows:

$$L'_P = \frac{Q_P * DR_{IP} * k}{D_P} \quad (\text{Eq. 6.3-4})$$

where:

$L'_P$  = provisional limiting release rate- particulates ( $\mu\text{Ci/min}$ )

$Q_P$  = total particulate source term (Ci)

Approval	MWS
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$DR_{IP}$  = dose rate limit for I-131, tritium, and particulate effluent (1500 mrem/year maximum organ, inhalation) (ref. TS 3.11.2.1.b)

$DR_{IP}$  = dose rate limit for I-131, I-133, tritium, and particulate effluent (1500 mrem/year maximum organ, inhalation) (ref. TRO 3.11.2.1, II.A)

$D_p$  = limiting (maximum) organ dose for all age groups resulting from the source term  $Q_p$  (mrem)

$k$  = units conversion factor  
( $1E6 \mu\text{Ci}/\text{Ci}$ ) \* (1 yr/365 days) \* (1 day/ 24 hours) \* (1 hour/ 60 minutes)

Environmental Services shall determine  $D_p$  in accordance with ODCM-QA-004 using the particulate source term and dispersion parameters provided in Attachment A.

Note,  $Q_p$  is the sum of the particulate activities provided in Attachment A. The ratio of the annual source term to the corresponding organ dose is used in the above equations. Thus, either the total annual release per unit or the total annual release for the site may be used.

b. Environmental Services shall set the site limiting release rate for particulates,  $L_p$ , as the lesser of  $L'_p$  and the site limiting release rate for particulates implemented in the Emergency Plan. The Emergency Plan may be revised to implement  $L'_p$  to provide additional flexibility in plant operations.

#### 6.3.4 Monitor Limiting Concentration - Particulates

Environmental Services shall determine the limiting particulate release rate for each vent as follows:

$$L_{p-v} = 0.2 L'_p \quad (\text{Eq. 6.3-5})$$

where:

$L_{p-v}$  = limiting particulate release rate per vent ( $\mu\text{Ci}/\text{min}$ )

$L'_p$  = limiting release rate - particulate from §6.3.3 ( $\mu\text{Ci}/\text{min}$ )

Environmental Services shall determine the Particulates Limiting Concentration for each monitor as follows:

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$$C_{P-max-V} = \frac{L_{P-V}}{F_V} \quad (\text{Eq. 6.3-6})$$

where:

$C_{P-max-V}$  = limiting particulate concentration for vent V ( $\mu\text{Ci/cc}$ )

$L_{P-V}$  = limiting particulate release rate per vent from Equation 6.3-5 ( $\mu\text{Ci/min}$ )

$F_V$  = vent flow high limit for vent V ( $\text{cc/min}$ )

#### 6.3.4 Monitoring Limiting Concentration - Particulates

Environmental Services shall determine the limiting particulate concentration as follows:

$$C_P = \frac{L_P}{\sum F_V} \quad (\text{Eq. 6.3-5})$$

where:

$C_P$  = limiting particulate concentration ( $\mu\text{Ci/cc}$ )

$L_P$  = limiting particulate release rate from §6.3.3 ( $\mu\text{Ci/min}$ )

$F_V$  = vent flow high limit for vent v ( $\text{cc/min}$ )

#### 6.4 Airborne Monitor Line Loss Corrections

6.4.1 Chemistry shall apply the following correction factors to monitor data and sample analysis results in order to correct for airborne effluent monitor sample line loss in accordance with station procedures:

Approval	MWS
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**CORRECTION FACTORS**

<b><u>Routine Effluent Monitors</u></b>	<b><u>Iodine</u></b>	<b><u>Particulates</u></b>
Reactor Building Unit 1	1.5	3.2
Reactor Building Unit 2	1.5	3.2
Turbine Building Unit 1	1.6	3.6
Turbine Building Unit 2	1.6	3.6
Standby Gas Treatment	1.5	3.9

<b><u>Post-Accident Vent Monitors</u></b>	<b><u>Iodine</u></b>	<b><u>Particulates</u></b>
Turbine Building Unit 1	1.7	4.2
Turbine Building Unit 2	1.7	4.3
Standby Gas Treatment	1.6	4.4

**7.0 RECORDS**

None.

odcm-qa-003(26)

Approval	MWS
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**PARAMETERS USED TO DETERMINE AIRBORNE EFFLUENT MONITOR SETPOINTS**

NUCLIDE	TOTAL RELEASE (1) (Ci/year per reactor)
Ar-41	2.5E+01
Kr-83m	4.0E+00
Kr-85m	1.7E+03
Kr-85	2.7E+02
Kr-87	3.2E+01
Kr-88	6.6E+02
Xe-131m	7.1E+01
Xe-133m	1.4E+01
Xe-133	1.25E+04
Xe-135m	2.2E+02
Xe-135	5.9E+02
Xe-138	2.9E+02

NUCLIDE	TOTAL RELEASE (1) (Ci/year per reactor)
I-131	1.2E-01
Cr-51	1.2E-04
Mn-54	3.6E-04
Fe-59	1.6E-04
Co-58	5.8E-05
Co-60	1.1E-03
Zn-65	5.5E-05
Sr-89	1.8E-05
Sr-90	3.1E-06
Zr-95	8.7E-06
Sb-124	5.1E-06
Cs-134	1.3E-04
Cs-136	1.3E-03
Cs-137	2.1E-04
Ba-140	4.2E-05
Ce-141	2.9E-05

Annual Average Dispersion Parameters (2)

Relative Concentration	4.1E-5 sec/m <sup>3</sup>
Decayed Relative Concentration	4.1E-5 sec/m <sup>3</sup>
Decayed, depleted Relative Concentration	3.8E-5 sec/m <sup>3</sup>
Deposition Rate	4.2E-8 m <sup>-2</sup>

Notes:

1. Final Environmental Statement Table 4.4.
2. SSES 1982 Meteorology Report.

**PARAMETERS USED TO DETERMINE AIRBORNE EFFLUENT MONITOR SETPOINTS**

NUCLIDE	TOTAL RELEASE (1) (Ci/year per reactor)
Ar-41	2.60E+01
Kr-83m	0.00E+00
Kr-85m	1.10E+01
Kr-85	2.30E+02
Kr-87	1.42E+01
Kr-88	2.22E+01
Kr-89	1.47E+02
Xe-131m	1.80E+01
Xe-133m	0.00E+00
Xe-133	2.23E+03
Xe-135m	6.70E+02
Xe-135	9.73E+02
Xe-137	4.68E+02
Xe-138	2.10E+02

NUCLIDE	TOTAL RELEASE (1) (Ci/year per reactor)
I-131 (2)	1.02E-01/1.23E-01
I-133(2)	1.14E+00/1.45E+00
Cr-51	2.08E-05
Mn-54	5.52E-05
Fe-59	7.10E-06
Co-58	7.00E-06
Co-60	1.23E-04
Zn-65	6.53E-05
Sr-89	1.25E-05
Sr-90	1.40E-07
Nb-95	1.00E-04
Zr-95	1.81E-05
Ru-103	4.21E-05
Ag-110m	2.40E-08
Sb-124	1.40E-06
Cs-134	7.46E-05
Cs-136	7.10E-06
Cs-137	1.11E-04
Ba-140	2.51E-04
Ce-141	2.91E-05

Annual Average Dispersion Parameters - Limiting Site Boundary (3)

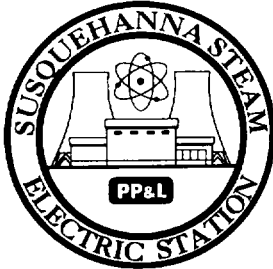
Relative Concentration	1.46E-5 sec/m <sup>3</sup>
Decayed Relative Concentration	1.46E-5 sec/m <sup>3</sup>
Decayed, Depleted Relative Concentration	1.35E-5 sec/m <sup>3</sup>
Deposition Rate	3.35E-8 m <sup>-2</sup>

Notes:

1. Design basis "expected" gaseous effluent releases per EC-RADN-1041 (particulates with half-lives greater than 8 days)
2. Use limiting case Normal Water Chemistry/Hydrogen Water Chemistry
3. 1973-76 Meteorological Data Updated to 1996 Land Use Survey per EC-RADN-1041



# PROCEDURE COVER SHEET

	NUCLEAR DEPARTMENT PROCEDURE	ODCM-QA-004 Revision 1 Page 1 of 57
	AIRBORNE EFFLUENT DOSE CALCULATIONS	
<u>QUALITY CLASSIFICATION:</u> <input checked="" type="checkbox"/> QA Program <input type="checkbox"/> Non-QA Program		<u>APPROVAL CLASSIFICATION:</u> <input checked="" type="checkbox"/> Plant <input type="checkbox"/> Non-Plant <input type="checkbox"/> Instruction
EFFECTIVE DATE: <u>10/12/00</u> PERIODIC REVIEW FREQUENCY: <u>N/A</u> PERIODIC REVIEW DUE DATE: <u>N/A</u>		
<u>RECOMMENDED REVIEWS:</u>  		
Procedure Owner: <u>R. K. Barclay</u>  Responsible Supervisor: <u>Supervisor – Environmental Services</u>  Responsible FUM: <u>Manager – Nuclear Technology</u>  Responsible Approver: <u>General Manager – SSES</u>		

## **PROCEDURE REVISION SUMMARY**

### **TITLE: AIRBORNE EFFLUENT DOSE CALCULATIONS**

1. Added the grass-to-meat-to-man airborne pathway to those already listed in Step 2.5.3 to be consistent with the airborne pathways listed in TR B 3.11.2.3.
2. Added Step 2.5.5 to ensure that the ODCM specifically requires as part of its dose calculation methodology that data from specific Insignificant Effluent Pathways be included, at least quarterly, in surveillances performed to show compliance with applicable TR dose limits.
3. Changed Steps 2.6.1.a, 2.6.1.b, and 2.6.1.c, as appropriate, to instruct that effluent from the following Insignificant Effluent Pathways are included when determining compliance with SSES radioactive effluent dose limits on a "per reactor unit" basis: Units 1 and 2 CSTs, Units 1 and 2 Main Turbine and RFPT Lube Oil systems, Units 1 and 2 Hydrogen Seal Oil Systems, and the RWST. Added words to Step 2.6.1.c to address apportionment of releases from common systems or structures on other than an equal basis if sufficient information is available to do so. Added the Sewage Treatment Plant.
4. Removed redundant steps and gray shading incorporated for the transition to ITS.
5. A minor editorial change was made to Step 4.2.1 to emphasize the action to be taken rather than the responsibility to take the action. This makes Step 4.2.1 consistent with the format and emphasis of Step 4.2.2.
6. Step 2.4.2 deleted in response to CR #183964. This CR determined that the requirement in Step 2.4.2 to add a margin of 15% (a factor of 1.15) is "unnecessarily conservative."

The above changes have been evaluated as to not decrease the level of effluent control or the accuracy and/or reliability of dose calculations or setpoint determinations as required by 10CFR20.1302, 40CFR190, 10CFR50.36a and 10CFR50, Appendix I.

In addition, these changes (1) do not alter the conduct of the radiological environmental monitoring program, (2) do not change the radioactive effluent controls and radiological environmental monitoring activities, and (3) do not change the scope of information to be included in the Annual Radiological Environmental Operating and Radioactive Effluent Release Reports.

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## 1.0 PURPOSE

The purpose of this procedure is to provide the methodology and parameters used in calculating air dose resulting from noble gas effluent and maximum individual, whole body, and organ doses due to airborne effluents to ensure compliance with the dose limitations in the Technical Requirements Manual (Sections 3.11.2.2, 3.11.2.3, 3.11.2.5 and 3.11.3) and 10CFR20.1302.

This procedure constitutes part of the SSES Offsite Dose Calculation Manual (ODCM) which is a licensing basis document.

## 2.0 POLICY/DISCUSSION

### 2.1 Meteorological Parameters

- 2.1.1 The meteorological parameters are provided by the SSES meteorology program. Instrumentation and controls necessary to ensure that sufficient meteorological data are available to determine radiation doses to the public as a result of radioactive releases are specified in TR 3.3.3. Data reduction and evaluation are performed in accordance with NEPM-QA-1017.
- 2.1.2 Annual dose calculations for the Annual Effluent and Waste Disposal Report are based on the actual meteorological conditions concurrent with the reporting year.
- 2.1.3 Monthly dose calculations are based on the limiting sector average annual dispersion factors based on a selected period of time. The dispersion factors currently used are provided in Attachment B.
- 2.1.4 The methodology described herein incorporates parameters specific to the SSES site (Attachment C).
- 2.1.5 Use of the no-decay-undepleted X/Q is recommended for manual dose computations, because it is conservative for all isotopes. Consideration for depletion of radioiodines and particulates and radioactive decay of the plume is acceptable, but not required. The Environmental Services - Health Physicist (Effluent) or the Meteorological Contract Administrator should be contacted for details.

### 2.2 Noble Gases

- 2.2.1 The methods for sampling and analysis of continuous ventilation releases are given in the applicable plant procedures.

### 2.3 Radionuclides Other Than Noble Gases

- 2.3.1 The methods for sampling and analysis of continuous ventilation releases for radioiodines and radioactive particulates are given in the applicable plant procedures and shall be performed in accordance with TR Table 3.11.2.1-1.

## 2.4 Use of GASPAR Computer Program

- 2.4.1 Airborne effluent surveillances and dose projection calculations are performed using the GASPAR computer program as a method of implementing the methodology of Regulatory Guide 1.109. This program calculates the maximum individual doses due to radionuclides released in gaseous effluents from SSES. The GASPAR computer code was developed by the NRC to perform dose calculations from airborne effluent using the assumptions of Regulatory Guide 1.109.

The code implements the semi-infinite cloud model and the dose calculational models of Regulatory Guide 1.109 and is used to calculate maximum individual doses and maximum individual organ doses from SSES. A more detailed description of the GASPAR code can be found in NUREG-0597 and NUREG/CR-4653.

## 2.5 Effluent Data

- 2.5.1 The total number of Curies released for each radionuclide during the time period being evaluated is supplied by the SSES effluent monitoring program.
- 2.5.2 For determination of compliance with the Technical Requirements Manual dose limits, effluent totals shall be based only on activity positively detected at the 95% confidence level.
- 2.5.3 Applicable airborne pathways at SSES include immersion, inhalation, ground exposure, vegetable ingestion, and cow-milk ingestion.

The grass-to-meat-to-man airborne pathway is applicable depending on its identification in the annual Land Use Census Report.

- 2.5.4 Quarterly doses are the summation of the applicable monthly values.
- 2.5.5 Effluent data from the following Insignificant Effluent Pathways shall be included in surveillances to show compliance with the applicable TR dose limits at least quarterly: Units 1 and 2 CSTs, Units 1 and 2 Main Turbine and RFPT Lube Oil systems, Units 1 and 2 Hydrogen Seal Oil Systems, the RWST, and the Sewage Treatment Facility.

The contribution from Insignificant Effluent Pathways to the total dose from all SSES effluents should be small enough that the dose from these pathways combined with the dose from Significant Effluent Pathways



would not be expected to challenge the radiological effluent dose limits for the SSES.

## 2.6 Assignment of Releases to the Reactor Units

2.6.1 For determination of compliance with SSES radioactive effluent dose limits which are on a "per reactor unit" basis:

- a. Effluent from the Unit 1 Reactor Building vent and the Unit 1 Turbine Building vent shall be included as Unit 1 releases. Effluent from the following Insignificant Effluent Pathways associated with Unit 1 shall also be included in the Unit 1 releases: the Unit 1 Condensate Storage Tank Vent, the Unit 1 Main Turbine and RFPT Lube Oil System vents, and the Unit 1 Hydrogen Seal Oil system vent. The Radwaste Building vent shall also be included in Unit 1 releases.
- b. Effluent from the Unit 2 Reactor Building vent and the Unit 2 Turbine Building vent shall be included as Unit 2 releases. Effluents from the following Insignificant Effluent Pathways associated with Unit 2 shall also be included in the Unit 2 releases: the Unit 2 Condensate Storage Tank vent, the Unit 2 Main Turbine and RFPT Lube Oil System vents, and the Unit 2 Hydrogen Seal Oil System vent.
- c. Effluent from the Standby Gas Treatment System vent and the following Insignificant Effluent Pathways common to both Units 1 and 2 shall be divided equally between Units 1 and 2 releases, or apportioned appropriately between the units if sufficient information is available: Refueling Water Storage Tank and the Sewage Treatment Plant.

## 3.0 REFERENCES

- 3.1 TR Table 3.11.2.1-1, Radioactive Gaseous Waste Sampling and Analysis Program
- 3.2 TR 3.11.2.2, [Radioactive Effluents] [Gaseous Effluents] Dose-Noble Gases
- 3.3 TR 3.11.2.3, [Radioactive Effluents] [Gaseous Effluents] Dose-Iodine, Tritium, and Radionuclides in Particulate Form
- 3.4 TR 3.11.2.5, [Radioactive Effluents] [Gaseous Effluents] Ventilation Exhaust Treatment System
- 3.5 TR 3.11.3, Total Dose
- 3.6 TR 3.3.3, Meteorological Instrumentation

- 3.7 10CFR20 Appendix B, Annual Limits on Intake (ALIs) and Derived Air Concentrations (DACs) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewage
- 3.8 Regulatory Guide 1.109, Rev. 1, October, 1977, Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purposes of Evaluating Compliance with 10 CFR 50, Appendix I
- 3.9 NUREG-0133, Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants
- 3.10 NEPM-QA-1011, Radiological Effluent Dose Calculation and Reporting
- 3.11 NEPM-QA-1017, SSES Meteorological Data Processing and Reporting
- 3.12 ODCM-QA-006, Total Dose Calculations
- 3.13 NUREG/CR-0597, "User's Guide to GASPAR Code"
- 3.14 NUREG/CR-4653, 1987, GASPAR II - Technical Reference and User Guide
- 3.15 PP&L Study EC-ENVR-1031, "Software Verification and Validation Test Report- GASPAR", Rev. 0.
- 3.16 Reference letter R. K. Barclay to File R9-5, "Technical Documentation of Lotus 1-2-3 ODCMTAB and TGTMSR Files: Gaseous Factor Calculation using NUREG-0133/ Reg. Guide 1.109 Methodology," PLI-69605, 11/8/91
- 3.17 Reference letter R. K. Barclay to File R9-5, "Technical Documentation: ODCMTAB.WK1 Revision 1 Correction of Tritium in Vegetation Pathway Dose Calculations Factor Algorithm," PLI 72980, 11/24/92
- 3.18 PP&L Calculation EC-ENVR-1035, "Investigation of GASPAR Program Cow Milk Ingestion Pathway Discrepancy," Rev. 0
- 3.19 FSAR Chapter 11.3, Gaseous Waste Management Systems

#### **4.0 RESPONSIBILITIES**

##### **4.1 Supervisor- Operations Technology**

- 4.1.1 Ensures adequacy and correctness of methodology to be used in calculating doses resulting from airborne effluents.

##### **4.2 Environmental Services- Health Physicist (Effluent)**

- 4.2.1 Determines the cumulative dose contributions for the current calendar quarter and current calendar year every 31 days in fulfillment of TRSs

3.11.2.2.1, 3.11.2.3.1, 3.11.3.1 in accordance with NEPM-QA-1011, Radiological Effluent Dose Calculation and Reporting.

4.2.2 Develops methodology and parameters to be used in calculating doses resulting from airborne effluents to ensure compliance with the dose limitations in the Technical Requirements Manual.

#### 4.3 Meteorological Contract Administrator

4.3.1 Coordinates and reviews data collection, processing, and reporting of SSES meteorological data.

### 5.0 DEFINITIONS

5.1 FID - Fraction of airborne radioiodine effluent that is estimated to be elemental iodine. The fraction of iodine deposited (FID) is assumed to be 0.5 (Regulatory Guide 1.109 (page 1.109-26)).

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

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

### 6.0 PROCEDURE

#### 6.1 Noble Gases

6.1.1 The Environmental Services Health Physicist shall determine the dose rate at a specified location due to noble gases released in airborne effluents by the following equation for whole body dose:

$$D_{wb} = \sum_i (K_i)(X/Q)_v (Q'_{iv}) (S_F) \quad (\text{Eq. 1})$$

and by the following equation for skin dose:

$$D_S = \sum_i [L_i + ((1.11 (M_i)(S_F)))] (X/Q)_v (Q'_{iv}) \quad (\text{Eq. 2})$$

where:

- $D_{wb}$  = the annual whole body dose (mrem/yr).
- $K_i$  = the whole body dose factor due to gamma emissions for each identified noble gas radionuclide (i) (mrem/yr per  $\mu\text{Ci}/\text{m}^3$ ) from Attachment A.
- $(X/Q)_v$  = the relative concentration factor for the specified location from vent release point (v) such as from Attachment B ( $\text{sec}/\text{m}^3$ ).
- $Q'_{iv}$  = the release rate of radionuclide (i) from vent (v) ( $\mu\text{Ci}/\text{sec}$ ).
- $S_F$  = the gamma shielding factor  
 = 0.7 for maximally exposed individual  
 = 1.0 for instantaneous dose rate
- $D_s$  = the annual skin dose (mrem/yr).
- $L_i$  = the skin dose factor due to the beta emissions for each identified noble gas radionuclide (i) (mrem/yr per  $\mu\text{Ci}/\text{m}^3$ ) from Attachment A.
- $M_i$  = the air dose factor due to gamma emissions for each identified noble gas radionuclide (i) (mrad/yr per  $\mu\text{Ci}/\text{m}^3$ ) from Attachment A (conversion constant of 1.11 converts [air dose- mrad] to [skin dose-mrem]).

6.1.2 The Environmental Services Health Physicist shall determine the air dose at a specified location due to noble gases released in airborne effluents during any specified time period by the following equation for gamma radiation:

$$D_g = 3.17E - 8 \sum_i (M_i)(X / Q)_v (Q_{iv}) \quad (\text{Eq. 3})$$

and by the following equation for beta radiation:

$$D_b = 3.17E - 8 \sum_i (N_i)(X / Q)_v (Q_{iv}) \quad (\text{Eq. 4})$$

where:

- $D_g$  = the total gamma air dose from airborne effluents for the specified time period (mrad).

- $D_b$  = the total beta air dose from airborne effluents for the specified time period (mrad).
- $3.17E-8$  = the inverse of seconds in a year (yr/sec).
- $M_i$  = the air dose factor due to gamma emissions for each identified noble gas radionuclide (i) (mrad/yr per  $\mu\text{Ci}/\text{m}^3$ ) from Attachment A.
- $N_i$  = the air dose factor due to beta emissions for each identified noble gas radionuclide (i) (mrad/yr per  $\mu\text{Ci}/\text{m}^3$ ) from Attachment A.
- $(X/Q)_v$  = the relative concentration factor for the specified location from vent release point (v) such as from Attachment B ( $\text{sec}/\text{m}^3$ ).
- $Q_{iv}$  = the integrated release rate of radionuclide (i) from all vents (v) for a specified time period ( $\mu\text{Ci}$ ).

## 6.2 Radionuclides Other Than Noble Gases

- 6.2.1 The Environmental Services Health Physicist shall determine the dose rate at a specified location due to inhalation of radioactive materials released in airborne effluent (including I-131 and I-133) by the following equation for any organ:

$$D_c = \sum_i (R_i)(W_v)(Q'_{iv}) \quad (\text{Eq. 5})$$

where:

- $D_c$  = the annual organ dose (mrem/yr).
- $R_i$  = the dose rate parameter based on inhalation pathway for radionuclides other than noble gases for the inhalation pathway (mrem/yr per  $\mu\text{Ci}/\text{m}^3$ ) from Attachment D.
- $W_v$  = the relative concentration factor for the specified location from vent release point (v) from Attachment B ( $\text{sec}/\text{m}^3$ ).
- $Q'_{iv}$  = the release rate of radionuclide (i) from vent (v) ( $\mu\text{Ci}/\text{sec}$ ).

- 6.2.2 The Environmental Services Health Physicist shall determine the critical organ dose to an individual from radionuclides other than noble gases released in airborne effluent (including I-131 and I-133) during any specified time period at a specified location by the following equation:

$$D_c = 3.17E-8 \sum_i (R_i)(W_v)(Q_{iv}) \quad (\text{Eq. 6})$$

where:

- $D_c$  = the total dose to a critical organ from radionuclides other than noble gases for a specified time period (mrem).
- $R_i$  = the dose rate parameter based on inhalation pathway for each radionuclide other than noble gases (i) for the inhalation pathway (mrem/yr per  $\mu\text{Ci}/\text{m}^3$ ) and for ingestion and ground plane pathways (mrem- $\text{m}^2/\text{yr}$  per  $\mu\text{Ci}/\text{sec}$ ) from Attachment D.
- $W_v$  = Relative concentration ( $X/Q$ ) ( $\text{sec}/\text{m}^3$ ) for the inhalation pathway and relative deposition ( $D/Q$ :  $\text{m}^{-2}$ ) for the ingestion and ground pathways such as from Attachment B.
- $Q_{iv}$  = the integrated release of radionuclide (i) from all vents (v) for a specified time period ( $\mu\text{Ci}$ ).
- $3.17E-8$  = the inverse of seconds in a year (yr/sec)

For radioiodines, the deposition model considers only the elemental fraction of the effluent. Thus, deposition is computed only for that fraction of the effluent that is estimated to be elemental iodine. The fraction iodine deposited (FID) is assumed to be 0.5 (Regulatory Guide 1.109 (page 1.109-26)). The deposition pathway dose factors for radioiodines presented in Attachment D have been adjusted by a factor of 0.5.

### 6.3 Use of GASPAR Computer Program

- 6.3.1 The Environmental Services Health Physicist shall use the standard site specific information listed in Attachment C when GASPAR is used for surveillance purposes as described in NEPM-QA-1011, Attachments D and E.

#### 6.4 Airborne Effluent Dose Calculations Exceeding Twice the Quarterly or Annual TRM Values

- 6.4.1 When the results of airborne dose calculations exceed twice the value of TR's 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3.a, or 3.11.2.3.b, calculations shall be made which include the direct radiation contribution in accordance with ODCM-QA-006 to determine if the limits of TR 3.11.3 have been exceeded. If the limits of TR 3.11.3 have been exceeded, a special report shall be prepared and submitted to the NRC within 30 days which addresses the actions specified in TR 3.11.3.

### 7.0 RECORDS

None.

odcm-qa-004(26)

### **DOSE FACTORS FOR NOBLE GASES (1)**

	Whole Body Dose Factor	Skin Dose Factor	Gamma Air Dose Factor	Beta Air Dose Factor
	$K_i$	$L_i$	$M_i$	$N_i$
Radionuclide	(mrem/yr per $\mu\text{Ci}/\text{m}^3$ )	(mrem/yr-per $\mu\text{Ci}/\text{m}^3$ )	(mrad/yr per $\mu\text{Ci}/\text{m}^3$ )	(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

1. The listed dose factors are for radionuclides that may be detected in airborne effluents and derived from Table B-1 in Reg. Guide 1.109.



**ANNUAL AVERAGE DISPERSION FACTORS  
USED FOR MONTHLY SURVEILLANCES <sup>(1)</sup>**

Type of Location	Direction	Distance (miles)	X/Q (sec/m <sup>3</sup> )	X/Q (sec/m <sup>3</sup> )	X/Q (sec/m <sup>3</sup> )	D/Q (per m <sup>2</sup> )
			no decay	2.260 day decay	8.000 day decay	
			undepleted	undepleted	depleted	
Maximum Site Boundary	SW	0.60	2.40E-05	2.40E-05	2.10E-05	3.00E-08
Closest Site Boundary	S	0.34	1.40E-05	1.40E-05	1.30E-05	4.50E-08
Maximum X/Q Residence	WSW	1.16	1.10E-05	1.10E-05	9.70E-06	1.10E-08
Maximum Dairy Animal	WSW	1.70	6.60E-06	6.50E-06	5.50E-06	6.10E-09
Maximum D/Q Residence	SE	0.38	4.10E-06	4.10E-06	3.80E-06	2.20E-08

**Notes:**

1. July, 1981, through December, 1985, meteorological data.

**SITE SPECIFIC INFORMATION USED BY GASPAR CODE**

1)	The distance from the facility to the NE corner of the U.S. (Maine)	590 miles
2)	Fraction of year leafy vegetables are grown	0.33
3)	Fraction of year cows are on pasture (April-Nov.)	0.60
4)	Fraction of crop from garden	0.76
5)	Fraction of daily intake of cows derived from pasture while on pasture	0.42
6)	Absolute humidity over growing season	9.0 g/m <sup>3</sup>
	Relative humidity if T is supplied	67.6%
7)	Average temperature over growing season	60.2 °F
8)	Fraction of year goats are on pasture	0.60
9)	Fraction of daily intake of goat from pasture while on pasture	0.75
10)	Fraction of year beef cattle are on pasture	0.60
11)	Fraction of daily intake of beef cattle derived from pasture while on pasture	0.55

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	H-3								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	0.00E+00	1.38E+03	1.38E+03	1.38E+03	1.38E+03	1.38E+03	1.38E+03	N/A
MILK	TEEN	0.00E+00	1.80E+03	1.80E+03	1.80E+03	1.80E+03	1.80E+03	1.80E+03	N/A
	CHILD	0.00E+00	2.84E+03	2.84E+03	2.84E+03	2.84E+03	2.84E+03	2.84E+03	N/A
	INFANT	0.00E+00	4.31E+03	4.31E+03	4.31E+03	4.31E+03	4.31E+03	4.31E+03	N/A
COW	ADULT	0.00E+00	6.77E+02	6.77E+02	6.77E+02	6.77E+02	6.77E+02	6.77E+02	N/A
MILK	TEEN	0.00E+00	8.82E+02	8.82E+02	8.82E+02	8.82E+02	8.82E+02	8.82E+02	N/A
	CHILD	0.00E+00	1.39E+03	1.39E+03	1.39E+03	1.39E+03	1.39E+03	1.39E+03	N/A
	INFANT	0.00E+00	2.11E+03	2.11E+03	2.11E+03	2.11E+03	2.11E+03	2.11E+03	N/A
MEAT	ADULT	0.00E+00	2.89E+02	2.89E+02	2.49E+05	2.89E+02	2.89E+02	2.89E+02	N/A
	TEEN	0.00E+00	1.72E+02	1.72E+02	1.72E+02	1.72E+02	1.72E+02	1.72E+02	N/A
	CHILD	0.00E+00	2.08E+02	2.08E+02	2.08E+02	2.08E+02	2.08E+02	2.08E+02	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	1.82E+03	1.82E+03	1.82E+03	1.82E+03	1.82E+03	1.82E+03	N/A
	TEEN	0.00E+00	2.18E+03	2.18E+03	2.18E+03	2.18E+03	2.18E+03	2.18E+03	N/A
	CHILD	0.00E+00	3.42E+03	3.42E+03	3.42E+03	3.42E+03	3.42E+03	3.42E+03	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	4.17E+03	4.17E+03	4.17E+03	4.17E+03	4.17E+03	4.17E+03	N/A
INGESTION	TEEN	0.00E+00	5.03E+03	5.03E+03	5.03E+03	5.03E+03	5.03E+03	5.03E+03	N/A
	CHILD	0.00E+00	7.86E+03	7.86E+03	7.86E+03	7.86E+03	7.86E+03	7.86E+03	N/A
	INFANT	0.00E+00	6.43E+03	6.43E+03	6.43E+03	6.43E+03	6.43E+03	6.43E+03	N/A
INHALATION	ADULT	0.00E+00	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	1.26E+03	N/A
	TEEN	0.00E+00	1.27E+03	1.27E+03	1.27E+03	1.27E+03	1.27E+03	1.27E+03	N/A
	CHILD	0.00E+00	1.12E+03	1.12E+03	1.12E+03	1.12E+03	1.12E+03	1.12E+03	N/A
	INFANT	0.00E+00	6.47E+02	6.47E+02	6.47E+02	6.47E+02	6.47E+02	6.47E+02	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	4.31E+03	2.11E+03	2.89E+02	3.42E+03	7.86E+03	1.27E+03

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	C-14								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	1.69E+08	3.39E+07	3.39E+07	3.39E+07	3.39E+07	3.39E+07	3.39E+07	N/A
MILK	TEEN	3.12E+08	6.24E+07	6.24E+07	6.24E+07	6.24E+07	6.24E+07	6.24E+07	N/A
	CHILD	7.68E+08	1.54E+08	1.54E+08	1.54E+08	1.54E+08	1.54E+08	1.54E+08	N/A
	INFANT	1.50E+09	3.21E+08	3.21E+08	3.21E+08	3.21E+08	3.21E+08	3.21E+08	N/A
COW	ADULT	1.35E+08	2.71E+07	2.71E+07	2.71E+07	2.71E+07	2.71E+07	2.71E+07	N/A
MILK	TEEN	2.50E+08	4.99E+07	4.99E+07	4.99E+07	4.99E+07	4.99E+07	4.99E+07	N/A
	CHILD	6.14E+08	1.23E+08	1.23E+08	1.23E+08	1.23E+08	1.23E+08	1.23E+08	N/A
	INFANT	1.20E+09	2.57E+08	2.57E+08	2.57E+08	2.57E+08	2.57E+08	2.57E+08	N/A
MEAT	ADULT	1.36E+08	2.72E+07	2.72E+07	2.72E+07	2.72E+07	2.72E+07	2.72E+07	N/A
	TEEN	1.15E+08	2.30E+07	2.30E+07	2.30E+07	2.30E+07	2.30E+07	2.30E+07	N/A
	CHILD	2.16E+08	4.33E+07	4.33E+07	4.33E+07	4.33E+07	4.33E+07	4.33E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	2.06E+08	4.13E+07	4.13E+07	4.13E+07	4.13E+07	4.13E+07	4.13E+07	N/A
	TEEN	3.49E+08	6.98E+07	6.98E+07	6.98E+07	6.98E+07	6.98E+07	6.98E+07	N/A
	CHILD	8.53E+08	1.71E+08	1.71E+08	1.71E+08	1.71E+08	1.71E+08	1.71E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	6.47E+08	1.29E+08	1.29E+08	1.29E+08	1.29E+08	1.29E+08	1.29E+08	N/A
INGESTION	TEEN	1.03E+09	2.05E+08	2.05E+08	2.05E+08	2.05E+08	2.05E+08	2.05E+08	N/A
	CHILD	2.45E+09	4.90E+08	4.90E+08	4.90E+08	4.90E+08	4.90E+08	4.90E+08	N/A
	INFANT	2.71E+09	5.78E+08	5.78E+08	5.78E+08	5.78E+08	5.78E+08	5.78E+08	N/A
INHALATION	ADULT	1.82E+04	3.41E+03	3.41E+03	3.41E+03	3.41E+03	3.41E+03	3.41E+03	N/A
	TEEN	2.60E+04	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	4.87E+03	N/A
	CHILD	3.59E+04	6.73E+03	6.73E+03	6.73E+03	6.73E+03	6.73E+03	6.73E+03	N/A
	INFANT	2.65E+04	5.31E+03	5.31E+03	5.31E+03	5.31E+03	5.31E+03	5.31E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	1.50E+09	1.20E+09	2.16E+08	8.53E+08	2.71E+09	3.59E+04

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	P-32								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	9.28E+09	5.77E+08	3.59E+08	0.00E+00	0.00E+00	0.00E+00	1.04E+09	N/A
MILK	TEEN	1.71E+10	1.06E+09	6.64E+08	0.00E+00	0.00E+00	0.00E+00	1.44E+09	N/A
	CHILD	4.22E+10	1.98E+09	1.63E+09	0.00E+00	0.00E+00	0.00E+00	1.17E+09	N/A
	INFANT	7.25E+10	5.12E+09	3.37E+09	0.00E+00	0.00E+00	0.00E+00	1.18E+09	N/A
COW	ADULT	4.36E+09	2.71E+08	1.69E+08	0.00E+00	0.00E+00	0.00E+00	4.91E+08	N/A
MILK	TEEN	8.05E+09	4.99E+08	3.12E+08	0.00E+00	0.00E+00	0.00E+00	6.77E+08	N/A
	CHILD	1.99E+10	9.29E+08	7.65E+08	0.00E+00	0.00E+00	0.00E+00	5.49E+08	N/A
	INFANT	4.09E+10	2.41E+09	1.59E+09	0.00E+00	0.00E+00	0.00E+00	5.54E+08	N/A
MEAT	ADULT	1.55E+09	9.63E+07	5.99E+07	0.00E+00	0.00E+00	0.00E+00	1.74E+08	N/A
	TEEN	1.31E+09	8.11E+07	5.07E+07	0.00E+00	0.00E+00	0.00E+00	1.10E+08	N/A
	CHILD	2.47E+09	1.15E+08	9.51E+07	0.00E+00	0.00E+00	0.00E+00	6.82E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	7.09E+08	4.41E+07	2.74E+07	0.00E+00	0.00E+00	0.00E+00	7.98E+07	N/A
	TEEN	9.57E+08	5.93E+07	3.71E+07	0.00E+00	0.00E+00	0.00E+00	8.05E+07	N/A
	CHILD	2.16E+09	1.01E+08	8.34E+07	0.00E+00	0.00E+00	0.00E+00	5.98E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.59E+10	9.89E+08	6.15E+08	0.00E+00	0.00E+00	0.00E+00	1.79E+09	N/A
INGESTION	TEEN	2.74E+10	1.70E+09	1.06E+09	0.00E+00	0.00E+00	0.00E+00	2.31E+09	N/A
	CHILD	6.67E+10	3.12E+09	2.57E+09	0.00E+00	0.00E+00	0.00E+00	1.84E+09	N/A
	INFANT	1.13E+11	7.53E+09	4.96E+09	0.00E+00	0.00E+00	0.00E+00	1.73E+09	N/A
INHALATION	ADULT	1.32E+06	7.71E+04	5.01E+04	0.00E+00	0.00E+00	0.00E+00	8.64E+04	N/A
	TEEN	1.89E+06	1.10E+05	7.16E+04	0.00E+00	0.00E+00	0.00E+00	9.28E+04	N/A
	CHILD	2.60E+06	1.14E+05	9.88E+04	0.00E+00	0.00E+00	0.00E+00	4.22E+04	N/A
	INFANT	2.03E+06	1.12E+05	7.74E+04	0.00E+00	0.00E+00	0.00E+00	1.61E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	7.25E+10	4.09E+10	2.47E+09	2.16E+09	1.13E+11	2.60E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Cr-51								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	5.45E+06
	TEEN	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	5.45E+06
	CHILD	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	5.45E+06
	INFANT	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	4.61E+06	5.45E+06
GOAT	ADULT	0.00E+00	0.00E+00	1.61E+03	9.64E+02	3.55E+02	2.14E+03	4.06E+05	N/A
MILK	TEEN	0.00E+00	0.00E+00	2.82E+03	1.56E+03	6.17E+02	4.02E+03	4.73E+05	N/A
	CHILD	0.00E+00	0.00E+00	5.74E+03	3.19E+03	8.71E+02	5.82E+03	3.05E+05	N/A
	INFANT	0.00E+00	0.00E+00	9.10E+03	5.94E+03	1.30E+03	1.16E+04	2.65E+05	N/A
COW	ADULT	0.00E+00	0.00E+00	7.99E+03	4.77E+03	1.76E+03	1.06E+04	2.01E+06	N/A
MILK	TEEN	0.00E+00	0.00E+00	1.39E+04	7.75E+03	3.06E+03	1.99E+04	2.34E+06	N/A
	CHILD	0.00E+00	0.00E+00	2.84E+04	1.58E+04	4.32E+03	2.88E+04	1.51E+06	N/A
	INFANT	0.00E+00	0.00E+00	4.51E+04	2.94E+04	6.43E+03	5.72E+04	1.31E+06	N/A
MEAT	ADULT	0.00E+00	0.00E+00	2.50E+03	1.49E+03	5.50E+02	3.31E+03	6.28E+05	N/A
	TEEN	0.00E+00	0.00E+00	2.00E+03	1.11E+03	4.38E+02	2.85E+03	3.36E+05	N/A
	CHILD	0.00E+00	0.00E+00	3.11E+03	1.73E+03	4.72E+02	3.16E+03	1.65E+05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	0.00E+00	3.35E+04	2.01E+04	7.39E+03	4.45E+04	8.44E+06	N/A
	TEEN	0.00E+00	0.00E+00	5.02E+04	2.79E+04	1.10E+04	7.17E+04	8.44E+06	N/A
	CHILD	0.00E+00	0.00E+00	9.96E+04	5.53E+04	1.51E+04	1.01E+05	5.28E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	0.00E+00	4.56E+04	2.73E+04	1.01E+04	6.06E+04	1.15E+07	N/A
INGESTION	TEEN	0.00E+00	0.00E+00	6.90E+04	3.83E+04	1.51E+04	9.85E+04	1.16E+07	N/A
	CHILD	0.00E+00	0.00E+00	1.37E+05	7.60E+04	2.08E+04	1.39E+05	7.26E+06	N/A
	INFANT	0.00E+00	0.00E+00	5.42E+04	3.53E+04	7.72E+03	6.88E+04	1.58E+06	N/A
INHALATION	ADULT	0.00E+00	0.00E+00	1.00E+02	5.95E+01	2.28E+01	1.44E+04	3.32E+03	N/A
	TEEN	0.00E+00	0.00E+00	1.35E+02	7.50E+01	3.07E+01	2.10E+04	3.00E+03	N/A
	CHILD	0.00E+00	0.00E+00	1.54E+02	8.55E+01	2.43E+01	1.70E+04	1.08E+03	N/A
	INFANT	0.00E+00	0.00E+00	8.95E+01	5.75E+01	1.32E+01	1.28E+04	3.57E+02	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
4.61E+06	5.45E+06	4.73E+05	2.34E+06	6.28E+05	8.44E+06	1.16E+07	2.10E+04

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Mn-54								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.61E+09
	TEEN	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.61E+09
	CHILD	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.61E+09
	INFANT	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.37E+09	1.61E+09
GOAT	ADULT	0.00E+00	6.14E+05	1.17E+05	0.00E+00	1.83E+05	0.00E+00	1.88E+06	N/A
MILK	TEEN	0.00E+00	1.02E+06	2.03E+05	0.00E+00	3.05E+05	0.00E+00	2.10E+06	N/A
	CHILD	0.00E+00	1.53E+06	4.07E+05	0.00E+00	4.29E+05	0.00E+00	1.28E+06	N/A
	INFANT	0.00E+00	2.84E+06	6.45E+05	0.00E+00	6.30E+05	0.00E+00	1.04E+06	N/A
COW	ADULT	0.00E+00	3.92E+06	7.49E+05	0.00E+00	1.17E+06	0.00E+00	1.20E+07	N/A
MILK	TEEN	0.00E+00	6.54E+06	1.30E+06	0.00E+00	1.95E+06	0.00E+00	1.34E+07	N/A
	CHILD	0.00E+00	9.78E+06	2.61E+06	0.00E+00	2.74E+06	0.00E+00	8.21E+06	N/A
	INFANT	0.00E+00	1.82E+07	4.12E+06	0.00E+00	4.03E+06	0.00E+00	6.68E+06	N/A
MEAT	ADULT	0.00E+00	4.79E+06	9.14E+05	0.00E+00	1.43E+06	0.00E+00	1.47E+07	N/A
	TEEN	0.00E+00	3.65E+06	7.25E+05	0.00E+00	1.09E+06	0.00E+00	7.49E+06	N/A
	CHILD	0.00E+00	4.18E+06	1.11E+06	0.00E+00	1.17E+06	0.00E+00	3.51E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	2.80E+08	5.35E+07	0.00E+00	8.34E+07	0.00E+00	8.58E+08	N/A
	TEEN	0.00E+00	4.27E+08	8.46E+07	0.00E+00	1.27E+08	0.00E+00	8.75E+08	N/A
	CHILD	0.00E+00	6.34E+08	1.69E+08	0.00E+00	1.78E+08	0.00E+00	5.32E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	2.90E+08	5.53E+07	0.00E+00	8.62E+07	0.00E+00	8.87E+08	N/A
INGESTION	TEEN	0.00E+00	4.38E+08	8.69E+07	0.00E+00	1.31E+08	0.00E+00	8.98E+08	N/A
	CHILD	0.00E+00	6.49E+08	1.73E+08	0.00E+00	1.82E+08	0.00E+00	5.45E+08	N/A
	INFANT	0.00E+00	2.10E+07	4.77E+06	0.00E+00	4.66E+06	0.00E+00	7.73E+06	N/A
INHALATION	ADULT	0.00E+00	3.96E+04	6.30E+03	0.00E+00	9.84E+03	1.40E+06	7.74E+04	N/A
	TEEN	0.00E+00	5.11E+04	8.40E+03	0.00E+00	1.27E+04	1.98E+06	6.68E+04	N/A
	CHILD	0.00E+00	4.29E+04	9.51E+03	0.00E+00	1.00E+04	1.58E+06	2.29E+04	N/A
	INFANT	0.00E+00	2.53E+04	4.98E+03	0.00E+00	4.98E+03	1.00E+06	7.06E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.37E+09	1.61E+09	2.84E+06	1.82E+07	1.47E+07	8.75E+08	8.98E+08	1.98E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Fe-55								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	2.06E+05	1.42E+05	3.32E+04	0.00E+00	0.00E+00	7.94E+04	8.16E+04	N/A
MILK	TEEN	3.65E+05	2.59E+05	6.04E+04	0.00E+00	0.00E+00	1.64E+05	1.12E+05	N/A
	CHILD	9.17E+05	4.86E+05	1.51E+05	0.00E+00	0.00E+00	2.75E+05	9.01E+04	N/A
	INFANT	8.52E+07	7.16E+05	1.91E+05	0.00E+00	0.00E+00	3.50E+05	9.09E+04	N/A
COW	ADULT	1.25E+07	8.64E+06	2.01E+06	0.00E+00	0.00E+00	4.82E+06	4.95E+06	N/A
MILK	TEEN	2.22E+07	1.57E+07	3.67E+06	0.00E+00	0.00E+00	9.97E+06	6.80E+06	N/A
	CHILD	5.56E+07	2.95E+07	9.14E+06	0.00E+00	0.00E+00	1.67E+07	5.47E+06	N/A
	INFANT	6.73E+07	4.34E+07	1.16E+07	0.00E+00	0.00E+00	2.12E+07	5.52E+06	N/A
MEAT	ADULT	1.61E+08	1.11E+08	2.60E+07	0.00E+00	0.00E+00	6.22E+07	6.39E+07	N/A
	TEEN	1.31E+08	9.29E+07	2.17E+07	0.00E+00	0.00E+00	5.89E+07	4.02E+07	N/A
	CHILD	2.51E+08	1.33E+08	4.13E+07	0.00E+00	0.00E+00	7.54E+07	2.47E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.89E+08	1.31E+08	3.05E+07	0.00E+00	0.00E+00	7.30E+07	7.50E+07	N/A
	TEEN	3.08E+08	2.18E+08	5.09E+07	0.00E+00	0.00E+00	1.38E+08	9.44E+07	N/A
	CHILD	7.67E+08	4.07E+08	1.26E+08	0.00E+00	0.00E+00	2.30E+08	7.53E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	3.63E+08	2.51E+08	5.85E+07	0.00E+00	0.00E+00	1.40E+08	1.44E+08	N/A
INGESTION	TEEN	4.61E+08	3.27E+08	7.62E+07	0.00E+00	0.00E+00	2.07E+08	1.41E+08	N/A
	CHILD	1.07E+09	5.70E+08	1.77E+08	0.00E+00	0.00E+00	3.22E+08	1.06E+08	N/A
	INFANT	1.52E+08	4.42E+07	1.18E+07	0.00E+00	0.00E+00	2.16E+07	5.61E+06	N/A
INHALATION	ADULT	2.46E+04	1.70E+04	3.94E+03	0.00E+00	0.00E+00	7.21E+04	6.03E+03	N/A
	TEEN	3.34E+04	2.38E+04	5.54E+03	0.00E+00	0.00E+00	1.24E+05	6.39E+03	N/A
	CHILD	4.74E+04	2.52E+04	7.77E+03	0.00E+00	0.00E+00	1.11E+05	2.87E+03	N/A
	INFANT	1.97E+04	1.17E+04	3.33E+03	0.00E+00	0.00E+00	8.69E+04	1.09E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	8.52E+07	6.73E+07	2.51E+08	7.67E+08	1.07E+09	1.24E+05



**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Mn-56								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	0.00E+00	7.17E-04	1.27E-04	0.00E+00	9.11E-04	0.00E+00	2.29E-02	N/A
MILK	TEEN	0.00E+00	1.27E-03	2.26E-04	0.00E+00	1.61E-03	0.00E+00	8.37E-02	N/A
	CHILD	0.00E+00	2.22E-03	5.01E-04	0.00E+00	2.68E-03	0.00E+00	3.21E-01	N/A
	INFANT	0.00E+00	5.43E-03	9.36E-04	0.00E+00	4.67E-03	0.00E+00	4.93E-01	N/A
COW	ADULT	0.00E+00	1.05E-03	1.86E-04	0.00E+00	1.33E-03	0.00E+00	3.34E-02	N/A
MILK	TEEN	0.00E+00	1.85E-03	3.30E-04	0.00E+00	2.35E-03	0.00E+00	1.22E-01	N/A
	CHILD	0.00E+00	3.23E-03	7.30E-04	0.00E+00	3.91E-03	0.00E+00	4.69E-01	N/A
	INFANT	0.00E+00	7.92E-03	1.37E-03	0.00E+00	6.81E-03	0.00E+00	7.19E-01	N/A
MEAT	ADULT	0.00E+00	5.00E-54	8.86E-55	0.00E+00	6.34E-54	0.00E+00	1.59E-52	N/A
	TEEN	0.00E+00	4.06E-54	7.21E-55	0.00E+00	5.14E-54	0.00E+00	2.67E-52	N/A
	CHILD	0.00E+00	5.41E-54	1.22E-54	0.00E+00	6.54E-54	0.00E+00	7.84E-52	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	5.25E+00	9.31E-01	0.00E+00	6.66E+00	0.00E+00	1.67E+02	N/A
	TEEN	0.00E+00	4.73E+00	8.42E-01	0.00E+00	5.99E+00	0.00E+00	3.11E+02	N/A
	CHILD	0.00E+00	6.19E+00	1.40E+00	0.00E+00	7.49E+00	0.00E+00	8.97E+02	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	5.25E+00	9.31E-01	0.00E+00	6.66E+00	0.00E+00	1.68E+02	N/A
INGESTION	TEEN	0.00E+00	4.73E+00	8.42E-01	0.00E+00	5.99E+00	0.00E+00	3.12E+02	N/A
	CHILD	0.00E+00	6.20E+00	1.40E+00	0.00E+00	7.50E+00	0.00E+00	8.98E+02	N/A
	INFANT	0.00E+00	1.34E-02	2.30E-03	0.00E+00	1.15E-02	0.00E+00	1.21E+00	N/A
INHALATION	ADULT	0.00E+00	1.24E+00	1.83E-01	0.00E+00	1.30E+00	9.44E+03	2.02E+04	N/A
	TEEN	0.00E+00	1.70E+00	2.52E-01	0.00E+00	1.79E+00	1.52E+04	5.74E+04	N/A
	CHILD	0.00E+00	1.66E+00	3.12E-01	0.00E+00	1.67E+00	1.31E+04	1.23E+05	N/A
	INFANT	0.00E+00	1.54E+00	2.21E-01	0.00E+00	1.10E+00	1.25E+04	7.17E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	4.93E-01	7.19E-01	7.84E-52	8.97E+02	8.98E+02	1.23E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Co-58								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	4.39E+08
	TEEN	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	4.39E+08
	CHILD	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	4.39E+08
	INFANT	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	3.75E+08	4.39E+08
GOAT MILK	ADULT	0.00E+00	3.00E+05	6.72E+05	0.00E+00	0.00E+00	0.00E+00	6.07E+06	N/A
	TEEN	0.00E+00	5.05E+05	1.16E+06	0.00E+00	0.00E+00	0.00E+00	6.96E+06	N/A
	CHILD	0.00E+00	7.71E+05	2.36E+06	0.00E+00	0.00E+00	0.00E+00	4.50E+06	N/A
	INFANT	0.00E+00	1.54E+06	3.85E+06	0.00E+00	0.00E+00	0.00E+00	3.84E+06	N/A
COW MILK	ADULT	0.00E+00	1.70E+06	3.81E+06	0.00E+00	0.00E+00	0.00E+00	3.44E+07	N/A
	TEEN	0.00E+00	2.86E+06	6.59E+06	0.00E+00	0.00E+00	0.00E+00	3.94E+07	N/A
	CHILD	0.00E+00	4.37E+06	1.34E+07	0.00E+00	0.00E+00	0.00E+00	2.55E+07	N/A
	INFANT	0.00E+00	8.74E+06	2.18E+07	0.00E+00	0.00E+00	0.00E+00	2.18E+07	N/A
MEAT	ADULT	0.00E+00	7.78E+06	1.74E+07	0.00E+00	0.00E+00	0.00E+00	1.58E+08	N/A
	TEEN	0.00E+00	6.00E+06	1.38E+07	0.00E+00	0.00E+00	0.00E+00	8.27E+07	N/A
	CHILD	0.00E+00	7.01E+06	2.14E+07	0.00E+00	0.00E+00	0.00E+00	4.09E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	2.61E+07	5.86E+07	0.00E+00	0.00E+00	0.00E+00	5.29E+08	N/A
	TEEN	0.00E+00	3.96E+07	9.14E+07	0.00E+00	0.00E+00	0.00E+00	5.47E+08	N/A
	CHILD	0.00E+00	5.99E+07	1.83E+08	0.00E+00	0.00E+00	0.00E+00	3.49E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL INGESTION	ADULT	0.00E+00	3.59E+07	8.05E+07	0.00E+00	0.00E+00	0.00E+00	7.28E+08	N/A
	TEEN	0.00E+00	4.90E+07	1.13E+08	0.00E+00	0.00E+00	0.00E+00	6.76E+08	N/A
	CHILD	0.00E+00	7.20E+07	2.20E+08	0.00E+00	0.00E+00	0.00E+00	4.20E+08	N/A
	INFANT	0.00E+00	1.03E+07	2.56E+07	0.00E+00	0.00E+00	0.00E+00	2.56E+07	N/A
INHALATION	ADULT	0.00E+00	1.58E+03	2.07E+03	0.00E+00	0.00E+00	9.28E+05	1.06E+05	N/A
	TEEN	0.00E+00	2.07E+03	2.78E+03	0.00E+00	0.00E+00	1.34E+06	9.52E+04	N/A
	CHILD	0.00E+00	1.77E+03	3.16E+03	0.00E+00	0.00E+00	1.11E+06	3.44E+04	N/A
	INFANT	0.00E+00	1.22E+03	1.82E+03	0.00E+00	0.00E+00	7.77E+05	1.11E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
3.75E+08	4.39E+08	6.96E+06	3.94E+07	1.58E+08	5.47E+08	7.28E+08	1.34E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Fe-59								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	3.17E+08
	TEEN	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	3.17E+08
	CHILD	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	3.17E+08
	INFANT	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	2.70E+08	3.17E+08
GOAT	ADULT	1.92E+05	4.52E+05	1.73E+05	0.00E+00	0.00E+00	1.26E+05	1.51E+06	N/A
MILK	TEEN	3.35E+05	7.83E+05	3.02E+05	0.00E+00	0.00E+00	2.47E+05	1.85E+06	N/A
	CHILD	7.78E+05	1.26E+06	6.27E+05	0.00E+00	0.00E+00	3.65E+05	1.31E+06	N/A
	INFANT	1.12E+08	2.54E+06	9.99E+05	0.00E+00	0.00E+00	7.49E+05	1.21E+06	N/A
COW	ADULT	9.41E+06	2.21E+07	8.47E+06	0.00E+00	0.00E+00	6.18E+06	7.37E+07	N/A
MILK	TEEN	1.64E+07	3.83E+07	1.48E+07	0.00E+00	0.00E+00	1.21E+07	9.06E+07	N/A
	CHILD	3.81E+07	6.16E+07	3.07E+07	0.00E+00	0.00E+00	1.79E+07	6.41E+07	N/A
	INFANT	7.11E+07	1.24E+08	4.89E+07	0.00E+00	0.00E+00	3.67E+07	5.93E+07	N/A
MEAT	ADULT	1.03E+08	2.42E+08	9.27E+07	0.00E+00	0.00E+00	6.76E+07	8.06E+08	N/A
	TEEN	8.23E+07	1.92E+08	7.41E+07	0.00E+00	0.00E+00	6.05E+07	4.54E+08	N/A
	CHILD	1.46E+08	2.36E+08	1.18E+08	0.00E+00	0.00E+00	6.84E+07	2.46E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.02E+08	2.39E+08	9.17E+07	0.00E+00	0.00E+00	6.68E+07	7.97E+08	N/A
	TEEN	1.58E+08	3.68E+08	1.42E+08	0.00E+00	0.00E+00	1.16E+08	8.71E+08	N/A
	CHILD	3.60E+08	5.82E+08	2.90E+08	0.00E+00	0.00E+00	1.69E+08	6.06E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	2.14E+08	5.04E+08	1.93E+08	0.00E+00	0.00E+00	1.41E+08	1.68E+09	N/A
INGESTION	TEEN	2.57E+08	5.99E+08	2.31E+08	0.00E+00	0.00E+00	1.89E+08	1.42E+09	N/A
	CHILD	5.45E+08	8.81E+08	4.39E+08	0.00E+00	0.00E+00	2.55E+08	9.18E+08	N/A
	INFANT	1.83E+08	1.27E+08	4.99E+07	0.00E+00	0.00E+00	3.74E+07	6.05E+07	N/A
INHALATION	ADULT	1.18E+04	2.78E+04	1.06E+04	0.00E+00	0.00E+00	1.02E+06	1.88E+05	N/A
	TEEN	1.59E+04	3.70E+04	1.43E+04	0.00E+00	0.00E+00	1.53E+06	1.78E+05	N/A
	CHILD	2.07E+04	3.34E+04	1.67E+04	0.00E+00	0.00E+00	1.27E+06	7.07E+04	N/A
	INFANT	1.36E+04	2.35E+04	9.48E+03	0.00E+00	0.00E+00	1.01E+06	2.48E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
2.70E+08	3.17E+08	1.12E+08	1.24E+08	8.06E+08	8.71E+08	1.68E+09	1.53E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Co-60								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.51E+10
	TEEN	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.51E+10
	CHILD	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.51E+10
	INFANT	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.13E+10	2.51E+10
GOAT	ADULT	0.00E+00	1.25E+06	2.76E+06	0.00E+00	0.00E+00	0.00E+00	2.35E+07	N/A
MILK	TEEN	0.00E+00	2.12E+06	4.78E+06	0.00E+00	0.00E+00	0.00E+00	2.77E+07	N/A
	CHILD	0.00E+00	3.30E+06	9.72E+06	0.00E+00	0.00E+00	0.00E+00	1.83E+07	N/A
	INFANT	0.00E+00	6.73E+06	1.59E+07	0.00E+00	0.00E+00	0.00E+00	1.60E+07	N/A
COW	ADULT	0.00E+00	8.29E+06	1.83E+07	0.00E+00	0.00E+00	0.00E+00	1.56E+08	N/A
MILK	TEEN	0.00E+00	1.41E+07	3.17E+07	0.00E+00	0.00E+00	0.00E+00	1.83E+08	N/A
	CHILD	0.00E+00	2.18E+07	6.44E+07	0.00E+00	0.00E+00	0.00E+00	1.21E+08	N/A
	INFANT	0.00E+00	4.46E+07	1.05E+08	0.00E+00	0.00E+00	0.00E+00	1.06E+08	N/A
MEAT	ADULT	0.00E+00	4.19E+07	9.23E+07	0.00E+00	0.00E+00	0.00E+00	7.86E+08	N/A
	TEEN	0.00E+00	3.25E+07	7.32E+07	0.00E+00	0.00E+00	0.00E+00	4.23E+08	N/A
	CHILD	0.00E+00	3.86E+07	1.14E+08	0.00E+00	0.00E+00	0.00E+00	2.14E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	1.51E+08	3.34E+08	0.00E+00	0.00E+00	0.00E+00	2.84E+09	N/A
	TEEN	0.00E+00	2.35E+08	5.29E+08	0.00E+00	0.00E+00	0.00E+00	3.06E+09	N/A
	CHILD	0.00E+00	3.62E+08	1.07E+09	0.00E+00	0.00E+00	0.00E+00	2.01E+09	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	2.03E+08	4.47E+08	0.00E+00	0.00E+00	0.00E+00	3.81E+09	N/A
INGESTION	TEEN	0.00E+00	2.84E+08	6.39E+08	0.00E+00	0.00E+00	0.00E+00	3.69E+09	N/A
	CHILD	0.00E+00	4.26E+08	1.26E+09	0.00E+00	0.00E+00	0.00E+00	2.36E+09	N/A
	INFANT	0.00E+00	5.13E+07	1.21E+08	0.00E+00	0.00E+00	0.00E+00	1.22E+08	N/A
INHALATION	ADULT	0.00E+00	1.15E+04	1.48E+04	0.00E+00	0.00E+00	5.97E+06	2.85E+05	N/A
	TEEN	0.00E+00	1.51E+04	1.98E+04	0.00E+00	0.00E+00	8.72E+06	2.59E+05	N/A
	CHILD	0.00E+00	1.31E+04	2.26E+04	0.00E+00	0.00E+00	7.07E+06	9.62E+04	N/A
	INFANT	0.00E+00	8.02E+03	1.18E+04	0.00E+00	0.00E+00	4.51E+06	3.19E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
2.13E+10	2.51E+10	2.77E+07	1.83E+08	7.86E+08	3.06E+09	3.81E+09	8.72E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ni-63								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	5.19E+08	3.59E+07	1.74E+07	0.00E+00	0.00E+00	0.00E+00	7.50E+06	N/A
MILK	TEEN	9.11E+08	6.43E+07	3.09E+07	0.00E+00	0.00E+00	0.00E+00	1.02E+07	N/A
	CHILD	2.28E+09	1.22E+08	7.77E+07	0.00E+00	0.00E+00	0.00E+00	8.24E+06	N/A
	INFANT	2.24E+10	1.66E+08	9.34E+07	0.00E+00	0.00E+00	0.00E+00	8.28E+06	N/A
COW	ADULT	3.45E+09	2.39E+08	1.16E+08	0.00E+00	0.00E+00	0.00E+00	5.00E+07	N/A
MILK	TEEN	6.07E+09	4.29E+08	2.06E+08	0.00E+00	0.00E+00	0.00E+00	6.82E+07	N/A
	CHILD	1.52E+10	8.15E+08	5.18E+08	0.00E+00	0.00E+00	0.00E+00	5.49E+07	N/A
	INFANT	1.79E+10	1.11E+09	6.22E+08	0.00E+00	0.00E+00	0.00E+00	5.52E+07	N/A
MEAT	ADULT	1.06E+10	7.38E+08	3.57E+08	0.00E+00	0.00E+00	0.00E+00	1.54E+08	N/A
	TEEN	8.56E+09	6.05E+08	2.90E+08	0.00E+00	0.00E+00	0.00E+00	9.63E+07	N/A
	CHILD	1.64E+10	8.79E+08	5.59E+08	0.00E+00	0.00E+00	0.00E+00	5.92E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	9.43E+09	6.54E+08	3.16E+08	0.00E+00	0.00E+00	0.00E+00	1.36E+08	N/A
	TEEN	1.52E+10	1.07E+09	5.15E+08	0.00E+00	0.00E+00	0.00E+00	1.71E+08	N/A
	CHILD	3.79E+10	2.03E+09	1.29E+09	0.00E+00	0.00E+00	0.00E+00	1.37E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	2.40E+10	1.67E+09	8.07E+08	0.00E+00	0.00E+00	0.00E+00	3.48E+08	N/A
INGESTION	TEEN	3.07E+10	2.17E+09	1.04E+09	0.00E+00	0.00E+00	0.00E+00	3.46E+08	N/A
	CHILD	7.18E+10	3.84E+09	2.44E+09	0.00E+00	0.00E+00	0.00E+00	2.59E+08	N/A
	INFANT	4.04E+10	1.28E+09	7.16E+08	0.00E+00	0.00E+00	0.00E+00	6.34E+07	N/A
INHALATION	ADULT	4.32E+05	3.14E+04	1.45E+04	0.00E+00	0.00E+00	1.78E+05	1.34E+04	N/A
	TEEN	5.80E+05	4.34E+04	1.98E+04	0.00E+00	0.00E+00	3.07E+05	1.42E+04	N/A
	CHILD	8.21E+05	4.63E+04	2.80E+04	0.00E+00	0.00E+00	2.75E+05	6.33E+03	N/A
	INFANT	3.39E+05	2.04E+04	1.16E+04	0.00E+00	0.00E+00	2.09E+05	2.42E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	2.24E+10	1.79E+10	1.64E+10	3.79E+10	7.18E+10	8.21E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Zn-65								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	8.50E+08
	TEEN	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	8.50E+08
	CHILD	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	8.50E+08
	INFANT	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	7.40E+08	8.50E+08
GOAT	ADULT	9.87E+07	3.14E+08	1.42E+08	0.00E+00	2.10E+08	0.00E+00	1.98E+08	N/A
MILK	TEEN	1.51E+08	5.26E+08	2.45E+08	0.00E+00	3.37E+08	0.00E+00	2.23E+08	N/A
	CHILD	2.97E+08	7.92E+08	4.93E+08	0.00E+00	4.99E+08	0.00E+00	1.39E+08	N/A
	INFANT	3.33E+09	1.37E+09	6.31E+08	0.00E+00	6.64E+08	0.00E+00	1.16E+09	N/A
COW	ADULT	6.24E+08	1.99E+09	8.97E+08	0.00E+00	1.33E+09	0.00E+00	1.25E+09	N/A
MILK	TEEN	9.58E+08	3.33E+09	1.55E+09	0.00E+00	2.13E+09	0.00E+00	1.41E+09	N/A
	CHILD	1.88E+09	5.01E+09	3.12E+09	0.00E+00	3.16E+09	0.00E+00	8.80E+08	N/A
	INFANT	2.53E+09	8.66E+09	3.99E+09	0.00E+00	4.20E+09	0.00E+00	7.31E+09	N/A
MEAT	ADULT	1.82E+08	5.79E+08	2.62E+08	0.00E+00	3.87E+08	0.00E+00	3.65E+08	N/A
	TEEN	1.28E+08	4.44E+08	2.07E+08	0.00E+00	2.84E+08	0.00E+00	1.88E+08	N/A
	CHILD	1.92E+08	5.11E+08	3.18E+08	0.00E+00	3.22E+08	0.00E+00	8.98E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	2.83E+08	9.01E+08	4.07E+08	0.00E+00	6.03E+08	0.00E+00	5.68E+08	N/A
	TEEN	3.97E+08	1.38E+09	6.43E+08	0.00E+00	8.83E+08	0.00E+00	5.84E+08	N/A
	CHILD	7.73E+08	2.06E+09	1.28E+09	0.00E+00	1.30E+09	0.00E+00	3.62E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.19E+09	3.78E+09	1.71E+09	0.00E+00	2.53E+09	0.00E+00	2.38E+09	N/A
INGESTION	TEEN	1.63E+09	5.68E+09	2.65E+09	0.00E+00	3.63E+09	0.00E+00	2.40E+09	N/A
	CHILD	3.14E+09	8.37E+09	5.21E+09	0.00E+00	5.28E+09	0.00E+00	1.47E+09	N/A
	INFANT	5.85E+09	1.00E+10	4.63E+09	0.00E+00	4.86E+09	0.00E+00	8.47E+09	N/A
INHALATION	ADULT	3.24E+04	1.03E+05	4.66E+04	0.00E+00	6.90E+04	8.64E+07	5.34E+04	N/A
	TEEN	3.86E+04	1.34E+05	6.24E+04	0.00E+00	8.64E+04	1.24E+06	4.66E+04	N/A
	CHILD	4.25E+04	1.13E+05	7.03E+04	0.00E+00	7.14E+04	9.95E+05	1.63E+04	N/A
	INFANT	1.93E+04	6.26E+04	3.11E+04	0.00E+00	3.25E+04	6.47E+05	5.14E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
7.40E+08	8.50E+08	3.33E+09	8.66E+09	5.79E+08	2.06E+09	1.00E+10	1.24E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Rb-86								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	1.02E+07
	TEEN	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	1.02E+07
	CHILD	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	1.02E+07
	INFANT	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	8.89E+06	1.02E+07
GOAT	ADULT	0.00E+00	1.42E+08	6.63E+07	0.00E+00	0.00E+00	0.00E+00	2.80E+07	N/A
MILK	TEEN	0.00E+00	2.59E+08	1.22E+08	0.00E+00	0.00E+00	0.00E+00	3.84E+07	N/A
	CHILD	0.00E+00	4.81E+08	2.96E+08	0.00E+00	0.00E+00	0.00E+00	3.09E+07	N/A
	INFANT	0.00E+00	1.22E+09	6.03E+08	0.00E+00	0.00E+00	0.00E+00	3.12E+07	N/A
COW	ADULT	0.00E+00	6.78E+08	3.16E+08	0.00E+00	0.00E+00	0.00E+00	1.34E+08	N/A
MILK	TEEN	0.00E+00	1.24E+09	5.80E+08	0.00E+00	0.00E+00	0.00E+00	1.83E+08	N/A
	CHILD	0.00E+00	2.29E+09	1.41E+09	0.00E+00	0.00E+00	0.00E+00	1.47E+08	N/A
	INFANT	0.00E+00	5.81E+09	2.87E+09	0.00E+00	0.00E+00	0.00E+00	1.49E+08	N/A
MEAT	ADULT	0.00E+00	1.65E+08	7.67E+07	0.00E+00	0.00E+00	0.00E+00	3.25E+07	N/A
	TEEN	0.00E+00	1.37E+08	6.45E+07	0.00E+00	0.00E+00	0.00E+00	2.03E+07	N/A
	CHILD	0.00E+00	1.95E+08	1.20E+08	0.00E+00	0.00E+00	0.00E+00	1.25E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	1.32E+08	6.17E+07	0.00E+00	0.00E+00	0.00E+00	2.61E+07	N/A
	TEEN	0.00E+00	1.93E+08	9.07E+07	0.00E+00	0.00E+00	0.00E+00	2.86E+07	N/A
	CHILD	0.00E+00	3.40E+08	2.09E+08	0.00E+00	0.00E+00	0.00E+00	2.19E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	1.12E+09	5.20E+08	0.00E+00	0.00E+00	0.00E+00	2.20E+08	N/A
INGESTION	TEEN	0.00E+00	1.83E+09	8.57E+08	0.00E+00	0.00E+00	0.00E+00	2.70E+08	N/A
	CHILD	0.00E+00	3.31E+09	2.03E+09	0.00E+00	0.00E+00	0.00E+00	2.13E+08	N/A
	INFANT	0.00E+00	7.03E+09	3.48E+09	0.00E+00	0.00E+00	0.00E+00	1.80E+08	N/A
INHALATION	ADULT	0.00E+00	1.35E+05	5.90E+04	0.00E+00	0.00E+00	0.00E+00	1.66E+04	N/A
	TEEN	0.00E+00	1.90E+05	8.40E+04	0.00E+00	0.00E+00	0.00E+00	1.77E+04	N/A
	CHILD	0.00E+00	1.98E+05	1.14E+05	0.00E+00	0.00E+00	0.00E+00	7.99E+03	N/A
	INFANT	0.00E+00	1.90E+05	8.82E+04	0.00E+00	0.00E+00	0.00E+00	3.04E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
8.89E+06	1.02E+07	1.22E+09	5.81E+09	1.95E+08	3.40E+08	7.03E+09	1.98E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Sr-89								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.49E+04
	TEEN	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.49E+04
	CHILD	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.49E+04
	INFANT	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.14E+04	2.49E+04
GOAT	ADULT	1.54E+09	0.00E+00	4.43E+07	0.00E+00	0.00E+00	0.00E+00	2.47E+08	N/A
MILK	TEEN	2.84E+09	0.00E+00	8.14E+07	0.00E+00	0.00E+00	0.00E+00	3.39E+08	N/A
	CHILD	7.04E+09	0.00E+00	2.01E+08	0.00E+00	0.00E+00	0.00E+00	2.72E+08	N/A
	INFANT	6.37E+09	0.00E+00	3.84E+08	0.00E+00	0.00E+00	0.00E+00	2.75E+08	N/A
COW	ADULT	4.76E+08	0.00E+00	1.37E+07	0.00E+00	0.00E+00	0.00E+00	7.64E+07	N/A
MILK	TEEN	8.78E+08	0.00E+00	2.51E+07	0.00E+00	0.00E+00	0.00E+00	1.05E+08	N/A
	CHILD	2.17E+09	0.00E+00	6.20E+07	0.00E+00	0.00E+00	0.00E+00	8.41E+07	N/A
	INFANT	4.13E+09	0.00E+00	1.18E+08	0.00E+00	0.00E+00	0.00E+00	8.49E+07	N/A
MEAT	ADULT	1.20E+08	0.00E+00	3.44E+06	0.00E+00	0.00E+00	0.00E+00	1.92E+07	N/A
	TEEN	1.01E+08	0.00E+00	2.90E+06	0.00E+00	0.00E+00	0.00E+00	1.21E+07	N/A
	CHILD	1.92E+08	0.00E+00	5.48E+06	0.00E+00	0.00E+00	0.00E+00	7.42E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	8.19E+09	0.00E+00	2.35E+08	0.00E+00	0.00E+00	0.00E+00	1.31E+09	N/A
	TEEN	1.35E+10	0.00E+00	3.86E+08	0.00E+00	0.00E+00	0.00E+00	1.60E+09	N/A
	CHILD	3.29E+10	0.00E+00	9.39E+08	0.00E+00	0.00E+00	0.00E+00	1.27E+09	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.03E+10	0.00E+00	2.96E+08	0.00E+00	0.00E+00	0.00E+00	1.66E+09	N/A
INGESTION	TEEN	1.73E+10	0.00E+00	4.95E+08	0.00E+00	0.00E+00	0.00E+00	2.06E+09	N/A
	CHILD	4.23E+10	0.00E+00	1.21E+09	0.00E+00	0.00E+00	0.00E+00	1.64E+09	N/A
	INFANT	1.05E+10	0.00E+00	5.02E+08	0.00E+00	0.00E+00	0.00E+00	3.60E+08	N/A
INHALATION	ADULT	3.04E+05	0.00E+00	8.72E+03	0.00E+00	0.00E+00	1.40E+06	3.50E+05	N/A
	TEEN	4.34E+05	0.00E+00	1.25E+04	0.00E+00	0.00E+00	2.42E+06	3.71E+05	N/A
	CHILD	5.99E+05	0.00E+00	1.72E+04	0.00E+00	0.00E+00	2.16E+06	1.67E+05	N/A
	INFANT	3.98E+05	0.00E+00	1.14E+04	0.00E+00	0.00E+00	2.03E+06	6.40E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
2.14E+04	2.49E+04	7.04E+09	4.13E+09	1.92E+08	3.29E+10	4.23E+10	2.42E+06



**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Sr-90								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	6.30E+10	0.00E+00	1.55E+10	0.00E+00	0.00E+00	0.00E+00	1.82E+09	N/A
MILK	TEEN	8.91E+10	0.00E+00	2.20E+10	0.00E+00	0.00E+00	0.00E+00	2.50E+09	N/A
	CHILD	1.51E+11	0.00E+00	3.82E+10	0.00E+00	0.00E+00	0.00E+00	2.03E+09	N/A
	INFANT	7.80E+10	0.00E+00	4.17E+10	0.00E+00	0.00E+00	0.00E+00	2.05E+09	N/A
COW	ADULT	2.40E+10	0.00E+00	5.88E+09	0.00E+00	0.00E+00	0.00E+00	6.93E+08	N/A
MILK	TEEN	3.39E+10	0.00E+00	8.37E+09	0.00E+00	0.00E+00	0.00E+00	9.51E+08	N/A
	CHILD	5.72E+10	0.00E+00	1.45E+10	0.00E+00	0.00E+00	0.00E+00	7.71E+08	N/A
	INFANT	6.23E+10	0.00E+00	1.59E+10	0.00E+00	0.00E+00	0.00E+00	7.78E+08	N/A
MEAT	ADULT	7.00E+09	0.00E+00	1.72E+09	0.00E+00	0.00E+00	0.00E+00	2.02E+08	N/A
	TEEN	4.53E+09	0.00E+00	1.12E+09	0.00E+00	0.00E+00	0.00E+00	1.27E+08	N/A
	CHILD	5.85E+09	0.00E+00	1.48E+09	0.00E+00	0.00E+00	0.00E+00	7.88E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	5.48E+11	0.00E+00	1.34E+11	0.00E+00	0.00E+00	0.00E+00	1.58E+10	N/A
	TEEN	7.10E+11	0.00E+00	1.75E+11	0.00E+00	0.00E+00	0.00E+00	1.99E+10	N/A
	CHILD	1.19E+12	0.00E+00	3.02E+11	0.00E+00	0.00E+00	0.00E+00	1.61E+10	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	6.42E+11	0.00E+00	1.58E+11	0.00E+00	0.00E+00	0.00E+00	1.85E+10	N/A
INGESTION	TEEN	8.37E+11	0.00E+00	2.07E+11	0.00E+00	0.00E+00	0.00E+00	2.35E+10	N/A
	CHILD	1.41E+12	0.00E+00	3.56E+11	0.00E+00	0.00E+00	0.00E+00	1.89E+10	N/A
	INFANT	1.40E+11	0.00E+00	5.76E+10	0.00E+00	0.00E+00	0.00E+00	2.82E+09	N/A
INHALATION	ADULT	9.92E+07	0.00E+00	6.10E+06	0.00E+00	0.00E+00	9.60E+06	7.22E+05	N/A
	TEEN	1.08E+08	0.00E+00	6.68E+06	0.00E+00	0.00E+00	1.65E+07	7.65E+05	N/A
	CHILD	1.01E+08	0.00E+00	6.44E+06	0.00E+00	0.00E+00	1.48E+07	3.43E+05	N/A
	INFANT	4.09E+07	0.00E+00	2.59E+06	0.00E+00	0.00E+00	1.12E+07	1.31E+05	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	1.51E+11	6.23E+10	7.00E+09	1.19E+12	1.41E+12	1.08E+08

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Y-90								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	3.83E+00	0.00E+00	1.03E-01	0.00E+00	0.00E+00	0.00E+00	4.06E+04	N/A
MILK	TEEN	7.03E+00	0.00E+00	1.89E-01	0.00E+00	0.00E+00	0.00E+00	5.80E+04	N/A
	CHILD	1.74E+01	0.00E+00	4.66E-01	0.00E+00	0.00E+00	0.00E+00	4.95E+04	N/A
	INFANT	3.07E+02	0.00E+00	9.86E-01	0.00E+00	0.00E+00	0.00E+00	5.08E+04	N/A
COW	ADULT	1.79E+01	0.00E+00	4.79E-01	0.00E+00	0.00E+00	0.00E+00	1.89E+05	N/A
MILK	TEEN	3.28E+01	0.00E+00	8.84E-01	0.00E+00	0.00E+00	0.00E+00	2.71E+05	N/A
	CHILD	8.12E+01	0.00E+00	2.17E+00	0.00E+00	0.00E+00	0.00E+00	2.31E+05	N/A
	INFANT	1.72E+02	0.00E+00	4.60E+00	0.00E+00	0.00E+00	0.00E+00	2.37E+05	N/A
MEAT	ADULT	3.55E+01	0.00E+00	9.52E-01	0.00E+00	0.00E+00	0.00E+00	3.76E+05	N/A
	TEEN	2.99E+01	0.00E+00	8.04E-01	0.00E+00	0.00E+00	0.00E+00	2.46E+05	N/A
	CHILD	5.65E+01	0.00E+00	1.51E+00	0.00E+00	0.00E+00	0.00E+00	1.61E+05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	4.39E+03	0.00E+00	1.18E+02	0.00E+00	0.00E+00	0.00E+00	4.65E+07	N/A
	TEEN	4.10E+03	0.00E+00	1.10E+02	0.00E+00	0.00E+00	0.00E+00	3.38E+07	N/A
	CHILD	7.61E+03	0.00E+00	2.04E+02	0.00E+00	0.00E+00	0.00E+00	2.17E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	4.44E+03	0.00E+00	1.19E+02	0.00E+00	0.00E+00	0.00E+00	4.71E+07	N/A
INGESTION	TEEN	4.17E+03	0.00E+00	1.12E+02	0.00E+00	0.00E+00	0.00E+00	3.44E+07	N/A
	CHILD	7.77E+03	0.00E+00	2.08E+02	0.00E+00	0.00E+00	0.00E+00	2.21E+07	N/A
	INFANT	4.78E+02	0.00E+00	5.59E+00	0.00E+00	0.00E+00	0.00E+00	2.88E+05	N/A
INHALATION	ADULT	2.09E+03	0.00E+00	5.61E+01	0.00E+00	0.00E+00	1.70E+05	5.06E+05	N/A
	TEEN	2.98E+03	0.00E+00	8.00E+01	0.00E+00	0.00E+00	2.93E+05	5.59E+05	N/A
	CHILD	4.11E+03	0.00E+00	1.11E+02	0.00E+00	0.00E+00	2.62E+05	2.68E+05	N/A
	INFANT	3.29E+03	0.00E+00	8.82E+01	0.00E+00	0.00E+00	2.69E+05	1.04E+05	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	5.80E+04	2.71E+05	3.76E+05	4.65E+07	4.71E+07	5.59E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Sr-91								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	2.73E+04	0.00E+00	1.10E+03	0.00E+00	0.00E+00	0.00E+00	1.30E+05	N/A
MILK	TEEN	5.02E+04	0.00E+00	2.00E+03	0.00E+00	0.00E+00	0.00E+00	2.28E+05	N/A
	CHILD	1.23E+05	0.00E+00	4.65E+03	0.00E+00	0.00E+00	0.00E+00	2.72E+05	N/A
	INFANT	1.22E+05	0.00E+00	9.29E+03	0.00E+00	0.00E+00	0.00E+00	3.04E+05	N/A
COW	ADULT	7.29E+03	0.00E+00	2.94E+02	0.00E+00	0.00E+00	0.00E+00	3.47E+04	N/A
MILK	TEEN	1.34E+04	0.00E+00	5.32E+02	0.00E+00	0.00E+00	0.00E+00	6.07E+04	N/A
	CHILD	3.28E+04	0.00E+00	1.24E+03	0.00E+00	0.00E+00	0.00E+00	7.25E+04	N/A
	INFANT	6.84E+04	0.00E+00	2.48E+03	0.00E+00	0.00E+00	0.00E+00	8.10E+04	N/A
MEAT	ADULT	5.01E-11	0.00E+00	2.02E-12	0.00E+00	0.00E+00	0.00E+00	2.38E-10	N/A
	TEEN	4.21E-11	0.00E+00	1.68E-12	0.00E+00	0.00E+00	0.00E+00	1.91E-10	N/A
	CHILD	7.90E-11	0.00E+00	2.98E-12	0.00E+00	0.00E+00	0.00E+00	1.74E-10	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.01E+05	0.00E+00	4.06E+03	0.00E+00	0.00E+00	0.00E+00	4.79E+05	N/A
	TEEN	9.39E+04	0.00E+00	3.74E+03	0.00E+00	0.00E+00	0.00E+00	4.26E+05	N/A
	CHILD	1.73E+05	0.00E+00	6.53E+03	0.00E+00	0.00E+00	0.00E+00	3.82E+05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.35E+05	0.00E+00	5.46E+03	0.00E+00	0.00E+00	0.00E+00	6.44E+05	N/A
INGESTION	TEEN	1.58E+05	0.00E+00	6.27E+03	0.00E+00	0.00E+00	0.00E+00	7.14E+05	N/A
	CHILD	3.29E+05	0.00E+00	1.24E+04	0.00E+00	0.00E+00	0.00E+00	7.26E+05	N/A
	INFANT	1.91E+05	0.00E+00	1.18E+04	0.00E+00	0.00E+00	0.00E+00	3.85E+05	N/A
INHALATION	ADULT	6.19E+01	0.00E+00	2.50E+00	0.00E+00	0.00E+00	3.65E+04	1.91E+05	N/A
	TEEN	8.80E+01	0.00E+00	3.51E+00	0.00E+00	0.00E+00	6.07E+04	2.59E+05	N/A
	CHILD	1.21E+02	0.00E+00	4.59E+00	0.00E+00	0.00E+00	5.33E+04	1.74E+05	N/A
	INFANT	9.56E+01	0.00E+00	3.46E+00	0.00E+00	0.00E+00	5.26E+04	7.34E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	3.04E+05	8.10E+04	2.38E-10	4.79E+05	7.26E+05	2.59E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Y-91								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.20E+06
	TEEN	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.20E+06
	CHILD	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.20E+06
	INFANT	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.06E+06	1.20E+06
GOAT	ADULT	5.32E+02	0.00E+00	1.42E+01	0.00E+00	0.00E+00	0.00E+00	2.93E+05	N/A
MILK	TEEN	9.79E+02	0.00E+00	2.62E+01	0.00E+00	0.00E+00	0.00E+00	4.01E+05	N/A
	CHILD	2.42E+03	0.00E+00	6.47E+01	0.00E+00	0.00E+00	0.00E+00	3.22E+05	N/A
	INFANT	3.78E+04	0.00E+00	1.21E+02	0.00E+00	0.00E+00	0.00E+00	3.25E+05	N/A
COW	ADULT	2.94E+03	0.00E+00	7.85E+01	0.00E+00	0.00E+00	0.00E+00	1.62E+06	N/A
MILK	TEEN	5.40E+03	0.00E+00	1.45E+02	0.00E+00	0.00E+00	0.00E+00	2.22E+06	N/A
	CHILD	1.34E+04	0.00E+00	3.57E+02	0.00E+00	0.00E+00	0.00E+00	1.78E+06	N/A
	INFANT	2.51E+04	0.00E+00	6.68E+02	0.00E+00	0.00E+00	0.00E+00	1.80E+06	N/A
MEAT	ADULT	4.65E+05	0.00E+00	1.24E+04	0.00E+00	0.00E+00	0.00E+00	2.56E+08	N/A
	TEEN	3.91E+05	0.00E+00	1.05E+04	0.00E+00	0.00E+00	0.00E+00	1.60E+08	N/A
	CHILD	7.39E+05	0.00E+00	1.98E+04	0.00E+00	0.00E+00	0.00E+00	9.85E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	4.27E+06	0.00E+00	1.14E+05	0.00E+00	0.00E+00	0.00E+00	2.35E+09	N/A
	TEEN	7.05E+06	0.00E+00	1.89E+05	0.00E+00	0.00E+00	0.00E+00	2.89E+09	N/A
	CHILD	1.72E+07	0.00E+00	4.60E+05	0.00E+00	0.00E+00	0.00E+00	2.29E+09	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	4.74E+06	0.00E+00	1.27E+05	0.00E+00	0.00E+00	0.00E+00	2.61E+09	N/A
INGESTION	TEEN	7.45E+06	0.00E+00	2.00E+05	0.00E+00	0.00E+00	0.00E+00	3.05E+09	N/A
	CHILD	1.79E+07	0.00E+00	4.80E+05	0.00E+00	0.00E+00	0.00E+00	2.39E+09	N/A
	INFANT	6.29E+04	0.00E+00	7.88E+02	0.00E+00	0.00E+00	0.00E+00	2.12E+06	N/A
INHALATION	ADULT	4.62E+05	0.00E+00	1.24E+04	0.00E+00	0.00E+00	1.70E+06	3.85E+05	N/A
	TEEN	6.61E+05	0.00E+00	1.77E+04	0.00E+00	0.00E+00	2.94E+06	4.09E+05	N/A
	CHILD	9.14E+05	0.00E+00	2.44E+04	0.00E+00	0.00E+00	2.63E+06	1.84E+05	N/A
	INFANT	5.88E+05	0.00E+00	1.57E+04	0.00E+00	0.00E+00	2.45E+06	7.03E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.06E+06	1.20E+06	4.01E+05	2.22E+06	2.56E+08	2.89E+09	3.05E+09	2.94E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Nb-95								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.59E+08
	TEEN	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.59E+08
	CHILD	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.59E+08
	INFANT	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.35E+08	1.59E+08
GOAT	ADULT	4.78E+03	2.66E+03	1.43E+03	0.00E+00	2.63E+03	0.00E+00	1.61E+07	N/A
MILK	TEEN	8.15E+03	4.52E+03	2.49E+03	0.00E+00	4.38E+03	0.00E+00	1.93E+07	N/A
	CHILD	1.84E+04	7.17E+03	5.12E+03	0.00E+00	6.73E+03	0.00E+00	1.33E+07	N/A
	INFANT	2.86E+05	1.42E+04	8.18E+03	0.00E+00	1.01E+04	0.00E+00	1.19E+07	N/A
COW	ADULT	2.44E+04	1.36E+04	7.31E+03	0.00E+00	1.34E+04	0.00E+00	8.25E+07	N/A
MILK	TEEN	4.17E+04	2.31E+04	1.27E+04	0.00E+00	2.24E+04	0.00E+00	9.89E+07	N/A
	CHILD	9.41E+04	3.67E+04	2.62E+04	0.00E+00	3.44E+04	0.00E+00	6.78E+07	N/A
	INFANT	1.76E+05	7.24E+04	4.18E+04	0.00E+00	5.19E+04	0.00E+00	6.11E+07	N/A
MEAT	ADULT	8.48E+05	4.72E+05	2.54E+05	0.00E+00	4.66E+05	0.00E+00	2.86E+09	N/A
	TEEN	6.62E+05	3.67E+05	2.02E+05	0.00E+00	3.56E+05	0.00E+00	1.57E+09	N/A
	CHILD	1.14E+06	4.45E+05	3.18E+05	0.00E+00	4.18E+05	0.00E+00	8.23E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.10E+05	6.11E+04	3.28E+04	0.00E+00	6.04E+04	0.00E+00	3.71E+08	N/A
	TEEN	1.64E+05	9.10E+04	5.01E+04	0.00E+00	8.82E+04	0.00E+00	3.89E+08	N/A
	CHILD	3.63E+05	1.41E+05	1.01E+05	0.00E+00	1.33E+05	0.00E+00	2.61E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	9.87E+05	5.49E+05	2.95E+05	0.00E+00	5.43E+05	0.00E+00	3.33E+09	N/A
INGESTION	TEEN	8.76E+05	4.86E+05	2.68E+05	0.00E+00	4.71E+05	0.00E+00	2.08E+09	N/A
	CHILD	1.62E+06	6.30E+05	4.50E+05	0.00E+00	5.92E+05	0.00E+00	1.17E+09	N/A
	INFANT	4.62E+05	8.65E+04	5.00E+04	0.00E+00	6.20E+04	0.00E+00	7.30E+07	N/A
INHALATION	ADULT	1.41E+04	7.82E+03	4.21E+03	0.00E+00	7.74E+03	5.05E+05	1.04E+05	N/A
	TEEN	1.86E+04	1.03E+04	5.66E+03	0.00E+00	1.00E+04	7.51E+05	9.68E+04	N/A
	CHILD	2.35E+04	9.18E+03	6.55E+03	0.00E+00	8.62E+03	6.14E+05	3.70E+04	N/A
	INFANT	1.57E+04	6.43E+03	3.78E+03	0.00E+00	4.72E+03	4.79E+05	1.27E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.35E+08	1.59E+08	1.93E+07	9.89E+07	2.86E+09	3.89E+08	3.33E+09	7.51E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Zr-95								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.81E+08
	TEEN	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.81E+08
	CHILD	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.81E+08
	INFANT	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.42E+08	2.81E+08
GOAT	ADULT	5.92E+01	1.90E+01	1.28E+01	0.00E+00	2.98E+01	0.00E+00	6.01E+04	N/A
MILK	TEEN	1.03E+02	3.26E+01	2.25E+01	0.00E+00	4.80E+01	0.00E+00	7.53E+04	N/A
	CHILD	2.40E+02	5.28E+01	4.70E+01	0.00E+00	7.56E+01	0.00E+00	5.51E+04	N/A
	INFANT	3.56E+03	1.04E+02	7.38E+01	0.00E+00	1.12E+02	0.00E+00	5.18E+04	N/A
COW	ADULT	3.31E+02	1.06E+02	7.18E+01	0.00E+00	1.67E+02	0.00E+00	3.36E+05	N/A
MILK	TEEN	5.79E+02	1.83E+02	1.26E+02	0.00E+00	2.68E+02	0.00E+00	4.21E+05	N/A
	CHILD	1.34E+03	2.95E+02	2.63E+02	0.00E+00	4.23E+02	0.00E+00	3.08E+05	N/A
	INFANT	2.39E+03	5.82E+02	4.12E+02	0.00E+00	6.27E+02	0.00E+00	2.90E+05	N/A
MEAT	ADULT	7.83E+05	2.51E+05	1.70E+05	0.00E+00	3.94E+05	0.00E+00	7.96E+08	N/A
	TEEN	6.27E+05	1.98E+05	1.36E+05	0.00E+00	2.91E+05	0.00E+00	4.57E+08	N/A
	CHILD	1.11E+06	2.45E+05	2.18E+05	0.00E+00	3.50E+05	0.00E+00	2.55E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	9.90E+05	3.17E+05	2.15E+05	0.00E+00	4.98E+05	0.00E+00	1.01E+09	N/A
	TEEN	1.56E+06	4.91E+05	3.38E+05	0.00E+00	7.22E+05	0.00E+00	1.13E+09	N/A
	CHILD	3.57E+06	7.85E+05	6.99E+05	0.00E+00	1.12E+06	0.00E+00	8.19E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.77E+06	5.69E+05	3.85E+05	0.00E+00	8.92E+05	0.00E+00	1.80E+09	N/A
INGESTION	TEEN	2.18E+06	6.89E+05	4.74E+05	0.00E+00	1.01E+06	0.00E+00	1.59E+09	N/A
	CHILD	4.69E+06	1.03E+06	9.17E+05	0.00E+00	1.47E+06	0.00E+00	1.07E+09	N/A
	INFANT	5.94E+03	6.86E+02	4.86E+02	0.00E+00	7.39E+02	0.00E+00	3.41E+05	N/A
INHALATION	ADULT	1.07E+05	3.44E+04	2.33E+04	0.00E+00	5.42E+04	1.77E+06	1.50E+05	N/A
	TEEN	1.46E+05	4.58E+04	3.15E+04	0.00E+00	6.74E+04	2.69E+06	1.49E+05	N/A
	CHILD	1.90E+05	4.18E+04	3.70E+04	0.00E+00	5.96E+04	2.23E+06	6.11E+04	N/A
	INFANT	1.15E+05	2.79E+04	2.03E+04	0.00E+00	3.11E+04	1.75E+06	2.17E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
2.42E+08	2.81E+08	7.53E+04	4.21E+05	7.96E+08	1.13E+09	1.80E+09	2.69E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Mo-99								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	0.00E+00	1.34E+06	2.55E+05	0.00E+00	3.03E+06	0.00E+00	3.10E+06	N/A
MILK	TEEN	0.00E+00	2.42E+06	4.61E+05	0.00E+00	5.53E+06	0.00E+00	4.33E+06	N/A
	CHILD	0.00E+00	4.39E+06	1.09E+06	0.00E+00	9.38E+06	0.00E+00	3.63E+06	N/A
	INFANT	0.00E+00	1.12E+07	2.19E+06	0.00E+00	1.68E+07	0.00E+00	3.70E+06	N/A
COW	ADULT	0.00E+00	6.24E+06	1.19E+06	0.00E+00	1.41E+07	0.00E+00	1.45E+07	N/A
MILK	TEEN	0.00E+00	1.13E+07	2.15E+06	0.00E+00	2.58E+07	0.00E+00	2.02E+07	N/A
	CHILD	0.00E+00	2.05E+07	5.07E+06	0.00E+00	4.38E+07	0.00E+00	1.70E+07	N/A
	INFANT	0.00E+00	5.24E+07	1.02E+07	0.00E+00	7.83E+07	0.00E+00	1.73E+07	N/A
MEAT	ADULT	0.00E+00	3.30E+04	6.27E+03	0.00E+00	7.46E+04	0.00E+00	7.64E+04	N/A
	TEEN	0.00E+00	2.73E+04	5.20E+03	0.00E+00	6.24E+04	0.00E+00	4.88E+04	N/A
	CHILD	0.00E+00	3.79E+04	9.38E+03	0.00E+00	8.10E+04	0.00E+00	3.14E+04	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	2.03E+06	3.86E+05	0.00E+00	4.60E+06	0.00E+00	4.71E+06	N/A
	TEEN	0.00E+00	1.86E+06	3.55E+05	0.00E+00	4.27E+06	0.00E+00	3.34E+06	N/A
	CHILD	0.00E+00	2.54E+06	6.30E+05	0.00E+00	5.43E+06	0.00E+00	2.10E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	9.64E+06	1.83E+06	0.00E+00	2.18E+07	0.00E+00	2.24E+07	N/A
INGESTION	TEEN	0.00E+00	1.56E+07	2.97E+06	0.00E+00	3.56E+07	0.00E+00	2.79E+07	N/A
	CHILD	0.00E+00	2.75E+07	6.80E+06	0.00E+00	5.87E+07	0.00E+00	2.27E+07	N/A
	INFANT	0.00E+00	6.37E+07	1.24E+07	0.00E+00	9.51E+07	0.00E+00	2.10E+07	N/A
INHALATION	ADULT	0.00E+00	1.21E+02	2.30E+01	0.00E+00	2.91E+02	9.12E+04	2.48E+05	N/A
	TEEN	0.00E+00	1.69E+02	3.22E+01	0.00E+00	4.11E+02	1.54E+05	2.69E+05	N/A
	CHILD	0.00E+00	1.72E+02	4.26E+01	0.00E+00	3.92E+02	1.35E+05	1.27E+05	N/A
	INFANT	0.00E+00	1.65E+02	3.23E+01	0.00E+00	2.65E+02	1.35E+05	4.87E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	1.68E+07	7.83E+07	8.10E+04	5.43E+06	9.51E+07	2.69E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Tc-99m								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	1.79E-01	5.07E-01	6.46E+00	0.00E+00	7.70E+00	2.48E-01	3.00E+02	N/A
MILK	TEEN	3.11E-01	8.68E-01	1.12E+01	0.00E+00	1.29E+01	4.82E-01	5.70E+02	N/A
	CHILD	7.13E-01	1.40E+00	2.32E+01	0.00E+00	2.03E+01	7.10E-01	7.96E+02	N/A
	INFANT	1.24E+01	3.06E+00	3.94E+01	0.00E+00	3.29E+01	1.60E+00	8.89E+02	N/A
COW	ADULT	8.37E-01	2.36E+00	3.01E+01	0.00E+00	3.59E+01	1.16E+00	1.40E+03	N/A
MILK	TEEN	1.45E+00	4.05E+00	5.25E+01	0.00E+00	6.03E+01	2.25E+00	2.66E+03	N/A
	CHILD	3.33E+00	6.53E+00	1.08E+02	0.00E+00	9.49E+01	3.31E+00	3.71E+03	N/A
	INFANT	6.92E+00	1.43E+01	1.84E+02	0.00E+00	1.54E+02	7.47E+00	4.15E+03	N/A
MEAT	ADULT	1.47E-21	4.14E-21	5.28E-20	0.00E+00	6.29E-20	2.03E-21	2.45E-18	N/A
	TEEN	1.16E-21	3.25E-21	4.21E-20	0.00E+00	4.84E-20	1.80E-21	2.13E-18	N/A
	CHILD	2.04E-21	4.01E-21	6.64E-20	0.00E+00	5.82E-20	2.03E-21	2.28E-18	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.02E+00	2.89E+00	3.68E+01	0.00E+00	4.39E+01	1.42E+00	1.71E+03	N/A
	TEEN	9.03E-01	2.52E+00	3.26E+01	0.00E+00	3.75E+01	1.40E+00	1.65E+03	N/A
	CHILD	1.55E+00	3.05E+00	5.05E+01	0.00E+00	4.43E+01	1.55E+00	1.73E+03	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	2.04E+00	5.76E+00	7.34E+01	0.00E+00	8.75E+01	2.82E+00	3.41E+03	N/A
INGESTION	TEEN	2.67E+00	7.43E+00	9.63E+01	0.00E+00	1.11E+02	4.13E+00	4.88E+03	N/A
	CHILD	5.60E+00	1.10E+01	1.82E+02	0.00E+00	1.59E+02	5.57E+00	6.25E+03	N/A
	INFANT	1.93E+01	1.73E+01	2.23E+02	0.00E+00	1.87E+02	9.07E+00	5.04E+03	N/A
INHALATION	ADULT	1.03E-03	2.91E-03	3.70E-02	0.00E+00	4.42E-02	7.64E+02	4.16E+03	N/A
	TEEN	1.38E-03	3.86E-03	4.99E-02	0.00E+00	5.76E-02	1.15E+03	6.13E+03	N/A
	CHILD	1.78E-03	3.48E-03	5.77E-02	0.00E+00	5.07E-02	9.51E+02	4.81E+03	N/A
	INFANT	1.40E-03	2.88E-03	3.72E-02	0.00E+00	3.11E-02	8.11E+02	2.03E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	8.89E+02	4.15E+03	2.45E-18	1.73E+03	6.25E+03	6.13E+03



**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ru-103								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.25E+08
	TEEN	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.25E+08
	CHILD	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.25E+08
	INFANT	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.07E+08	1.25E+08
GOAT	ADULT	5.98E+01	0.00E+00	2.58E+01	0.00E+00	2.28E+02	0.00E+00	6.98E+03	N/A
MILK	TEEN	1.06E+02	0.00E+00	4.55E+01	0.00E+00	3.75E+02	0.00E+00	8.88E+03	N/A
	CHILD	2.52E+02	0.00E+00	9.67E+01	0.00E+00	6.33E+02	0.00E+00	6.50E+03	N/A
	INFANT	4.24E+03	0.00E+00	1.70E+02	0.00E+00	1.06E+03	0.00E+00	6.19E+03	N/A
COW	ADULT	3.11E+02	0.00E+00	1.34E+02	0.00E+00	1.19E+03	0.00E+00	3.63E+04	N/A
MILK	TEEN	5.53E+02	0.00E+00	2.37E+02	0.00E+00	1.95E+03	0.00E+00	4.62E+04	N/A
	CHILD	1.31E+03	0.00E+00	5.03E+02	0.00E+00	3.29E+03	0.00E+00	3.38E+04	N/A
	INFANT	2.65E+03	0.00E+00	8.86E+02	0.00E+00	5.51E+03	0.00E+00	3.22E+04	N/A
MEAT	ADULT	3.97E+07	0.00E+00	1.71E+07	0.00E+00	1.52E+08	0.00E+00	4.64E+09	N/A
	TEEN	3.24E+07	0.00E+00	1.38E+07	0.00E+00	1.14E+08	0.00E+00	2.70E+09	N/A
	CHILD	5.85E+07	0.00E+00	2.25E+07	0.00E+00	1.47E+08	0.00E+00	1.51E+09	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	3.77E+06	0.00E+00	1.62E+06	0.00E+00	1.44E+07	0.00E+00	4.40E+08	N/A
	TEEN	5.91E+06	0.00E+00	2.53E+06	0.00E+00	2.08E+07	0.00E+00	4.94E+08	N/A
	CHILD	1.37E+07	0.00E+00	5.28E+06	0.00E+00	3.46E+07	0.00E+00	3.55E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	4.35E+07	0.00E+00	1.87E+07	0.00E+00	1.66E+08	0.00E+00	5.08E+09	N/A
INGESTION	TEEN	3.83E+07	0.00E+00	1.64E+07	0.00E+00	1.35E+08	0.00E+00	3.20E+09	N/A
	CHILD	7.22E+07	0.00E+00	2.78E+07	0.00E+00	1.82E+08	0.00E+00	1.87E+09	N/A
	INFANT	6.89E+03	0.00E+00	1.06E+03	0.00E+00	6.57E+03	0.00E+00	3.84E+04	N/A
INHALATION	ADULT	1.53E+03	0.00E+00	6.58E+02	0.00E+00	5.83E+03	5.05E+05	1.10E+05	N/A
	TEEN	2.10E+03	0.00E+00	8.96E+02	0.00E+00	7.43E+03	7.83E+05	1.09E+05	N/A
	CHILD	2.79E+03	0.00E+00	1.07E+03	0.00E+00	7.03E+03	6.62E+05	4.48E+04	N/A
	INFANT	2.02E+03	0.00E+00	6.79E+02	0.00E+00	4.24E+03	5.52E+05	1.61E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.07E+08	1.25E+08	8.88E+03	4.62E+04	4.64E+09	4.94E+08	5.08E+09	7.83E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ru-106								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	5.01E+08
	TEEN	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	5.01E+08
	CHILD	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	5.01E+08
	INFANT	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	4.18E+08	5.01E+08
GOAT	ADULT	1.50E+03	0.00E+00	1.90E+02	0.00E+00	2.90E+03	0.00E+00	9.71E+04	N/A
MILK	TEEN	2.76E+03	0.00E+00	3.48E+02	0.00E+00	5.32E+03	0.00E+00	1.32E+05	N/A
	CHILD	6.79E+03	0.00E+00	8.47E+02	0.00E+00	9.17E+03	0.00E+00	1.06E+05	N/A
	INFANT	1.17E+05	0.00E+00	1.75E+03	0.00E+00	1.65E+04	0.00E+00	1.06E+05	N/A
COW	ADULT	9.65E+03	0.00E+00	1.22E+03	0.00E+00	1.86E+04	0.00E+00	6.24E+05	N/A
MILK	TEEN	1.77E+04	0.00E+00	2.24E+03	0.00E+00	3.42E+04	0.00E+00	8.51E+05	N/A
	CHILD	4.37E+04	0.00E+00	5.45E+03	0.00E+00	5.90E+04	0.00E+00	6.80E+05	N/A
	INFANT	9.00E+04	0.00E+00	1.12E+04	0.00E+00	1.06E+05	0.00E+00	6.83E+05	N/A
MEAT	ADULT	1.48E+09	0.00E+00	1.87E+08	0.00E+00	2.85E+09	0.00E+00	9.56E+10	N/A
	TEEN	1.24E+09	0.00E+00	1.57E+08	0.00E+00	2.40E+09	0.00E+00	5.97E+10	N/A
	CHILD	2.34E+09	0.00E+00	2.92E+08	0.00E+00	3.16E+09	0.00E+00	3.64E+10	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.73E+08	0.00E+00	2.19E+07	0.00E+00	3.34E+08	0.00E+00	1.12E+10	N/A
	TEEN	2.91E+08	0.00E+00	3.67E+07	0.00E+00	5.61E+08	0.00E+00	1.40E+10	N/A
	CHILD	7.11E+08	0.00E+00	8.88E+07	0.00E+00	9.61E+08	0.00E+00	1.11E+10	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.65E+09	0.00E+00	2.09E+08	0.00E+00	3.19E+09	0.00E+00	1.07E+11	N/A
INGESTION	TEEN	1.53E+09	0.00E+00	1.93E+08	0.00E+00	2.96E+09	0.00E+00	7.36E+10	N/A
	CHILD	3.05E+09	0.00E+00	3.81E+08	0.00E+00	4.12E+09	0.00E+00	4.75E+10	N/A
	INFANT	2.07E+05	0.00E+00	1.30E+04	0.00E+00	1.23E+05	0.00E+00	7.90E+05	N/A
INHALATION	ADULT	6.91E+04	0.00E+00	8.72E+03	0.00E+00	1.34E+05	9.36E+06	9.12E+05	N/A
	TEEN	9.84E+04	0.00E+00	1.24E+04	0.00E+00	1.90E+05	1.61E+07	9.60E+05	N/A
	CHILD	1.36E+05	0.00E+00	1.69E+04	0.00E+00	1.84E+05	1.43E+07	4.29E+05	N/A
	INFANT	8.68E+04	0.00E+00	1.09E+04	0.00E+00	1.07E+05	1.16E+07	1.64E+05	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
4.18E+08	5.01E+08	1.32E+05	8.51E+05	9.56E+10	1.40E+10	1.07E+11	1.61E+07

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ag-110m								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.97E+09
	TEEN	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.97E+09
	CHILD	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.97E+09
	INFANT	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.40E+09	3.97E+09
GOAT	ADULT	4.19E+06	3.88E+06	2.30E+06	0.00E+00	7.63E+06	0.00E+00	1.58E+09	N/A
MILK	TEEN	6.93E+06	6.56E+06	3.99E+06	0.00E+00	1.25E+07	0.00E+00	1.84E+09	N/A
	CHILD	1.50E+07	1.02E+07	8.12E+06	0.00E+00	1.89E+07	0.00E+00	1.21E+09	N/A
	INFANT	2.32E+08	2.03E+07	1.34E+07	0.00E+00	2.90E+07	0.00E+00	1.05E+09	N/A
COW	ADULT	2.65E+07	2.46E+07	1.46E+07	0.00E+00	4.83E+07	0.00E+00	1.00E+10	N/A
MILK	TEEN	4.39E+07	4.15E+07	2.53E+07	0.00E+00	7.92E+07	0.00E+00	1.17E+10	N/A
	CHILD	9.52E+07	6.43E+07	5.14E+07	0.00E+00	1.20E+08	0.00E+00	7.65E+09	N/A
	INFANT	1.76E+08	1.28E+08	8.50E+07	0.00E+00	1.84E+08	0.00E+00	6.66E+09	N/A
MEAT	ADULT	3.42E+06	3.17E+06	1.88E+06	0.00E+00	6.23E+06	0.00E+00	1.29E+09	N/A
	TEEN	2.59E+06	2.45E+06	1.49E+06	0.00E+00	4.68E+06	0.00E+00	6.89E+08	N/A
	CHILD	4.30E+06	2.90E+06	2.32E+06	0.00E+00	5.41E+06	0.00E+00	3.45E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	9.41E+06	8.70E+06	5.17E+06	0.00E+00	1.71E+07	0.00E+00	3.55E+09	N/A
	TEEN	1.42E+07	1.34E+07	8.18E+06	0.00E+00	2.56E+07	0.00E+00	3.78E+09	N/A
	CHILD	3.06E+07	2.06E+07	1.65E+07	0.00E+00	3.85E+07	0.00E+00	2.46E+09	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	4.36E+07	4.03E+07	2.39E+07	0.00E+00	7.92E+07	0.00E+00	1.64E+10	N/A
INGESTION	TEEN	6.76E+07	6.40E+07	3.89E+07	0.00E+00	1.22E+08	0.00E+00	1.80E+10	N/A
	CHILD	1.45E+08	9.80E+07	7.83E+07	0.00E+00	1.83E+08	0.00E+00	1.17E+10	N/A
	INFANT	4.07E+08	1.49E+08	9.84E+07	0.00E+00	2.13E+08	0.00E+00	7.71E+09	N/A
INHALATION	ADULT	1.08E+04	1.00E+04	5.94E+03	0.00E+00	1.97E+04	4.63E+06	3.02E+05	N/A
	TEEN	1.38E+04	1.31E+04	7.99E+03	0.00E+00	2.50E+04	6.75E+06	2.73E+05	N/A
	CHILD	1.69E+04	1.14E+04	9.14E+03	0.00E+00	2.12E+04	5.48E+06	1.00E+05	N/A
	INFANT	9.98E+03	7.22E+03	5.00E+03	0.00E+00	1.09E+04	3.67E+06	3.30E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
3.40E+09	3.97E+09	1.84E+09	1.17E+10	1.29E+09	3.78E+09	1.80E+10	6.75E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Te-129m								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	2.29E+07
	TEEN	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	2.29E+07
	CHILD	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	2.29E+07
	INFANT	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	1.96E+07	2.29E+07
GOAT	ADULT	3.47E+06	1.29E+06	5.49E+05	1.19E+06	1.45E+07	0.00E+00	1.75E+07	N/A
MILK	TEEN	6.34E+06	2.35E+06	1.00E+06	2.05E+06	2.65E+07	0.00E+00	2.38E+07	N/A
	CHILD	1.56E+07	4.37E+06	2.43E+06	5.04E+06	4.59E+07	0.00E+00	1.91E+07	N/A
	INFANT	2.68E+08	1.10E+07	4.94E+06	1.23E+07	8.03E+07	0.00E+00	1.92E+07	N/A
COW	ADULT	1.76E+07	6.58E+06	2.79E+06	6.06E+06	7.36E+07	0.00E+00	8.88E+07	N/A
MILK	TEEN	3.22E+07	1.20E+07	5.10E+06	1.04E+07	1.35E+08	0.00E+00	1.21E+08	N/A
	CHILD	7.95E+07	2.22E+07	1.23E+07	2.56E+07	2.33E+08	0.00E+00	9.69E+07	N/A
	INFANT	1.63E+08	5.60E+07	2.51E+07	6.27E+07	4.08E+08	0.00E+00	9.74E+07	N/A
MEAT	ADULT	4.15E+08	1.55E+08	6.57E+07	1.43E+08	1.73E+09	0.00E+00	2.09E+09	N/A
	TEEN	3.48E+08	1.29E+08	5.51E+07	1.12E+08	1.46E+09	0.00E+00	1.31E+09	N/A
	CHILD	6.56E+08	1.83E+08	1.02E+08	2.11E+08	1.93E+09	0.00E+00	8.00E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.92E+08	7.16E+07	3.04E+07	6.59E+07	8.01E+08	0.00E+00	9.66E+08	N/A
	TEEN	3.06E+08	1.14E+08	4.85E+07	9.89E+07	1.28E+09	0.00E+00	1.15E+09	N/A
	CHILD	7.39E+08	2.06E+08	1.15E+08	2.38E+08	2.17E+09	0.00E+00	9.01E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	6.28E+08	2.34E+08	9.94E+07	2.16E+08	2.62E+09	0.00E+00	3.16E+09	N/A
INGESTION	TEEN	6.93E+08	2.57E+08	1.10E+08	2.24E+08	2.90E+09	0.00E+00	2.60E+09	N/A
	CHILD	1.49E+09	4.16E+08	2.31E+08	4.80E+08	4.37E+09	0.00E+00	1.82E+09	N/A
	INFANT	4.31E+08	6.70E+07	3.01E+07	7.50E+07	4.88E+08	0.00E+00	1.17E+08	N/A
INHALATION	ADULT	9.76E+03	4.67E+03	1.58E+03	3.44E+03	3.66E+04	1.16E+06	3.83E+05	N/A
	TEEN	1.39E+04	6.58E+03	2.25E+03	4.58E+03	5.19E+04	1.98E+06	4.05E+05	N/A
	CHILD	1.92E+04	6.85E+03	3.04E+03	6.33E+03	5.03E+04	1.76E+06	1.82E+05	N/A
	INFANT	1.41E+04	6.09E+03	2.23E+03	5.47E+03	3.18E+04	1.68E+06	6.90E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.96E+07	2.29E+07	2.68E+08	4.08E+08	2.09E+09	2.17E+09	4.37E+09	1.98E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	I-131								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	1.04E+07
	TEEN	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	1.04E+07
	CHILD	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	1.04E+07
	INFANT	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	8.50E+06	1.04E+07
GOAT	ADULT	8.00E+07	1.15E+08	6.55E+07	3.75E+10	1.96E+08	0.00E+00	3.02E+07	N/A
MILK	TEEN	1.45E+08	2.03E+08	1.09E+08	5.95E+10	3.50E+08	0.00E+00	4.02E+07	N/A
	CHILD	3.52E+08	3.54E+08	2.01E+08	1.17E+11	5.80E+08	0.00E+00	3.15E+07	N/A
	INFANT	6.10E+08	8.65E+08	3.81E+08	2.85E+11	1.01E+09	0.00E+00	3.09E+07	N/A
COW	ADULT	3.73E+07	5.35E+07	3.06E+07	1.75E+10	9.15E+07	0.00E+00	1.41E+07	N/A
MILK	TEEN	6.75E+05	9.50E+07	5.10E+07	2.77E+10	1.63E+08	0.00E+00	1.88E+07	N/A
	CHILD	1.65E+08	1.65E+08	9.40E+07	5.45E+10	2.71E+08	0.00E+00	1.47E+07	N/A
	INFANT	3.43E+08	4.04E+08	1.78E+08	1.33E+11	4.72E+08	0.00E+00	1.44E+07	N/A
MEAT	ADULT	1.77E+06	2.54E+06	1.45E+06	8.30E+08	4.34E+06	0.00E+00	6.70E+05	N/A
	TEEN	1.47E+06	2.06E+06	1.11E+06	6.00E+08	3.55E+06	0.00E+00	4.08E+05	N/A
	CHILD	2.73E+06	2.75E+06	1.56E+06	9.05E+08	4.51E+06	0.00E+00	2.45E+05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.43E+07	2.05E+07	1.18E+07	6.70E+09	3.51E+07	0.00E+00	5.40E+06	N/A
	TEEN	1.44E+07	2.02E+07	1.08E+07	5.90E+09	3.47E+07	0.00E+00	3.98E+06	N/A
	CHILD	2.77E+07	2.79E+07	1.59E+07	9.20E+09	4.58E+07	0.00E+00	2.48E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.34E+08	1.91E+08	1.10E+08	6.25E+10	3.27E+08	0.00E+00	5.05E+07	N/A
INGESTION	TEEN	2.29E+08	3.20E+08	1.72E+08	9.35E+10	5.50E+08	0.00E+00	6.35E+07	N/A
	CHILD	5.45E+08	5.50E+08	3.13E+08	1.82E+11	9.05E+08	0.00E+00	4.90E+07	N/A
	INFANT	9.55E+08	1.27E+09	5.60E+08	4.17E+11	1.49E+09	0.00E+00	4.53E+07	N/A
INHALATION	ADULT	2.52E+04	3.58E+04	2.05E+04	1.19E+07	6.13E+04	0.00E+00	6.28E+03	N/A
	TEEN	3.54E+04	4.91E+04	2.64E+04	1.46E+07	8.40E+04	0.00E+00	6.49E+03	N/A
	CHILD	4.81E+04	4.81E+04	2.73E+04	1.62E+07	7.88E+04	0.00E+00	2.84E+03	N/A
	INFANT	3.79E+04	4.44E+04	1.96E+04	1.48E+07	5.18E+04	0.00E+00	1.06E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec  
Deposition pathways adjusted for Fraction Iodine Deposited (FID).

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
8.50E+06	1.04E+07	2.85E+11	1.33E+11	9.05E+08	9.20E+09	4.17E+11	1.62E+07

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	I-132								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	4.44E-02	1.19E-01	4.15E-02	4.15E+00	1.89E-01	0.00E+00	2.23E-02	N/A
MILK	TEEN	7.85E-02	2.06E-01	7.40E-02	6.95E+00	3.24E-01	0.00E+00	8.95E-02	N/A
	CHILD	1.86E-01	3.42E-01	1.57E-01	1.59E+01	5.25E-01	0.00E+00	4.03E-01	N/A
	INFANT	3.22E-01	7.85E-01	2.79E-01	3.68E+01	8.75E-01	0.00E+00	6.35E-01	N/A
COW	ADULT	2.07E-02	5.55E-02	1.94E-02	1.94E+00	8.80E-02	0.00E+00	1.04E-02	N/A
MILK	TEEN	3.67E-02	9.60E-02	3.45E-02	3.24E+00	1.52E-01	0.00E+00	4.19E-02	N/A
	CHILD	8.70E-02	1.60E-01	7.35E-02	7.40E+00	2.44E-01	0.00E+00	1.88E-01	N/A
	INFANT	1.80E-01	3.66E-01	1.30E-01	1.72E+01	4.08E-01	0.00E+00	2.97E-01	N/A
MEAT	ADULT	1.15E-59	3.07E-59	1.08E-59	1.08E-57	4.90E-59	0.00E+00	5.75E-60	N/A
	TEEN	9.35E-60	2.44E-59	8.75E-60	8.20E-58	3.85E-59	0.00E+00	1.07E-59	N/A
	CHILD	1.69E-57	3.10E-59	1.43E-59	1.44E-57	4.75E-59	0.00E+00	3.65E-59	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	9.50E+00	2.54E+01	8.90E+00	8.90E+02	4.05E+01	0.00E+00	4.78E+00	N/A
	TEEN	8.55E+00	2.24E+01	8.05E+00	7.55E+02	3.53E+01	0.00E+00	9.75E+00	N/A
	CHILD	1.52E+01	2.80E+01	1.29E+01	1.30E+03	4.28E+01	0.00E+00	3.29E+01	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	9.55E+00	2.56E+01	8.95E+00	8.95E+02	4.08E+01	0.00E+00	4.81E+00	N/A
INGESTION	TEEN	8.70E+00	2.27E+01	8.15E+00	7.65E+02	3.58E+01	0.00E+00	9.90E+00	N/A
	CHILD	1.55E+01	2.85E+01	1.31E+01	1.32E+03	4.36E+01	0.00E+00	3.35E+01	N/A
	INFANT	5.00E-01	1.15E+00	4.10E-01	5.40E+01	1.29E+00	0.00E+00	9.30E-01	N/A
INHALATION	ADULT	1.16E+03	3.26E+03	1.16E+03	1.14E+05	5.18E+03	0.00E+00	4.06E+02	N/A
	TEEN	1.59E+03	4.38E+03	1.58E+03	1.51E+05	6.92E+03	0.00E+00	1.27E+03	N/A
	CHILD	2.12E+03	4.07E+03	1.88E+03	1.94E+05	6.25E+03	0.00E+00	3.20E+03	N/A
	INFANT	1.69E+03	3.54E+03	1.26E+03	1.69E+05	3.95E+03	0.00E+00	1.90E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec  
Deposition pathways adjusted for Fraction Iodine Deposited (FID).

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	3.68E+01	1.72E+01	1.44E-57	1.30E+03	1.32E+03	1.94E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Te-132								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	1.30E+05	8.39E+04	7.88E+04	9.27E+04	8.08E+05	0.00E+00	3.97E+06	N/A
MILK	TEEN	2.32E+05	1.47E+05	1.38E+05	1.55E+05	1.41E+06	0.00E+00	4.65E+06	N/A
	CHILD	5.53E+05	2.45E+05	2.96E+05	3.57E+05	2.27E+06	0.00E+00	2.47E+06	N/A
	INFANT	9.50E+06	5.64E+05	5.27E+05	8.33E+05	3.53E+06	0.00E+00	2.09E+06	N/A
COW	ADULT	6.05E+05	3.91E+05	3.67E+05	4.32E+05	3.77E+06	0.00E+00	1.85E+07	N/A
MILK	TEEN	1.08E+06	6.85E+05	6.45E+05	7.22E+05	6.57E+06	0.00E+00	2.17E+07	N/A
	CHILD	2.58E+06	1.14E+06	1.38E+06	1.66E+06	1.06E+07	0.00E+00	1.15E+07	N/A
	INFANT	5.32E+06	2.63E+06	2.46E+06	3.89E+06	1.65E+07	0.00E+00	9.74E+06	N/A
MEAT	ADULT	4.68E+05	3.03E+05	2.84E+05	3.34E+05	2.92E+06	0.00E+00	1.43E+07	N/A
	TEEN	3.83E+05	2.43E+05	2.28E+05	2.56E+05	2.33E+06	0.00E+00	7.68E+06	N/A
	CHILD	6.99E+05	3.09E+05	3.74E+05	4.51E+05	2.87E+06	0.00E+00	3.11E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.42E+06	9.18E+05	8.62E+05	1.01E+06	8.84E+06	0.00E+00	4.34E+07	N/A
	TEEN	1.29E+06	8.17E+05	7.69E+05	8.61E+05	7.83E+06	0.00E+00	2.59E+07	N/A
	CHILD	2.31E+06	1.02E+06	1.24E+06	1.49E+06	9.49E+06	0.00E+00	1.03E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	2.62E+06	1.70E+06	1.59E+06	1.87E+06	1.63E+07	0.00E+00	8.02E+07	N/A
INGESTION	TEEN	2.99E+06	1.89E+06	1.78E+06	1.99E+06	1.81E+07	0.00E+00	5.99E+07	N/A
	CHILD	6.15E+06	2.72E+06	3.29E+06	3.96E+06	2.53E+07	0.00E+00	2.74E+07	N/A
	INFANT	1.48E+07	3.20E+06	2.98E+06	4.72E+06	2.00E+07	0.00E+00	1.18E+07	N/A
INHALATION	ADULT	2.60E+02	2.15E+02	1.62E+02	1.90E+02	1.46E+03	2.88E+05	5.10E+05	N/A
	TEEN	3.60E+02	2.90E+02	2.19E+02	2.46E+02	1.95E+03	4.49E+05	4.63E+05	N/A
	CHILD	4.81E+02	2.72E+02	2.63E+02	3.17E+02	1.77E+03	3.77E+05	1.38E+05	N/A
	INFANT	3.72E+02	2.37E+02	1.76E+02	2.79E+02	1.03E+03	3.40E+05	4.41E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	9.50E+06	2.17E+07	1.43E+07	4.34E+07	8.02E+07	5.10E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	I-133								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	1.05E+06	1.82E+06	5.55E+05	2.67E+08	3.17E+06	0.00E+00	1.64E+06	N/A
MILK	TEEN	1.91E+06	3.24E+06	v1980000	4.52E+08	5.70E+06	0.00E+00	2.45E+06	N/A
	CHILD	4.64E+06	5.75E+06	2.17E+06	1.07E+09	9.55E+06	0.00E+00	2.31E+06	N/A
	INFANT	8.15E+06	1.43E+07	4.18E+06	2.60E+09	1.68E+07	0.00E+00	2.42E+06	N/A
COW	ADULT	4.88E+05	8.50E+05	2.59E+05	1.25E+08	1.48E+06	0.00E+00	7.60E+05	N/A
MILK	TEEN	8.90E+05	1.51E+06	4.61E+05	2.11E+08	2.65E+06	0.00E+00	1.15E+06	N/A
	CHILD	2.17E+06	2.68E+06	1.01E+06	4.97E+08	4.46E+06	0.00E+00	1.08E+06	N/A
	INFANT	4.57E+06	6.65E+06	1.95E+06	1.21E+09	7.80E+06	0.00E+00	1.13E+06	N/A
MEAT	ADULT	6.00E-02	1.05E-01	3.19E-02	1.54E+01	1.83E-01	0.00E+00	9.40E-02	N/A
	TEEN	5.05E-02	8.55E-02	2.61E-02	1.19E+01	1.50E-01	0.00E+00	6.45E-02	N/A
	CHILD	9.35E-02	1.16E-01	4.38E-02	2.15E+01	1.93E-01	0.00E+00	4.66E-02	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	3.44E+05	6.00E+05	1.83E+05	8.80E+07	1.05E+06	0.00E+00	5.40E+05	N/A
	TEEN	3.20E+05	5.40E+05	1.66E+05	7.55E+07	9.50E+05	0.00E+00	4.10E+05	N/A
	CHILD	5.85E+05	7.20E+05	2.73E+05	1.34E+08	1.20E+06	0.00E+00	2.91E+05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.88E+06	3.27E+06	9.95E+05	4.80E+08	5.70E+06	0.00E+00	2.94E+06	N/A
INGESTION	TEEN	3.12E+06	5.30E+06	1.62E+06	7.40E+08	9.30E+06	0.00E+00	4.01E+06	N/A
	CHILD	7.40E+06	9.15E+06	3.46E+06	1.70E+09	1.52E+07	0.00E+00	3.68E+06	N/A
	INFANT	1.28E+07	2.09E+07	6.10E+06	3.81E+09	2.46E+07	0.00E+00	3.54E+06	N/A
INHALATION	ADULT	8.64E+03	1.48E+04	4.52E+03	2.15E+06	2.58E+04	0.00E+00	8.88E+03	N/A
	TEEN	1.22E+04	2.05E+04	6.22E+03	2.92E+06	3.59E+04	0.00E+00	1.03E+04	N/A
	CHILD	1.66E+04	2.03E+04	7.70E+03	3.85E+06	3.38E+04	0.00E+00	5.48E+03	N/A
	INFANT	1.32E+04	1.92E+04	5.60E+03	3.56E+06	2.24E+04	0.00E+00	2.16E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec  
Deposition pathways adjusted for Fraction Iodine Deposited (FID).

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	2.60E+09	1.21E+09	2.15E+01	1.34E+08	3.81E+09	3.85E+06



**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	I-134								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	5.45E-13	1.48E-12	5.30E-13	2.57E-11	2.36E-12	0.00E+00	1.29E-15	N/A
MILK	TEEN	9.70E-13	2.57E-12	9.20E-13	4.28E-11	4.05E-12	0.00E+00	3.38E-14	N/A
	CHILD	2.29E-12	4.26E-12	1.96E-12	9.80E-11	6.50E-12	0.00E+00	2.82E-12	N/A
	INFANT	3.96E-12	9.75E-12	3.46E-12	2.27E-10	1.09E-11	0.00E+00	1.01E-11	N/A
COW	ADULT	2.54E-13	6.90E-13	2.47E-13	1.20E-11	1.10E-12	0.00E+00	6.00E-16	N/A
MILK	TEEN	4.52E-13	1.20E-12	4.30E-13	2.00E-11	1.89E-12	0.00E+00	1.58E-14	N/A
	CHILD	1.07E-12	1.99E-12	9.15E-13	4.57E-11	3.04E-12	0.00E+00	1.32E-12	N/A
	INFANT	2.22E-12	4.54E-12	1.62E-12	1.06E-10	5.10E-12	0.00E+00	4.70E-12	N/A
MEAT	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.60E-05	4.33E-05	1.55E-05	7.50E-04	6.90E-05	0.00E+00	3.77E-08	N/A
	TEEN	1.44E-05	3.82E-05	1.37E-05	6.35E-04	6.00E-05	0.00E+00	5.05E-07	N/A
	CHILD	2.56E-05	4.75E-05	2.19E-05	1.10E-03	7.25E-05	0.00E+00	3.15E-05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.60E-05	4.33E-05	1.55E-05	7.50E-04	6.90E-05	0.00E+00	3.77E-08	N/A
INGESTION	TEEN	1.44E-05	3.82E-05	1.37E-05	6.35E-04	6.00E-05	0.00E+00	5.05E-07	N/A
	CHILD	2.56E-05	4.75E-05	2.19E-05	1.10E-03	7.25E-05	0.00E+00	3.15E-05	N/A
	INFANT	6.20E-12	1.43E-11	5.10E-12	3.33E-10	1.60E-11	0.00E+00	1.48E-11	N/A
INHALATION	ADULT	6.44E+02	1.73E+03	6.15E+02	2.98E+04	2.75E+03	0.00E+00	1.01E+00	N/A
	TEEN	8.88E+02	2.32E+03	8.40E+02	3.95E+04	3.66E+03	0.00E+00	2.04E+01	N/A
	CHILD	1.17E+03	2.16E+03	9.95E+02	5.07E+04	3.30E+03	0.00E+00	9.55E+02	N/A
	INFANT	9.21E+02	1.88E+03	6.65E+02	4.45E+04	2.09E+03	0.00E+00	1.29E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec  
Deposition pathways adjusted for Fraction Iodine Deposited (FID).

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	2.27E-10	1.06E-10	0.00E+00	1.10E-03	1.10E-03	5.07E+04

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Cs-134								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	7.92E+09
	TEEN	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	7.92E+09
	CHILD	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	7.92E+09
	INFANT	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	6.79E+09	7.92E+09
GOAT	ADULT	1.06E+10	2.53E+10	2.07E+10	0.00E+00	8.19E+09	2.72E+09	4.43E+08	N/A
MILK	TEEN	1.85E+10	4.35E+10	2.02E+10	0.00E+00	1.38E+10	5.27E+09	5.41E+08	N/A
	CHILD	4.26E+10	6.99E+10	1.47E+10	0.00E+00	2.17E+10	7.77E+09	3.77E+08	N/A
	INFANT	2.29E+10	1.28E+11	1.29E+10	0.00E+00	3.30E+10	1.35E+10	3.48E+08	N/A
COW	ADULT	2.79E+09	6.63E+09	5.42E+09	0.00E+00	2.15E+09	7.12E+08	1.16E+08	N/A
MILK	TEEN	4.84E+09	1.14E+10	5.28E+09	0.00E+00	3.62E+09	1.38E+09	1.42E+08	N/A
	CHILD	1.12E+10	1.83E+10	3.86E+09	0.00E+00	5.68E+09	2.04E+09	9.87E+07	N/A
	INFANT	1.80E+10	3.35E+10	3.39E+09	0.00E+00	8.63E+09	3.54E+09	9.11E+07	N/A
MEAT	ADULT	3.59E+08	8.54E+08	6.98E+08	0.00E+00	2.76E+08	9.17E+07	1.49E+07	N/A
	TEEN	2.85E+08	6.71E+08	3.12E+08	0.00E+00	2.13E+08	8.15E+07	8.35E+06	N/A
	CHILD	5.03E+08	8.26E+08	1.74E+08	0.00E+00	2.56E+08	9.18E+07	4.45E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	4.21E+09	1.00E+10	8.19E+09	0.00E+00	3.24E+09	1.08E+09	1.75E+08	N/A
	TEEN	6.70E+09	1.58E+10	7.31E+09	0.00E+00	5.01E+09	1.91E+09	1.96E+08	N/A
	CHILD	1.53E+10	2.52E+10	5.31E+09	0.00E+00	7.80E+09	2.80E+09	1.36E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.80E+10	4.28E+10	3.50E+10	0.00E+00	1.39E+10	4.60E+09	7.49E+08	N/A
INGESTION	TEEN	3.03E+10	7.13E+10	3.31E+10	0.00E+00	2.27E+10	8.65E+09	8.87E+08	N/A
	CHILD	6.96E+10	1.14E+11	2.41E+10	0.00E+00	3.54E+10	1.27E+10	6.16E+08	N/A
	INFANT	4.09E+10	1.62E+11	1.63E+10	0.00E+00	4.16E+10	1.70E+10	4.39E+08	N/A
INHALATION	ADULT	3.73E+05	8.48E+05	7.28E+05	0.00E+00	2.87E+05	9.76E+04	1.04E+04	N/A
	TEEN	5.02E+05	1.13E+06	5.49E+05	0.00E+00	3.75E+05	1.46E+05	9.76E+03	N/A
	CHILD	6.51E+05	1.01E+06	2.25E+05	0.00E+00	3.30E+05	1.21E+05	3.85E+03	N/A
	INFANT	3.96E+05	7.03E+05	7.45E+04	0.00E+00	1.90E+05	7.97E+04	1.33E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
6.79E+09	7.92E+09	1.28E+11	3.35E+10	8.54E+08	2.52E+10	1.62E+11	1.13E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	I-135								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	3.47E+03	9.10E+03	3.35E+03	6.00E+05	1.46E+04	0.00E+00	1.03E+04	N/A
MILK	TEEN	6.15E+03	1.59E+04	5.90E+03	1.02E+06	2.51E+04	0.00E+00	1.76E+04	N/A
	CHILD	1.46E+04	2.63E+04	1.24E+04	2.33E+06	4.03E+04	0.00E+00	2.00E+04	N/A
	INFANT	2.53E+04	6.05E+04	2.20E+04	5.40E+06	6.70E+04	0.00E+00	2.19E+04	N/A
COW	ADULT	1.62E+03	4.24E+03	1.57E+03	2.80E+05	6.80E+03	0.00E+00	4.79E+03	N/A
MILK	TEEN	2.88E+03	7.40E+03	2.74E+03	4.76E+05	1.17E+04	0.00E+00	8.20E+03	N/A
	CHILD	6.80E+03	1.23E+04	5.80E+03	1.09E+06	1.88E+04	0.00E+00	9.35E+03	N/A
	INFANT	1.42E+04	2.82E+04	1.03E+04	2.53E+06	3.14E+04	0.00E+00	1.02E+04	N/A
MEAT	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	6.45E+03	1.69E+04	6.20E+03	1.11E+06	2.70E+04	0.00E+00	1.90E+04	N/A
	TEEN	5.80E+03	1.50E+04	5.55E+03	9.60E+05	2.37E+04	0.00E+00	1.66E+04	N/A
	CHILD	1.03E+04	1.86E+04	8.80E+03	1.65E+06	2.85E+04	0.00E+00	1.42E+04	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.15E+04	3.02E+04	1.12E+04	1.99E+06	4.84E+04	0.00E+00	3.41E+04	N/A
INGESTION	TEEN	1.49E+04	3.82E+04	1.42E+04	2.46E+06	6.05E+04	0.00E+00	4.24E+04	N/A
	CHILD	3.17E+04	5.70E+04	2.70E+04	5.05E+06	8.75E+04	0.00E+00	4.35E+04	N/A
	INFANT	3.94E+04	8.85E+04	3.23E+04	7.95E+06	9.85E+04	0.00E+00	3.20E+04	N/A
INHALATION	ADULT	2.68E+03	6.98E+03	2.57E+03	4.48E+05	1.11E+04	0.00E+00	5.25E+03	N/A
	TEEN	3.70E+03	9.44E+03	3.49E+03	6.21E+05	1.49E+04	0.00E+00	6.95E+03	N/A
	CHILD	4.92E+03	8.73E+03	4.14E+03	7.92E+05	1.34E+04	0.00E+00	4.44E+03	N/A
	INFANT	3.86E+03	7.60E+03	2.77E+03	6.96E+05	8.47E+03	0.00E+00	1.83E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec  
Deposition pathways adjusted for Fraction Iodine Deposited (FID).

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	5.40E+06	2.53E+06	0.00E+00	1.65E+06	7.95E+06	7.92E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Cs-136								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08
	TEEN	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08
	CHILD	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08
	INFANT	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.49E+08	1.69E+08
GOAT	ADULT	3.57E+08	1.41E+09	1.01E+09	0.00E+00	7.84E+08	1.07E+08	1.60E+08	N/A
MILK	TEEN	6.07E+08	2.39E+09	1.61E+09	0.00E+00	1.30E+09	2.05E+08	1.92E+08	N/A
	CHILD	1.37E+09	3.77E+09	2.44E+09	0.00E+00	2.01E+09	2.99E+08	1.32E+08	N/A
	INFANT	8.93E+08	7.88E+09	2.94E+09	0.00E+00	3.14E+09	6.42E+08	1.20E+08	N/A
COW	ADULT	6.69E+07	2.64E+08	1.90E+08	0.00E+00	1.47E+08	2.02E+07	3.00E+07	N/A
MILK	TEEN	1.14E+08	4.48E+08	3.01E+08	0.00E+00	2.44E+08	3.85E+07	3.61E+07	N/A
	CHILD	2.57E+08	7.07E+08	4.58E+08	0.00E+00	3.77E+08	5.62E+07	2.48E+07	N/A
	INFANT	5.02E+08	1.48E+09	5.52E+08	0.00E+00	5.89E+08	1.20E+08	2.24E+07	N/A
MEAT	ADULT	4.00E+06	1.58E+07	1.14E+07	0.00E+00	8.78E+06	1.20E+06	1.79E+06	N/A
	TEEN	3.12E+06	1.23E+07	8.24E+06	0.00E+00	6.68E+06	1.05E+06	9.87E+05	N/A
	CHILD	5.38E+06	1.48E+07	9.57E+06	0.00E+00	7.87E+06	1.17E+06	5.20E+05	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	2.03E+07	8.01E+07	5.76E+07	0.00E+00	4.46E+07	6.11E+06	9.10E+06	N/A
	TEEN	2.43E+07	9.58E+07	6.43E+07	0.00E+00	5.21E+07	8.22E+06	7.71E+06	N/A
	CHILD	4.96E+07	1.36E+08	8.82E+07	0.00E+00	7.26E+07	1.08E+07	4.79E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	4.48E+08	1.77E+09	1.27E+09	0.00E+00	9.84E+08	1.35E+08	2.01E+08	N/A
INGESTION	TEEN	7.49E+08	2.95E+09	1.98E+09	0.00E+00	1.60E+09	2.53E+08	2.37E+08	N/A
	CHILD	1.68E+09	4.63E+09	2.99E+09	0.00E+00	2.46E+09	3.67E+08	1.63E+08	N/A
	INFANT	1.40E+09	9.35E+09	3.49E+09	0.00E+00	3.73E+09	7.62E+08	1.42E+08	N/A
INHALATION	ADULT	3.90E+04	1.46E+05	1.10E+05	0.00E+00	8.56E+04	1.20E+04	1.17E+04	N/A
	TEEN	5.15E+04	1.94E+05	1.37E+05	0.00E+00	1.10E+05	1.78E+04	1.09E+04	N/A
	CHILD	6.51E+04	1.71E+05	1.16E+05	0.00E+00	9.55E+04	1.45E+04	4.18E+03	N/A
	INFANT	4.83E+04	1.35E+05	5.29E+04	0.00E+00	5.64E+04	1.18E+04	1.43E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/ $m^3$   
Deposition pathways: units are mrem- $m^2$ /yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.49E+08	1.69E+08	7.88E+09	1.48E+09	1.58E+07	1.36E+08	9.35E+09	1.94E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Cs-137								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.19E+10
	TEEN	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.19E+10
	CHILD	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.19E+10
	INFANT	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.02E+10	1.19E+10
GOAT	ADULT	1.42E+10	1.94E+10	1.27E+10	0.00E+00	6.59E+09	2.19E+09	3.76E+08	N/A
MILK	TEEN	2.58E+10	3.43E+10	1.19E+10	0.00E+00	1.17E+10	4.53E+09	4.88E+08	N/A
	CHILD	6.20E+10	5.94E+10	8.77E+09	0.00E+00	1.94E+10	6.96E+09	3.72E+08	N/A
	INFANT	3.30E+10	1.16E+11	8.22E+09	0.00E+00	3.11E+10	1.26E+10	3.62E+08	N/A
COW	ADULT	3.78E+09	5.17E+09	3.39E+09	0.00E+00	1.76E+09	5.84E+08	1.00E+08	N/A
MILK	TEEN	6.86E+09	9.12E+09	3.18E+09	0.00E+00	3.10E+09	1.21E+09	1.30E+08	N/A
	CHILD	1.65E+10	1.58E+10	2.33E+09	0.00E+00	5.15E+09	1.85E+09	9.90E+07	N/A
	INFANT	2.64E+10	3.09E+10	2.19E+09	0.00E+00	8.28E+09	3.35E+09	9.65E+07	N/A
MEAT	ADULT	4.91E+08	6.71E+08	4.40E+08	0.00E+00	2.28E+08	7.58E+07	1.30E+07	N/A
	TEEN	4.08E+08	5.42E+08	1.89E+08	0.00E+00	1.85E+08	7.17E+07	7.72E+06	N/A
	CHILD	7.51E+08	7.19E+08	1.06E+08	0.00E+00	2.34E+08	8.42E+07	4.50E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	5.76E+09	7.88E+09	5.16E+09	0.00E+00	2.68E+09	8.89E+08	1.53E+08	N/A
	TEEN	9.58E+09	1.27E+10	4.44E+09	0.00E+00	4.34E+09	1.69E+09	1.81E+08	N/A
	CHILD	2.29E+10	2.19E+10	3.24E+09	0.00E+00	7.15E+09	2.57E+09	1.37E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	2.42E+10	3.32E+10	2.17E+10	0.00E+00	1.13E+10	3.74E+09	6.42E+08	N/A
INGESTION	TEEN	4.26E+10	5.67E+10	1.97E+10	0.00E+00	1.93E+10	7.49E+09	8.06E+08	N/A
	CHILD	1.02E+11	9.79E+10	1.44E+10	0.00E+00	3.19E+10	1.15E+10	6.13E+08	N/A
	INFANT	5.94E+10	1.47E+11	1.04E+10	0.00E+00	3.94E+10	1.60E+10	4.59E+08	N/A
INHALATION	ADULT	4.78E+05	6.21E+05	4.28E+05	0.00E+00	2.22E+05	7.52E+04	8.40E+03	N/A
	TEEN	6.70E+05	8.48E+05	3.11E+05	0.00E+00	3.04E+05	1.21E+05	8.48E+03	N/A
	CHILD	9.07E+05	8.25E+05	1.28E+05	0.00E+00	2.82E+05	1.04E+05	3.62E+03	N/A
	INFANT	5.49E+05	6.12E+05	4.55E+04	0.00E+00	1.72E+05	7.13E+04	1.33E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.02E+10	1.19E+10	1.16E+11	3.09E+10	7.51E+08	2.29E+10	1.47E+11	9.07E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ba-140								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.32E+07
	TEEN	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.32E+07
	CHILD	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.32E+07
	INFANT	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.03E+07	2.32E+07
GOAT	ADULT	1.46E+06	1.83E+03	9.54E+04	0.00E+00	6.22E+02	1.05E+03	3.00E+06	N/A
MILK	TEEN	2.63E+06	3.22E+03	1.69E+05	0.00E+00	1.09E+03	2.17E+03	4.05E+06	N/A
	CHILD	6.35E+06	5.56E+03	3.70E+05	0.00E+00	1.81E+03	3.31E+03	3.22E+06	N/A
	INFANT	1.09E+08	1.31E+04	6.73E+05	0.00E+00	3.10E+03	8.02E+03	3.21E+06	N/A
COW	ADULT	6.83E+06	8.58E+03	4.47E+05	0.00E+00	2.92E+03	4.91E+03	1.41E+07	N/A
MILK	TEEN	1.23E+07	1.51E+04	7.94E+05	0.00E+00	5.12E+03	1.02E+04	1.90E+07	N/A
	CHILD	2.97E+07	2.61E+04	1.74E+06	0.00E+00	8.48E+03	1.55E+04	1.51E+07	N/A
	INFANT	6.12E+07	6.12E+04	3.15E+06	0.00E+00	1.45E+04	3.76E+04	1.50E+07	N/A
MEAT	ADULT	9.52E+06	1.20E+04	6.24E+05	0.00E+00	4.07E+03	6.85E+03	1.96E+07	N/A
	TEEN	7.87E+06	9.65E+03	5.07E+05	0.00E+00	3.27E+03	6.49E+03	1.21E+07	N/A
	CHILD	1.45E+07	1.27E+04	8.48E+05	0.00E+00	4.14E+03	7.59E+03	7.36E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	5.98E+07	7.51E+04	3.92E+06	0.00E+00	2.55E+04	4.30E+04	1.23E+08	N/A
	TEEN	7.50E+07	9.19E+04	4.83E+06	0.00E+00	3.12E+04	6.18E+04	1.16E+08	N/A
	CHILD	1.62E+08	1.42E+05	9.48E+06	0.00E+00	4.63E+04	8.48E+04	8.23E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	7.76E+07	9.75E+04	5.08E+06	0.00E+00	3.31E+04	5.58E+04	1.60E+08	N/A
INGESTION	TEEN	9.78E+07	1.20E+05	6.31E+06	0.00E+00	4.07E+04	8.06E+04	1.51E+08	N/A
	CHILD	2.13E+08	1.87E+05	1.24E+07	0.00E+00	6.08E+04	1.11E+05	1.08E+08	N/A
	INFANT	1.70E+08	7.43E+04	3.83E+06	0.00E+00	1.76E+04	4.56E+04	1.82E+07	N/A
INHALATION	ADULT	3.90E+04	4.90E+01	2.57E+03	0.00E+00	1.67E+01	1.27E+06	2.18E+05	N/A
	TEEN	5.47E+04	6.94E+01	3.52E+03	0.00E+00	2.28E+01	2.03E+06	2.29E+05	N/A
	CHILD	7.40E+04	6.48E+01	4.33E+02	0.00E+00	2.11E+01	1.74E+06	1.02E+05	N/A
	INFANT	5.60E+04	5.60E+01	2.90E+03	0.00E+00	1.34E+01	1.60E+06	3.84E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
2.03E+07	2.32E+07	1.09E+08	6.12E+07	1.96E+07	1.62E+08	2.13E+08	2.03E+06

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	La-140								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	2.44E-01	1.23E-01	3.25E-02	0.00E+00	0.00E+00	0.00E+00	9.02E+03	N/A
MILK	TEEN	4.38E-01	2.15E-01	5.72E-02	0.00E+00	0.00E+00	0.00E+00	1.24E+04	N/A
	CHILD	1.05E+00	3.66E-01	1.23E-01	0.00E+00	0.00E+00	0.00E+00	1.02E+04	N/A
	INFANT	1.82E+01	8.63E-01	2.22E-01	0.00E+00	0.00E+00	0.00E+00	1.01E+04	N/A
COW	ADULT	1.14E+00	5.73E-01	1.51E-01	0.00E+00	0.00E+00	0.00E+00	4.21E+04	N/A
MILK	TEEN	2.04E+00	1.00E+00	2.67E-01	0.00E+00	0.00E+00	0.00E+00	5.76E+04	N/A
	CHILD	4.89E+00	1.71E+00	5.76E-01	0.00E+00	0.00E+00	0.00E+00	4.76E+04	N/A
	INFANT	1.02E+01	4.03E+00	1.04E+00	0.00E+00	0.00E+00	0.00E+00	4.73E+04	N/A
MEAT	ADULT	1.22E-02	6.16E-03	1.63E-03	0.00E+00	0.00E+00	0.00E+00	4.53E+02	N/A
	TEEN	1.01E-02	4.94E-03	1.32E-03	0.00E+00	0.00E+00	0.00E+00	2.84E+02	N/A
	CHILD	1.84E-02	6.44E-03	2.17E-03	0.00E+00	0.00E+00	0.00E+00	1.79E+02	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	6.53E+02	3.29E+02	8.69E+01	0.00E+00	0.00E+00	0.00E+00	2.41E+07	N/A
	TEEN	5.96E+02	2.93E+02	7.79E+01	0.00E+00	0.00E+00	0.00E+00	1.68E+07	N/A
	CHILD	1.07E+03	3.74E+02	1.26E+02	0.00E+00	0.00E+00	0.00E+00	1.04E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	6.54E+02	3.30E+02	8.71E+01	0.00E+00	0.00E+00	0.00E+00	2.42E+07	N/A
INGESTION	TEEN	5.99E+02	2.94E+02	7.83E+01	0.00E+00	0.00E+00	0.00E+00	1.69E+07	N/A
	CHILD	1.08E+03	3.76E+02	1.27E+02	0.00E+00	0.00E+00	0.00E+00	1.05E+07	N/A
	INFANT	2.85E+01	4.89E+00	1.26E+00	0.00E+00	0.00E+00	0.00E+00	5.74E+04	N/A
INHALATION	ADULT	3.44E+02	1.74E+02	4.58E+01	0.00E+00	0.00E+00	1.36E+05	4.58E+05	N/A
	TEEN	4.79E+02	2.36E+02	6.26E+01	0.00E+00	0.00E+00	2.14E+05	4.87E+05	N/A
	CHILD	6.44E+02	2.25E+02	7.55E+01	0.00E+00	0.00E+00	1.83E+05	2.26E+05	N/A
	INFANT	5.05E+02	2.00E+02	5.15E+01	0.00E+00	0.00E+00	1.68E+05	8.48E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	1.24E+04	5.76E+04	4.53E+02	2.41E+07	2.42E+07	4.87E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ce-141								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.52E+07
	TEEN	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.52E+07
	CHILD	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.52E+07
	INFANT	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.35E+07	1.52E+07
GOAT	ADULT	2.78E+02	1.88E+02	2.13E+01	0.00E+00	8.73E+01	0.00E+00	7.19E+05	N/A
MILK	TEEN	5.10E+02	3.40E+02	3.91E+01	0.00E+00	1.60E+02	0.00E+00	9.74E+05	N/A
	CHILD	1.26E+03	6.26E+02	9.30E+01	0.00E+00	2.75E+02	0.00E+00	7.81E+05	N/A
	INFANT	2.07E+04	1.52E+03	1.79E+02	0.00E+00	4.68E+02	0.00E+00	7.84E+05	N/A
COW	ADULT	1.41E+03	9.51E+02	1.08E+02	0.00E+00	4.42E+02	0.00E+00	3.64E+06	N/A
MILK	TEEN	2.58E+03	1.72E+03	1.98E+02	0.00E+00	8.11E+02	0.00E+00	4.93E+06	N/A
	CHILD	6.35E+03	3.17E+03	4.70E+02	0.00E+00	1.39E+03	0.00E+00	3.95E+06	N/A
	INFANT	1.26E+04	7.68E+03	9.04E+02	0.00E+00	2.37E+03	0.00E+00	3.97E+06	N/A
MEAT	ADULT	5.11E+03	3.46E+03	3.92E+02	0.00E+00	1.61E+03	0.00E+00	1.32E+07	N/A
	TEEN	4.29E+03	2.87E+03	3.29E+02	0.00E+00	1.35E+03	0.00E+00	8.20E+06	N/A
	CHILD	8.08E+03	4.03E+03	5.99E+02	0.00E+00	1.77E+03	0.00E+00	5.03E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.49E+05	1.01E+05	1.14E+04	0.00E+00	4.69E+04	0.00E+00	3.86E+08	N/A
	TEEN	2.38E+05	1.59E+05	1.83E+04	0.00E+00	7.49E+04	0.00E+00	4.55E+08	N/A
	CHILD	5.73E+05	2.86E+05	4.25E+04	0.00E+00	1.25E+05	0.00E+00	3.57E+08	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.56E+05	1.06E+05	1.20E+04	0.00E+00	4.90E+04	0.00E+00	4.03E+08	N/A
INGESTION	TEEN	2.46E+05	1.64E+05	1.88E+04	0.00E+00	7.72E+04	0.00E+00	4.69E+08	N/A
	CHILD	5.89E+05	2.94E+05	4.36E+04	0.00E+00	1.29E+05	0.00E+00	3.67E+08	N/A
	INFANT	3.33E+04	9.20E+03	1.08E+03	0.00E+00	2.84E+03	0.00E+00	4.75E+06	N/A
INHALATION	ADULT	1.99E+04	1.35E+04	1.53E+03	0.00E+00	6.26E+03	3.62E+05	1.20E+05	N/A
	TEEN	2.84E+04	1.90E+04	2.17E+03	0.00E+00	8.88E+03	6.14E+05	1.26E+05	N/A
	CHILD	3.92E+04	1.95E+04	2.90E+03	0.00E+00	8.55E+03	5.44E+05	5.66E+04	N/A
	INFANT	2.77E+04	1.67E+04	1.99E+03	0.00E+00	5.25E+03	5.17E+05	2.16E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
1.35E+07	1.52E+07	9.74E+05	4.93E+06	1.32E+07	4.55E+08	4.69E+08	6.14E+05



**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Pr-143								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	8.57E+00	3.44E+00	4.25E-01	0.00E+00	1.98E+00	0.00E+00	3.75E+04	N/A
MILK	TEEN	1.57E+01	6.28E+00	7.83E-01	0.00E+00	3.65E+00	0.00E+00	5.18E+04	N/A
	CHILD	3.89E+01	1.17E+01	1.93E+00	0.00E+00	6.33E+00	0.00E+00	4.20E+04	N/A
	INFANT	6.71E+02	3.01E+01	3.99E+00	0.00E+00	1.12E+01	0.00E+00	4.25E+04	N/A
COW	ADULT	4.02E+01	1.61E+01	1.99E+00	0.00E+00	9.31E+00	0.00E+00	1.76E+05	N/A
MILK	TEEN	7.39E+01	2.95E+01	3.68E+00	0.00E+00	1.71E+01	0.00E+00	2.43E+05	N/A
	CHILD	1.83E+02	5.49E+01	9.07E+00	0.00E+00	2.97E+01	0.00E+00	1.97E+05	N/A
	INFANT	3.78E+02	1.41E+02	1.87E+01	0.00E+00	5.26E+01	0.00E+00	2.00E+05	N/A
MEAT	ADULT	6.96E+03	2.79E+03	3.45E+02	0.00E+00	1.61E+03	0.00E+00	3.05E+07	N/A
	TEEN	5.86E+03	2.34E+03	2.92E+02	0.00E+00	1.36E+03	0.00E+00	1.93E+07	N/A
	CHILD	1.11E+04	3.33E+03	5.50E+02	0.00E+00	1.80E+03	0.00E+00	1.20E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	3.04E+04	1.22E+04	1.51E+03	0.00E+00	7.04E+03	0.00E+00	1.33E+08	N/A
	TEEN	4.00E+04	1.60E+04	1.99E+03	0.00E+00	9.27E+03	0.00E+00	1.31E+08	N/A
	CHILD	8.98E+04	2.69E+04	4.45E+03	0.00E+00	1.46E+04	0.00E+00	9.68E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	3.74E+04	1.50E+04	1.86E+03	0.00E+00	8.67E+03	0.00E+00	1.64E+08	N/A
INGESTION	TEEN	4.59E+04	1.83E+04	2.28E+03	0.00E+00	1.07E+04	0.00E+00	1.51E+08	N/A
	CHILD	1.01E+05	3.03E+04	5.01E+03	0.00E+00	1.64E+04	0.00E+00	1.09E+08	N/A
	INFANT	1.05E+03	1.72E+02	2.27E+01	0.00E+00	6.38E+01	0.00E+00	2.42E+05	N/A
INHALATION	ADULT	9.36E+03	3.75E+03	4.64E+02	0.00E+00	2.16E+03	2.81E+05	2.00E+05	N/A
	TEEN	1.34E+04	5.31E+03	6.62E+02	0.00E+00	3.09E+03	4.83E+05	2.14E+05	N/A
	CHILD	1.85E+04	5.55E+03	9.14E+02	0.00E+00	3.00E+03	4.33E+05	9.73E+04	N/A
	INFANT	1.40E+04	5.24E+03	6.99E+02	0.00E+00	1.97E+03	4.33E+05	3.72E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	5.18E+04	2.43E+05	3.05E+07	1.33E+08	1.64E+08	4.83E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Ce-144								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	7.96E+07
	TEEN	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	7.96E+07
	CHILD	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	7.96E+07
	INFANT	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	6.88E+07	7.96E+07
GOAT	ADULT	2.60E+04	1.09E+04	1.39E+03	0.00E+00	6.44E+03	0.00E+00	8.78E+06	N/A
MILK	TEEN	4.78E+04	1.98E+04	2.57E+03	0.00E+00	1.18E+04	0.00E+00	1.20E+07	N/A
	CHILD	1.18E+05	3.69E+04	6.28E+03	0.00E+00	2.04E+04	0.00E+00	9.63E+06	N/A
	INFANT	1.41E+06	6.91E+04	9.46E+03	0.00E+00	2.79E+04	0.00E+00	9.68E+06	N/A
COW	ADULT	1.65E+05	6.91E+04	8.88E+03	0.00E+00	4.10E+04	0.00E+00	5.59E+07	N/A
MILK	TEEN	3.04E+05	1.26E+05	1.63E+04	0.00E+00	7.52E+04	0.00E+00	7.65E+07	N/A
	CHILD	7.50E+05	2.35E+05	4.00E+04	0.00E+00	1.30E+05	0.00E+00	6.13E+07	N/A
	INFANT	1.07E+06	4.40E+05	6.02E+04	0.00E+00	1.78E+05	0.00E+00	6.17E+07	N/A
MEAT	ADULT	7.55E+05	3.16E+05	4.05E+04	0.00E+00	1.87E+05	0.00E+00	2.55E+08	N/A
	TEEN	6.36E+05	2.63E+05	3.42E+04	0.00E+00	1.57E+05	0.00E+00	1.60E+08	N/A
	CHILD	1.20E+06	3.76E+05	6.40E+04	0.00E+00	2.08E+05	0.00E+00	9.80E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	2.94E+07	1.23E+07	1.58E+06	0.00E+00	7.30E+06	0.00E+00	9.95E+09	N/A
	TEEN	4.95E+07	2.05E+07	2.66E+06	0.00E+00	1.22E+07	0.00E+00	1.24E+10	N/A
	CHILD	1.21E+08	3.80E+07	6.46E+06	0.00E+00	2.10E+07	0.00E+00	9.90E+09	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	3.04E+07	1.27E+07	1.63E+06	0.00E+00	7.53E+06	0.00E+00	1.03E+10	N/A
INGESTION	TEEN	5.05E+07	2.09E+07	2.71E+06	0.00E+00	1.25E+07	0.00E+00	1.27E+10	N/A
	CHILD	1.23E+08	3.86E+07	6.57E+06	0.00E+00	2.14E+07	0.00E+00	1.01E+10	N/A
	INFANT	2.48E+06	5.09E+05	6.97E+04	0.00E+00	2.06E+05	0.00E+00	7.14E+07	N/A
INHALATION	ADULT	3.43E+06	1.43E+06	1.84E+05	0.00E+00	8.48E+05	7.78E+06	8.16E+05	N/A
	TEEN	4.89E+06	2.02E+06	2.62E+05	0.00E+00	1.21E+06	1.34E+07	8.64E+05	N/A
	CHILD	6.77E+06	2.12E+06	3.61E+05	0.00E+00	1.17E+06	1.20E+07	3.89E+05	N/A
	INFANT	3.19E+06	1.21E+06	1.76E+05	0.00E+00	5.38E+05	9.84E+06	1.48E+05	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
6.88E+07	7.96E+07	1.20E+07	7.65E+07	2.55E+08	1.24E+10	1.27E+10	1.34E+07

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Pr-144								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
MILK	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
COW	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
MILK	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
MEAT	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
INGESTION	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
INHALATION	ADULT	3.01E-02	1.25E-02	1.53E-03	0.00E+00	7.05E-03	1.02E+03	2.15E-08	N/A
	TEEN	4.30E-02	1.76E-02	2.18E-03	0.00E+00	1.01E-02	1.75E+03	2.35E-04	N/A
	CHILD	5.96E-02	1.85E-02	3.00E-03	0.00E+00	9.77E-03	1.57E+03	1.97E+02	N/A
	INFANT	4.79E-02	1.85E-02	2.41E-03	0.00E+00	6.72E-03	1.61E+03	4.28E+03	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.28E+03

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Nd-147								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	9.97E+06
	TEEN	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	9.97E+06
	CHILD	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	9.97E+06
	INFANT	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	8.31E+06	9.97E+06
GOAT	ADULT	5.09E+00	5.89E+00	3.52E-01	0.00E+00	3.44E+02	0.00E+00	2.83E+04	N/A
MILK	TEEN	9.80E+00	1.07E+01	6.38E-01	0.00E+00	6.26E+00	0.00E+00	3.84E+04	N/A
	CHILD	2.40E+01	1.95E+01	1.51E+00	0.00E+00	1.07E+01	0.00E+00	3.09E+04	N/A
	INFANT	3.97E+02	4.90E+01	3.00E+00	0.00E+00	1.89E+01	0.00E+00	3.10E+04	N/A
COW	ADULT	2.38E+01	2.75E+01	1.65E+00	0.00E+00	1.61E+01	0.00E+00	1.32E+05	N/A
MILK	TEEN	4.58E+01	4.98E+01	2.98E+00	0.00E+00	2.93E+01	0.00E+00	1.80E+05	N/A
	CHILD	1.12E+02	9.11E+01	7.05E+00	0.00E+00	5.00E+01	0.00E+00	1.44E+05	N/A
	INFANT	2.23E+02	2.29E+02	1.40E+01	0.00E+00	8.82E+01	0.00E+00	1.45E+05	N/A
MEAT	ADULT	2.34E+03	2.70E+03	1.62E+02	0.00E+00	1.58E+03	0.00E+00	1.30E+07	N/A
	TEEN	2.06E+03	2.24E+03	1.34E+02	0.00E+00	1.31E+03	0.00E+00	8.08E+06	N/A
	CHILD	3.86E+03	3.13E+03	2.42E+02	0.00E+00	1.72E+03	0.00E+00	4.96E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	1.39E+04	1.61E+04	9.61E+02	0.00E+00	9.39E+03	0.00E+00	7.71E+07	N/A
	TEEN	1.72E+04	1.87E+04	1.12E+03	0.00E+00	1.10E+04	0.00E+00	6.74E+07	N/A
	CHILD	3.65E+04	2.95E+04	2.29E+03	0.00E+00	1.62E+04	0.00E+00	4.68E+07	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	1.63E+04	1.88E+04	1.12E+03	0.00E+00	1.10E+04	0.00E+00	9.03E+07	N/A
INGESTION	TEEN	1.93E+04	2.10E+04	1.26E+03	0.00E+00	1.23E+04	0.00E+00	7.57E+07	N/A
	CHILD	4.05E+04	3.28E+04	2.54E+03	0.00E+00	1.80E+04	0.00E+00	5.19E+07	N/A
	INFANT	6.20E+02	2.78E+02	1.70E+01	0.00E+00	1.07E+02	0.00E+00	1.76E+05	N/A
INHALATION	ADULT	5.27E+03	6.10E+03	3.65E+02	0.00E+00	3.56E+03	2.21E+05	1.73E+05	N/A
	TEEN	7.86E+03	8.56E+03	5.13E+02	0.00E+00	5.02E+03	3.72E+05	1.82E+05	N/A
	CHILD	1.08E+04	8.73E+03	6.81E+02	0.00E+00	4.81E+03	3.28E+05	8.21E+04	N/A
	INFANT	7.94E+03	8.13E+03	5.00E+02	0.00E+00	3.15E+03	3.22E+05	3.12E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
8.31E+06	9.97E+06	3.84E+04	1.80E+05	1.30E+07	7.71E+07	9.03E+07	3.72E+05

**ODCM MAXIMUM PATHWAY DOSE FACTORS: RADIONUCLIDES OTHER THAN NOBLE GASES**

Isotope:	Np-239								
PATHWAY	AGE GROUP	BONE	LIVER	T.BODY	THYROID	KIDNEY	LUNG	G.I.	SKIN
GROUND	ADULT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	TEEN	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	CHILD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
GOAT	ADULT	1.98E-01	1.95E-02	1.08E-02	0.00E+00	6.08E-02	0.00E+00	4.00E+03	N/A
MILK	TEEN	3.79E-01	3.57E-02	1.98E-02	0.00E+00	1.12E-01	0.00E+00	5.74E+03	N/A
	CHILD	9.32E-01	6.69E-02	4.70E-02	0.00E+00	1.93E-01	0.00E+00	4.95E+03	N/A
	INFANT	1.64E+01	9.96E-02	9.96E-02	0.00E+00	3.51E-01	0.00E+00	5.09E+03	N/A
COW	ADULT	9.26E-01	9.10E-02	5.02E-02	0.00E+00	2.84E-01	0.00E+00	1.87E+04	N/A
MILK	TEEN	1.77E+00	1.67E-01	9.25E-02	0.00E+00	5.23E-01	0.00E+00	2.68E+04	N/A
	CHILD	4.35E+00	3.12E-01	2.19E-01	0.00E+00	9.02E-01	0.00E+00	2.31E+04	N/A
	INFANT	9.19E+00	8.22E-01	4.64E-01	0.00E+00	1.64E+00	0.00E+00	2.38E+04	N/A
MEAT	ADULT	8.54E-02	8.40E-03	4.63E-03	0.00E+00	2.62E-02	0.00E+00	1.72E+03	N/A
	TEEN	7.47E-02	7.04E-03	3.91E-03	0.00E+00	2.21E-02	0.00E+00	1.13E+03	N/A
	CHILD	1.41E-01	1.01E-02	7.09E-03	0.00E+00	2.92E-02	0.00E+00	7.47E+02	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
VEGETABLE	ADULT	4.71E+02	4.63E+01	2.55E+01	0.00E+00	1.45E+02	0.00E+00	9.50E+06	N/A
	TEEN	4.57E+02	4.31E+01	2.40E+01	0.00E+00	1.35E+02	0.00E+00	6.94E+06	N/A
	CHILD	8.44E+02	6.06E+01	4.26E+01	0.00E+00	1.75E+02	0.00E+00	4.49E+06	N/A
	INFANT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	N/A
TOTAL	ADULT	4.72E+02	4.64E+01	2.56E+01	0.00E+00	1.45E+02	0.00E+00	9.53E+06	N/A
INGESTION	TEEN	4.60E+02	4.33E+01	2.41E+01	0.00E+00	1.36E+02	0.00E+00	6.97E+06	N/A
	CHILD	8.50E+02	6.10E+01	4.29E+01	0.00E+00	1.76E+02	0.00E+00	4.52E+06	N/A
	INFANT	2.56E+01	9.22E-01	5.64E-01	0.00E+00	1.99E+00	0.00E+00	2.89E+04	N/A
INHALATION	ADULT	2.30E+02	2.26E+01	1.24E+01	0.00E+00	7.00E+01	3.76E+04	1.19E+05	N/A
	TEEN	3.38E+02	3.19E+01	1.77E+01	0.00E+00	1.00E+02	6.49E+04	1.32E+05	N/A
	CHILD	4.66E+02	3.34E+01	2.35E+01	0.00E+00	9.73E+01	5.81E+04	6.40E+04	N/A
	INFANT	3.71E+02	3.32E+01	1.88E+01	0.00E+00	6.62E+01	5.95E+04	2.49E+04	N/A

\*Airborne pathways and tritium ingestion: units are mrem/yr/ $\mu$ Ci/m<sup>3</sup>  
Deposition pathways: units are mrem-m<sup>2</sup>/yr/ $\mu$ Ci/sec

*** MAXIMUM VALUES FOR PATHWAYS ***							
GROUND: T.B./ORG.	GROUND: SKIN	GOAT MILK	COW MILK	MEAT	VEGETABLE	TOTAL INGESTION	INHALATION
0.00E+00	0.00E+00	5.74E+03	2.68E+04	1.72E+03	9.50E+06	9.53E+06	1.32E+05