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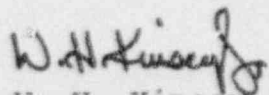
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U. S. Nuclear Regulatory Commission  
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South Texas Project  
Units 1 and 2  
Docket Nos. STN 50-498, STN 50-499  
Semiannual Radioactive Effluent  
Release Report for the Second Half of 1992

Pursuant to the South Texas Project Electric Generating Station (STPEGS) Technical Specification 6.9.1.4 and 10CFR50.36a, attached is the Semiannual Radioactive Effluent Release Report for the second half of 1992. The report covers the period from July 1, 1992 to December 31, 1992.

If you have any questions on this matter, please contact Mr. C. A. Ayala at (512) 972-8628.

  
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Attachment: Semiannual Radioactive Effluent Release  
Report for the Second Half of 1992.

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HOUSTON LIGHTING AND POWER COMPANY

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION UNIT ONE

LICENSE NO. NPF-76

AND

SOUTH TEXAS PROJECT ELECTRIC GENERATING STATION UNIT TWO

LICENSE NO. NPF-80

SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

JULY 1, 1992 THROUGH DECEMBER 31, 1992

Prepared by: *[Signature]*  
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2/23/93  
Date

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2/23/93  
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## REPORT SUMMARY

This report summarizes the radioactive liquid and gaseous effluents from the South Texas Project Electric Generating Station for the second half of 1992.

The radioactive waste treatment systems at the South Texas Project are designed to collect and process liquid and gaseous wastes which contain radioactivity. Any effluents from the plant are measured by installed plant radiation monitors which continuously monitor the ventilation exhaust points from each unit. Similarly, the liquid discharge line from each unit automatically monitors effluents to the onsite 7000 acre reservoir. This reservoir is entirely within the owner controlled area and no public access is permitted. During 1992, no discharges were made to the Colorado River from the reservoir. The radiation monitors and associated sample analyses on the liquid and gaseous systems will allow accurate determination of the type and quantities of any radioactive materials released in plant effluents.

Based on the information collected from the monitors and samples, a hypothetical radiation dose to the population in the surrounding area is calculated. These calculations utilize the actual release data and actual meteorological conditions for gaseous effluents. All credible paths for radioactivity to reach an individual, such as the consumption of vegetables from a garden or fish from the river, are factored into the calculation to determine the maximum possible dose a person could receive.

The Semiannual Radioactive Effluent Release Report for the second half of 1992 shows that all effluent releases were well below applicable limits and were consistent with results from previous reporting periods. In 1992, the worst case, or most conservatively calculated dose to a member of the public attributed to the operation of the South Texas Project Electric Generating Station was  $< 1$  millirem which is only about 3% of the established regulatory limit. As a point of reference, the typical annual radiation dose to an individual from natural sources is 300 millirem. The plant operation is consistently controlled to stay well within the limits to ensure maximum protection for the population and the environment.

## TABLE OF CONTENTS

SUBJECT	PAGE
1.0 Introduction	4
2.0 Supplemental Information for Effluent and Waste Disposal	4
2.1 Regulatory Limits	4
2.2 Maximum Permissible Concentrations	5
2.3 Average Energy (MeV/Disintegration)	6
2.4 Measurements and Approximations of Total Activity	6
2.5 Batch Releases	10
2.6 Abnormal (Unplanned) Releases	12
2.7 Estimate of Total Error	12
2.8 Solid Waste Shipments	13
2.9 Radiological Impact on Man	13
2.10 Meteorological Data	13
2.11 Lower Limit of Detection (LLD)	14
2.12 Dose to MEMBERS OF THE PUBLIC from Direct Radiation	14
3.0 Technical Specification Reporting Requirements	15
3.1 Radioactive Waste Treatment System Design Modifications Description	15
3.2 Inoperable Effluent Monitoring Instrumentation Explanation	15
3.3 Gas Storage Tank Curie Limit Violation Description	16
3.4 Unprotected Outdoor Tank Curie Limit Violation Description	16
3.5 Abnormal (Unplanned) Release Description	16
3.6 Radioactive Waste Process Control Program Changes	16
3.7 Offsite Dose Calculation Manual (ODCM) Changes	16
3.8 New Land Use Census Location(s) Identification	20
4.0 Revisions to Previous Reports	20
4.1 Gaseous Effluents for 1992	20
4.2 Liquid Effluents for 1992	20

LIST OF TABLES

	PAGE
Gaseous Effluents for 1992 3rd and 4th Quarters	21
Liquid Effluents for 1992 3rd and 4th Quarters	27
Solid Waste and Irradiated Fuel Shipments 3rd and 4th Quarters, 1992	32
Dose Accumulations for 1992	36
Joint Frequency Tables for 1992 First Quarter	40
Joint Frequency Tables for 1992 Second Quarter	49
Joint Frequency Tables for 1992 Third Quarter	58
Joint Frequency Tables for 1992 Fourth Quarter	67
Meteorological Conditions During Batch Releases First Quarter for 1992	76
Meteorological Conditions During Batch Releases Second Quarter for 1992	85
Meteorological Conditions During Batch Releases Third Quarter for 1992	94
Meteorological Conditions During Batch Releases Fourth Quarter for 1992	104

LIST OF APPENDICES

	PAGE
Appendix A - Revised Gaseous Effluents for 1992 1st and 2nd Quarters	113
Appendix B - Revised Liquid Effluents for 1992 1st and 2nd Quarters	118
Appendix C - Results of the Protected Area Direct Radiation Measurement Program	123
Appendix D - Offsite Dose Calculation Manual, Revision 5	125



## 1.0 Introduction

This Semiannual Radioactive Effluent Release Report for the period July 1, 1992, through December 31, 1992, is submitted in accordance with Appendix A of License NPF-76 and NPF-80, Technical Specifications and Offsite Dose Calculation Manual (ODCM).

A single submittal is made for both units which combines those sections that are common. Separate tables of releases and release totals are included where separate processing systems exist.

This report includes an annual summary of hourly meteorological measurements taken during each quarter. This data appears as tables of wind direction and wind speed by atmospheric stability class. Hourly meteorological data for batch releases are presented for the period of actual release. All assessments of radiation doses are performed in accordance with the Offsite Dose Calculation Manual (ODCM).

Liquid quarterly composites for Strontium-89 and Strontium-90 for the 4th quarter, 1992, will be updated in the next Semiannual Radioactive Effluent Release Report if appropriate.

## 2.0 Supplemental Information for Effluent and Waste Disposal

### Unit Number 1

Type: PWR	Houston Lighting & Power Co.
Docket No. 50-498	Power (MWT)- 3800
Cooling Water Source:	Initial Criticality-(March 8, 1988)
Main Cooling Reservoir	

### Unit Number 2

Type: PWR	Houston Lighting & Power Co.
Docket No. 50-499	Power (MWT)- 3800
Cooling Water Source:	Initial Criticality-(March 12, 1989)
Main Cooling Reservoir	

## 2.1 Regulatory Limits

### 2.1.1 Fission and activation gases

The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the Site Boundary shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

#### 2.1.2 Iodines and Particulates, half-lives > 8 days

The dose to a Member of the Public from Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each unit, to areas at and beyond the Site Boundary shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrems to any organ and,
- b. During any calendar year: Less than or equal to 15 mrems to any organ.

#### 2.1.3 Liquid Effluents

The dose or dose commitment to a Member of the Public from radioactive materials in liquid effluents released, from each unit, to Unrestricted Areas shall be limited to:

- a. During any calendar quarter: Less than or equal to 1.5 mrems to the whole body and to less than or equal to 5 mrems to any organ, and
- b. During any calendar year: Less than or equal to 3 mrems to the whole body and to less than or equal to 10 mrems to any organ.

### 2.2 Maximum Permissible Concentrations

#### 2.2.1 Gaseous Effluents

The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the Site Boundary shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrems/yr to the whole body and less than or equal to 3000 mrems/yr to the skin and
- b. For Iodine-131, for Iodine-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrems/yr to any organ.

### 2.2.2 Liquid Effluents

The concentration of radioactive material released in liquid effluents to Unrestricted Areas shall be limited to the concentrations specified in 10CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases the concentration shall be limited to 2.0E-04 micro curie/ml total activity.

### 2.3 Average Energy (MeV/Disintegration)

The Average Energy (or E-bar) shall be the average (weighted in proportion to the concentration of each radionuclide in the reactor coolant at the time of sampling) of the sum of the average beta and gamma energies per disintegration for the isotopes other than Iodines, with half-lives greater than 15 minutes, making up at least 95% of the total non-iodine activity in the coolant.

E-bar (MeV/Disintegration) 0.58 Unit 1  
0.250 Unit 2

The average energy (E-bar) of the radionuclide mixture in releases of fission and activation gases follows:

E-bar (MeV/Disintegration) 0.213 Unit 1  
0.184 Unit 2

### 2.4 Measurement and Approximations of Total Activity

The following discussions detail the methods used to measure and approximate total activity for the following:

- a. Fission and Activation Gases
- b. Iodines
- c. Particulates
- d. Liquid Effluents

Tables A3-1 and A4-1 of the STPEGS Offsite Dose Calculation Manual (ODCM) give sampling frequencies and lower limit of detection requirements for the analysis of liquid and gaseous effluent streams.

## 2.4.1 Gaseous Effluents

### 2.4.1.1 Fission and Activation Gases

The following noble gases are considered in evaluating gaseous airborne discharges:

Ar-41	Xe-131m
Kr-83m	Xe-133m
Kr-85m	Xe-133
Kr-85	Xe-135m
Kr-87	Xe-135
Kr-88	Xe-137
Kr-89	Xe-138
Kr-90	

### 2.4.1.2 Iodines and Particulates

The radioiodines and radioactive materials in particulate forms to be considered are:

Cr-51	Sb-124	H-3
Mn-54	I-131	Mo-99
Fe-59	I-133	
Co-58	Cs-134	
Co-60	Cs-136	
Zn-65	Cs-137	
Sr-89	Ba-140	
Sr-90	Ce-141	
Zr-95	Ce-144	

Other nuclides with half-lives greater than 8 days

### 2.4.1.3 Analytical Methods

#### a. Batch Gaseous Releases

Pre-release grab samples from the plant containment atmosphere, prior to issuance of weekly permits, and pre-release grab samples from the RCS Vacuum Degassing System are analyzed on a Gamma Spectroscopy System utilizing high purity germanium detectors (HPGe) for noble gas, iodine and particulate activity.

The radionuclide values obtained are used in conjunction with the gross noble gas release rate monitoring data collected by the radiation monitoring system to estimate the release rate of each radionuclide in the effluent streams.

b. Continuous Gaseous Releases

Periodic noble gas and tritium grab samples are taken from the continuous release points (i.e. the Unit Vent and the Condenser Air Removal System exhaust, secondary steam leakage, and the MAB elevator machine room exhaust fan). Continuous sampling for particulates and iodine is also performed on the effluent streams. These samples are analyzed for gross alpha and gamma radionuclides, as described above for batch releases. Strontium-89 and Strontium-90 analysis is performed by an offsite laboratory.

2.4.2 Liquid Effluents

The radionuclides listed below are considered when evaluating liquid effluents:

H3	Y-90	I-133
Na-24	Y-91m	I-134
Cr-51	Y-91	I-135
Mn-54	Y-93	Cs-134
Mn-56	Zr-95	Cs-136
Fe-55	Zr-97	Cs-137
Fe-59	Nb-95	Cs-138
Co-58	Mo-99	Ba-139
Co-60	Tc-99m	Ba-140
Ni-65	Tc-101	Ba-141
Cu-64	Ru-105	Ba-142
Zn-65	Ru-106	La-140
Zn-69	Ag-110m	La-142
Br-83	Te-125m	Ce-141
Br-84	Te-127m	Ce-143
Br-85	Te-127	Ce-144
Rb-86	Te-129m	Pr-143
Rb-88	Te-129	Pr-144
Rb-89	Te-131m	Nd-147
Sr-89	Te-131	W-187
Sr-90	Te-132	Np-239
Sr-91	I-130	.LIQ*
Sr-92	I-131	.ALPHA (Gross Alpha)
	I-132	.Xe-133
		.Xe-135

\*other identified radionuclides



#### 2.4.2.1 Analytical Methods

##### a. Liquid Releases

Liquid effluents that are processed by the liquid waste processing system are released as batches. Liquid effluents that are due to primary to secondary leakage or other plant operations are released as continuous releases. For batch releases, representative pre-release grab samples are taken and analyzed in accordance with Table A3-1 of the ODCM. For continuous releases, representative samples are collected weekly and analyzed. Radionuclide analyses are performed using the Gamma Spectroscopy System. Aliquots of each pre-release batch sample and of representative samples for continuous releases are composited in accordance with the requirements in Table A3-1 of the ODCM. Gross alpha determinations are made using a Gas-Flow Proportional Counting System. Tritium concentrations are determined using Liquid Scintillation Counting techniques. Dissolved and entrained gas concentrations are determined by counting grab samples on the Gamma Spectroscopy System. Strontium 89 and 90 and Iron 55 determinations are performed by an offsite laboratory.

The radionuclide concentrations obtained are used with the flow total for each batch release. The error associated with the flow measurement is small in relation to the counting uncertainty of the radionuclide concentration analysis. The average uncertainty associated with counting measurements is 5% or less at the 95% confidence level.

## 2.5 Batch Releases

Liquid and gaseous summaries are compiled from permits generated using the Nuclear Data Effluent Management System and plant procedures. Liquid batch releases are accounted for by individual permits. Gaseous batch releases are accounted for by weekly permits. Batch times represent the actual period of releases. Since the only type batch releases at STPEGS are containment building purges or pressure reliefs which are also monitored and quantified by the unit vent, the Xe-133 radioactivity released in this mode is accounted for in the continuous release totals with all other containment building radioactivities being reported in the batch release totals.

2.5.1 Liquid (Unit 1)	Quarter 3	Quarter 4
a. Number of releases:	<u>112</u>	<u>150</u>
b. Total time period for releases (min):	<u>6298.73</u>	<u>8683.78</u>
c. Maximum time period for a release (min):	<u>69.00</u>	<u>76.00</u>
d. Average time period for a release (min):	<u>56.24</u>	<u>57.89</u>
e. Minimum time period for a release (min):	<u>41.07</u>	<u>41.00</u>
2.5.2 Gaseous (Unit 1)		
a. Number of releases:	<u>56</u>	<u>44</u>
b. Total time period for releases (min):	<u>11325</u>	<u>86355</u>
c. Maximum time period for a release (min):	<u>3119</u>	<u>9389</u>
d. Average time period for a release (min):	<u>202</u>	<u>1963</u>
e. Minimum time period for a release (min):	<u>2</u>	<u>4</u>

	Quarter 3	Quarter 4
2.5.3 Liquid (Unit 2)		
a. Number of releases:	<u>85</u>	<u>100</u>
b. Total time period for releases (min):	<u>4263.35</u>	<u>5143.50</u>
c. Maximum time period for a release (min):	<u>59.95</u>	<u>58.00</u>
d. Average time period for a release (min):	<u>50.16</u>	<u>51.44</u>
e. Minimum time period for a release (min):	<u>28.05</u>	<u>41.00</u>
2.5.4 Gaseous (Unit 2)		
a. Number of releases:	<u>74</u>	<u>85</u>
b. Total time period for releases (min):	<u>1459</u>	<u>1079</u>
c. Maximum time period for a release (min):	<u>207</u>	<u>32</u>
d. Average time period for a release (min):	<u>20</u>	<u>13</u>
e. Minimum time period for a release (min):	<u>3</u>	<u>4</u>

2.6	Abnormal (Unplanned) Releases	Quarter 3	Quarter 4
2.6.1	Liquid (Unit 1)		
a.	Number of releases:	<u>0</u>	<u>0</u>
b.	Total activity released (curies):	<u>0.000E+00</u>	<u>0.000E+00</u>
2.6.2	Gaseous (Unit 1)		
a.	Number of releases:	<u>0</u>	<u>0</u>
b.	Total activity released (curies):	<u>0.000E+00</u>	<u>0.000E+00</u>
2.6.3	Liquid (Unit 2)		
a.	Number of releases:	<u>0</u>	<u>0</u>
b.	Total activity released (curies):	<u>0.000E+00</u>	<u>0.000E+00</u>
2.6.4	Gaseous (Unit 2)		
a.	Number of releases:	<u>0</u>	<u>0</u>
b.	Total activity released (curies):	<u>0.000E+00</u>	<u>0.000E+00</u>
2.7	Estimate of Total Error		
2.7.1	Liquid		
a.	The maximum error associated with volume and flow measurements, based upon plant calibration practice, is estimated to be +/- 1.277%.		
b.	The average uncertainty associated with counting measurements is 5% or less at the 95% confidence level.		
c.	The error associated with dilution volume is estimated to be +/- 10%.		

### 2.7.2 Gaseous

- a. The maximum error associated with monitor readings, sample flow, vent flow, sample collection, monitor calibration and laboratory procedures are collectively estimated to be:

Fission and Activation Gases	+25%
Iodines	+25%
Particulates	+25%
Tritium	+25%

- b. The average uncertainty associated with counting measurements is 5% or less at the 95% confidence level for fission and activation gases, iodines, particulates and tritium.

### 2.7.3 Solid Radioactive Waste

The error associated in determining the contents and volume of solid radwaste shipments is estimated to be +/- 5% and +/- 1%, respectively.

### 2.8 Solid Waste Shipments

A total of seventeen (17) shipments of radioactive dry active waste and resin were made during the reporting period. A summary of the data is provided in the Solid Waste and Irradiated Fuel Shipments Table.

### 2.9 Radiological Impact on Man (ref. Technical Specifications 6.9.1.4)

This data for the period January 1, 1992, through December 31, 1992, is provided in the Dose Accumulations and the Summary of Direct Radiation Tables.

### 2.10 Meteorological Data

The 1992 meteorological data is presented in the form of joint frequency tables. Each quarter contains eight tables, one for each stability class and one for all classes combined.



A second set of joint frequency tables is provided for time periods when the gaseous effluent release rate was significantly higher than normal. Typical noble gas release rates seldom exceed about 10 uCi/sec for Unit 1 and 40 uCi/sec for Unit 2, so these tables contain meteorological conditions during periods when the noble gas release rate exceed 20 uCi/sec for Unit 1 or 40 uCi/sec for Unit 2. These tables also contain meteorological conditions during periods of significant radiiodine or radioactive particulate releases.

#### 2.11 Lower Limit of Detection (LLD)

The LLD (an a priori limit) is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability, and only a 5% probability of falsely concluding that a blank observation represents a "real" signal. A reported value < LLD is indicated by a Ø in the attached tables.

#### 2.12 Dose to MEMBERS OF THE PUBLIC from Direct Radiation

The Off-site Dose Calculation Manual (ODCM) includes the direct radiation from plant structures as a component of the dose to a hypothetical, highest exposed Member of the Public due to plant operations. The ODCM allows measurements made near plant structures to be used in these calculations following suitable adjustments for distance and exposure time. In 1992 numerous TLDs were placed along the fence to the protected areas surrounding Units 1 and 2 of STPEGS. The results of these measurements are shown in Appendix C. The net dose rate values in the table of Appendix C show what dose rate can be attributed to STPEGS operation in excess of the natural radiation dose rate which existed in the area of STPEGS prior to plant construction (base background dose rate calculated from 1986 site perimeter TLD data). Using the time a Member of the Public might be exposed, and the distance to the exposure location, doses to hypothetical Members of the Public can be estimated. The ODCM requires examination of three such individuals: a Member of the Public who drives past STPEGS while commuting to work, a Member of the Public who visits the STPEGS Visitor's Center, and a Member of the Public who tours the site outside the protected area fence.

In 1992 the highest exposed Member of the Public was an individual who toured the site and spent 0.5 hours on the Heavy Haul Road behind Unit 2. The radiation dose to this individual was calculated to be 0.0008 mrem and was calculated as follows:

$$0.0015 \text{ mrem/hour} * 0.5 \text{ hours/tour} = 0.0008 \text{ mrem}$$

0.0015 mrem/hour = the average dose rate for station 0-06 during 1992.  
0.5 hours/tour - time spent on Heavy Haul Road behind Unit 1.

This dose of 0.0008 mrem is small when compared to the Technical Specification limit of 15 mrem to any organ during a year. By comparison, the dose attributable to direct radiation arising from natural sources averages 61.6 mrem per year in the vicinity of STPEGS.

### 3.0 Technical Specifications Reporting Requirements

#### 3.1 Radioactive Waste Treatment System Design Modification Description (ref. Technical Specifications 6.15)

No major design modifications were made to the liquid, gaseous, or solid radioactive waste treatment systems during this reporting period:

#### 3.2 Inoperable Effluent Monitoring Instrumentation Explanation (ref. Technical Specifications 6.9.1.4)

Explanations of why inoperable liquid and/or gaseous effluent monitoring instrumentation were not corrected within the time specified in Sections 3.3.3.10 or 3.3.3.11 of Technical Specifications are as follows:

##### 3.2.1 Condenser Vacuum Pump Wide Range Gas Monitors N1RA-RT-8027/N2RA-RT-8027

Condenser Vacuum Pump Wide Range Gas Monitors process flow channels N1RA-RT-8027A and N2RA-RT-8027A were removed from service on November 1, 1988, at 0100. Since the problems with the monitors were not repaired within 30 days, the following is provided as an explanation.

The Condenser Vacuum Pump Wide Range Gas Monitors N1RA-RT-8027 and N2RA-RT-8027 have similar problems with the process flow stream. In both units, the actual process flowrate is less than the designed process flowrate.

On December 21, 1992, the USNRC approved removing the Radiological Effluent Technical Specifications (RETS) from the Technical Specifications and placing them in the Offsite Dose Calculation Manual (ODCM). Plant Modifications 89-066 and 89-067 have been completed to reroute the condenser vacuum exhaust to the respective unit vent. A change to the ODCM, placing these exhaust paths in service is expected to be completed during the first half of 1993.

3.3 Gas Storage Tank Curie Limit Violation Description (ref. Technical Specifications 6.9.1.4)

The RCS Vacuum Degassing System was not used during this reporting period. Therefore, the quantity of radioactive material in the RCS Vacuum Degassing System Storage Tanks did not exceed the limits set forth in Section 3.11.2.6 of Technical Specifications.

3.4 Unprotected Outdoor Tank Curie Limit Violation Description (ref. Technical Specifications 6.9.1.4)

There are no Unprotected Outdoor Tanks at STPEGS.

3.5 Abnormal (Unplanned) Release Description (ref. Technical Specifications 6.9.1.4)

No abnormal releases from STPEGS Unit 1 or Unit 2 to UNRESTRICTED AREAS occurred during this reporting period.

3.6 Radioactive Waste Process Control Program Changes (ref. Technical Specifications 6.13)

There were no changes to the Radioactive Waste Process Control Program (PCP) during this reporting period.

3.7 Offsite Dose Calculation Manual Changes (ref. Technical Specifications 6.14)

Revision 5 of the ODCM includes changes to Part A which were approved by the NRC late in 1992. The changes to Part A were limited to relocating the Radiological Effluent Technical Specifications in accordance with Generic Letter 89-01. Since the NRC reviewed the changes to Part A and approved them, no additional justification or discussion is provided here.

Part B was also modified, and these changes are marked with bars in the right margin of each affected page with some exceptions. Changes in spelling, punctuation, or text which were to clarify or correct minor errors were not marked. Also, although Table B4-7 was changed substantially and Table B4-11 was added, change bars are not indicated because of the length of these tables.

3.7.1 A definition of "batch" releases was added to provide specific guidance at STPEGS. This definition involves the concept that batch release must be anticipated, limited in duration, and involve significant releases above average. Examples of continuous and batch releases are provided. See page B2-1.

- 3.7.2 Liquid effluent releases are monitored only during the time a radioactive waste monitoring tank is being discharged. The radioactive waste stream monitor is isolated between planned releases to preserve the monitor background within acceptable limits. Revision 5 makes this more clear on page B2-2.
- 3.7.3 The effluent monitor response example calculations of pages B3-4 and B3-5 are revised to reflect a revised Table B3-1 and pages B3-11 and B3-12. The nuclide specific responses of this table are calculated using the Effluent Management System (EMS) software purchased in 1990 by the Chemical Analysis Group. Although a few of the individual factors in Revision 5 of Table B3-1 differ from the corresponding factors from Revision 4, the response calculated using Revision 5 values agrees within a few percent of the Revision 4 calculation for a typical radioactive waste monitor tank.
- 3.7.4 The response function tables and examples provided for calculating alarm set points are described as "typical" to allow the use of revised calibration data as it becomes available, pages B3-12 and B3-13.
- 3.7.5 A typographical error in the description of a key variable, Dose(a,j), is corrected on page B4-1.
- 3.7.6 The reference to the Gulf of Mexico is deleted from all consideration of liquid releases. In 1992 the Colorado River was diverted into Matagorda Bay, and this estuary now provides the limiting exposure pathways for saltwater fish and crustaceans, not the Gulf of Mexico. Pages B4-1 and B4-2 reflect this change. Most references to the Gulf of Mexico have been removed from Revision 5 of the ODCM.
- 3.7.7 A new liquid effluent model is adopted by Revision 5 to the ODCM. The model reflects the Colorado River diversion into Matagorda Bay as well as recent operational data on reservoir releases. Page B4-2, B4-3, B4-4, B4-5, Table B4-1, and Table B4-7 reflect these changes.

The new liquid model dilutes the combined activities reaching Matagorda Bay from Little Robbins Slough, West Branch of the Colorado River, and the Colorado River. The dilution model assumes that the activity reaching the northwest area of Matagorda Bay mixes uniformly in the bay due to naturally existing currents. Since Matagorda Bay has an effective flow rate of 193,820 acre-ft/day due to the average 1 foot daily tide, activity is effectively mixed in this flow.

The relief well flow rates of pages B4-3 and B4-4 come from a study of the ditch system around the main cooling reservoir. The net flow of these ditches attributable to reservoir leakage was identified as relief well flow in Revision 5 of the ODCM although the relief well system alone does not account for all the quoted flow.

A new factor is introduced on page B4-3 to account for the portion of activity released to the reservoir which could be available in the water. The balance of the activity released to the reservoir is presumed to be absorbed in bottom sediment. This factor allows only 5% of the activity (not including tritium) released to the reservoir to be available for leakage through the relief well system or through reservoir blowdown to the offsite environment. Cobalt releases to the reservoir and cobalt measurements of the reservoir water were used to make an estimate for this factor. Although not all nuclides may exhibit this partition factor between water and sediment, other assumptions in the model should assure that the reservoir release factors are conservative.

The blowdown fractions are also adjusted to reflect operating experience, page B4-3 and B4-4. The blowdown is assumed to be not more than the previously projected blowdown rate (13,425 acre-ft/yr) divided by the four years of two unit operation without blowdown or 3400 acre-ft/yr (rounded to two significant figures). This value may still be somewhat conservative, but it does more closely account for blowdown.

- 3.7.8 A typographical error was corrected in Eq. 4.4i and the description of the variable was improved, page B4-10. A sentence was added to the discussion of the use of Eq. 4.4i for the cases of tritium and carbon-14, page B4-11.
- 3.7.9 Sections 4.4.3.1, 4.4.3.2, 4.4.3.3, 4.4.3.4, 4.4.3.5, 4.4.4, 4.4.4.1, and 4.4.4.2 of Revision 4 are deleted from Revision 5 of the ODCM. The equations discussed in these sections were useful only to approximate the values calculated using GASPAN and the Regulatory Guide 1.109 equations. Since we now have two computer systems which can provide these factors, either computer may be used to check the values calculated by the other. The need for approximating equations for checking the reasonableness of the dose factors tabulated in the ODCM is no longer necessary. Also, a provision is added on page B4-12 to allow use of dose factors different from the factors tabulated in the ODCM. Although the factors calculated by the two computers are effectively the same, they may differ by a few percent depending on round off errors and other factors.



- 3.7.10 Section B4.9, pages B4-13 and B4-14, is added to describe the calculation of population doses. The section describes in general terms how the population dose factors of Tables B4-11, pages B4-136 to B4-244, were generated. A description is also provided on how these dose factors may be used to calculate population dose. Tables B4-8, B4-9, and B4-10 are also added to provide population data necessary to complete the related calculations, pages B4-131 to B4-135.
- 3.7.11 Table B4-4, page B4-19, is added to specifically identify the pathways to be used for individual and population dose calculations.
- 3.7.12 Table B4-6, page B4-21, is added to document the distances to the site boundary and to the nearest individual for individual dose calculations.
- 3.7.13 The revision of the average annual main reservoir blowdown from 13,425 to 3400 acre-ft/yr described in 3.7.7 required a change to the examples given on pages B4-246 and B4-248.
- 3.7.14 Figure B4-1, page B4-250, is revised to reflect the diversion of the Colorado River into Matagorda Bay.
- 3.7.15 A reference to the STP Environmental Report was deleted on page B5-1 since this document is no longer the only source of information used for characterizing the population near STPEGS.
- 3.7.16 The requirement to take soil samples annually is reduced to sampling only if deemed necessary, page B5-2, and the required samples are eliminated from Table B5-1, page B5-6. Soil samples have never been required per Table A5-1, but were taken during the early years of the Radiological Environmental Monitoring Program (REMP) to establish baseline data.
- 3.7.17 The frequency for surface water sampling is reduced to semiannually from quarterly, pages B5-3 and B5-7. Table A5-1 does not require either the number of samples or the frequency listed in Table B5-1, page B5-7. Operating experience suggests that sampling at a reduced frequency will provide the desired assurance that all water related pathways are being monitored adequately.
- 3.7.18 The number of airborne environmental samples is reduced from 12 per week to 5 per week, page B5-6. This change is based on four years of two unit operation, and satisfies the minimum program required by Table A5-1.

- 3.7.19 The number of ground water sampling stations is reduced to 1 in Table B5-1, page B5-7. This corresponds to the minimum program described in Table A5-1.
- 3.7.20 The number of sediment samples is reduced from 10 to 3 in Table B5-1, page B5-8. This reduced sampling program reflects the findings of nuclide deposition in sediments over the past four years. The sediment sampling still meets the minimum requirements of Table A5-1.
- 3.7.21 The 2 pasture grass samples of Table B5-1, page B5-9 are eliminated. These were optional samples and no further data is needed at this time.
- 3.7.22 Descriptions are added for 7 new sample locations in Table B5-2, pages B5-11 and B5-14. These locations provide additional approved sampling stations to the current list.

3.8 New Land Use Census Location(s) Identification (ref. Technical Specifications 3.12.2.a)

No new locations for dose calculation were identified from the 1992 Land Use Census.

4.0 Revisions to Previous Reports

4.1 Gaseous Effluents for 1992

The Unit 1 and Unit 2 Gaseous Effluents for 1st and 2nd Quarters 1992 have been revised to reflect the gross alpha radioactivity analyses results for the second quarter. (Appendix A)

4.2 Liquid Effluents for 1992

The Unit 1 and Unit 2 Liquid Effluents for 1st and 2nd Quarters 1992 have been revised to reflect the Iron-55 analysis results for the second quarter. (Appendix B)

GASEOUS EFFLUENTS  
FOR 1992  
3rd and 4th Quarters

SITE: South Texas Project Electric Generating Station  
 UNIT: 1 YEAR: 1992

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL AIRBORNE EFFLUENTS

Unit: 1

Starting : 1-Jul-1992 Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION GASES				
-----				
1. TOTAL RELEASE	CURIES	9.203E+01	1.523E+01	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	1.157E+01	1.916E+00	
-----				
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		4.288E-03	7.097E-04	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131 + IODINE-133	CURIES	1.809E-03	3.079E-04	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	2.276E-04	3.874E-05	
-----				
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		2.501E-04	4.257E-05	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	1.596E-04	1.322E-04	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	2.008E-05	1.663E-05	
-----				
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		2.206E-05	1.828E-05	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	1.015E-06	4.692E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	5.326E+00	5.146E+00	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	6.701E-01	6.474E-01	
-----				
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		3.723E-04	3.597E-04	
-----				

SITE: South Texas Project Electric Generating Station  
 UNIT: 1 YEAR: 1992

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
 : BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES  
 REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
<b>FISSION GASES</b>					
AR-41	CURIES	1.45E-02	0.00E+00	2.91E-01	0.00E+00
KR-85M	CURIES	7.29E-02	0.00E+00	3.80E-03	0.00E+00
KR-87	CURIES	9.42E-02	0.00E+00	0.00E+00	0.00E+00
KR-88	CURIES	1.90E-01	0.00E+00	4.80E-03	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	3.04E-01	1.83E-01
XE-133 (1)	CURIES	8.46E+01	1.50E+01	0.00E+00	0.00E+00
XE-133M	CURIES	0.00E+00	0.00E+00	8.97E-01	4.74E-02
XE-135	CURIES	5.28E+00	0.00E+00	1.05E-01	0.00E+00
XE-135M	CURIES	9.30E-02	0.00E+00	0.00E+00	0.00E+00
XE-138	CURIES	5.52E-02	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	9.04E+01	1.50E+01	1.60E+00	2.31E-01
<b>IODINES</b>					
I-131	CURIES	1.03E-03	1.86E-04	8.71E-05	1.21E-04
I-132	CURIES	4.94E-05	0.00E+00	0.00E+00	0.00E+00
I-133	CURIES	6.75E-04	0.00E+00	1.29E-05	0.00E+00
I-135	CURIES	4.97E-05	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.80E-03	1.86E-04	1.00E-04	1.21E-04
<b>PARTICULATES</b>					
CO-58	CURIES	4.86E-05	6.51E-05	1.63E-05	1.83E-05
CO-60	CURIES	9.50E-06	1.15E-05	2.42E-06	2.26E-06
CR-51	CURIES	5.65E-06	2.41E-05	7.35E-06	6.88E-06
CS-134	CURIES	1.91E-05	0.00E+00	7.87E-06	0.00E+00
CS-136	CURIES	3.82E-06	0.00E+00	0.00E+00	0.00E+00
CS-137	CURIES	1.57E-05	0.00E+00	7.12E-06	0.00E+00
FE-59	CURIES	8.56E-08	0.00E+00	0.00E+00	0.00E+00
MN-54	CURIES	1.39E-05	2.38E-06	9.36E-07	0.00E+00
MO-99	CURIES	5.35E-07	0.00E+00	0.00E+00	0.00E+00
NB-95	CURIES	0.00E+00	1.47E-06	0.00E+00	0.00E+00
TC-99M	CURIES	5.44E-07	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.17E-04	1.04E-04	4.20E-05	2.75E-05

(1) Xe133 radioactivity was continuously quantified by the unit vent noble gas monitor. Xe133 releases of 1.16E+02 and 9.99E+00 Ci for the third and fourth quarters, respectively, were not included with the batch releases.

SITE: South Texas Project Electric Generating Station  
 UNIT: 1            YEAR: 1992

REPORT CATEGORY            : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
                               : BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY         : FISSION GASES, IODINES, AND PARTICULATES  
 REPORTING PERIOD         : QUARTER # 3 AND QUARTER # 4 YEAR 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
OTHER					
H-3	CURIES	5.13E+00	4.81E+00	1.93E-01	3.36E-01
TOTAL FOR PERIOD	CURIES	5.13E+00	4.81E+00	1.93E-01	3.36E-01



SITE: South Texas Project Electric Generating Station  
 UNIT: 2            YEAR: 1992

HOUSTON LIGHTING & POWER  
 SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL AIRBORNE EFFLUENTS

Unit: 2

Starting : 1-Jul-1992            Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION GASES				
-----				
1. TOTAL RELEASE	CURIES	2.748E+02	2.318E+02	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	3.457E+01	2.917E+01	
-----				
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		1.280E-02	1.080E-02	
-----				
B. RADIOIODINES				
-----				
1. TOTAL IODINE-131 + IODINE-133	CURIES	1.833E-05	8.526E-06	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	2.307E-06	1.072E-06	
-----				
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		2.535E-06	1.178E-06	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	0.000E+00	1.199E-06	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	0.000E+00	1.509E-07	
-----				
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		0.000E+00	1.658E-07	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	6.428E-07	7.926E-07	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	2.713E+01	2.241E+01	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/sec	3.414E+00	2.820E+00	
-----				
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		1.896E-03	1.566E-03	
-----				

SITE: South Texas Project Electric Generating Station  
 UNIT: 2            YEAR: 1992

HOUSTON LIGHTING & POWER

Unit 2

REPORT CATEGORY            : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
                                  : BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY            : FISSION GASES, IODINES, AND PARTICULATES  
 REPORTING PERIOD            : QUARTER # 3 AND QUARTER # 4 YEAR 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
FISSION GASES					
AR-41	CURIES	0.00E+00	0.00E+00	1.42E-01	1.04E-01
XE-133 (1)	CURIES	2.74E+02	2.31E+02	0.00E+00	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	5.61E-05	0.00E+00
TOTAL FOR PERIOD	CURIES	2.74E+02	2.31E+02	1.43E-01	1.04E-01
IODINES					
I-131	CURIES	4.39E-06	3.87E-06	1.13E-06	1.88E-06
I-135	CURIES	9.59E-06	0.00E+00	3.21E-06	2.76E-06
TOTAL FOR PERIOD	CURIES	1.39E-05	3.87E-06	4.35E-06	4.64E-06
PARTICULATES					
CO-60	CURIES	0.00E+00	1.14E-06	0.00E+00	5.03E-08
TOTAL FOR PERIOD	CURIES	0.00E+00	1.14E-06	0.00E+00	5.03E-08
OTHER					
H-3	CURIES	2.70E+01	2.23E+01	8.53E-02	7.36E-02
TOTAL FOR PERIOD	CURIES	2.70E+01	2.23E+01	8.53E-02	7.36E-02

(1) Xe133 radioactivity was continuously quantified by the unit vent noble gas monitor. Xe133 releases of 1.35E-01 and 9.68E-02 Ci for the third and fourth quarters, respectively, were not included with the batch releases.



LIQUID EFFLUENTS  
FOR 1992  
3rd and 4th Quarters

SITE: South Texas Project Electric Generating Station  
 UNIT: 1                      YEAR: 1992

HOUSTON LIGHTING & POWER  
 SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL LIQUID EFFLUENTS

Unit: 1

Starting : 1-Jul-1992                      Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
A. FISSION & ACTIVATION PRODUCTS				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	4.336E-01	1.152E+00	5
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	4.334E-08	1.386E-07	
3. PERCENT OF MPC LIMIT (FRACTIONAL)	%	9.490E-01	6.323E-01	
B. TRITIUM				
1. TOTAL RELEASE	CURIES	1.486E+02	2.506E+01	5
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.485E-05	3.015E-06	
3. % OF MPC LIMIT (3.00E-03 uCi/mL)	%	4.952E-01	1.005E-01	
C. DISSOLVED AND ENTRAINED GASES				
1. TOTAL RELEASE	CURIES	1.212E+00	1.619E-02	5
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.211E-07	1.948E-09	
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	6.058E-02	9.743E-04	
D. GROSS ALPHA RADIOACTIVITY				
1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	5
E. WASTE VOL RELEASED				
1. TOTAL PRE-DILUTION VOLUME	LITERS	1.287E+07	5.788E+06	1.3
2. BATCH PRE-DILUTION VOLUME	LITERS	5.228E+06	5.788E+06	1.3
F. VOLUME OF DILUTION WATER USED				
	LITERS	9.991E+09	8.306E+09	10

SITE: South Texas Project Electric Generating Station  
 UNIT: 1 YEAR: 1992

HOUSTON LIGHTING & POWER

Unit 1

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
 : TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY : ALL RADIONUCLIDES  
 REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1992

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
ALL NUCLIDES					
AG-110M	CURIES	0.00E+00	0.00E+00	4.17E-03	4.46E-03
CO-57	CURIES	0.00E+00	0.00E+00	4.88E-04	2.37E-03
CO-58	CURIES	0.00E+00	0.00E+00	1.23E-01	7.37E-01
CO-60	CURIES	2.45E-06	0.00E+00	9.19E-02	1.43E-01
CR-51	CURIES	0.00E+00	0.00E+00	1.36E-03	4.70E-02
CS-134	CURIES	0.00E+00	0.00E+00	2.53E-02	4.35E-03
CS-136	CURIES	0.00E+00	0.00E+00	8.97E-05	0.00E+00
CS-137	CURIES	4.73E-07	0.00E+00	3.33E-02	4.19E-03
FE-55	CURIES	0.00E+00	0.00E+00	6.96E-02	1.33E-01
FE-59	CURIES	0.00E+00	0.00E+00	5.19E-04	9.40E-03
H-3	CURIES	1.37E-02	0.00E+00	1.48E+02	2.50E+01
I-131	CURIES	1.34E-06	0.00E+00	2.42E-02	7.85E-03
I-133	CURIES	0.00E+00	0.00E+00	1.20E-03	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	1.47E-03	3.60E-03
KR-85M	CURIES	0.00E+00	0.00E+00	7.10E-05	0.00E+00
LA-140	CURIES	0.00E+00	0.00E+00	7.35E-05	1.87E-05
MN-54	CURIES	0.00E+00	0.00E+00	1.19E-02	1.85E-02
MO-99	CURIES	0.00E+00	0.00E+00	1.84E-03	4.86E-06
NA-24	CURIES	0.00E+00	0.00E+00	3.48E-05	4.12E-06
NB-95	CURIES	0.00E+00	0.00E+00	3.65E-04	6.24E-03
NB-97	CURIES	0.00E+00	0.00E+00	8.37E-05	5.49E-06
OTHER	CURIES	0.00E+00	0.00E+00	7.14E-03	1.51E-04
PR-144	CURIES	3.00E+00	0.00E+00	0.00E+00	3.31E-04
SB-124	CURIES	0.00E+00	0.00E+00	1.81E-02	1.22E-02
SB-125	CURIES	1.49E-06	0.00E+00	1.59E-02	1.74E-02
SN-113	CURIES	0.00E+00	0.00E+00	1.24E-05	1.03E-04
TC-99M	CURIES	0.00E+00	0.00E+00	1.87E-03	4.94E-06
TE-129M	CURIES	0.00E+00	0.00E+00	3.11E-04	0.00E+00
TE-132	CURIES	0.00E+00	0.00E+00	0.00E+00	5.53E-06
XE-131M	CURIES	0.00E+00	0.00E+00	1.63E-02	1.32E-03
XE-133	CURIES	0.00E+00	0.00E+00	1.17E+00	1.12E-02
XE-133M	CURIES	0.00E+00	0.00E+00	1.16E-02	0.00E+00
XE-135	CURIES	0.00E+00	0.00E+00	5.33E-03	0.00E+00
ZN-65	CURIES	0.00E+00	0.00E+00	5.63E-05	0.00E+00
ZR-95	CURIES	0.00E+00	0.00E+00	1.10E-04	2.64E-03
ZR-97	CURIES	0.00E+00	0.00E+00	1.26E-04	0.00E+00
TOTAL FOR PERIOD	CURIES	1.37E-02	0.00E+00	1.50E+02	2.62E+01

SITE: South Texas Project Electric Generating Station  
UNIT: 2 YEAR: 1992

HOUSTON LIGHTING & POWER  
SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
ALL LIQUID EFFLUENTS

Unit: 2

Starting : 1-Jul-1992 Ending : 31-Dec-1992

TYPE OF EFFLUENT	UNITS	QUARTER 3	QUARTER 4	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	3.112E-01	3.243E-01	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	4.313E-08	4.146E-08	
-----				
3. PERCENT OF MPC LIMIT (FRACTIONAL)	%	2.531E-02	6.831E-02	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.917E+02	2.871E+02	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	2.657E-05	3.670E-05	
-----				
3. % OF MPC LIMIT (3.00E-03 uCi/mL)	%	8.857E-01	1.223E+00	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	1.177E-02	2.811E-01	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/mL	1.632E-09	3.594E-08	
-----				
3. PERCENT OF LIMIT (2.00E-04 uCi/mL)	%	8.161E-04	1.797E-02	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	5
-----				
E. WASTE VOL RELEASED				
-----				
1. TOTAL PRE-DILUTION VOLUME	LITERS	8.460E+06	8.984E+06	1.3
-----				
2. BATCH PRE-DILUTION VOLUME	LITERS	3.772E+06	4.090E+06	1.3
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	7.205E+09	7.812E+09	10
-----				

SITE: South Texas Project Electric Generating Station  
 UNIT: 2 YEAR: 1992

HOUSTON LIGHTING & POWER  
 Unit 2

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
 : TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY : ALL RADIONUCLIDES  
 REPORTING PERIOD : QUARTER # 3 AND QUARTER # 4 YEAR 1992

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 3	QUARTER 4	QUARTER 3	QUARTER 4
ALL NUCLIDES					
AG-110M	CURIES	0.00E+00	0.00E+00	4.53E-04	2.35E-03
CO-57	CURIES	0.00E+00	0.00E+00	2.76E-04	7.41E-04
CO-58	CURIES	0.00E+00	0.00E+00	1.10E-02	1.61E-02
CO-60	CURIES	0.00E+00	0.00E+00	3.86E-02	1.40E-01
CR-51	CURIES	0.00E+00	0.00E+00	0.00E+00	4.55E-04
CS-134	CURIES	0.00E+00	0.00E+00	5.33E-06	4.53E-05
CS-137	CURIES	0.00E+00	0.00E+00	1.62E-05	2.48E-04
FE-55	CURIES	0.00E+00	0.00E+00	2.52E-01	1.42E-01
FE-59	CURIES	0.00E+00	0.00E+00	1.97E-04	3.10E-06
H-3	CURIES	4.80E-02	5.15E-02	1.91E+02	2.87E+02
KR-85M	CURIES	0.00E+00	0.00E+00	0.00E+00	4.12E-05
MN-54	CURIES	0.00E+00	0.00E+00	5.89E-03	1.79E-02
NB-95	CURIES	0.00E+00	0.00E+00	8.67E-04	1.27E-03
NB-97	CURIES	0.00E+00	0.00E+00	4.42E-05	1.38E-04
OTHER	CURIES	0.00E+00	0.00E+00	0.00E+00	8.95E-07
SB-124	CURIES	0.00E+00	0.00E+00	3.41E-06	0.00E+00
SB-125	CURIES	0.00E+00	0.00E+00	6.95E-04	1.65E-03
SN-113	CURIES	0.00E+00	0.00E+00	1.44E-04	1.16E-04
XE-131M	CURIES	0.00E+00	0.00E+00	0.00E+00	1.16E-03
XE-133	CURIES	0.00E+00	0.00E+00	1.16E-02	2.72E-01
XE-133M	CURIES	0.00E+00	0.00E+00	5.70E-05	4.58E-03
XE-135	CURIES	0.00E+00	0.00E+00	8.48E-05	3.13E-03
ZN-65	CURIES	0.00E+00	0.00E+00	0.00E+00	7.26E-05
ZR-95	CURIES	0.00E+00	0.00E+00	2.06E-04	1.63E-04
ZR-97	CURIES	0.00E+00	0.00E+00	1.88E-05	0.00E+00
TOTAL FOR PERIOD	CURIES	4.80E-02	5.15E-02	1.92E+02	2.87E+02

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

3rd and 4th Quarters, 1992



EFFLUENT AND WASTE DISPOSAL REPORT  
 SOLID WASTE AND IRRADIATED FUEL SHIPMENTS  
 FROM 7/1/92 0:00 TO 12/31/92 23:00

A. Solid Waste Shipped off site for burial or disposal (not irradiated fuel)

1. Type of Waste	Unit	6 Month Period	Est. Total Error %
A. Spent Resins, Filter Sludges, Evaporator Bottoms, Etc.	M <sup>3</sup>	3.59E+01	+ 1%
	CI	4.35E+02	- 5%
B. Dry Compressible Waste * Contaminated Equip., Etc.	M <sup>3</sup>	2.26E+01	+ 1%
	CI	8.42E-01	- 5%
C. Irradiated Components, Control Rods, Etc.	M <sup>3</sup>	0.000E+00	N/A
	CI	0.000E+00	N/A
D. Other **	M <sup>3</sup>	6.90E-02	+ 1%
	CI	2.00E-08	- 5%

\* Seven shipments of DAW sent for offsite volume reduction (369 m<sup>3</sup>,  
6.41E-01 Ci)

\*\* Other waste consisted of oily waste filter cake shipped with Dry Waste to  
vendor for processing (shipment 2-92-0227).

2. Estimate of Major Nuclide Composition (By Type of Waste)

A. 1	Fe55	44.3%
2	Ni63	29.2%
3	Co60	18.4%
4	Co58	3.6%
5	Mn54	1.4%
6	Cs137	0.9%
7	Ni59	0.6%
8	Sb125	0.4%
9	Nb95	0.4%
10	Cs134	0.4%
11	Zr95	0.2%

2. Estimate of Major Nuclide Composition (By Type of Waste) (Cont.)

B.	1	Fe55	44.9%
	2	Co58	20.6%
	3	Co60	8.1%
	4	Ni63	5.1%
	5	Fe59	4.5%
	6	Cr51	3.2%
	7	Mn54	1.9%
	8	Nb95	1.6%
	9	Zr95	0.8%
	10	Sb124	0.4%
C.	N/A		N/A
D.	1	Co60	79.5%
	2	Mn54	20.5%

3. Solid Waste Disposition (Not Irradiated Fuel)

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination *</u>
7	Truck	Scientific Ecology Group, Inc. (SEG) 1560 Bear Creek Rd. Oak Ridge, TN
10		Chem-Nuclear Systems (CNSI) Barnwell Waste Management Facility Osborne Road Barnwell, SC
		US Ecology (USEN) Beatty Street Beatty, NV

\* All shipments from STPEGS were either to SEG or CNSI. However, SEG buried STPEGS waste at both CNSI and USEN.



4. Class of Solid Waste

AU, AS, B, C \*\*

5. Type of Containers Used for Shipment

Strong Tight, High Integrity Containers, Type A Casks, Type B Casks

6. Solidification Agent

N/A

B. Irradiated Fuel Shipment (Disposition)

Number of Shipments   Mode of Transportation   Destination

--NO SHIPMENTS MADE DURING THIS PERIOD--

\*\* Class C waste based on 120.3 ft<sup>3</sup> of liquid process filters  
(shipment 1-92-0243).

DOSE ACCUMULATION  
FOR 1992

SITE: South Texas Project Electric Generating Station  
 UNIT: 1                      YEAR: 1992

SUMMARY OF MAXIMUM INDIVIDUAL DOSES  
 TOTAL ACCUMULATION FOR PERIODS:  
 LIQUID: FROM 1/ 1/92 0:00 TO 12/31/92 23:00  
 GASEOUS: FROM 1/ 1/92 0:00 TO 12/31/92 23:00  
 AIR: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MR)
LIQUID	TOTAL BODY	7.38E-02	TEEN	RECEPTOR 3		2.5E+00	3.0
LIQUID	GI-TRACT	1.28E-01	TEEN	RECEPTOR 3		1.3E+00	10.0
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	1.06E-02		1400.	N	1.1E-01	10.0
NOBLE GAS	AIR DOSE (BETA-MRAD)	2.50E-02		1540.	NNW	1.3E-01	20.0
NOBLE GAS	TOTAL BODY	3.97E-03	ALL <sup>(1)</sup>	1400.	N	7.9E-02	5.0
NOBLE GAS	TOTAL BODY	1.11E-03	ALL <sup>(2)</sup>	4000.	WSW	2.2E-02	5.0
NOBLE GAS	SKIN	1.05E-02	ALL <sup>(1)</sup>	1400.	N	7.0E-02	15.0
NOBLE GAS	SKIN	2.96E-03	ALL <sup>(2)</sup>	4000.	WSW	2.0E-02	15.0
IODINE+ PARTICULATES	THYROID	5.35E-01	INFANT <sup>(1)</sup>	1400.	N	3.6E+00	15.0
IODINE+ PARTICULATES	THYROID	3.80E-03	CHILD <sup>(2)</sup>	5600.	N	2.5E-02	15.0

SUMMARY OF POPULATION DOSES  
 TOTAL ACCUMULATION FOR PERIODS:  
 LIQUID: FROM 1/ 1/92 0:00 TO 12/31/92 23:00  
 GASEOUS: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)	AVERAGE DOSE TO POPULATION (REM/PERSON)
LIQUID	TOTAL BODY	5.9E-01	9.1E-06 <sup>(3)</sup>
GASEOUS	TOTAL BODY	1.4E-02	4.9E-08 <sup>(4)</sup>

- (1) Doses were calculated for HYPOTHETICAL receptors at the site boundary.
- (2) Highest dose for REAL individual or receptor.
- (3) Calculation based on a population of 152,000 for shore line exposure, 303,000 for SW invertebrate ingestion and 3,300 for SW sport fish ingestion.
- (4) Calculation based on a population of 299,000 within fifty (50) miles of STPEGS.

SITE: South Texas Project Electric Generating Station  
 UNIT: 2 YEAR: 1992

SUMMARY OF MAXIMUM INDIVIDUAL DOSES  
 TOTAL ACCUMULATION FOR PERIODS:  
 LIQUID: FROM 1/ 1/92 0:00 TO 12/31/92 23:00  
 GASEOUS: FROM 1/ 1/92 0:00 TO 12/31/92 23:00  
 AIR: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)	% OF APPLICABLE LIMIT	LIMIT (MR)
LIQUID	TOTAL BODY	7.99E-02	TEEN	RECEPTOR 3		2.7E+00	3.0
LIQUID	BONE	2.45E-01	CHILD	RECEPTOR 1		2.5E+00	10.0
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	1.46E-02		1540.	NNW	1.5E-01	10.0
NOBLE GAS	AIR DOSE (BETA-MRAD)	4.26E-02		1540.	NNW	2.1E-01	20.0
NOBLE GAS	TOTAL BODY	5.19E-03	ALL <sup>(1)</sup>	1540.	NNW	1.0E-01	5.0
NOBLE GAS	TOTAL BODY	1.58E-03	ALL <sup>(2)</sup>	4000.	WSW	3.2E-02	5.0
NOBLE GAS	SKIN	1.45E-02	ALL <sup>(1)</sup>	1540.	NNW	9.7E-02	15.0
NOBLE GAS	SKIN	4.38E-03	ALL <sup>(2)</sup>	4000.	WSW	2.9E-02	15.0
IODINE+ PARTICULATES	THYROID	1.79E-02	CHILD <sup>(1)</sup>	1540.	NNW	1.2E-01	15.0
IODINE+ PARTICULATES	THYROID	1.91E-03	CHILD <sup>(2)</sup>	5600.	NNW	1.3E-02	15.0

SUMMARY OF POPULATION DOSES  
 TOTAL ACCUMULATION FOR PERIODS:  
 LIQUID: FROM 1/ 1/92 0:00 TO 12/31/92 23:00  
 GASEOUS: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	ESTIMATED POPULATION DOSE (PERSON-REM)	AVERAGE DOSE TO POPULATION (REM/PERSON)
LIQUID	TOTAL BODY	6.0E-01	8.8E-06 <sup>(3)</sup>
GASEOUS	TOTAL BODY	1.6E-02	5.5E-08 <sup>(4)</sup>

- (1) Doses were calculated for HYPOTHETICAL receptors at the site boundary.  
 (2) Highest dose for REAL individual or receptor.  
 (3) Calculation based on a population of 152,000 for shore line exposure, 303,000 for SW invertebrate ingestion and 3,300 for SW sport fish ingestion.  
 (4) Calculation based on a population of 299,000 within fifty (50) miles of STPEGS.

SITE: South Texas Project Electric Generating Station  
 UNIT: 1 PLUS 2 YEAR: 1992

SUMMARY OF MAXIMUM INDIVIDUAL DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

GASEOUS: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

AIR: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	UNIT 1 ESTIMATED DOSE (MREM)	UNIT 2 ESTIMATED DOSE (MREM)	TOTAL 1+2 ESTIMATED DOSE (MREM)	AGE GROUP	LOCATION DIST (M)	DIR (TOWARD)
LIQUID	TOTAL BODY	7.38E-02	8.02E-02	1.54E-01	TEEN	RECEPTOR 3	
LIQUID	BONE	1.25E-01	2.45E-01	3.70E-01	CHILD	RECEPTOR 1	
NOBLE GAS	AIR DOSE (GAMMA-MRAD)	9.60E-03	1.46E-02	2.42E-02	ALL	1540.	NNW
NOBLE GAS	AIR DOSE (BETA-MRAD)	2.50E-02	4.26E-02	6.77E-02	ALL	1540.	NNW
NOBLE GAS	TOTAL BODY	3.46E-03	5.19E-03	8.65E-03	ALL <sup>(1)</sup>	1540.	NNW
NOBLE GAS	TOTAL BODY	1.11E-03	1.58E-03	2.69E-03	ALL <sup>(2)</sup>	4000.	WSW
NOBLE GAS	SKIN	9.46E-03	1.45E-02	2.40E-02	ALL <sup>(1)</sup>	1540.	NNW
NOBLE GAS	SKIN	2.96E-03	4.38E-03	7.34E-03	ALL <sup>(2)</sup>	4000.	WSW
IODINE+	THYROID	5.35E-01	9.58E-03	5.45E-01	INFANT <sup>(1)</sup>	1400.	N
PARTICULATES	THYROID	3.55E-03	1.91E-03	5.46E-03	CHILD <sup>(2)</sup>	5600.	NNW

SUMMARY OF POPULATION DOSES

TOTAL ACCUMULATION FOR PERIODS:

LIQUID: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

GASEOUS: FROM 1/ 1/92 0:00 TO 12/31/92 23:00

EFFLUENT	APPLICABLE ORGAN	TOTAL 1+2 ESTIMATED POPULATION DOSE (PERSON-REM)	TOTAL 1+2 AVERAGE DOSE TO POPULATION (REM/PERSON)
LIQUID	TOTAL BODY	1.2E+00	1.8E-05 <sup>(3)</sup>
GASEOUS	TOTAL BODY	3.1E-02	1.0E-07 <sup>(4)</sup>

- <sup>(1)</sup>Doses were calculated for HYPOTHETICAL receptors at the site boundary.  
<sup>(2)</sup>Highest dose for REAL individual or receptor.  
<sup>(3)</sup> Calculation based on a population of 152,000 for shore line exposure, 303,000 for SW invertebrate ingestion and 3,300 for SW sport fish ingestion.  
<sup>(4)</sup> Calculation based on a population of 299,000 within fifty (50) miles of STPEGS.

JOINT FREQUENCY TABLES FOR 1992

First Quarter

JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	1	0	0	0	0	0	1	2.1	4.1
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	3	2	0	0	0	5	10.4	13.2
SSE	0	0	0	0	4	0	0	0	4	8.3	15.9
S	0	0	0	1	3	0	0	0	4	8.3	15.3
SSW	0	0	0	1	9	2	0	0	12	25.0	16.9
SW	0	0	1	1	2	0	0	0	4	8.3	11.9
WSW	0	0	0	2	1	0	0	0	3	6.3	11.2
W	0	0	1	1	0	0	0	0	2	4.2	6.6
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	1	1	1	0	0	0	3	6.3	10.9
NNW	0	0	0	2	2	6	0	0	10	20.8	16.9
TOTAL	0	0	4	12	24	8	0	0	48	100.0	
%	0.0	0.0	8.3	25.0	50.0	16.7	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 14.5 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 3  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184



JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	2	4	0	0	0	6	10.7	12.8
NNE	0	0	0	1	0	0	0	0	1	1.8	7.9
NE	0	0	1	0	0	0	0	0	1	1.8	5.6
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	1	0	0	0	0	1	1.8	12.4
SE	0	0	0	3	2	0	0	0	5	8.9	13.8
SSE	0	0	0	0	2	0	0	0	2	3.6	15.4
S	0	0	0	4	1	0	0	0	5	8.9	12.3
SSW	0	0	1	3	3	0	0	0	7	12.5	11.9
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	2	3	0	0	0	5	8.9	12.5
W	0	0	0	1	0	0	0	0	1	1.8	12.0
WNW	0	0	1	1	1	2	0	0	5	8.9	15.4
NW	0	0	2	1	2	0	0	0	5	8.9	11.3
NNW	0	0	1	7	3	1	0	0	12	21.4	11.2
TOTAL	0	0	6	26	21	3	0	0	56	100.0	
%	0.0	0.0	10.7	46.4	37.5	5.4	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.3 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 3  
 TOTAL NUMBER OF INVALID HOURS= 3  
 TOTAL NUMBER OF VALID HOURS= 2181  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2184



JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	7	4	0	0	0	11	10.4	11.2
NNE	0	0	0	3	1	0	0	0	4	3.8	10.1
NE	0	0	1	0	0	0	0	0	1	0.9	6.1
ENE	0	0	0	2	0	0	0	0	2	1.9	10.1
E	0	0	1	0	1	0	0	0	2	1.9	9.3
ESE	0	0	1	1	0	0	0	0	2	1.9	9.7
SE	0	0	0	0	5	1	0	0	6	5.7	16.5
SSE	0	0	0	3	2	1	0	0	6	5.7	13.6
S	0	0	0	7	4	0	0	0	11	10.4	10.6
SSW	0	0	0	6	1	1	0	0	8	7.5	11.6
SW	0	0	5	5	1	1	0	0	12	11.3	9.8
WSW	0	0	3	2	1	0	0	0	6	5.7	9.3
W	0	0	2	2	2	0	0	0	6	5.7	10.6
WNW	0	1	1	0	0	0	0	0	2	1.9	3.9
NW	0	0	2	3	1	6	0	0	12	11.3	15.3
NNW	0	0	0	11	4	0	0	0	15	14.2	11.2
TOTAL	0	1	16	52	27	10	0	0	106	100.0	
%	0.0	0.9	15.1	49.1	25.5	9.4	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.5 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 3  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5 -	-12.5 -	-18.5 -	-24.5 -	-32.5				
N	0	4	28	34	39	2	0	0	107	12.0	10.5
NNE	0	1	27	19	12	0	0	0	59	6.6	8.8
NE	0	3	16	35	13	1	0	0	68	7.6	9.5
ENE	0	2	15	30	10	0	0	0	57	6.4	9.8
E	0	1	8	34	22	5	0	0	70	7.9	12.0
ESE	0	3	6	48	21	0	0	0	78	8.8	11.0
SE	0	0	20	47	49	1	0	0	117	13.1	11.6
SSE	0	0	10	25	23	2	0	0	60	6.7	11.9
S	0	1	7	25	12	3	0	0	48	5.4	11.4
SSW	0	2	13	14	5	0	0	0	34	3.8	8.6
SW	0	0	8	11	1	0	0	0	20	2.2	8.0
WSW	0	0	12	9	1	0	0	0	22	2.5	7.7
W	0	1	9	2	0	0	0	0	12	1.3	6.5
WNW	0	2	7	4	0	0	0	0	13	1.5	6.1
NW	0	4	17	10	14	5	0	0	50	5.6	10.5
NNW	0	2	16	36	16	5	0	0	75	8.4	10.5
TOTAL	0	26	219	383	238	24	0	0	890	100.0	
%	0.0	2.9	24.6	43.0	26.7	2.7	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.4 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 3  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	32	26	9	0	0	0	69	9.7	8.4
NNE	0	1	14	12	0	0	0	0	27	3.8	7.1
NE	0	2	16	20	2	0	0	0	40	5.6	7.7
ENE	1	3	35	19	5	2	0	0	65	9.1	7.9
E	0	3	31	29	13	2	0	0	78	10.9	8.9
ESE	0	3	20	27	7	0	0	0	57	8.0	8.7
SE	0	0	36	45	18	0	0	0	99	13.9	9.3
SSE	0	1	7	19	3	3	2	0	35	4.9	11.3
S	0	2	14	32	2	2	3	0	55	7.7	10.4
SSW	0	1	13	35	0	0	0	0	49	6.9	8.3
SW	0	1	5	11	0	0	0	0	17	2.4	8.5
WSW	0	3	4	7	0	0	0	0	14	2.0	6.6
W	1	1	6	4	0	0	0	0	12	1.7	6.0
WNW	0	1	3	1	0	0	0	0	5	0.7	5.2
NW	0	3	18	18	3	2	0	0	44	6.2	8.4
NNW	0	3	11	24	7	3	0	0	48	6.7	9.9
TOTAL	2	30	265	329	69	14	5	0	714	100.0	
%	0.3	4.2	37.1	46.1	9.7	2.0	0.7	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.7 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 3  
 TOTAL NUMBER OF INVALID HOURS= 3  
 TOTAL NUMBER OF VALID HOURS= 2181  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	2	15	0	0	0	0	0	17	9.6	5.6
NNE	0	3	18	2	0	0	0	0	23	12.9	5.4
NE	0	0	10	2	0	0	0	0	12	6.7	5.9
ENE	0	1	12	0	0	0	0	0	13	7.3	5.4
E	0	3	12	1	0	0	0	0	16	9.0	5.1
ESE	0	1	9	0	0	0	0	0	10	5.6	4.3
SE	0	2	8	1	0	0	0	0	11	6.2	5.2
SSE	0	2	1	2	1	0	0	0	6	3.4	7.4
S	0	1	6	1	0	0	0	0	8	4.5	5.1
SSW	0	0	4	1	0	0	0	0	5	2.8	6.5
SW	0	1	1	1	0	0	0	0	3	1.7	6.0
WSW	0	1	5	4	0	0	0	0	10	5.6	6.5
W	0	0	7	1	0	0	0	0	8	4.5	5.5
WNW	0	0	8	0	0	0	0	0	8	4.5	4.7
NW	0	2	8	0	0	0	0	0	10	5.6	4.8
NNW	0	2	14	2	0	0	0	0	18	10.1	5.6
TOTAL	0	21	138	18	1	0	0	0	178	100.0	
%	0.0	11.8	77.5	10.1	0.6	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 5.5 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 3  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5	- 7.5	-12.5	-18.5	-24.5	-32.5				
N	0	7	4	0	0	0	0	0	11	5.8	3.4
NNE	0	11	12	0	0	0	0	0	23	12.2	3.6
NE	0	6	9	0	0	0	0	0	15	7.9	4.5
ENE	0	10	2	0	0	0	0	0	12	6.3	3.2
E	1	6	12	0	0	0	0	0	19	10.1	3.8
ESE	0	8	4	0	1	0	0	0	13	6.9	4.3
SE	0	3	2	0	0	0	0	0	5	2.6	3.5
SSE	0	1	3	1	0	0	0	0	5	2.6	6.4
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	1	0	0	0	0	0	0	1	0.5	2.0
SW	0	1	0	0	0	0	0	0	1	0.5	2.5
WSW	0	1	0	1	0	0	0	0	2	1.1	5.7
W	0	3	13	0	0	0	0	0	16	8.5	4.9
WNW	0	8	21	1	0	0	0	0	30	15.9	4.4
NW	0	5	14	0	0	0	0	0	19	10.1	4.0
NNW	0	11	5	1	0	0	0	0	17	9.0	3.5
TOTAL	1	82	101	4	1	0	0	0	189	100.0	
%	0.5	43.4	53.4	2.1	0.5	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.0 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 3  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 1/ 1/92 0:00 TO 3/31/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	15	79	69	56	2	0	0	221	10.1	9.2
NNE	0	16	71	37	13	0	0	0	137	6.3	7.0
NE	0	11	53	57	15	1	0	0	137	6.3	8.1
ENE	1	16	65	51	15	2	0	0	150	6.9	8.0
E	1	13	64	64	36	7	0	0	185	8.5	9.2
ESE	0	15	40	77	29	0	0	0	161	7.4	9.2
SE	0	5	66	99	76	2	0	0	248	11.4	10.4
SSE	0	4	21	50	35	6	2	0	118	5.4	11.5
S	0	4	27	70	22	5	3	0	131	6.0	10.7
SSW	0	4	31	60	18	3	0	0	116	5.3	9.6
SW	0	3	20	29	4	1	0	0	57	2.6	8.6
WSW	0	5	24	27	6	0	0	0	62	2.8	7.9
W	1	5	38	11	2	0	0	0	57	2.6	6.3
WNW	0	12	41	7	1	2	0	0	63	2.9	5.7
NW	0	14	62	33	21	13	0	0	143	6.6	9.0
NNW	0	18	47	83	32	15	0	0	195	8.9	9.7
TOTAL	3	160	749	824	381	59	5	0	2181	100.0	
%	0.1	7.3	34.3	37.8	17.5	2.7	0.2	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.1 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 3  
 TOTAL NUMBER OF INVALID HOURS= 3  
 TOTAL NUMBER OF VALID HOURS= 2181  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLES FOR 1992

Second Quarter



JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	1	1	6	0	0	0	0	8	6.0	8.5
NNE	0	0	3	2	0	0	0	0	5	3.7	7.6
NE	0	0	1	0	0	0	0	0	1	0.7	6.1
ENE	0	1	1	0	0	0	0	0	2	1.5	3.5
E	0	0	1	0	0	0	0	0	1	0.7	5.3
ESE	0	1	2	2	2	0	0	0	7	5.2	8.0
SE	0	0	2	11	7	2	0	0	22	16.4	12.8
SSE	0	0	1	9	7	0	0	0	17	12.7	11.6
S	0	0	4	19	23	0	0	0	46	34.3	11.8
SSW	0	0	1	6	14	0	0	0	21	15.7	13.2
SW	0	0	0	0	2	0	0	0	2	1.5	15.3
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	2	0	0	0	0	0	2	1.5	3.7
TOTAL	0	3	19	55	55	2	0	0	134	100.0	
%	0.0	2.2	14.2	41.0	41.0	1.5	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.3 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	4	0	0	0	0	4	3.1	9.2
NNE	0	0	1	0	0	0	0	0	1	0.8	6.5
NE	0	0	2	0	0	0	0	0	2	1.6	4.8
ENE	0	1	0	0	0	0	0	0	1	0.8	1.7
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	1	1	0	0	0	2	1.6	10.9
SE	0	0	1	3	13	2	0	0	18	14.1	14.6
SSE	0	0	0	10	4	0	0	0	14	10.9	11.7
S	0	0	6	38	15	0	0	0	59	46.1	10.8
SSW	0	1	7	5	2	0	0	0	15	11.7	7.9
SW	0	0	1	4	0	0	0	0	5	3.9	9.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	1	0	0	0	0	1	0.8	10.2
NW	0	1	0	1	0	0	0	0	2	1.6	6.6
NNW	0	0	1	3	0	0	0	0	4	3.1	9.5
TOTAL	0	3	19	69	35	2	0	0	128	100.0	
%	0.0	2.3	14.8	53.9	27.3	1.6	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.7 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	1	0	2	0	0	0	0	3	2.3	7.6
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	1	1	0	0	0	0	2	1.6	6.9
ENE	0	0	1	0	0	0	0	0	1	0.8	7.5
E	0	2	1	1	0	0	0	0	4	3.1	5.1
ESE	0	0	0	6	1	0	0	0	7	5.4	9.9
SE	0	0	1	7	6	2	0	0	16	12.4	13.4
SSE	0	0	3	5	4	0	0	0	12	9.3	10.9
S	0	0	11	28	5	0	0	0	44	34.1	10.0
SSW	0	0	6	15	2	0	0	0	23	17.8	8.6
SW	0	0	4	4	0	0	0	0	8	6.2	7.9
WSW	0	1	1	0	0	0	0	0	2	1.6	4.9
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	1	0	0	0	0	0	1	0.8	4.5
NW	0	0	0	2	0	0	0	0	2	1.6	10.0
NNW	0	1	0	3	0	0	0	0	4	3.1	7.6
TOTAL	0	5	30	74	18	2	0	0	129	100.0	
%	0.0	3.9	23.3	57.4	14.0	1.6	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.6 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	3	9	10	1	0	0	0	23	3.7	7.4
NNE	0	2	10	14	0	0	0	0	26	4.2	7.7
NE	0	3	8	15	0	0	0	0	26	4.2	7.8
ENE	0	1	14	10	0	0	0	0	25	4.1	7.3
E	0	1	5	3	3	0	0	0	12	2.0	8.9
ESE	0	0	9	18	7	0	0	0	34	5.3	9.5
SE	0	4	18	56	27	0	0	0	105	17.1	10.5
SSE	0	1	23	68	20	0	0	0	112	18.2	10.0
S	0	1	28	78	12	0	0	0	119	19.3	9.2
SSW	0	0	14	31	6	0	0	0	51	8.3	9.3
SW	0	0	5	8	0	0	0	0	13	2.1	7.9
WSW	0	3	3	3	0	0	0	0	9	1.5	6.0
W	0	0	5	1	0	0	0	0	6	1.0	5.6
WNW	0	2	7	1	0	0	0	0	10	1.6	5.3
NW	1	1	4	9	3	0	0	0	18	2.9	8.7
NNW	1	2	13	9	1	0	0	0	26	4.2	7.0
TOTAL	2	24	175	334	80	0	0	0	615	100.0	
%	0.3	3.9	28.5	54.3	13.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.0 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	11	26	8	0	0	0	0	45	5.4	5.3
NNE	0	21	16	15	0	0	0	0	52	6.2	5.4
NE	0	16	33	14	0	0	0	0	63	7.5	5.6
ENE	0	13	14	8	1	0	0	0	36	4.3	5.4
E	0	7	14	1	1	0	0	0	23	2.7	5.1
ESE	0	12	50	11	2	0	0	0	75	8.9	5.9
SE	0	11	65	43	2	0	0	0	121	14.4	6.9
SSE	0	6	70	62	2	0	0	0	140	16.7	7.3
S	0	1	35	50	3	0	0	0	89	10.6	8.2
SSW	0	1	39	40	2	0	0	0	82	9.8	7.7
SW	0	1	9	19	0	0	0	0	29	3.5	8.3
WSW	0	0	6	0	0	0	0	0	6	0.7	5.3
W	0	2	5	1	0	0	0	0	8	1.0	5.3
WNW	0	4	7	4	0	0	0	0	15	1.8	5.4
NW	0	7	6	1	1	0	0	0	15	1.8	4.9
NNW	0	7	20	12	0	0	0	0	39	4.7	5.7
TOTAL	0	120	415	289	14	0	0	0	838	100.0	
%	0.0	14.3	49.5	34.5	1.7	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.6 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	10	5	1	0	0	0	0	16	6.8	3.7
NNE	0	9	4	1	0	0	0	0	14	5.9	3.5
NE	0	13	11	0	0	0	0	0	24	10.1	3.7
ENE	0	14	16	0	0	0	0	0	30	12.7	3.6
E	0	9	8	0	0	0	0	0	17	7.2	3.4
ESE	0	17	15	0	0	0	0	0	32	13.5	3.6
SE	0	5	30	1	0	0	0	0	36	15.2	4.6
SSE	0	3	17	1	0	0	0	0	21	8.9	4.7
S	0	3	2	1	0	0	0	0	6	2.5	4.9
SSW	0	0	1	0	0	0	0	0	1	0.4	3.6
SW	0	0	3	0	0	0	0	0	3	1.3	5.8
WSW	0	0	1	0	0	0	0	0	1	0.4	6.0
W	0	5	7	0	0	0	0	0	12	5.1	4.2
WNW	0	3	4	0	0	0	0	0	7	3.0	4.0
NW	0	4	4	0	0	0	0	0	8	3.4	3.7
NNW	0	2	6	1	0	0	0	0	9	3.8	5.6
TOTAL	0	97	134	6	0	0	0	0	237	100.0	
%	0.0	40.9	56.5	2.5	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.1 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 2  
 TOTAL NUMBER OF INVALID HOURS= 3  
 TOTAL NUMBER OF VALID HOURS= 2181  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	3	3	0	0	0	0	0	6	6.0	3.9
NNE	0	3	4	0	0	0	0	0	7	7.0	3.9
NE	0	6	8	3	0	0	0	0	17	17.0	4.8
ENE	0	6	2	0	0	0	0	0	8	8.0	2.7
E	0	6	2	0	0	0	0	0	8	8.0	3.1
ESE	0	5	7	0	0	0	0	0	12	12.0	3.6
SE	0	6	11	2	0	0	0	0	19	19.0	4.6
SSE	0	1	2	0	0	0	0	0	3	3.0	5.5
S	0	0	1	1	0	0	0	0	2	2.0	7.6
SSW	0	0	1	0	0	0	0	0	1	1.0	4.2
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	1	0	0	0	0	0	1	1.0	6.0
W	0	1	2	0	0	0	0	0	3	3.0	4.7
WNW	0	2	4	0	0	0	0	0	6	6.0	3.7
NW	0	0	3	0	0	0	0	0	3	3.0	4.2
NNW	0	2	2	0	0	0	0	0	4	4.0	3.6
TOTAL	0	41	53	6	0	0	0	0	100	100.0	
%	0.0	41.0	53.0	6.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.1 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALJD HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184



JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 4/ 1/92 0:00 TO 6/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	29	44	31	1	0	0	0	105	4.8	5.9
NNE	0	35	38	32	0	0	0	0	105	4.8	5.7
NE	0	38	64	33	0	0	0	0	135	6.2	5.6
ENE	0	36	48	18	1	0	0	0	103	4.7	5.1
E	0	25	31	5	4	0	0	0	65	3.0	5.1
ESE	0	35	83	38	13	0	0	0	169	7.7	6.3
SE	0	26	128	122	55	6	0	0	337	15.5	8.7
SSE	0	11	116	155	37	0	0	0	319	14.6	8.6
S	0	5	87	215	58	0	0	0	365	16.7	9.6
SSW	0	2	69	97	26	0	0	0	194	8.9	8.8
SW	0	1	22	35	2	0	0	0	60	2.8	8.3
WSW	0	4	12	3	0	0	0	0	19	0.9	5.7
W	0	8	19	2	0	0	0	0	29	1.3	4.9
WNW	0	11	23	6	0	0	0	0	40	1.8	5.0
NW	1	13	17	13	4	0	0	0	48	2.2	6.4
NNW	1	14	44	28	1	0	0	0	88	4.0	6.2
TOTAL	2	293	845	833	202	6	0	0	2181	100.0	
%	0.1	13.4	38.7	38.2	9.3	0.3	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 7.6 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 2  
TOTAL NUMBER OF INVALID HOURS= 3  
TOTAL NUMBER OF VALID HOURS= 2181  
TOTAL NUMBER OF HOURS FOR PERIOD= 2184

JOINT FREQUENCY TABLES FOR 1992

Third Quarter

JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	3	5	0	0	0	0	8	4.2	8.0
NNE	0	0	3	7	5	0	0	0	15	7.9	10.5
NE	0	0	0	1	2	1	0	0	4	2.1	16.8
ENE	0	0	1	2	0	0	0	0	3	1.6	7.2
E	0	0	0	1	0	0	0	0	1	0.5	8.0
ESE	0	1	1	3	1	0	0	0	6	3.2	9.1
SE	0	0	0	15	4	0	0	0	19	10.0	11.5
SSE	0	1	3	23	3	1	0	0	31	16.3	10.8
S	0	0	2	40	38	2	0	0	82	43.2	13.0
SSW	0	1	0	4	9	0	0	0	14	7.4	12.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	1	0	0	0	0	0	1	0.5	5.1
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	3	3	0	0	0	0	6	3.2	7.8
TOTAL	0	3	17	104	62	4	0	0	190	100.0	
%	0.0	1.6	8.9	54.7	32.6	2.1	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.7 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	6	0	0	0	0	0	6	3.3	6.2
NNE	0	0	4	9	2	0	0	0	15	8.3	9.4
NE	0	0	1	4	0	1	0	0	6	3.3	11.0
ENE	0	0	2	4	0	0	0	0	6	3.3	8.4
E	0	0	1	0	0	0	0	0	1	0.6	7.5
ESE	0	0	2	5	0	0	0	0	7	3.9	7.7
SE	0	0	1	15	0	0	0	0	16	8.9	9.6
SSE	0	0	1	22	3	0	0	0	26	14.4	10.1
S	0	0	1	62	17	0	0	0	80	44.4	11.3
SSW	0	0	1	11	4	0	0	0	16	8.9	11.1
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	1	0	0	0	0	0	1	0.6	4.1
TOTAL	0	0	21	132	26	1	0	0	180	100.0	
%	0.0	0.0	11.7	73.3	14.4	0.6	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.3 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	1	2	1	0	0	0	0	4	2.1	5.3
NNE	0	0	6	6	2	0	0	0	14	7.4	8.6
NE	0	0	3	6	0	0	0	0	9	4.7	7.6
ENE	0	1	6	7	0	0	0	0	14	7.4	7.4
E	0	1	3	2	0	0	0	0	6	3.2	6.5
ESE	0	0	3	4	2	0	0	0	9	4.7	9.5
SE	0	0	6	19	1	0	0	0	26	13.7	9.2
SSE	0	0	3	18	1	0	0	0	22	11.6	9.5
S	0	0	9	40	12	0	0	0	61	32.1	9.9
SSW	0	0	4	10	2	0	0	0	16	8.4	10.0
SW	0	0	4	1	0	0	0	0	5	2.6	6.5
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	3	0	0	0	0	3	1.6	9.2
NW	0	0	1	0	0	0	0	0	1	0.5	6.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	3	50	117	20	0	0	0	190	100.0	
%	0.0	1.6	26.3	61.6	10.5	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.0 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	3	7	0	0	0	0	0	10	2.2	4.3
NNE	0	2	11	14	3	0	0	0	30	6.7	8.0
NE	0	3	29	8	2	0	0	0	42	9.3	6.8
ENE	0	2	12	6	3	0	0	0	23	5.1	7.3
E	0	0	7	6	4	0	0	0	17	3.8	8.9
ESE	0	3	10	11	0	0	0	0	24	5.3	7.2
SE	0	1	23	32	0	0	0	0	56	12.4	7.8
SSE	0	1	28	40	1	0	0	0	70	15.6	8.4
S	0	0	20	74	19	0	0	0	113	25.1	10.0
SSW	0	1	6	22	3	0	0	0	32	7.1	9.3
SW	0	2	5	3	0	0	0	0	10	2.2	6.4
WSW	0	3	1	0	0	0	0	0	4	0.9	3.1
W	1	1	0	0	0	0	0	0	2	0.4	1.9
WNW	0	0	4	3	0	0	0	0	7	1.6	6.9
NW	0	1	2	1	0	0	0	0	4	0.9	5.2
NNW	0	0	5	1	0	0	0	0	6	1.3	6.0
TOTAL	1	23	170	221	35	0	0	0	450	100.0	
%	0.2	5.1	37.8	49.1	7.8	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.2 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	6	5	5	0	0	0	0	16	2.6	6.3
NNE	0	3	20	32	0	0	0	0	55	8.9	7.2
NE	0	2	21	7	0	0	0	0	30	4.8	6.1
ENE	0	5	17	1	1	0	0	0	24	3.9	5.7
E	0	6	18	5	0	0	0	0	29	4.7	5.7
ESE	0	3	28	5	0	0	0	0	36	5.8	5.5
SE	0	2	66	8	0	0	0	0	76	12.3	6.0
SSE	0	1	103	69	3	0	0	0	176	28.4	7.5
S	0	0	20	75	19	0	0	0	114	18.4	10.1
SSW	0	1	4	26	3	0	0	0	34	5.5	9.4
SW	0	1	0	8	0	0	0	0	9	1.5	8.4
WSW	0	0	2	2	0	0	0	0	4	0.6	9.0
W	0	0	1	1	0	0	0	0	2	0.3	8.5
WNW	0	0	8	0	0	0	0	0	8	1.3	5.0
NW	0	0	1	0	0	0	0	0	1	0.2	5.5
NNW	0	2	3	0	0	0	0	0	5	0.8	3.6
TOTAL	0	32	317	244	26	0	0	0	619	100.0	
%	0.0	5.2	51.2	39.4	4.2	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 7.5 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208



JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	13	11	1	0	0	0	0	25	5.9	4.0
NNE	0	17	33	11	0	0	0	0	61	14.5	5.1
NE	0	20	26	2	0	0	0	0	48	11.4	4.3
ENE	0	10	16	0	0	0	0	0	26	6.2	3.8
E	0	14	20	1	0	0	0	0	35	8.3	4.0
ESE	0	21	23	0	0	0	0	0	44	10.5	3.7
SE	0	6	82	1	0	0	0	0	89	21.1	4.6
SSE	0	1	54	3	0	0	0	0	58	13.8	5.8
S	0	0	3	0	0	0	0	0	3	0.7	4.8
SSW	0	1	1	3	0	0	0	0	5	1.2	7.4
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	1	4	0	0	0	0	0	5	1.2	5.5
WNW	0	1	6	0	0	0	0	0	7	1.7	4.5
NW	0	1	3	0	0	0	0	0	4	1.0	4.3
NNW	0	8	3	0	0	0	0	0	11	2.6	3.2
TOTAL	0	114	285	22	0	0	0	0	421	100.0	
%	0.0	27.1	67.7	5.2	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.6 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 1  
 TOTAL NUMBER OF INVALID HOURS= 9  
 TOTAL NUMBER OF VALID HOURS= 2199  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	3	2	0	0	0	0	0	5	3.4	3.9
NNE	0	9	20	1	0	0	0	0	30	20.1	4.1
NE	0	21	24	0	0	0	0	0	45	30.2	3.6
ENE	0	15	21	0	0	0	0	0	36	24.2	3.9
E	0	5	10	0	0	0	0	0	15	10.1	3.7
ESE	0	0	5	0	0	0	0	0	5	3.4	4.9
SE	0	0	2	0	0	0	0	0	2	1.3	4.6
SSE	0	0	1	0	0	0	0	0	1	0.7	6.5
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	1	0	0	0	0	0	1	0.7	3.7
NW	0	1	2	0	0	0	0	0	3	2.0	5.1
NNW	0	6	0	0	0	0	0	0	6	4.0	3.0
TOTAL	0	60	88	1	0	0	0	0	149	100.0	
%	0.0	40.3	59.1	0.7	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 3.9 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 7/ 1/92 0:00 TO 9/30/92 23:00

PRIMARY TOWER  
WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3 6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	26	36	12	0	0	0	0	74	3.4	5.2
NNE	0	31	97	80	12	0	0	0	220	10.0	6.8
NE	0	46	104	28	4	2	0	0	184	8.4	5.6
ENE	0	33	75	20	4	0	0	0	132	6.0	5.5
E	0	26	59	15	4	0	0	0	104	4.7	5.4
ESE	0	28	72	28	3	0	0	0	131	6.0	5.7
SE	0	9	180	90	5	0	0	0	284	12.9	6.8
SSE	0	4	193	175	11	1	0	0	384	17.5	8.0
S	0	0	55	291	105	2	0	0	453	20.6	10.7
SSW	0	4	16	76	21	0	0	0	117	5.3	10.0
SW	0	3	9	12	0	0	0	0	24	1.1	7.2
WSW	0	3	4	2	0	0	0	0	9	0.4	5.9
W	1	2	5	1	0	0	0	0	9	0.4	5.4
WNW	0	1	19	6	0	0	0	0	26	1.2	5.8
NW	0	3	9	1	0	0	0	0	13	0.6	5.0
NNW	0	16	15	4	0	0	0	0	35	1.6	4.5
TOTAL	1	235	948	841	169	5	0	0	2199	100.0	
%	0.0	10.7	43.1	38.2	7.7	0.2	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 7.6 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 9  
TOTAL NUMBER OF VALID HOURS= 2199  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLES FOR 1992

Fourth Quarter

JOINT FREQUENCY TABLE

-----  
 STABILITY CLASS -A-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	13	4	0	0	0	17	11.0	11.8
NNE	0	0	2	4	4	0	0	0	10	6.5	11.4
NE	0	0	1	3	2	0	0	0	6	3.9	10.4
ENE	0	0	1	3	3	0	0	0	7	4.5	11.4
E	0	0	1	3	3	1	0	0	8	5.2	13.2
ESE	0	0	0	6	8	0	0	0	14	9.1	12.7
SE	0	0	1	8	9	3	0	0	21	13.6	12.9
SSE	0	0	0	2	1	0	0	0	3	1.9	13.3
S	0	0	0	7	25	2	0	0	34	22.1	14.5
SSW	0	0	1	5	3	0	0	0	9	5.8	11.3
SW	0	0	1	0	0	0	0	0	1	0.6	3.7
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	1	0	0	1	0	0	0	2	1.3	10.1
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	3	14	1	0	0	0	18	11.7	9.6
NNW	0	0	1	1	2	0	0	0	4	2.6	11.6
TOTAL	0	1	12	69	66	6	0	0	154	100.0	
%	0.0	0.6	7.8	44.8	42.9	3.9	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.3 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 1  
 TOTAL NUMBER OF INVALID HOURS= 2  
 TOTAL NUMBER OF VALID HOURS= 2206  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	8	3	0	0	0	11	10.6	12.2
NNE	0	0	6	5	0	0	0	0	11	10.6	7.6
NE	0	0	3	3	0	0	0	0	6	5.8	7.9
ENE	0	0	0	1	0	0	0	0	1	1.0	11.9
E	0	0	2	3	6	0	0	0	11	10.6	12.4
ESE	0	0	0	4	2	0	0	0	6	5.8	12.3
SE	0	0	0	5	0	2	0	0	7	6.7	13.7
SSE	0	0	1	3	5	0	0	0	9	8.7	11.8
S	0	0	1	1	4	0	0	0	6	5.8	12.0
SSW	0	0	1	10	1	0	0	0	12	11.5	9.7
SW	0	0	0	1	0	0	0	0	1	1.0	9.2
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	1	3	0	0	0	0	4	3.8	8.3
WNW	0	0	1	3	0	0	0	0	4	3.8	9.1
NW	0	0	3	7	1	0	0	0	11	10.6	8.4
NNW	0	0	0	3	1	0	0	0	4	3.8	11.5
TOTAL	0	0	19	60	23	2	0	0	104	100.0	
%	0.0	0.0	18.3	57.7	22.1	1.9	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.5 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 2  
TOTAL NUMBER OF VALID HOURS= 2206  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	5	7	1	1	0	0	14	12.5	9.2
NNE	0	0	1	7	0	0	0	0	8	7.1	9.3
NE	0	0	1	3	1	0	0	0	5	4.5	8.9
ENE	0	0	2	6	0	0	0	0	8	7.1	9.5
E	0	0	4	1	1	0	0	0	6	5.4	7.9
ESE	0	0	0	6	0	3	0	0	9	8.0	14.5
SE	0	0	0	7	1	1	0	0	9	8.0	11.9
SSE	0	0	1	3	0	0	0	0	4	3.6	10.2
S	0	0	1	4	4	0	0	0	9	8.0	11.6
SSW	0	0	1	3	2	0	0	0	6	5.4	10.4
SW	0	0	0	1	0	0	0	0	1	0.9	9.9
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	3	1	1	0	0	0	5	4.5	8.5
WNW	0	2	0	2	1	0	0	0	5	4.5	9.0
NW	0	0	7	6	0	0	0	0	13	11.6	8.0
NNW	0	0	4	5	1	0	0	0	10	8.9	8.4
TOTAL	0	2	30	62	13	5	0	0	112	100.0	
%	0.0	1.8	26.8	55.4	11.6	4.5	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.8 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 2  
TOTAL NUMBER OF VALID HOURS= 2206  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208



JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	4	22	36	22	11	0	0	95	12.6	11.2
NNE	0	3	30	39	12	0	0	0	84	11.2	8.7
NE	0	2	33	36	17	0	0	0	88	11.7	9.2
ENE	0	1	12	36	4	0	0	0	53	7.1	8.8
E	0	6	13	34	20	0	0	0	73	9.7	9.9
ESE	0	0	11	31	26	2	0	0	70	9.3	11.5
SE	0	3	7	39	19	3	0	0	71	9.3	11.3
SSE	0	1	7	33	23	3	0	0	67	8.9	11.5
S	0	2	8	11	10	0	0	0	31	4.1	9.8
SSW	0	2	11	7	0	0	0	0	20	2.7	6.9
SW	0	1	6	1	0	0	0	0	8	1.1	6.6
WSW	0	1	4	0	0	0	0	0	5	0.7	4.6
W	0	2	3	0	0	0	0	0	5	0.7	4.2
WNW	0	1	5	3	1	0	0	0	10	1.3	8.0
NW	0	2	4	5	1	0	0	0	12	1.6	8.0
NNW	0	2	22	20	14	1	0	0	59	7.9	9.6
TOTAL	0	33	198	331	169	20	0	0	751	100.0	
%	0.0	4.4	26.4	44.1	22.5	2.7	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.9 MPH

HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0

TOTAL NUMBER OF CALMS= 1

TOTAL NUMBER OF INVALID HOURS= 2

TOTAL NUMBER OF VALID HOURS= 2206

TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5 -	-12.5 -	-18.5 -	-24.5 -	-32.5				
N	0	5	19	9	7	0	0	0	40	7.2	7.6
NNE	0	2	9	17	1	0	0	0	29	5.3	7.7
NE	0	5	28	20	1	0	0	0	54	9.8	7.0
ENE	0	4	29	10	0	0	0	0	43	7.8	6.4
E	0	4	25	25	1	1	0	0	56	10.1	7.7
ESE	0	6	24	25	5	1	0	0	61	11.1	8.1
SE	0	4	33	44	8	0	0	0	89	16.1	8.6
SSE	0	1	18	19	7	9	2	0	56	10.1	11.5
S	0	2	10	16	12	0	0	0	40	7.2	10.0
SSW	0	1	10	17	1	0	0	0	29	5.3	7.9
SW	0	0	1	9	1	0	0	0	11	2.0	9.4
WSW	0	0	3	1	0	0	0	0	4	0.7	7.2
W	0	0	1	0	0	0	0	0	1	0.2	3.7
WNW	0	0	6	1	0	0	0	0	7	1.3	6.8
NW	0	2	7	3	0	0	0	0	12	2.2	5.7
NNW	0	7	10	3	0	0	0	0	20	3.6	5.2
TOTAL	0	43	233	219	44	11	2	0	552	100.0	
%	0.0	7.8	42.2	39.7	8.0	2.0	0.4	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.1 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 2  
TOTAL NUMBER OF VALID HOURS= 2206  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	4	10	0	0	0	0	0	14	6.1	4.7
NNE	0	0	15	8	0	0	0	0	23	10.1	6.7
NE	1	4	22	0	0	0	0	0	27	11.8	5.1
ENE	0	1	23	0	0	0	0	0	24	10.5	5.7
E	0	0	15	3	0	0	0	0	18	7.9	6.2
ESE	0	1	21	2	0	0	0	0	24	10.5	6.1
SE	0	3	11	0	0	0	0	0	14	6.1	4.9
SSE	0	1	13	7	0	0	0	0	21	9.2	7.0
S	0	0	6	1	0	0	0	0	7	3.1	5.9
SSW	0	0	3	0	0	0	0	0	3	1.3	5.0
SW	0	0	3	1	0	0	0	0	4	1.8	6.9
WSW	0	0	5	1	0	0	0	0	6	2.6	6.0
W	0	0	1	0	0	0	0	0	1	0.4	4.2
WNW	0	4	5	1	0	0	0	0	10	4.4	4.5
NW	0	2	8	1	0	0	0	0	11	4.8	4.9
NNW	0	3	17	1	0	0	0	0	21	9.2	5.5
TOTAL	1	23	178	26	0	0	0	0	228	100.0	
%	0.4	10.1	78.1	11.4	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 5.7 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 2  
TOTAL NUMBER OF VALID HOURS= 2206  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	7	2	0	0	0	0	0	9	3.0	2.9
NNE	0	11	6	0	0	0	0	0	17	5.6	3.4
NE	0	21	48	0	0	0	0	0	69	22.6	4.2
ENE	0	14	49	1	0	0	0	0	64	21.0	4.6
E	0	13	34	0	0	0	0	0	47	15.4	4.2
ESE	0	7	9	0	0	0	0	0	16	5.2	4.2
SE	0	4	15	1	0	0	0	0	20	6.6	4.5
SSE	0	1	8	0	0	0	0	0	9	3.0	4.6
S	0	2	1	0	0	0	0	0	3	1.0	3.7
SSW	0	0	1	0	0	0	0	0	1	0.3	5.0
SW	0	2	0	0	0	0	0	0	2	0.7	1.7
WSW	0	0	1	0	0	0	0	0	1	0.3	5.8
W	0	2	5	1	0	0	0	0	8	2.6	5.4
WNW	0	1	4	1	0	0	0	0	6	2.0	5.7
NW	0	2	9	0	0	0	0	0	11	3.6	4.2
NNW	0	8	14	0	0	0	0	0	22	7.2	4.1
TOTAL	0	95	206	4	0	0	0	0	305	100.0	
%	0.0	31.1	67.5	1.3	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.3 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 1  
 TOTAL NUMBER OF INVALID HOURS= 2  
 TOTAL NUMBER OF VALID HOURS= 2206  
 TOTAL NUMBER OF HOURS FOR PERIOD= 2208

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 10/ 1/92 0:00 TO 12/31/92 23:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5 -	-12.5 -	-18.5 -	-24.5 -	-32.5				
N	0	20	58	73	37	12	0	0	200	9.1	9.6
NNE	0	16	69	80	17	0	0	0	182	8.3	7.9
NE	1	32	136	65	21	0	0	0	255	11.6	6.9
ENE	0	20	116	57	7	0	0	0	200	9.1	6.7
E	0	23	94	69	31	2	0	0	219	9.9	8.0
ESE	0	14	65	74	41	6	0	0	200	9.1	9.4
SE	0	14	67	104	37	9	0	0	231	10.5	9.5
SSZ	0	4	48	67	36	12	2	0	169	7.7	10.6
S	0	6	27	40	55	2	0	0	130	5.9	11.0
SSW	0	3	28	42	7	0	0	0	80	3.6	8.4
SW	0	3	11	13	1	0	0	0	28	1.3	7.5
WSW	0	1	13	2	0	0	0	0	16	0.7	5.9
W	0	5	14	5	2	0	0	0	26	1.2	6.5
WNW	0	8	21	11	2	0	0	0	42	1.9	6.9
NW	0	8	41	36	3	0	0	0	88	4.0	7.2
NNW	0	20	68	33	18	1	0	0	140	6.3	7.5
TOTAL	1	197	876	771	315	44	2	0	2206	100.0	
%	0.0	8.9	39.7	35.0	14.3	2.0	0.1	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.4 MPH  
HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
TOTAL NUMBER OF CALMS= 1  
TOTAL NUMBER OF INVALID HOURS= 2  
TOTAL NUMBER OF VALID HOURS= 2206  
TOTAL NUMBER OF HOURS FOR PERIOD= 2208

METEOROLOGICAL CONDITIONS DURING BATCH RELEASES

First Quarter

JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5 -	-12.5 -	-18.5 -	-24.5 -	-32.5				
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	1	0	0	0	1	16.7	13.8
SW	0	0	0	1	2	0	0	0	3	50.0	13.3
WSW	0	0	0	2	0	0	0	0	2	33.3	10.1
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	3	3	0	0	0	6	100.0	
%	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.3 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75



JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	2	0	0	0	2	100.0	14.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	2	0	0	0	2	100.0	
%	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 14.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/ /92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5	-12.5	-18.5	-24.5	-32.5				
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	1	0	0	0	1	50.0	13.2
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	1	0	0	0	0	1	50.0	12.1
TOTAL	0	0	0	1	1	0	0	0	2	100.0	
%	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.7 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75

JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	7.5	-12.5	-18.5	-24.5	-32.5				
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	1	0	0	0	0	0	1	5.6	4.5
NE	0	0	1	0	0	0	0	0	1	5.6	4.7
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	1	0	0	0	0	0	1	5.6	3.9
ESE	0	0	0	1	0	0	0	0	1	5.6	8.4
SF	0	0	2	5	1	0	0	0	8	44.4	9.4
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	2	1	0	0	0	3	16.7	11.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	1	0	0	0	0	0	1	5.6	5.7
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	2	0	0	0	0	2	11.1	9.7
TOTAL	0	0	6	10	2	0	0	0	18	100.0	
%	0.0	0.0	33.3	55.6	11.1	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE: 8.7 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	7.5 -	12.5 -	18.5 -	24.5 -	32.5				
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	1	0	0	0	0	0	1	4.3	5.0
ENE	0	0	1	0	0	0	0	0	1	4.3	4.1
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	1	0	0	0	0	0	1	4.3	6.1
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	7	0	0	0	0	7	30.4	10.9
SSW	0	0	0	10	0	0	0	0	10	43.5	9.7
SW	0	0	1	0	0	0	0	0	1	4.3	6.5
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	1	0	0	0	0	0	1	4.3	6.5
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	1	0	0	0	0	0	1	4.3	7.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	6	17	0	0	0	0	23	100.0	
%	0.0	0.0	26.1	73.9	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.1 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	1	0	0	0	0	0	1	10.0	3.9
SSW	0	0	1	0	0	0	0	0	1	10.0	4.0
SW	0	1	0	1	0	0	0	0	2	20.0	5.9
WSW	0	1	2	1	0	0	0	0	4	40.0	4.7
W	0	0	2	0	0	0	0	0	2	20.0	4.2
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	2	6	2	0	0	0	0	10	100.0	
%	0.0	20.0	60.0	20.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.7 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	2	0	0	0	0	0	0	2	14.3	2.6
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	1	0	0	0	0	1	7.1	8.8
W	0	0	6	0	0	0	0	0	6	42.9	6.0
WNW	0	1	2	0	0	0	0	0	3	21.4	4.9
NW	0	1	0	0	0	0	0	0	1	7.1	3.0
NNW	0	1	0	0	0	0	0	0	1	7.1	2.0
TOTAL	0	5	8	1	0	0	0	0	14	100.0	
%	.0	35.7	57.1	7.1	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 5.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 1/25/92 21:00 TO 1/25/92 22:00  
 FROM 1/31/92 18:00 TO 2/ 1/92 17:00  
 FROM 3/14/92 7:00 TO 3/15/92 7:00  
 FROM 3/18/92 16:00 TO 3/19/92 11:00  
 FROM 3/27/92 13:00 TO 3/27/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	2	1	0	0	0	0	0	3	4.0	3.2
NE	0	0	2	0	0	0	0	0	2	2.7	4.8
ENE	0	0	1	0	0	0	0	0	1	1.3	4.1
E	0	0	1	0	0	0	0	0	1	1.3	3.9
ESE	0	0	1	1	0	0	0	0	2	2.7	7.3
SE	0	0	2	5	1	0	0	0	8	10.7	9.4
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	1	7	0	0	0	0	8	10.7	10.0
SSW	0	0	1	12	5	0	0	0	18	24.0	10.6
SW	0	1	1	2	2	0	0	0	6	8.0	9.7
WSW	0	1	2	4	0	0	0	0	7	9.3	6.8
W	0	0	10	0	0	0	0	0	10	13.3	5.7
WNW	0	1	2	0	0	0	0	0	3	4.0	4.9
NW	0	1	1	0	0	0	0	0	2	2.7	5.0
NNW	0	1	0	3	0	0	0	0	4	5.3	8.4
TOTAL	0	7	26	34	8	0	0	0	75	100.0	
%	0.0	9.3	34.7	45.3	10.7	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 8.1 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 75  
 TOTAL NUMBER OF HOURS FOR PERIOD= 75



METEOROLOGICAL CONDITIONS DURING BATCH RELEASES

Second Quarter

JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	0	0	0	0	0	0.0	
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

AVE SPEED FOR THIS TABLE= 0.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	0	0	0	0	0	0.0	0.0
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

AVE SPEED FOR THIS TABLE= 0.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	0	0	0	0	0	0.0	
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

AVE SPEED FOR THIS TABLE= 0.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	3	0	0	0	0	3	10.7	7.9
NNE	0	1	2	1	0	0	0	0	4	14.3	5.8
NE	0	1	1	2	0	0	0	0	4	14.3	6.3
ENE	0	0	2	1	0	0	0	0	3	10.7	7.1
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	2	0	0	0	0	2	7.1	8.8
S	0	0	1	0	0	0	0	0	1	3.6	5.6
SSW	0	0	0	1	0	0	0	0	1	3.6	9.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	2	1	0	0	0	0	3	10.7	6.6
WNW	0	1	3	0	0	0	0	0	4	14.3	4.8
NW	0	0	1	0	0	0	0	0	1	3.6	6.6
NNW	0	0	2	0	0	0	0	0	2	7.1	4.6
TOTAL	0	3	14	11	0	0	0	0	28	100.0	
%	0.0	10.7	50.0	39.3	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.4 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5 -	-12.5 -	-18.5 -	-24.5 -	-32.5				
N	0	0	4	1	0	0	0	0	5	18.5	7.2
NNE	0	0	1	1	0	0	0	0	2	7.4	7.4
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	1	2	0	0	0	0	3	11.1	8.3
E	0	1	0	0	0	0	0	0	1	3.7	2.4
ESE	0	2	0	0	0	0	0	0	2	7.4	2.5
SE	0	0	2	7	0	0	0	0	9	33.3	8.5
SSE	0	0	1	0	0	0	0	0	1	3.7	5.3
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	2	0	0	0	0	2	7.4	7.6
NW	0	0	2	0	0	0	0	0	2	7.4	6.7
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	3	11	13	0	0	0	0	27	100.0	
%	0.0	11.1	40.7	48.1	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 7.2 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	7.5 -	12.5 -	18.5 -	24.5 -	32.5				
N	0	1	0	0	0	0	0	0	1	14.3	2.6
NNE	0	1	0	0	0	0	0	0	1	14.3	2.8
NE	0	2	0	0	0	0	0	0	2	28.6	2.8
ENE	0	1	0	0	0	0	0	0	1	14.3	3.4
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	2	0	0	0	0	0	0	2	28.6	2.5
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	7	0	0	0	0	0	0	7	100.0	
%	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 2.8 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67



JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	1	0	0	0	0	0	0	1	20.0	3.5
NE	0	0	2	0	0	0	0	0	2	40.0	4.4
ENE	0	1	1	0	0	0	0	0	2	40.0	3.3
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	2	3	0	0	0	0	0	5	100.0	
%	0.0	40.0	60.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 3.8 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 4/ 2/92 21:00 TO 4/ 3/92 9:00  
 FROM 4/ 5/92 16:00 TO 4/ 6/92 17:00  
 FROM 4/12/92 0:00 TO 4/12/92 7:00  
 FROM 4/13/92 3:00 TO 4/13/92 8:00  
 FROM 4/14/92 8:00 TO 4/14/92 12:00  
 FROM 4/15/92 20:00 TO 4/16/92 1:00  
 FROM 4/17/92 0:00 TO 4/17/92 2:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	1	4	4	0	0	0	0	9	13.4	7.0
NNE	0	3	3	2	0	0	0	0	8	11.9	5.5
NE	0	3	3	2	0	0	0	0	8	11.9	4.9
ENE	0	2	4	3	0	0	0	0	9	13.4	6.2
E	0	1	0	0	0	0	0	0	1	1.5	2.4
ESE	0	4	0	0	0	0	0	0	4	6.0	2.5
SE	0	0	2	7	0	0	0	0	9	13.4	8.5
SSE	0	0	1	2	0	0	0	0	3	4.5	7.6
S	0	0	1	0	0	0	0	0	1	1.5	5.6
SSW	0	0	0	1	0	0	0	0	1	1.5	9.8
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	2	1	0	0	0	0	3	4.5	6.6
WNW	0	1	3	2	0	0	0	0	6	9.0	5.7
NW	0	0	3	0	0	0	0	0	3	4.5	6.7
NNW	0	0	2	0	0	0	0	0	2	3.0	4.6
TOTAL	0	15	28	24	0	0	0	0	67	100.0	
%	0.0	22.4	41.8	35.8	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.2 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 67  
 TOTAL NUMBER OF HOURS FOR PERIOD= 67

METEOROLOGICAL CONDITIONS DURING BATCH RELEASES

Third Quarter

JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	0	0	0	0	0	1	6.3	6.5
NNE	0	0	0	0	4	0	0	0	4	25.0	13.3
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	2	1	0	0	0	3	18.8	12.3
SSW	0	0	0	1	7	0	0	0	8	50.0	14.4
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	3	12	0	0	0	16	100.0	
	0.0	0.0	6.3	18.8	75.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 13.2 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	0	0	0	0	0	1	9.1	5.3
NNE	0	0	0	1	1	0	0	0	2	18.2	12.6
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	5	2	0	0	0	7	63.6	11.1
SSW	0	0	0	0	1	0	0	0	1	9.1	17.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	6	4	0	0	0	11	100.0	
%	0.0	0.0	9.1	54.5	36.4	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.4 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	1	0	0	0	0	1	16.7	11.1
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	1	1	1	0	0	0	3	50.0	10.8
SSW	0	0	0	0	2	0	0	0	2	33.3	16.6
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	2	3	0	0	0	6	100.0	
%	0.0	0.0	16.7	33.3	50.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.8 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	- 7.5 -	-12.5	-18.5	-24.5	-32.5				
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	1	0	0	0	0	1	16.7	11.1
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	1	1	1	0	0	0	3	50.0	10.8
SSW	0	0	0	0	2	0	0	0	2	33.3	16.6
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	2	3	0	0	0	6	100.0	
%	0.0	0.0	16.7	33.3	50.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 12.8 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99



JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	1	5	3	0	0	0	9	56.3	11.3
SSW	0	0	0	3	3	0	0	0	6	37.5	11.7
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	1	0	0	0	0	0	1	6.3	5.8
TOTAL	0	0	2	8	6	0	0	0	16	100.0	
%	0.0	0.0	12.5	50.0	37.5	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.1 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	0	0	0	0	0	1	2.6	5.3
NNE	0	0	1	0	0	0	0	0	1	2.6	3.9
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	1	0	0	0	0	0	1	2.6	4.9
SSE	0	0	4	0	0	0	0	0	4	10.5	6.3
S	0	0	4	12	4	0	0	0	20	52.6	10.5
SSW	0	0	1	8	2	0	0	0	11	28.9	9.9
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	12	20	6	0	0	0	38	100.0	
%	0.0	0.0	31.6	52.6	15.8	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.4 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	1	0	0	0	0	0	0	1	8.3	3.2
NE	0	1	0	0	0	0	0	0	1	8.3	3.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	1	0	0	0	0	0	1	8.3	4.4
SSE	0	0	9	0	0	0	0	0	9	75.0	5.2
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	2	10	0	0	0	0	0	12	100.0	
%	0.0	16.7	83.3	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 4.8 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		3.5 -	7.5	-12.5	-18.5	-24.5	-32.5				
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	0	0	0	0	0	0.0	
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

AVE SPEED FOR THIS TABLE= 0.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 9/17/92 22:00 TO 9/17/92 22:00  
 FROM 9/18/92 2:00 TO 9/18/92 3:00  
 FROM 9/18/92 13:00 TO 9/21/92 22:00  
 FROM 9/24/92 15:00 TO 9/24/92 21:00  
 FROM 9/28/92 10:00 TO 9/28/92 16:00

PRIMARY TOWER  
 WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+	3.6	7.6	12.6	18.6	24.6	32.6+	TOTAL	%	AVE SPEED
		- 3.5 -	7.5	-12.5	-18.5	-24.5	-32.5				
N	0	0	3	0	0	0	0	0	3	3.0	5.7
NNE	0	1	1	2	5	0	0	0	9	9.1	10.8
NE	0	1	0	0	0	0	0	0	1	1.0	3.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	2	0	0	0	0	0	2	2.0	4.7
SSE	0	0	13	0	0	0	0	0	13	13.1	5.6
S	0	0	6	25	11	0	0	0	42	42.4	10.9
SSW	0	0	1	12	15	0	0	0	28	28.3	12.3
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	1	0	0	0	0	0	1	1.0	5.8
TOTAL	0	2	27	39	31	0	0	0	99	100.0	
%	0.0	2.0	27.3	39.4	31.3	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 10.2 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 99  
 TOTAL NUMBER OF HOURS FOR PERIOD= 99

METEOROLOGICAL CONDITIONS DURING BATCH RELEASES

Fourth Quarter



JOINT FREQUENCY TABLE

STABILITY CLASS -A-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	2	0	0	0	0	2	66.7	11.3
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	1	0	0	0	0	1	33.3	11.7
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	3	0	0	0	0	3	100.0	
%	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 11.4 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8



JOINT FREQUENCY TABLE

STABILITY CLASS -B-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	0	0	0	0	0	0.0	
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

AVE SPEED FOR THIS TABLE= 0.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8

JOINT FREQUENCY TABLE

STABILITY CLASS -C-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	0	0	0	0	0	1	50.0	7.3
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	1	0	0	0	0	1	50.0	11.2
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	1	0	0	0	0	2	100.0	
%	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.3 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8

JOINT FREQUENCY TABLE

STABILITY CLASS -D-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	1	0	0	0	0	0	1	100.0	7.5
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	0	0	0	0	0	1	100.0	
%	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 7.5 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8

JOINT FREQUENCY TABLE

STABILITY CLASS -E-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5 -	7.6 -12.5 -	12.6 -18.5 -	18.6 -24.5 -	24.6 -32.5 -	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	1	0	0	0	0	1	100.0	9.7
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	1	0	0	0	0	1	100.0	
%	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.7 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8

JOINT FREQUENCY TABLE

STABILITY CLASS -F-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	1	0	0	0	0	0	1	100.0	6.5
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	1	0	0	0	0	0	1	100.0	
%	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 6.5 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8

JOINT FREQUENCY TABLE

STABILITY CLASS -G-

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CAJM+ - 3.5 -	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	0	0	0	0	0	0	0	0.0	0.0
NNE	0	0	0	0	0	0	0	0	0	0.0	0.0
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	0	0	0	0	0	0	0	0.0	0.0
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	0	0	0	0	0	0	0	0.0	
%	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

AVE SPEED FOR THIS TABLE= 0.0 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8

JOINT FREQUENCY TABLE

ALL CLASSES COMBINED

FROM 10/ 2/92 9:00 TO 10/ 2/92 12:00  
 FROM 10/ 6/92 15:00 TO 10/ 6/92 18:00

PRIMARY TOWER

WIND SPEED (MPH)

DIR (FROM)	CALM	CALM+ - 3.5	3.6 - 7.5	7.6 -12.5	12.6 -18.5	18.6 -24.5	24.6 -32.5	32.6+	TOTAL	%	AVE SPEED
N	0	0	1	2	0	0	0	0	3	37.5	9.9
NNE	0	0	1	0	0	0	0	0	1	12.5	7.5
NE	0	0	0	0	0	0	0	0	0	0.0	0.0
ENE	0	0	0	0	0	0	0	0	0	0.0	0.0
E	0	0	0	0	0	0	0	0	0	0.0	0.0
ESE	0	0	1	3	0	0	0	0	4	50.0	9.8
SE	0	0	0	0	0	0	0	0	0	0.0	0.0
SSE	0	0	0	0	0	0	0	0	0	0.0	0.0
S	0	0	0	0	0	0	0	0	0	0.0	0.0
SSW	0	0	0	0	0	0	0	0	0	0.0	0.0
SW	0	0	0	0	0	0	0	0	0	0.0	0.0
WSW	0	0	0	0	0	0	0	0	0	0.0	0.0
W	0	0	0	0	0	0	0	0	0	0.0	0.0
WNW	0	0	0	0	0	0	0	0	0	0.0	0.0
NW	0	0	0	0	0	0	0	0	0	0.0	0.0
NNW	0	0	0	0	0	0	0	0	0	0.0	0.0
TOTAL	0	0	3	5	0	0	0	0	8	100.0	
%	0.0	0.0	37.5	62.5	0.0	0.0	0.0	0.0	100.0		

AVE SPEED FOR THIS TABLE= 9.6 MPH  
 HOURS IN ABOVE TABLE WITH VARIABLE DIRECTION= 0  
 TOTAL NUMBER OF CALMS= 0  
 TOTAL NUMBER OF INVALID HOURS= 0  
 TOTAL NUMBER OF VALID HOURS= 8  
 TOTAL NUMBER OF HOURS FOR PERIOD= 8



APPENDIX A

REVISED GASEOUS EFFLUENTS

FOR 1992

1st and 2nd Quarters

SITE: South Texas Project Electric Generating Station  
 UNIT: 1            YEAR: 1992

HOUSTON LIGHTING & POWER

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL AIRBORNE EFFLUENTS

Unit: 1

Starting : 1-Jan-1992      Ending : 30-Jun-1992

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	9.329E+01	8.854E+01	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.186E+01	1.126E+01	
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		4.394E-03	4.171E-03	
-----				
B. RADIOIODINES				
-----				
1. TOTAL RADIOIODINES	CURIES	8.091E-04	8.534E-04	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.029E-04	1.085E-04	
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		2.573E-01	2.713E-01	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	1.742E-05	3.916E-05	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.215E-06	4.980E-06	
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		7.384E-04	1.660E-03	
4. GROSS ALPHA RADIOACTIVITY	CURIES	2.494E-06	*2.377E-06	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	7.905E+00	3.318E+01	25
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.005E+00	4.220E+00	
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		5.586E-04	2.344E-03	
-----				

\* Gross Alpha Radioactivity for second quarter 1992 update.

SITE: South Texas Project Electric Generating Station  
 UNIT: 1 YEAR: 1992

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
 : BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY : FISSION GASES, IODINES, AND PARTICULATES  
 REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
<b>FISSION GASES</b>					
AR-41	CURIES	0.00E+00	0.00E+00	1.35E+00	1.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	8.71E-01	5.69E-02
KR-85M	CURIES	1.67E-02	0.00E+00	2.94E-02	3.20E-02
KR-87	CURIES	0.00E+00	0.00E+00	2.20E-05	0.00E+00
KR-88	CURIES	0.00E+00	0.00E+00	5.50E-03	4.05E-02
XE-131M	CURIES	0.00E+00	0.00E+00	3.51E-01	1.22E+00
XE-133 (1)	CURIES	8.67E+01	8.38E+01	0.00E+00	0.00E+00
XE-133M	CURIES	0.00E+00	0.00E+00	4.59E-01	5.38E-01
XE-135	CURIES	2.93E+00	1.36E+00	5.73E-01	4.91E-01
TOTAL FOR PERIOD	CURIES	8.97E+01	8.51E+01	3.64E+00	3.38E+00
<b>IODINES</b>					
I-131	CURIES	3.27E-04	3.84E-04	1.75E-05	1.85E-05
I-132	CURIES	1.20E-04	0.00E+00	1.82E-06	0.00E+00
I-133	CURIES	3.27E-04	4.43E-04	1.58E-05	7.86E-06
TOTAL FOR PERIOD	CURIES	7.75E-04	8.28E-04	3.51E-05	2.64E-05
<b>PARTICULATES</b>					
CO-58	CURIES	0.00E+00	1.01E-05	1.99E-07	0.00E+00
CO-60	CURIES	1.59E-05	1.19E-05	0.00E+00	0.00E+00
CS-134	CURIES	5.59E-07	3.04E-06	0.00E+00	2.72E-06
CS-137	CURIES	7.58E-07	5.99E-06	0.00E+00	3.51E-06
MN-54	CURIES	0.00E+00	1.08E-06	0.00E+00	0.00E+00
SB-125	CURIES	0.00E+00	8.16E-07	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.72E-05	3.29E-05	1.99E-07	6.23E-06
<b>OTHER</b>					
H-3	CURIES	7.47E+00	3.28E+01	4.27E-01	3.10E-01
TOTAL FOR PERIOD	CURIES	7.47E+00	3.28E+01	4.27E-01	3.10E-01

(1) Xe133 radioactivity was continuously quantified by the unit vent noble gas monitor. Xe133 releases of 4.54E+01 and 6.13E+01 Ci for the first and second quarters, respectively, were not included with the batch releases.

SITE: South Texas Project Electric Generating Station  
 UNIT: 2 YEAR: 1992

HOUSTON LIGHTING & POWER

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL AIRBORNE EFFLUENTS

Unit: 2

Starting : 1-Jan-1992 Ending : 30-Jun-1992

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE	CURIES	1.368E+01	1.038E+02	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.739E+00	1.320E+01	
-----				
3. PERCENT OF LIMIT (2.70E+05 uCi/sec) %		6.443E-04	4.890E-03	
-----				
B. RADIOIODINES				
-----				
1. TOTAL RADIOIODINES	CURIES	1.238E-05	5.460E-05	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.574E-06	6.944E-06	
-----				
3. PERCENT OF LIMIT (4.00E-02 uCi/sec) %		3.936E-03	1.736E-02	
-----				
C. PARTICULATES				
-----				
1. PARTICULATES(HALF-LIVES>8 DAYS)	CURIES	1.170E-07	0.000E+00	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	1.488E-08	0.000E+00	
-----				
3. PERCENT OF LIMIT (3.00E-01 uCi/sec) %		4.960E-06	0.000E+00	
-----				
4. GROSS ALPHA RADIOACTIVITY	CURIES	3.195E-06	*1.247E-06	
-----				
D. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.735E+00	4.389E+00	25
-----				
2. AVERAGE RELEASE RATE FOR PERIOD	uCi/Sec	2.207E-01	5.582E-01	
-----				
3. PERCENT OF LIMIT (1.80E+05 uCi/sec) %		1.226E-04	3.101E-04	
-----				

\* Gross Alpha Radioactivity for second quarter 1992 update.

SITE: South Texas Project Electric Generating Station  
 UNIT: 2 YEAR: 1992

REPORT CATEGORY : SEMIANNUAL AIRBORNE GROUND LEVEL CONTINUOUS AND  
 TYPE OF ACTIVITY : BATCH RELEASES. TOTALS FOR EACH NUCLIDE RELEASED.  
 REPORTING PERIOD : FISSION GASES, IODINES, AND PARTICULATES  
 : QUARTER # 1 AND QUARTER # 2 YEAR 1992

		CONTINUOUS MODE		BATCH MODE	
NUCLIDES RELEASED	UNIT	QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
FISSION GASES					
AR-41	CURIES	0.00E+00	0.00E+00	2.95E-07	6.92E-01
XE-131M	CURIES	4.76E-04	0.00E+00	0.00E+00	0.00E+00
XE-133 (2)	CURIES	1.38E-01	1.03E+02	0.00E+00	0.00E+00
XE-135	CURIES	3.1E-01	0.00E+00	0.00E+00	1.72E-04
TOTAL FOR PERIOD	CURIES	1.38E-01	1.03E+02	2.95E-07	6.92E-01
IODINES					
I-131	CURIES	8.33E-06	1.17E-05	2.6E-07	1.14E-05
I-133	CURIES	3.71E-05	1.09E-05	7.59E-08	1.86E-05
TOTAL FOR PERIOD	CURIES	1.20E-05	2.46E-05	3.38E-07	3.01E-05
PARTICULATES					
CO-58	CURIES	1.17E-07	0.00E+00	0.00E+00	0.00E+00
TOTAL FOR PERIOD	CURIES	1.17E-07	0.00E+00	0.00E+00	0.00E+00
OTHER					
H-3	CURIES	1.71E+00	3.97E+00	1.93E-02	4.14E-01
TOTAL FOR PERIOD	CURIES	1.71E+00	3.97E+00	1.93E-02	4.14E-01

(2) Xe133 radioactivity was continuously quantified by the unit vent noble gas monitor. Xe133 releases of 1.38E-01 and 5.17E-01 Ci for the first and second quarters, respectively, were not included with the batch releases.

APPENDIX B  
REVISED LIQUID EFFLUENTS  
FOR 1992  
1st and 2nd Quarters



SITE: South Texas Project Electric Generating Station  
 UNIT: 1 YEAR: 1992

HOUSTON LIGHTING & POWER

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL LIQUID EFFLUENTS

Unit: 1

Starting : 1-Jan-1992 Ending : 30-Jun-1992

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	2.591E-01	2.822E-01	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	5.961E-08	3.993E-08	
-----				
3. PERCENT OF MPC LIMIT (FRACTIONAL) %		3.855E-01	3.819E-01	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.944E+02	2.512E+02	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.473E-05	3.577E-05	
-----				
3. PERCENT OF MPC LIMIT (3.00E-03 uCi/mL) %		1.491E+00	1.192E+00	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	1.061E-01	3.550E+00	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	2.424E-08	5.024E-07	
-----				
3. PERCENT OF LIMIT (2.00E-04 uCi/mL) %		1.212E-02	2.512E-01	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	5
-----				
F. WASTE VOLUME RELEASED				
-----				
1. TOTAL PRE-DILUTION VOLUME	LITERS	3.153E+07	4.332E+07	1.3
-----				
2. BATCH PRE-DILUTION VOLUME	LITERS	2.952E+06	4.327E+06	1.3
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	4.346E+09	7.022E+09	10
-----				



SITE: South Texas Project Electric Generating Station  
 UNIT: 1 YEAR: 1992

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
 : TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY : ALL RADIONUCLIDES  
 REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1992

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
ALL NUCLIDES					
AG-110M	CURIES	0.00E+00	0.00E+00	9.96E-04	6.54E-03
CO-57	CURIES	0.00E+00	0.00E+00	4.28E-04	3.65E-04
CO-58	CURIES	0.00E+00	2.37E-05	1.46E-02	3.37E-02
CO-60	CURIES	0.00E+00	1.73E-06	5.68E-02	1.02E-01
CR-51	CURIES	0.00E+00	0.00E+00	2.03E-04	2.76E-03
CS-134	CURIES	0.00E+00	0.00E+00	2.20E-02	1.14E-02
CS-136	CURIES	0.00E+00	0.00E+00	5.93E-05	2.70E-04
CS-137	CURIES	2.93E-06	0.00E+00	4.08E-02	1.48E-02
FE-55	CURIES	0.00E+00	0.00E+00	1.03E-01	*8.22E-02
FE-59	CURIES	0.00E+00	0.00E+00	0.00E+00	3.50E-03
H-3	CURIES	3.37E-02	6.31E-02	1.94E+02	2.51E+02
I-131	CURIES	1.64E-06	1.77E-05	2.87E-03	6.14E-03
I-133	CURIES	0.00E+00	2.08E-05	2.42E-04	0.00E+00
I-135	CURIES	0.00E+00	0.00E+00	2.64E-05	0.00E+00
KR-85	CURIES	0.00E+00	0.00E+00	3.89E-03	5.95E-02
LA-140	CURIES	0.00E+00	0.00E+00	0.00E+00	2.22E-04
MN-54	CURIES	1.43E-06	3.12E-06	9.69E-03	1.38E-02
MO-99	CURIES	0.00E+00	0.00E+00	6.02E-05	0.00E+00
NA-24	CURIES	0.00E+00	0.00E+00	5.09E-04	1.99E-06
NB-95	CURIES	0.00E+00	0.00E+00	9.42E-04	6.77E-04
NB-97	CURIES	0.00E+00	0.00E+00	6.69E-05	4.02E-04
OTHER	CURIES	0.00E+00	0.00E+00	1.57E-04	1.04E-04
SB-124	CURIES	0.00E+00	0.00E+00	3.22E-05	2.08E-05
SB-125	CURIES	0.00E+00	0.00E+00	4.79E-03	2.28E-03
SN-113	CURIES	0.00E+00	0.00E+00	8.69E-06	0.00E+00
TC-99M	CURIES	0.00E+00	0.00E+00	6.12E-05	0.00E+00
XE-131M	CURIES	0.00E+00	0.00E+00	4.18E-03	9.08E-02
XE-133	CURIES	9.45E-06	2.98E-05	9.77E-02	3.38E+00
XE-133M	CURIES	0.00E+00	0.00E+00	1.06E-04	1.40E-02
XE-135	CURIES	0.00E+00	0.00E+00	2.10E-04	7.05E-04
ZN-65	CURIES	0.00E+00	0.00E+00	1.33E-04	1.12E-04
ZR-95	CURIES	0.00E+00	0.00E+00	2.51E-04	2.23E-04
ZR-97	CURIES	0.00E+00	0.00E+00	0.00E+00	2.42E-04
TOTAL FOR PERIOD	CURIES	3.37E-02	6.32E-02	1.95E+02	2.55E+02

\* Iron-55 Radioactivity for second quarter 1992 update.

SITE: South Texas Project Electric Generating Station  
 UNIT: 2 YEAR: 1992

HOUSTON LIGHTING & POWER

SEMIANNUAL SUMMATION OF ALL RELEASES BY QUARTER  
 ALL LIQUID EFFLUENTS

Unit: 2

Starting : 1-Jan-1992 Ending : 30-Jun-1992

TYPE OF EFFLUENT	UNITS	QUARTER 1	QUARTER 2	EST. TOT ERROR %
-----				
A. FISSION & ACTIVATION PRODUCTS				
-----				
1. TOTAL RELEASE (NOT INCLUDING TRITIUM, GASES, ALPHA)	CURIES	3.297E-01	7.878E-01	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	9.247E-08	1.405E-07	
-----				
3. PERCENT OF MPC LIMIT (FRACTIONAL) %		1.326E-01	1.513E-01	
-----				
B. TRITIUM				
-----				
1. TOTAL RELEASE	CURIES	1.443E+02	1.191E+02	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	4.047E-05	2.161E-05	
-----				
3. PERCENT OF MPC LIMIT (3.00E-03 uCi/mL) %		1.349E+00	7.203E-01	
-----				
C. DISSOLVED AND ENTRAINED GASES				
-----				
1. TOTAL RELEASE	CURIES	3.860E-02	2.169E-02	5
-----				
2. AVERAGE DILUTED CONCENTRATION DURING PERIOD	uCi/ML	1.074E-08	3.917E-09	
-----				
3. PERCENT OF LIMIT (2.00E-04 uCi/mL) %		5.374E-03	1.958E-03	
-----				
D. GROSS ALPHA RADIOACTIVITY				
-----				
1. TOTAL RELEASE	CURIES	0.000E+00	0.000E+00	5
-----				
E. WASTE VOLUME RELEASED				
-----				
1. TOTAL PRE-DILUTION VOLUME	LITERS	2.503E+07	2.606E+07	1.3
-----				
2. BATCH PRE-DILUTION VOLUME	LITERS	2.603E+06	3.251E+06	1.3
-----				
F. VOLUME OF DILUTION WATER USED	LITERS	3.566E+09	5.512E+09	10
-----				

SITE: South Texas Project Electric Generating Station  
 UNIT: 2 YEAR: 1992

REPORT CATEGORY : SEMIANNUAL LIQUID CONTINUOUS AND BATCH RELEASES  
 : TOTALS FOR EACH NUCLIDE RELEASED.  
 TYPE OF ACTIVITY : ALL RADIONUCLIDES  
 REPORTING PERIOD : QUARTER # 1 AND QUARTER # 2 YEAR 1992

NUCLIDE	UNIT	CONTINUOUS RELEASES		BATCH RELEASES	
		QUARTER 1	QUARTER 2	QUARTER 1	QUARTER 2
ALL NUCLIDES					
AG-110M	CURIES	0.00E+00	0.00E+00	5.92E-04	1.14E-04
BE-7	CURIES	0.00E+00	0.00E+00	0.00E+00	2.03E-05
CE-144	CURIES	0.00E+00	0.00E+00	5.08E-05	0.00E+00
CO-57	CURIES	0.00E+00	0.00E+00	8.35E-04	1.68E-03
CO-58	CURIES	0.00E+00	0.00E+00	1.24E-01	1.26E-01
CO-60	CURIES	0.00E+00	0.00E+00	7.00E-02	1.70E-01
CR-51	CURIES	0.00E+00	0.00E+00	2.13E-02	4.28E-03
CS-137	CURIES	0.00E+00	0.00E+00	4.24E-05	6.38E-06
FE-55	CURIES	0.00E+00	0.00E+00	5.72E-02	*4.12E-01
FE-59	CURIES	0.00E+00	0.00E+00	1.45E-02	5.55E-03
H-3	CURIES	1.62E-02	5.78E-02	1.44E+02	1.19E+02
LA-140	CURIES	0.00E+00	0.00E+00	1.60E-05	4.15E-07
MN-54	CURIES	0.00E+00	0.00E+00	1.42E-02	3.14E-02
NA-24	CURIES	0.00E+00	0.00E+00	1.09E-05	1.28E-06
NB-95	CURIES	0.00E+00	0.00E+00	9.40E-03	1.07E-02
NB-97	CURIES	0.00E+00	0.00E+00	1.06E-04	2.12E-04
OTHER	CURIES	0.00E+00	0.00E+00	1.64E-05	0.00E+00
SB-124	CURIES	0.00E+00	0.00E+00	4.15E-03	1.48E-03
SB-125	CURIES	0.00E+00	0.00E+00	7.11E-03	6.04E-03
SN-113	CURIES	0.00E+00	0.00E+00	1.00E-03	1.34E-03
XE-133	CURIES	0.00E+00	0.00E+00	3.81E-02	2.16E-02
XE-133M	CURIES	0.00E+00	0.00E+00	2.39E-04	5.53E-05
XE-135	CURIES	0.00E+00	0.00E+00	2.08E-04	3.74E-05
ZN-65	CURIES	0.00E+00	0.00E+00	4.40E-04	7.45E-04
ZR-95	CURIES	0.00E+00	0.00E+00	4.75E-03	5.11E-03
TOTAL FOR PERIOD	CURIES	1.62E-02	5.78E-02	1.45E+02	1.19E+02

\* Iron-55 Radioactivity for second quarter 1992 update.

Appendix C: Results of the Protected Area

Direct Radiation Measurements Program

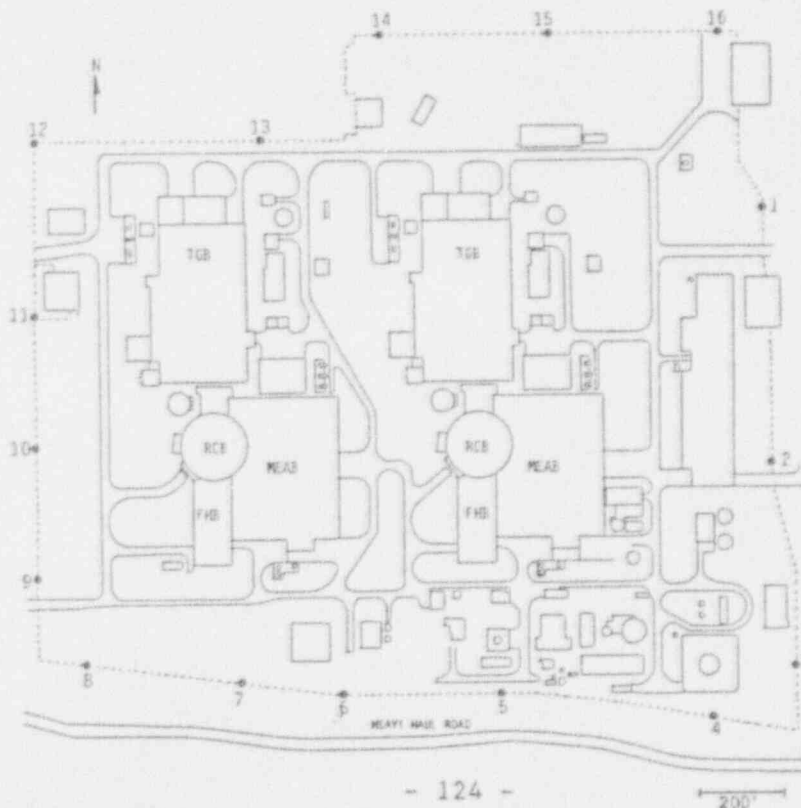
1992 STPEGS PROTECTED AREA TLD MONITORING STATIONS (PATS)

Station Number	1st Qtr Average (mrem)	2nd Qtr Average (mrem)	3rd Qtr Average (mrem)	4th Qtr Average (mrem)	Average Quarter NET DOSE *
1	12.4	11.7	11.8	12.5	**
2	12.7	12.1	12.6	13.5	**
3	10.8	10.3	10.8	11.5	**
4	11.9	11.0	11.4	12.8	**
5	13.5	12.4	13.3	14.5	**
6	21.5	17.7	18.1	17.6	0.0015
7	23.2	16.0	14.6	15.2	0.0008
8	15.3	13.1	13.6	13.3	**
9	12.4	11.6	11.9	13.3	**
10	11.9	11.0	11.5	12.7	**
11	10.7	10.2	10.6	11.4	**
12	11.1	10.3	10.4	11.9	**
13	10.5	10.1	10.3	11.4	**
14	10.6	10.2	10.5	11.6	**
15	10.6	10.2	11.0	11.5	**
16	10.6	10.1	10.5	11.8	**

Notes: \* Values normalized to a 91 day quarter.  
 Only calcium sulfate elements used (E2, E3, and E4).  
 NET DOSE RATE: The difference between the dose rate measured in 1992 and the rate measured in 1986 due to natural background.

([Avg. Stnd. Qtr. Dose Rate] - 15.4 mrem background) / 91 days / 24 hours

\*\*Net Dose Rate less than or equal to natural background.



Appendix D: Offsite Dose Calculation Manual

Revision 5

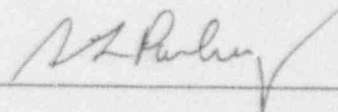


OFFSITE DOSE CALCULATION MANUAL  
(ODCM)

SOUTH TEXAS PROJECT

Revision 5

Plant Manager Approval



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PORC Meeting Number 93-001

January 5, 1993



## PREFACE

The South Texas Project (STP) Offsite Dose Calculation Manual (ODCM) is divided into two parts: Part A, Radiological Effluent Monitoring Programs, which provides the in-plant radiological effluent monitoring program requirements for liquid and gas sampling and analysis, along with the Radiological Environmental Monitoring Program requirements; and Part B, Radiological Calculational Methods and Parameters, which provides approved methods to determine effluent monitor setpoint values and estimates of doses and radionuclide concentrations occurring beyond the boundaries of the station resulting from normal station operation.

The sampling and analysis programs in Part A provide the inputs for the models of Part B in order to calculate offsite doses and radionuclide concentrations necessary to determine compliance with the dose and concentration requirements of Control 3/4.11 in Part A of the ODCM. The Radiological Environmental Monitoring Program required by Control 3/4.12 in Part A, and outlined within this manual provides the means to determine that measurable concentrations of radioactive materials released as a result of the operation of STP are not significantly higher than expected.

Changes to the ODCM shall be performed in accordance with Technical Specification 6.14.

TABLE OF CONTENTS

SECTION	PAGE
REFERENCES	x
 <u>PART A: RADIOLOGICAL EFFLUENT MONITORING PROGRAMS</u>	
<u>1.0 DEFINITIONS</u>	
1.1 ACTION	3
1.2 ANALOG CHANNEL OPERATIONAL TEST	3
1.3 CHANNEL CALIBRATION	3
1.4 CHANNEL CHECK	3
1.5 DIGITAL CHANNEL OPERATIONAL TEST	3
1.6 DOSE EQUIVALENT I-131	3
1.7 FREQUENCY NOTATION	4
1.8 GASEOUS WASTE PROCESSING SYSTEM	4
1.9 MEMBER(S) OF THE PUBLIC	4
1.10 OFFSITE DOSE CALCULATION MANUAL	4
1.11 OPERABLE - OPERABILITY	4
1.12 OPERATIONAL MODE - MODE	4
1.13 PURGE - PURGING	5
1.14 RATED THERMAL POWER	5
1.15 REPORTABLE EVENT	5
1.16 SITE BOUNDARY	5
1.17 SOLIDIFICATION	5
1.18 SOURCE CHECK	5
1.19 THERMAL POWER	5
1.20 UNRESTRICTED AREA	5
1.21 VENTING	5
TABLE 1.1 FREQUENCY NOTATION	6
TABLE 1.2 OPERATIONAL MODES	7

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
<u>2.0 RESPONSIBILITIES FOR PART A OF THE ODCM</u>	9
<u>3.0 and 4.0 CONTROLS AND SURVEILLANCE REQUIREMENTS</u>	
<u>3/4.0 APPLICABILITY</u>	11
<u>3/4.3 INSTRUMENTATION</u>	
<u>3/4.3.3 MONITORING INSTRUMENTATION</u>	
3/4.3.3.10 Radioactive Liquid Effluent Monitoring Instrumentation	13
TABLE 3.3-12 RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION	14
TABLE 4.3-8 RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS	16
3/4.3.3.11 Radioactive Gaseous Effluent Monitoring Instrumentation	18
TABLE 3.3-13 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION	19
TABLE 4.3-9 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS	21
<u>3/4.11 RADIOACTIVE EFFLUENTS</u>	
<u>3/4.11.1 LIQUID EFFLUENTS</u>	
3/4.11.1.1 Concentration	24
TABLE A3-1 RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM	25
3/4.11.1.2 Dose	28
3/4.11.1.3 Liquid Waste Processing System	29
<u>3/4.11.2 GASEOUS EFFLUENTS</u>	
3/4.11.2.1 Dose Rate	31
TABLE A4-1 RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM	32
3/4.11.2.2 Dose - Noble Gases	35
3/4.11.2.3 Dose - Iodine 131, 133, Tritium, and Radioactive Material in Particulate Form	35
3/4.11.2.4 Gaseous Waste Processing System	37
<u>3/4.11.4 TOTAL DOSE</u>	38

TABLE OF CONTENTS

<u>SECTION</u>	<u>PAGE</u>
<u>3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING</u>	
<u>3/4.12.1 MONITORING PROGRAM</u>	41
TABLE A5-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM	43
TABLE A5-2 DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS LOWER LIMIT OF DETECTION	50
TABLE A5-3 REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES REPORTING LEVELS	53
<u>3/4.12.2 LAND USE CENSUS</u>	54
<u>3/4.12.3 INTERLABORATORY COMPARISON PROGRAM</u>	56
 <u>BASES 3.0 and 4.0 CONTROLS AND SURVEILLANCE REQUIREMENTS</u>	
<u>3/4.3 INSTRUMENTATION</u>	
<u>3/4.3.3 MONITORING INSTRUMENTATION</u>	
3/4.3.3.10 Radioactive Liquid Effluent Monitoring Instrumentation	58
3/4.3.3.11 Radioactive Gaseous Effluent Monitoring Instrumentation	58
<u>3/4.11 RADIOACTIVE EFFLUENTS</u>	
<u>3/4.11.1 LIQUID EFFLUENTS</u>	
3/4.11.1.1 Concentration	59
3/4.11.1.2 Dose	59
3/4.11.1.3 Liquid Waste Processing System	60
<u>3/4.11.2 GASEOUS EFFLUENTS</u>	
3/4.11.2.1 Dose Rate	60
3/4.11.2.2 Dose - Noble Gases	61
3/4.11.2.3 Dose - Iodine-131, Iodine-133, Tritium, and Radioactive Material in Particulate Form	62
3/4.11.2.4 Gaseous Waste Processing System	62
<u>3/4.11.4 TOTAL DOSE</u>	63
<u>3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING</u>	
<u>3/4.12.1 MONITORING PROGRAM</u>	64
<u>3/4.12.2 LAND USE CENSUS</u>	64
<u>3/4.12.3 INTERLABORATORY COMPARISON PROGRAM</u>	65

TABLE OF CONTENTS

<u>SECTION</u>		<u>PAGE</u>
<u>5.0 DESIGN FEATURES</u>		
5.1.3	Map Defining Unrestricted Areas and Site Boundary for Radioactive Gaseous and Liquid Effluents	67
FIGURE 5.1-1	EXCLUSION AREA	68
FIGURE 5.1-2	LOW POPULATION ZONE	69
FIGURE 5.1-3	UNRESTRICTED AREA AND SITE BOUNDARY FOR RADIOACTIVE GASEOUS EFFLUENTS	70
FIGURE 5.1-4	UNRESTRICTED AREA AND SITE BOUNDARY FOR RADIOACTIVE LIQUID EFFLUENTS	71
<u>6.0 ADMINISTRATIVE CONTROLS</u>		
6.9.1.3	Annual Radiological Environmental Operating Report	73
6.9.1.4	Semiannual Radioactive Effluent Release Report	74
6.15.1	Major Changes to Liquid and Gaseous Radwaste Treatment Systems	76

## TABLE OF CONTENTS

SECTION	PAGE
<u>PART B: RADIOLOGICAL CALCULATIONAL METHODS AND PARAMETERS</u>	
<u>Section</u>	
1.0 <u>Introduction</u>	
1.1 Purpose	B1-1
1.2 General Site Description	B1-2
2.0 <u>Summary of Release Points and Detector System</u>	
2.1 Gaseous Release Points	B2-1
2.2 Liquid Release Points	B2-1
2.3 Detector System and Instrument Responses	B2-3
3.0 <u>Alarm Setpoint Adjustments</u>	
3.1 Liquid Effluents	B3-1
3.2 Gaseous Effluents	B3-5
4.0 <u>Off-Site Dose Calculations</u>	
4.1 Liquid Releases	B4-1
4.2 Liquid Exposure Dose Model	B4-1
4.3 Gaseous Releases	B4-5
4.4 Gaseous Dose Models and Dose Formulas	B4-8
4.5 Control 3.11.1.3	B4-11
4.6 Control 3.11.2.4	B4-11
4.7 Control 3.11.4 Dose Calculations	B4-12
4.8 Dose to MEMBERS OF THE PUBLIC On-Site	B4-12
4.9 Population Dose Estimation	B4-13
<u>Appendix to Part B, Section 4</u>	
Model of the Release of Radioactive Materials From the STPEGS Reservoir for Use in Off-Site Dose Calculations	B4-246
5.0 <u>Radiological Environmental Monitoring Program</u>	
5.1 Program Summary	B5-1
5.2 Sampling Program Description	B5-2
5.3 Sampling Frequency	B5-4
5.4 Sample Station Locations	B5-4
5.5 Quality Control	B5-4
5.6 Analytical Sensitivity	B5-4
5.7 Data Presentation	B5-4
5.8 Routine Reporting Requirements	B5-5



## LIST OF TABLES

### PART B

B3-1	Liquid Release Detector, RD-53, Response to 1 uCi/ml of Each Nuclide	B3-11
B3-2	Noble Gas Detector, RD-52, Response to 1 uCi/cc of Each Nuclide	B3-13
B3-3	Noble Gas Detector, RD-52, Response to Single Nuclide	B3-16
B4-1	Radionuclide Fractions Leaving STPEGS Via Liquid Routes	B4-15
B4-2	Liquid Dose Pathway Factor Description	B4-17
B4-3	Liquid Parameter Values for Eq. 4.2a and 4.2b	B4-18
B4-4	Pathways for Calculating Individual Doses from Liquid Effluent Releases	B4-19
B4-5	Particle Depletion and Deposition Factors for Ground Level Releases	B4-20
B4-6	Distances to Gaseous Dose Pathway Receptors for Individuals (meters)	B4-21
B4-7	Pathway Dose Factors	B4-22
B4-8	Liquid Parameter Values for Eq. 4.2a and 4.2b Population Dose Estimates	B4-131
B4-9	Pathways for Calculating Population Doses from Liquid Effluents	B4-132
B4-10a	Population Distribution	B4-133
B4-10b	Vegetation Ingestion Pathway Population Distribution	B4-134



B4-10c Beef Ingestion Pathway Population Distribution	B4-135
B4-11 Population Dose Factors	B4-136
B5-1 Minimum Operational Radiological Environmental Monitoring Program	B5-6
B5-2 Sample Station Locations	B5-10

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
B2-1 Unit Ventilation Systems	B2-4
B2-2 Turbine Building Ventilation System	B2-5
B2-3 Energy Response Curve for the RD-52 Offline Beta Detector Operating at 760 mm Hg and 25°C	B2-6
B2-4 RD-56 Particulate Detector Energy Response to Betas	B2-7
B2-5 Detector Energy Response to Gamma Radiations for the RD-53 Offline Gamma Detector	B2-8
B4-1 Lower Colorado River	B4-250
B4-2 STPEGS Site	B4-251

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## PART A

### RADIOLOGICAL EFFLUENT MONITORING PROGRAMS

#### INTRODUCTION

Part A of the Offsite Dose Calculation Manual (ODCM) describes the sampling and analysis programs conducted by STP which provide input to the models in Part B of the ODCM for calculating liquid and gaseous effluent concentrations, monitor setpoints, and offsite doses. The results of Part B calculations are used to determine compliance with the concentration and dose requirements of Part A.

The minimum required Radiological Environmental Monitoring Program (REMP) is described in Part A. The current sampling station locations, as well as the details of the current sampling program implementation and philosophy, appear in Part B. The information obtained from the REMP provides data which may allow evaluation of the relationship between quantities of radioactive materials released in effluents and resultant radiation doses to individuals from principal pathways of exposure. The data developed in the surveillance and monitoring programs described in Part A of the ODCM provide a means to confirm that measurable concentrations of radioactive materials released as a result of STP operations are not significantly higher than expected based on the models in Part B.

SECTION 1.0

DEFINITIONS

## 1.0 DEFINITIONS

The defined terms of this section appear in capitalized type and are applicable throughout these Controls.

### ACTION

1.1 ACTION shall be that part of a Control that prescribes remedial measures required under designated conditions.

### ANALOG CHANNEL OPERATIONAL TEST

1.2 An ANALOG CHANNEL OPERATIONAL TEST shall be the injection of a simulated signal into the channel as close to the sensor as practicable to verify OPERABILITY of alarm, interlock, and/or trip functions. The ANALOG CHANNEL OPERATIONAL TEST shall include adjustments, as necessary, of the alarm, interlock, and/or Trip Setpoints so that the Setpoints are within the required range and accuracy.

### CHANNEL CALIBRATION

1.3 A CHANNEL CALIBRATION shall be the adjustment, as necessary, of the channel so that it responds within the required range and accuracy to known values of input. The CHANNEL CALIBRATION shall encompass the entire channel including the sensors and alarm, interlock, and/or trip functions, and may be performed by any series of sequential, overlapping, or total channel steps so that the entire channel is calibrated.

### CHANNEL CHECK

1.4 A CHANNEL CHECK shall be the qualitative assessment of channel behavior during operation by observation. This determination shall include, where possible, comparison of the channel indication and/or status with other indications and/or status derived from independent instrument channels measuring the same parameter.

### DIGITAL CHANNEL OPERATIONAL TEST

1.5 A DIGITAL CHANNEL OPERATIONAL TEST shall consist of injecting simulated process data, where available, or exercising the digital computer hardware using data base manipulation to verify OPERABILITY of alarm, interlock, and/or trip functions.

### DOSE EQUIVALENT I-131

1.6 DOSE EQUIVALENT I-131 shall be that concentration of I-131 ( $\mu\text{Ci}/\text{gram}$ ) which alone would produce the same thyroid dose as the quantity and isotopic mixture of I-131, I-132, I-133, I-134, and I-135 actually present. The thyroid dose conversion factors used for this calculation shall be those listed in Table E-7 of NRC Regulatory Guide 1.109, Revision 1, October 1977.



## 1.0 DEFINITIONS (Continued)

### FREQUENCY NOTATION

1.7 The FREQUENCY NOTATION specified for the performance of Surveillance Requirements shall correspond to the intervals defined in Table 1.1.

### GASEOUS WASTE PROCESSING SYSTEM

1.8 A GASEOUS WASTE PROCESSING SYSTEM shall be any system designed and installed to reduce radioactive gaseous effluents by collecting Reactor Coolant System offgases from the Reactor Coolant System and providing for delay or holdup for the purpose of reducing the total radioactivity prior to release to the environment.

### MEMBER(S) OF THE PUBLIC

1.9 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 licensee, 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.

### OFFSITE DOSE CALCULATION MANUAL

1.10 The OFFSITE DOSE CALCULATION MANUAL (ODCM) contains the methodology and parameters used in: the calculation of offsite doses due to radioactive gaseous and liquid effluents, the calculation of gaseous and liquid effluent monitoring Alarm/Trip Setpoints, and the conduct of the Radiological Environmental Monitoring Program. The ODCM shall also contain: the Radioactive Effluent Controls and Radiological Environmental Monitoring Programs required by Technical Specification 6.8.3, and descriptions of the information that should be included in the Annual Radiological Environmental Operating Report and Semiannual Radioactive Effluent Release Report.

### OPERABLE - OPERABILITY

1.11 A system, subsystem, train, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified function(s), and when all necessary attendant instrumentation, controls, electrical power, cooling or seal water, lubrication or other auxiliary equipment that are required for the system, subsystem, train, component, or device to perform its function(s) are also capable of performing their related support function(s).

### OPERATIONAL MODE - MODE

1.12 An OPERATIONAL MODE (i.e., MODE) shall correspond to any one inclusive combination of core reactivity condition, power level, and average reactor coolant temperature specified in Table 1.2.

## 1.0 DEFINITIONS (Continued)

### PURGE - PURGING

1.13 PURGE or PURGING shall be any controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration or other operating condition, in such a manner that replacement air or gas is required to purify the confinement.

### RATED THERMAL POWER

1.14 RATED THERMAL POWER shall be a total reactor core heat transfer rate to the reactor coolant of 3800 MW<sub>t</sub>.

### REPORTABLE EVENT

1.15 A REPORTABLE EVENT shall be any of those conditions specified in Section 50.73 of 10 CFR Part 50.

### SITE BOUNDARY

1.16 The SITE BOUNDARY shall be that line beyond which the land is neither owned, nor leased, nor otherwise controlled by the licensee.

### SOLIDIFICATION

1.17 SOLIDIFICATION shall be the conversion of wet wastes into a form that meets shipping and burial ground requirements.

### SOURCE CHECK

1.18 A SOURCE CHECK shall be the qualitative assessment of channel response when the channel sensor is exposed to a source of increased radioactivity.

### THERMAL POWER

1.19 THERMAL POWER shall be the total reactor core heat transfer rate to the reactor coolant.

### UNRESTRICTED AREA

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

### VENTING

1.21 VENTING shall be the controlled process of discharging air or gas from a confinement to maintain temperature, pressure, humidity, concentration, or other operating condition, in such a manner that replacement air or gas is not provided or required during VENTING. Vent, used in system names, does not imply a VENTING process.

TABLE 1.1  
FREQUENCY NOTATION

<u>NOTATION</u>	<u>FREQUENCY</u>
S	At least once per 12 hours
D	At least once per 24 hours
W	At least once per 7 days
M	At least once per 31 days
Q	At least once per 92 days
SA	At least once per 184 days
R	At least once per 18 months
S/U	Prior to each reactor startup
N.A.	Not applicable
P	Completed prior to each release

TABLE 1.2  
OPERATIONAL MODES

<u>MODE</u>	<u>REACTIVITY CONDITION, <math>K_{eff}</math></u>	<u>% RATED THERMAL POWER*</u>	<u>AVERAGE COOLANT TEMPERATURE</u>
1. POWER OPERATION	$\geq 0.99$	$> 5\%$	$\geq 350^{\circ}\text{F}$
2. STARTUP	$\geq 0.99$	$\leq 5\%$	$\geq 350^{\circ}\text{F}$
3. HOT STANDBY	$< 0.99$	0	$\geq 350^{\circ}\text{F}$
4. HOT SHUTDOWN	$< 0.99$	0	$350^{\circ}\text{F} > T_{avg} > 200^{\circ}\text{F}$
5. COLD SHUTDOWN	$< 0.99$	0	$\leq 200^{\circ}\text{F}$
6. REFUELING**	$\leq 0.95$	0	$\leq 140^{\circ}\text{F}$

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\* Excluding decay heat.

\*\* Fuel in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.

SECTION 2.0  
RESPONSIBILITIES FOR PART A OF THE ODCM

2.0 RESPONSIBILITIES FOR PART A OF THE ODCM

All changes to Part A of the ODCM shall conform to the requirements of Technical Specification 6.14.

SECTIONS 3.0 and 4.0  
CONTROLS AND SURVEILLANCE REQUIREMENTS



## 3/4 CONTROLS AND SURVEILLANCE REQUIREMENTS

### 3/4.0 APPLICABILITY

#### CONTROLS

---

3.0.1 Compliance with the Controls contained in the succeeding controls is required during the OPERATIONAL MODES or other conditions specified therein; except that upon failure to meet the Control, the associated ACTION requirements shall be met.

3.0.2 Noncompliance with a control shall exist when the requirements of the Control and associated ACTION requirements are not met within the specified time intervals. If the Control is restored prior to expiration of the specified time intervals, completion of the ACTION requirements is not required.

3.0.3 When a Control is not met, except as provided in the associated ACTION requirements, within 1 hour action shall be initiated to place the unit in a MODE in which the control does not apply by placing it, as applicable, in:

- a. At least HOT STANDBY within the next 6 hours,
- b. At least HOT SHUTDOWN within the following 6 hours, and
- c. At least COLD SHUTDOWN within the subsequent 24 hours.

Where corrective measures are completed that permit operation under the ACTION requirements, the action may be taken in accordance with the specified time limits as measured from the time of failure to meet the Control. Exceptions to these requirements are stated in the individual controls.

This control is not applicable in MODE 5 or 6.

3.0.4 Entry into an OPERATIONAL MODE or other specified condition shall not be made when the conditions for the Control are not met and the associated ACTION requires a shutdown if they are not met within a specified time interval. Entry into an OPERATIONAL MODE or specified condition may be made in accordance with ACTION requirements when conformance to them permits continued operation of the facility for an unlimited period of time. This provision shall not prevent passage through or to OPERATIONAL MODES as required to comply with ACTION requirements. Exceptions to these requirements are stated in the individual controls.

## 3/4 CONTROLS AND SURVEILLANCE REQUIREMENTS

### 3/4.0 APPLICABILITY (Continued)

#### SURVEILLANCE REQUIREMENTS

---

4.0.1 Surveillance Requirements shall be met during the OPERATIONAL MODES or other conditions specified for individual Controls unless otherwise stated in an individual Surveillance Requirement.

4.0.2 Each Surveillance Requirement shall be performed within the specified surveillance interval with a maximum allowable extension not to exceed 25 percent of the specified surveillance interval.

4.0.3 Failure to perform a Surveillance Requirement within the allowed surveillance interval, defined by Control 4.0.2, shall constitute a failure to meet the OPERABILITY requirements for a Control. The time limits of the ACTION requirements are applicable at the time it is identified that a Surveillance Requirement has not been performed. The ACTION requirements may be delayed for up to 24 hours to permit the completion of the surveillance when the allowed outage time limits of the ACTION requirements are less than 24 hours. Surveillance Requirements do not have to be performed on inoperable equipment.

4.0.4 Entry into an OPERATIONAL MODE or other specified condition shall not be made unless the Surveillance Requirement(s) associated with the Control has been performed within the stated surveillance interval or as otherwise specified. This provision shall not prevent passage through or to OPERATIONAL MODES as required to comply with ACTION requirements.

### 3/4.3 INSTRUMENTATION

#### 3/4.3.3 MONITORING INSTRUMENTATION

##### 3/4.3.3.10 RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

#### CONTROLS

---

3.3.3.10 The radioactive liquid effluent monitoring instrumentation channels shown in Table 3.3-12 shall be OPERABLE with their Alarm/Trip Setpoints set to ensure that the limits of Control 3.11.1.1 are not exceeded. The Alarm/Trip Setpoints of these channels shall be determined and adjusted in accordance with the methodology and parameters in this manual.

APPLICABILITY: At all times.

ACTION:

- a. With a radioactive liquid effluent monitoring instrumentation channel Alarm/Trip Setpoint less conservative than required by the above control, immediately suspend the release of radioactive liquid effluents monitored by the affected channel, or declare the channel inoperable.
- b. With less than the minimum number of radioactive liquid effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.3-12. Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION, or explain in the next Semiannual Radioactive Effluent Release Report pursuant to Control 6.9.1.4 why this inoperability was not corrected within the time specified.
- c. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.3.3.10 Each radioactive liquid effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and DIGITAL CHANNEL OPERATIONAL TEST at the frequencies shown in Table 4.3-8.

TABLE 3.3-12

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>ACTION</u>
1. Radioactivity Monitors Providing Alarm and Automatic Termination of Release		
Liquid Waste Processing Discharge Monitor	1	43
2. Flow Rate Measurement Devices		
Liquid Waste Processing Discharge Line	1	46

TABLE 3.3-12 (Continued)

ACTION STATEMENTS

ACTION 43 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 14 days provided that prior to initiating a release:

- a. At least two independent samples are analyzed in accordance with Control 4.11.1.1.1, and
- b. At least two technically qualified members of the facility staff independently verify the release rate calculations and discharge line valving.

Otherwise, suspend release of radioactive effluents via this pathway.

ACTION 44 - (Not used)

ACTION 45 - (Not used)

ACTION 46 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours during actual releases. Pump performance curves generated in place may be used to estimate flow.

TABLE 4.3-8

RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>DIGITAL CHANNEL OPERATIONAL TEST</u>
1. Radioactivity Monitors Providing Alarm and Automatic Termination of Release				
Liquid Waste Processing Discharge Monitor	D	P	R <sup>(3)</sup>	Q <sup>(1)</sup>
2. Flow Rate Measurement Devices				
Liquid Waste Processing Discharge Line	D <sup>(4)</sup>	N.A.	R	N.A.

TABLE 4.3-8 (Continued)

TABLE NOTATIONS

- (1) The DIGITAL CHANNEL OPERATIONAL TEST shall also demonstrate that automatic isolation of this pathway and control room alarm annunciation occur if any of the following conditions exists:
  - a. Instrument indicates measured levels above the Alarm/Trip Setpoint, or
  - b. Monitor failure.
- (2) (Not used)
- (3) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards (NBS) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used.
- (4) CHANNEL CHECK shall consist of verifying indication of flow during periods of release. CHANNEL CHECK shall be made at least once per 24 hours on days on which continuous, periodic, or batch releases are made.



### 3/4.3 INSTRUMENTATION

#### 3/4.3.3 MONITORING INSTRUMENTATION

##### 3/4.3.3.11 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

#### CONTROLS

---

3.3.3.11 The radioactive gaseous effluent monitoring instrumentation channels shown in Table 3.3-13 shall be OPERABLE with their Alarm/Trip Setpoints set to ensure that the limits of Control 3.11.2.1 and Technical Specification 3.11.2.5 are not exceeded. The Alarm/Trip Setpoints of these channels meeting Control 3.11.2.1 shall be determined and adjusted in accordance with the methodology and parameters in this manual.

APPLICABILITY: As shown in Table 3.3-13

#### ACTION:

- a. With a radioactive gaseous effluent monitoring instrumentation channel Alarm/Trip Setpoint less conservative than required by the above control, immediately suspend the release of radioactive gaseous effluents monitored by the affected channel, or declare the channel inoperable.
- b. With the number of OPERABLE radioactive gaseous effluent monitoring instrumentation channels less than the Minimum Channels OPERABLE, take the ACTION shown in Table 3.3-13. Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION, or explain in the next Semiannual Radioactive Effluent Release Report pursuant to Control 6.9.1.4 why this inoperability was not corrected within the time specified.
- c. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.3.3.11 Each radioactive gaseous effluent monitoring instrumentation channel shall be demonstrated OPERABLE by performance of the CHANNEL CHECK, SOURCE CHECK, CHANNEL CALIBRATION, and ANALOG CHANNEL OPERATIONAL TEST or DIGITAL CHANNEL OPERATIONAL TEST, as applicable, at the frequencies shown in Table 4.3-9.

TABLE 3.3-13

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

<u>INSTRUMENT</u>	<u>MINIMUM CHANNELS OPERABLE</u>	<u>APPLICABILITY</u>	<u>ACTION</u>
1. (Not used)			
2. Condenser Evacuation System			
a. Condenser Air Removal System Discharge Header Noble Gas Activity Monitor	1	*	49
b. Flow Rate Monitor	1	*	48
c. Sampler Flow Rate Monitor	1	*	48
3. Unit Vent			
a. Noble Gas Activity Monitor	1	*	49
b. Iodine Monitor or Iodine Sampler	1	*	53
c. Particulate Monitor or Particulate Sampler	1	*	53
d. Flow Rate Monitor	1	*	48
e. Sample Flow Rate Monitor	1	*	48

TABLE 3.3-13 (Continued)

TABLE NOTATIONS

\* At all times

ACTION STATEMENTS

ACTION 47 - (Not used)

ACTION 48 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided the flow rate is estimated at least once per 4 hours.

ACTION 49 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via this pathway may continue for up to 30 days provided grab samples are taken at least once per 12 hours and these samples are analyzed for radioactivity within 24 hours.

ACTION 50 - (Not used)

ACTION 51 - (Not used)

ACTION 52 - (Not used)

ACTION 53 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, effluent releases via the affected pathway may continue for up to 30 days provided samples are continuously collected with auxiliary sampling equipment as required in this manual.

TABLE 4.3-9

RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION SURVEILLANCE REQUIREMENTS

<u>INSTRUMENT</u>	<u>CHANNEL CHECK</u>	<u>SOURCE CHECK</u>	<u>CHANNEL CALIBRATION</u>	<u>DIGITAL CHANNEL OPERATIONAL TEST</u>	<u>MODES FOR WHICH SURVEILLANCE IS REQUIRED</u>
1. (Not used)					
2. Condenser Evacuation System					
a. Condenser Air Removal System Discharge Header Noble Gas Activity Monitor	D	M	R <sup>(3)</sup>	Q <sup>(2)</sup>	*
b. Flow Rate Monitor	D	N.A.	R	N.A.	+
c. Sampler Flow Rate Monitor	D	N.A.	R	Q	*
3. Unit Vent					
a. Noble Gas Activity Monitor	D	M	R <sup>(3)</sup>	Q <sup>(2)</sup>	*
b. Iodine Monitor or Iodine Sampler	D W	M N.A.	R <sup>(3)</sup> N.A.	Q <sup>(2)</sup> N.A.	*
c. Particulate Monitor or Particulate Sampler	D W	M N.A.	R <sup>(3)</sup> N.A.	Q <sup>(2)</sup> N.A.	*
d. Flow Rate Monitor	D	N.A.	R	N.A.	*
e. Sampler Flow Rate Monitor	D	N.A.	R	Q	*

TABLE 4.3-9 (Continued)

TABLE NOTATIONS

\* At all times

(1) (Not used)

(2) The DIGITAL CHANNEL OPERATIONAL TEST shall also demonstrate that control room alarm annunciation occurs if any of the following conditions exists:

a. Instrument indicates measured levels above the Alarm Setpoint,  
or

b. Monitor failure.

(3) The initial CHANNEL CALIBRATION shall be performed using one or more of the reference standards certified by the National Bureau of Standards (NBS) or using standards that have been obtained from suppliers that participate in measurement assurance activities with NBS. These standards shall permit calibrating the system over its intended range of energy and measurement range. For subsequent CHANNEL CALIBRATION, sources that have been related to the initial calibration shall be used.

3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.1 LIQUID EFFLUENTS

LIQUID EFFLUENT SAMPLING AND ANALYSIS PROGRAM

Radioactive liquid wastes shall be sampled and analyzed in accordance with the program specified in Table A3-1 for STP. The results of the radioactive analysis shall be used as appropriate with the methodology of Part B of the ODCM to assure that the concentrations of liquid effluents from the cooling reservoir are maintained within the limits of Control 3.11.1.1.

Radioactive effluent information for liquids obtained from sampling and analysis programs shall also be used in conjunction with the methodologies in Part B to demonstrate compliance with the dose objectives and surveillance requirements of Controls 3/4.11.1.2 and 3/4.11.1.3, and Technical Specification 3/4.11.1.4.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### 3/4.11.1 LIQUID EFFLUENTS

##### 3/4.11.1.1 CONCENTRATION

#### CONTROLS

---

3.11.1.1 The concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS (See Figure 5.1-4) shall be limited to the concentrations specified in 10 CFR Part 20, Appendix B, Table II, Column 2 for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the concentration shall be limited to  $2 \times 10^{-4}$   $\mu\text{Ci/ml}$  total activity.

APPLICABILITY: At all times.

#### ACTION:

With the concentration of radioactive material released in liquid effluents to UNRESTRICTED AREAS exceeding the above limits, immediately restore the concentration to within the above limits.

#### SURVEILLANCE REQUIREMENTS

---

4.11.1.1.1 Radioactive liquid wastes shall be sampled and analyzed according to the sampling and analysis program specified in Table A3-1.

4.11.1.1.2 The results of the radioactivity analyses shall be used in accordance with the methodology and parameters in this manual to assure that the concentrations at the point of release are maintained within the limits of Control 3.11.1.1.



TABLE A3-1

## RADIOACTIVE LIQUID WASTE SAMPLING AND ANALYSIS PROGRAM

LIQUID RELEASE TYPE	SAMPLING FREQUENCY	MINIMUM ANALYSIS FREQUENCY	TYPE OF ACTIVITY ANALYSIS	LOWER LIMIT OF DETECTION (LLD) <sup>(1)</sup> ( $\mu\text{Ci/ml}$ )
1. Batch Waste Release Tanks <sup>(2)</sup>				
a. Waste Monitor Tanks	P Each Batch	P Each Batch	Principal Gamma Emitters <sup>(3)</sup>  I-131	$5 \times 10^{-7}$  $1 \times 10^{-6}$
b. Laundry and Hot Shower Tank	P One Batch/M	M	Dissolved and Entrained Gases (Gamma Emitters)	$1 \times 10^{-5}$
c. Waste Evaporator Condensate Tanks	P Each Batch	M Composite <sup>(4)</sup>	H-3  Cross Alpha	$1 \times 10^{-5}$  $1 \times 10^{-7}$
d. Any other tanks which discharge liquid wastes past RT-8038	P Each Batch	Q Composite <sup>(4)</sup>	Sr-89, Sr-90  Fe-55	$5 \times 10^{-8}$  $1 \times 10^{-6}$

TABLE A3-1 (Continued)

TABLE NOTATIONS

- (1) The LLD is defined, for purposes of these controls, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66s_b}{E * V * 2.22 * 10^6 * Y * e^{(-\lambda\Delta t)}}$$

Where:

LLD = the "a priori" lower limit of detection (microCurie per unit mass or volume),

$s_b$  = the standard deviation of the background counting rate or of the counting rate of a blank sample, as appropriate (counts per minute),

E = the counting efficiency (counts per disintegration),

V = the sample size (units of mass or volume),

$2.22 * 10^6$  = the number of disintegrations per minute per microCurie,

Y = the fractional radiochemical yield (non applicable),

$\lambda$  = the radioactive decay constant for the particular radionuclide ( $s^{-1}$ ), and

$\Delta t$  = the elapsed time between the midpoint of sample collection and the time of counting(s).

Typical values of E, V, Y, and  $\Delta t$  should be used in the calculation.

It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as an a posteriori (after the fact) limit for a particular measurement.

- (2) A batch release is the discharge of liquid wastes of a discrete volume. Prior to sampling for analyses, each batch shall be isolated, and then thoroughly mixed by methods described in plant operating procedures to assure representative sampling.

TABLE A3-1 (Continued)

TABLE NOTATIONS (Continued)

- (3) The principal gamma emitters for which the LLD specification applies include the following radionuclides: Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, and Ce-144. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Semiannual Radioactive Effluent Release Report pursuant to Control 6.9.1.4 as outlined in Regulatory Guide 1.21, Appendix B, Revision 1, June 1974.
- (4) A composite sample is one in which the quantity of liquid sampled is proportional to the quantity of liquid waste discharged and in which the method of sampling employed results in a specimen that is representative of the liquids released.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### 3/4.11.1 LIQUID EFFLUENTS

##### 3/4.11.1.2 DOSE

### CONTROLS

---

3.11.1.2 The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each unit, to UNRESTRICTED AREAS (see Figure 5.1-4) shall be limited:

- a. During any calendar quarter to less than or equal to 1.5 mrems to the whole body and to less than or equal to 5 mrems to any organ, and
- b. During any calendar year to less than or equal to 3 mrems to the whole body and to less than or equal to 10 mrems to any organ.

APPLICABILITY: At all times.

#### ACTION:

- a. With the calculated dose from the release of radioactive materials in liquid effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that identifies the cause(s) for exceeding the limit(s) and defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with the above limits. This Special Report shall also include: (1) the results of radiological analyses of the drinking water source, and (2) the radiological impact on finished drinking water supplies with regard to the requirements of 40 CFR Part 141, Safe Drinking Water Act.\*
- b. The provisions of Control 3.0.3 are not applicable.

### SURVEILLANCE REQUIREMENTS

---

4.11.1.2 Cumulative dose contributions from liquid effluents for the current calendar quarter and the current calendar year shall be determined in accordance with the methodology and parameters in this manual at least once per 31 days.

---

\* The requirements of ACTION a.(1) and (2) are applicable only if drinking water supply is taken from the receiving water body within 3 miles of the plant discharge. In the case of river-sited plants, this is 3 miles downstream only.

### 3/4.11 RADIOACTIVE EFFLUENT

#### 3/4.11.1 LIQUID EFFLUENTS

##### 3/4.11.1.3 LIQUID WASTE PROCESSING SYSTEM

#### CONTROLS

---

3.11.1.3 The Liquid Waste Processing System shall be OPERABLE and appropriate portions of the system shall be used to reduce releases of radioactivity when the projected doses due to the liquid effluent, from each unit, to UNRESTRICTED AREAS (see Figure 5.1-4) would exceed 0.06 mrem to the whole body or 0.2 mrem to any organ in a 31-day period.

APPLICABILITY: At all times.

#### ACTION:

- a. With radioactive liquid waste being discharged without treatment and in excess of the above limits and any portion of the Liquid Waste Processing System not in operation, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that includes the following information:
  1. Explanation of why liquid radwaste was being discharged without treatment, identification of any inoperable equipment or subsystems, and the reason for the inoperability,
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status, and
  3. Summary description of action(s) taken to prevent a recurrence.
- b. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.1.3.1 Doses due to liquid releases from each unit to UNRESTRICTED AREAS shall be projected at least once per 31 days in accordance with the methodology and parameters in this manual when Liquid Waste Processing Systems are not being fully utilized.

4.11.1.3.2 The installed Liquid Waste Processing System shall be considered OPERABLE by meeting Controls 3.11.1.1 and 3.11.1.2.

## 3/4.11 RADIOACTIVE EFFLUENTS

### 3/4.11.2 GASEOUS EFFLUENTS

#### GASEOUS EFFLUENT SAMPLING AND ANALYSIS PROGRAM

Radioactive gaseous wastes shall be sampled and analyzed in accordance with the program specified in Table A4-1 for STP. The results of the radioactive analyses shall be used as appropriate with the methodologies of Part B of the ODCM to assure that the dose rates due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary are within the limits of Control 3.11.2.1.

Radioactive effluent information for gaseous wastes obtained from sampling and analysis programs shall also be used in conjunction with the methodologies in Part B to demonstrate compliance with the dose objectives and surveillance requirements of Controls 3/4.11.2.1, 3/4.11.2.2, 3/4.11.2.3, 3/4.11.2.4, and 3/4.11.4.

### 3/4.11 RADIOACTIVE EFFLUENT

#### 3/4.11.2 GASEOUS EFFLUENTS

##### 3/4.11.2.1 DOSE RATE

#### CONTROLS

---

3.11.2.1 The dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the SITE BOUNDARY (see Figure 5.1-3) shall be limited to the following:

- a. For noble gases: Less than or equal to 500 mrem/yr to the whole body and less than or equal to 3000 mrem/yr to the skin, and
- b. For Iodine-131, for Iodine-133, for tritium, and for all radionuclides in particulate form with half-lives greater than 8 days: Less than or equal to 1500 mrem/yr to any organ.

APPLICABILITY: At all times.

#### ACTION:

With the dose rate(s) exceeding the above limits, immediately restore the release rate to within the above limit(s).

#### SURVEILLANCE REQUIREMENTS

---

4.11.2.1.1 The dose rate due to noble gases in gaseous effluents shall be determined to be within the above limits in accordance with the methodology and parameters in this manual.

4.11.2.1.2 The dose rate due to Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents shall be determined to be within the above limits in accordance with the methodology and parameters in this manual by obtaining representative samples and performing analyses in accordance with the sampling and analysis program specified in Table A4-1.



TABLE A4-1

RADIOACTIVE GASEOUS WASTE SAMPLING AND ANALYSIS PROGRAM

<u>GASEOUS RELEASE TYPE</u>	<u>SAMPLING FREQUENCY</u>	<u>MINIMUM ANALYSIS FREQUENCY</u>	<u>TYPE OF ACTIVITY ANALYSIS</u>	<u>LOWER LIMIT OF DETECTION (LLD)<sup>(1)</sup> (<math>\mu</math>Ci/ml)</u>
1. Unit Vent	M <sup>(3)(4)</sup>		Principal Gamma Emitters <sup>(2)</sup>	$1 \times 10^{-4}$
	Grab Sample	M	H-3 (oxide)	$1 \times 10^{-5}$
2. Condenser Air Removal System Discharge Header	M		Principal Gamma Emitters <sup>(2)</sup>	$1 \times 10^{-4}$
	Grab Sample	M	H-3 (oxide)	$1 \times 10^{-5}$
3. All Release Types as listed in 1. and 2. above	Continuous <sup>(6)</sup>	W <sup>(7)</sup>	I-131	$1 \times 10^{-12}$
		Charcoal Sample	I-133	$1 \times 10^{-10}$
	Continuous <sup>(6)</sup>	W <sup>(7)</sup>	Principal Gamma Emitters <sup>(2)</sup>	$1 \times 10^{-11}$
		Particulate Sample		
	Continuous <sup>(6)</sup>	M	Gross Alpha	$1 \times 10^{-11}$
		Composite Particulate Sample		
Continuous <sup>(6)</sup>	Q	Sr-89, Sr-90	$1 \times 10^{-11}$	
		Composite Particulate Sample		

TABLE A4-1 (Continued)

TABLE NOTATIONS

- (1) The LLD is defined, for purposes of these specifications, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66s_b}{E * V * 2.22 * 10^6 * Y * e^{(-\lambda\Delta t)}}$$

Where:

LLD = the "a priori" lower limit of detection (microCurie per unit mass or volume),

$s_b$  = the standard deviation of the background counting rate or of the counting rate of a blank sample, as appropriate (counts per minute),

E = the counting efficiency (counts per disintegration),

V = the sample size (units of mass or volume),

$2.22 * 10^6$  = the number of disintegrations per minute per microCurie,

Y = the fractional radiochemical yield, when applicable,

$\lambda$  = the radioactive decay constant for the particular radionuclide ( $s^{-1}$ ), and

$\Delta t$  = the elapsed time between the midpoint of sample collection and the time of counting(s).

Typical values of E, V, Y, and  $\Delta t$  should be used in the calculation.

It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as an a posteriori (after the fact) limit for a particular measurement.

TABLE A4-1 (Continued)

TABLE NOTATIONS (Continued)

- (2) The principal gamma emitters for which the LLD specification applies include the following radionuclides: Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, and Xe-138 in noble gas releases; and Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, I-131, Cs-134, Cs-137, Ce-141, and Ce-144 in Iodine and particulate releases. This list does not mean that only these nuclides are to be considered. Other gamma peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Semiannual Radioactive Effluent Release Report pursuant to Control 6.9.1.4 as outlined in Regulatory Guide 1.21, Appendix B, Revision 1, June 1974.
- (3) Sampling and analysis shall also be performed following shutdown, startup, or a THERMAL POWER change exceeding 15% of RATED THERMAL POWER within a 1-hour period.
- (4) Tritium grab samples shall be taken at least once per 24 hours when the refueling canal is flooded.
- (5) (Not used)
- (6) The ratio of the sample flow rate to the sampled stream flow rate shall be known for the time period covered by each dose or dose rate calculation made in accordance with Controls 3.11.2.1, 3.11.2.2, and 3.11.2.3.
- (7) Samples shall be changed at least once per 7 days and analyses shall be completed within 48 hours after changing, or after removal from sampler. Sampling shall also be performed at least once per 24 hours for at least 7 days following each shutdown, startup, or THERMAL POWER change exceeding 15% of RATED THERMAL POWER within a 1-hour period and analyses shall be completed within 48 hours of changing. When samples collected for 24 hours are analyzed, the corresponding LLDs may be increased by a factor of 10. This requirement does not apply if: (1) analysis shows that the DOSE EQUIVALENT I-131 concentration in the reactor coolant has not increased more than a factor of 3; and (2) the noble gas monitor shows that effluent activity has not increased more than a factor of 3.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### 3/4.11.2 GASEOUS EFFLUENTS

##### 3/4.11.2.2 DOSE - NOBLE GASES

#### CONTROLS

---

3.11.2.2 The air dose due to noble gases released in gaseous effluents, from each unit, to areas at and beyond the SITE BOUNDARY (see Figure 5.1-3) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 5 mrad for gamma radiation and less than or equal to 10 mrad for beta radiation, and
- b. During any calendar year: Less than or equal to 10 mrad for gamma radiation and less than or equal to 20 mrad for beta radiation.

APPLICABILITY: At all times.

#### ACTION

- a. With the calculated air dose from radioactive noble gases in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that identifies the cause(s) for exceeding the limit(s) and defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with the above limits.
- b. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.2.2 Cumulative dose contributions for the current calendar quarter and current calendar year for noble gases shall be determined in accordance with the methodology and parameters in this manual at least once per 31 days.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### 3/4.11.2 GASEOUS EFFLUENTS

##### 3/4.11.2.3 DOSE - IODINE-131, IODINE-133, TRITIUM, AND RADIOACTIVE MATERIAL IN PARTICULATE FORM

#### CONTROLS

---

3.11.2.3 The dose to a MEMBER OF THE PUBLIC from Iodine-131, Iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released, from each unit, to areas at and beyond the SITE BOUNDARY (see Figure 5.1-3) shall be limited to the following:

- a. During any calendar quarter: Less than or equal to 7.5 mrems to any organ, and
- b. During any calendar year: Less than or equal to 15 mrems to any organ.

APPLICABILITY: At all times.

#### ACTION:

- a. With the calculated dose from release of Iodine-131, Iodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days, in gaseous effluents exceeding any of the above limits, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that identifies the cause(s) for exceeding the limit(s) and defines the corrective actions that have been taken to reduce the releases and the proposed corrective actions to be taken to assure that subsequent releases will be in compliance with the above limits.
- b. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.2.3 Cumulative dose contributions for the current calendar quarter and current calendar year for Iodine-131, Iodine-133, tritium and radionuclides in particulate form with half-lives greater than 8 days shall be determined in accordance with the methodology and parameters in this manual at least once per 31 days.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### 3/4.11.2 GASEOUS EFFLUENTS

##### 3/4.11.2.4 GASEOUS WASTE PROCESSING SYSTEM

#### CONTROLS

---

3.11.2.4 The GASEOUS WASTE PROCESSING SYSTEM shall be OPERABLE and appropriate portions of this system shall be used to reduce releases of radioactivity when the projected doses in 31 days due to gaseous effluent releases, from each unit, to areas at and beyond the SITE BOUNDARY (see Figure 5.1-3) would exceed:

- a. 0.2 mrad to air from gamma radiation, or
- b. 0.4 mrad to air from beta radiation, or
- c. 0.3 mrem to any organ of a MEMBER OF THE PUBLIC.

APPLICABILITY: At all times.

#### ACTION:

- a. With radioactive gaseous waste being discharged without treatment and in excess of the above limits, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that includes the following information:
  1. Identification of any inoperable equipment or subsystems, and the reason for the inoperability,
  2. Action(s) taken to restore the inoperable equipment to OPERABLE status, and
  3. Summary description of action(s) taken to prevent a recurrence.
- b. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

---

4.11.2.4.1 Doses due to gaseous releases from each unit to areas at and beyond the SITE BOUNDARY shall be projected at least once per 31 days in accordance with the methodology and parameters in this manual when the GASEOUS WASTE PROCESS SYSTEM is not being fully utilized.

4.11.2.4.2 The installed GASEOUS WASTE PROCESSING SYSTEM shall be considered OPERABLE by meeting Controls 3.11.2.1, and either 3.11.2.2 or 3.11.2.3.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### 3/4.11.4 TOTAL DOSE

##### CONTROLS

---

3.11.4 The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to less than or equal to 25 mrems to the whole body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems.

APPLICABILITY: At all times.

##### ACTION:

- a. With the calculated doses from the release of radioactive materials in liquid or gaseous effluents exceeding twice the limits of Controls 3.11.1.2a, 3.11.1.2b, 3.11.2.2a, 3.11.2.2b, 3.11.2.3a, or 3.11.2.3b, calculations shall be made including direct radiation contributions from the units and from outside storage tanks to determine whether the above limits of Control 3.11.4 have been exceeded. If such is the case, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that defines the corrective action to be taken to reduce subsequent releases to prevent recurrence of exceeding the above limits and includes the schedule for achieving conformance with the above limits. This Special Report, as defined in 10 CFR Part 20.405(c), shall include an analysis that estimates the radiation exposure (dose) to a MEMBER OF THE PUBLIC from uranium fuel cycle sources, including all effluent pathways and direct radiation, for the calendar year that includes the release(s) covered by this report. It shall also describe levels of radiation and concentrations of radioactive material involved, and the cause of the exposure levels or concentrations. If the estimated dose(s) exceeds the above limits, and if the release condition resulting in violation of 40 CFR Part 190 has not already been corrected, the Special Report shall include a request for a variance in accordance with the provisions of 40 CFR Part 190. Submittal of the report is considered a timely request, and a variance is granted until staff action on the request is complete.
- b. The provisions of Control 3.0.3 are not applicable.



3/4.11 RADIOACTIVE EFFLUENTS

3/4.11.4 TOTAL DOSE (Continued)

SURVEILLANCE REQUIREMENTS

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4.11.4.1 Cumulative dose contributions from liquid and gaseous effluents shall be determined in accordance with Controls 4.11.1.2, 4.11.2.2, and 4.11.2.3, and in accordance with the methodology and parameters in this manual.

4.11.4.2 Cumulative dose contributions from direct radiation from the units and from radwaste storage tanks shall be determined in accordance with the methodology and parameters in this manual. This requirement is applicable only under conditions set forth in ACTION a. of Control 3.11.4.

### 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### SAMPLING AND ANALYSIS PROGRAM

The Radiological Environmental Monitoring Program (REMP) provides representative measurements of radiation and radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposure of MEMBERS OF THE PUBLIC resulting from station operation. This monitoring program is required by Control 3.12.1. The monitoring program implements Section IV.B.2 of Appendix I to 10 CFR Part 50, and thereby supplements the radiological effluent monitoring program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of effluent measurements and the modeling of the environmental exposure pathways which have been incorporated into Part B of the ODCM.

The monitoring program as specified at fuel load shall remain in effect for at least the first three years of commercial operation. Following this period, program changes may be initiated based on operational experience.

In accordance with Control Surveillance Requirement 4.12.1, a sampling and analysis program shall be conducted. The implemented Radiological Environmental Monitoring Program, as described in Section 5.0 of Part B of the ODCM, shall as a minimum satisfy the requirements of Table A5-1. Detection capability requirements and reporting levels for radioactivity concentrations in environmental samples are shown in Tables A5-2 and A5-3, respectively.

3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

3/4.12.1 MONITORING PROGRAM

CONTROLS

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3.12.1 The Radiological Environmental Monitoring Program (REMP) shall be conducted as specified in Table A5-1 and Table A5-2.

APPLICABILITY: At all times.

ACTION:

- a. With the Radiological Environmental Monitoring Program not being conducted as specified, prepare and submit to the Commission, in the Annual Radiological Environmental Operating Report required by Control 6.9.1.3, a description of the reasons for not conducting the program as required and the plans for preventing a recurrence.
- b. With the level of radioactivity as the result of plant effluents in an environmental sampling medium at a specified location exceeding the reporting levels of the REMP when averaged over any calendar quarter, prepare and submit to the Commission within 30 days, pursuant to Technical Specification 6.9.2, a Special Report that identifies the cause(s) for exceeding the limit(s) and defines the corrective actions to be taken to reduce radioactive effluents so that the potential annual dose\* to a MEMBER OF THE PUBLIC is less than the calendar year limits of Controls 3.11.1.2, 3.11.2.2, or 3.11.2.3. When more than one of the radionuclides in the REMP are detected in the sampling medium, this report shall be submitted if:

$$\frac{\text{concentration (1)}}{\text{reporting level (1)}} + \frac{\text{concentration (2)}}{\text{reporting level (2)}} + \dots \geq 1.0$$

When radionuclides other than those listed in the REMP are detected and are the result of plant effluents, this report shall be submitted if the potential annual dose\* to a MEMBER OF THE PUBLIC from all radionuclides is equal to or greater than the calendar year limits of Controls 3.11.1.2, 3.11.2.2 or 3.11.2.3. This report is not required if the measured level of radioactivity was not the result of plant effluents; however, in such an event, the condition shall be reported and described in the Annual Radiological Environmental Operating Report required by Control 6.9.1.3

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\* The methodology and parameters used to estimate the potential annual dose to a MEMBER OF THE PUBLIC shall be indicated in this report.

### 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### 3/4.12.1 MONITORING PROGRAM (Continued)

##### ACTION: (Continued)

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- c. With milk or fresh leafy vegetable samples unavailable from one or more of the sample locations required by the REMP, identify specific locations for obtaining replacement samples and add them within 30 days to the Radiological Environmental Monitoring Program given in this manual. The specific locations from which samples were unavailable may then be deleted from the monitoring program. Pursuant to Technical Specification 6.14, submit with the next Semiannual Radioactive Effluent Release Report documentation for a change to this manual including a revised figure(s) and table to Part B of this manual reflecting the new location(s) with supporting information identifying the cause of the unavailability of samples and justifying the selection of the new location(s) for obtaining samples.
  
- d. The provisions of Control 3.0.3 are not applicable.

##### SURVEILLANCE REQUIREMENTS

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4.12.1 The radiological environmental monitoring samples shall be collected pursuant to the REMP from the specific locations given in the table and figure(s) in this manual, and shall be analyzed pursuant to the requirements of and the detection capabilities required by the REMP.

TABLE A5-1

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

<u>EXPOSURE PATHWAY AND/OR SAMPLE</u>	<u>NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS<sup>(1)</sup></u>	<u>SAMPLING AND COLLECTION FREQUENCY</u>	<u>TYPE AND FREQUENCY OF ANALYSIS</u>
1. Direct Radiation <sup>(2)</sup>	<p>Forty routine monitoring stations, either with two or more dosimeters or with one instrument for measuring and recording dose rate continuously, placed as follows:</p> <ul style="list-style-type: none"><li>- An inner ring of stations, one in each meteorological sector in the general area of the SITE BOUNDARY;</li><li>- An outer ring of stations, one in each meteorological sector in the 6 to 8 km range from the site; and</li><li>- The balance of the stations to be placed in special interest areas such as population centers, nearby residences, schools, and in one or two areas to serve as control stations.</li></ul>	Quarterly.	Gamma dose quarterly.

TABLE A5-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

<u>EXPOSURE PATHWAY AND/OR SAMPLE</u>	<u>NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS<sup>(1)</sup></u>	<u>SAMPLING AND COLLECTION FREQUENCY</u>	<u>TYPE AND FREQUENCY OF ANALYSIS</u>
2. Airborne			
Radioiodine and Particulates	<p>Samples from five locations:</p> <ul style="list-style-type: none"> <li>- Three samples from close to the three SITE BOUNDARY locations in different sectors of the highest calculated annual average ground-level D/Q;</li> <li>- One sample from the vicinity of a community having the highest calculated annual average ground-level D/Q; and</li> <li>- One sample from a control location, as for example 15 to 30 km distant and in a minimal wind direction.</li> </ul>	<p>Continuous sampler operations with sample collection weekly, or more frequently if required by dust loading.</p>	<p><u>Radioiodine Canister:</u> I-131 analysis weekly.</p> <p><u>Particulate Sampler:</u> Gross Beta radioactivity analysis following filter change;<sup>(3)</sup> and gamma isotopic analysis of composite (by location) quarterly.</p>
3. Waterborne			
a. Surface <sup>(5)</sup>	<p>One sample from the Colorado River upstream of the main cooling reservoir spillway.</p> <p>One sample from the Colorado River downstream of the main cooling reservoir spillway.</p> <p>One sample from the main cooling reservoir.</p>	<p>Composite sample over a 1-month period.<sup>(6)</sup></p>	<p>Gamma isotopic analysis<sup>(4)</sup> monthly. Composite for tritium analysis quarterly.</p>

TABLE A5-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

<u>EXPOSURE PATHWAY AND/OR SAMPLE</u>	<u>NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS<sup>(1)</sup></u>	<u>SAMPLING AND COLLECTION FREQUENCY</u>	<u>TYPE AND FREQUENCY OF ANALYSIS</u>
3. Waterborne (Cont.)			
b. Ground	Sample from the shallow aquifer. <sup>(7)</sup>	Quarterly.	Gamma isotopic <sup>(4)</sup> and tritium analysis quarterly.
c. Drinking	One sample of each of one to three of the nearest water supplies that could be affected by its discharge.  One sample from a control location.  One sample from a site deep aquifer well.	Monthly.	Gross beta and gamma isotopic analysis <sup>(4)</sup> monthly. Tritium analysis quarterly.
d. Sediment from Shoreline	One sample from upstream and downstream of the cooling reservoir spillway area.  One sample from main cooling reservoir.	Semiannually.	Gamma isotopic analysis <sup>(4)</sup> semiannually.



TABLE A5-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

<u>EXPOSURE PATHWAY AND/OR SAMPLE</u>	<u>NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS<sup>(1)</sup></u>	<u>SAMPLING AND COLLECTION FREQUENCY</u>	<u>TYPE AND FREQUENCY OF ANALYSIS</u>
4. Ingestion			
a. Milk	<p>Samples from milk animals in three locations within 5 km distance having the highest dose potential. If there are none from which samples can be obtained, then one sample from milk animals in each of three areas between 5 to 8 km distance when doses are projected by calculation to be greater than 1 mrem per year.<sup>(8)</sup> One sample from milk animals at a control location greater than 30 km distant in a minimal wind direction. No samples are required if there are no milk animals from which samples can be obtained within the 8 km distance.</p>	<p>Semimonthly when animals are on pasture; monthly at other times.</p>	<p>Gamma isotopic<sup>(4)</sup> and I-131 analysis semimonthly when animals are on pasture; monthly at other times.</p>
b. Fish and Invertebrates	<p>One sample representing each commercially and recreationally important species in vicinity of plant discharge area.</p> <p>One sample representing each commercially and recreationally important species found within the main cooling reservoir.</p> <p>One sample representing the same species in areas not influenced by plant discharge.</p>	<p>Sample semiannually.</p>	<p>Gamma isotopic analysis<sup>(4)</sup> on edible portions.</p>

TABLE A5-1 (Continued)

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

<u>EXPOSURE PATHWAY AND/OR SAMPLE</u>	<u>NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS<sup>(1)</sup></u>	<u>SAMPLING AND COLLECTION FREQUENCY</u>	<u>TYPE AND FREQUENCY OF ANALYSIS</u>
4. Ingestion (Cont.)			
c. Food Products	One sample of each principle class of food products from any area that is irrigated by water that receives the main cooling reservoir discharges.	At time of harvest. <sup>(9)</sup>	Gamma isotopic analysis <sup>(4)</sup> in edible portion.
	Samples of three different kinds of broadleaf vegetation grown nearest each of two different offsite locations of highest predicted annual average ground level D,Q if milk sampling is not performed.	Monthly.	Gamma isotopic <sup>(4)</sup> and I-131 analysis.
	One sample each of the similar broadleaf vegetation grown 15 to 30 km distant in a minimal wind direction if milk sampling is not performed.	Monthly.	Gamma isotopic <sup>(4)</sup> and I-131 analysis.

TABLE A5-1 (Continued)

TABLE NOTATIONS

- (1) Specific parameters of distance and direction sector from the centerline of one reactor, and additional description where pertinent, shall be provided for each and every sample location in Table B5-3 in a table and figure(s) in this manual. Refer to NUREG-0133, "Preparation of Radiological Effluent Technical Specification For Nuclear Power Plants," October 1978, and Radiological Assessment Branch Technical Position, Revision 1, November 1979. Deviations are permitted from the required sampling schedule if specimens are unobtainable due to circumstances such as hazardous conditions, seasonal unavailability, and malfunction of automatic sampling equipment. If specimens are unobtainable due to sampling equipment malfunction, effort shall be made to complete corrective action prior to the end of the next sampling period. All deviations from the sampling schedule shall be documented in the Annual Radiological Environmental Operating Report pursuant to Control 6.9.1.3. It is recognized that, at times, it may not be possible or practicable to continue to obtain samples of the media of choice at the most desired location or time. In these instances, suitable alternative media and locations may be chosen for the particular pathway in question and appropriate substitutions made within 30 days in the Radiological Environmental Monitoring Program given in this manual. Pursuant to Technical Specification 6.14, submit in the next Semiannual Radioactive Effluent Release Report documentation for a change in this manual including a revised figure(s) and table for this manual reflecting the new location(s) with supporting information identifying the cause of the unavailability of samples for that pathway and justifying the selection of the new location(s) for obtaining samples.
- (2) One or more instruments, such as a pressurized ion chamber, for measuring and recording dose rate continuously may be used in place of, or in addition to, integrating dosimeters. For the purposes of this table, a thermoluminescent dosimeter (TLD) is considered to be one phosphor; two or more phosphors in a packet are considered as two or more dosimeters. Film badges shall not be used as dosimeters for measuring direct radiation. The 40 stations is not an absolute number. The number of direct monitoring stations may be reduced according to geographical limitations. TLD's may be located at nonprescribed distances from the plant due to access limitations.
- (3) Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than 10 times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.
- (4) Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

TABLE A5-1 (Continued)

TABLE NOTATIONS (Continued)

- (5) The "upstream sample" shall be taken at a distance beyond significant influence of the discharge. The "downstream" sample shall be taken in an area beyond but near the mixing zone. "Upstream" samples in an estuary must be taken far enough upstream to be beyond the plant influence. Salt water shall be sampled only when the receiving water is utilized for recreational activities.
- (6) A composite sample is one in which the quantity (aliquot) of liquid sampled is proportional to the quantity of flowing liquid and in which the method of sampling employed results in a specimen that is representative of the liquid flow. In this program, composite sample aliquots shall be collected at time intervals that are very short (e.g., hourly) relative to the compositing period (e.g., monthly) in order to assure obtaining a representative sample.
- (7) Groundwater samples shall be taken when this source is tapped for drinking or irrigation purposes in areas where the hydraulic gradient or recharge properties are suitable for contamination.
- (8) The dose shall be calculated for the maximum organ and age group, using the methodology and parameters in this manual.
- (9) If harvest occurs more than once a year, sampling shall be performed during each discrete harvest. If harvest occurs continually, sampling shall be monthly. Attention shall be paid to including samples of tuberous and root food products.

TABLE A5-2

DETECTION CAPABILITIES FOR ENVIRONMENTAL SAMPLE ANALYSIS<sup>(1),(2)</sup>  
LOWER LIMIT OF DETECTION<sup>(3)</sup>

<u>ANALYSIS</u>	<u>WATER</u> <u>(pCi/l)</u>	<u>AIRBORNE PARTICULATE</u> <u>OR GASES (pCi/m<sup>3</sup>)</u>	<u>FISH</u> <u>(pCi/kg. wet)</u>	<u>MILK</u> <u>(pCi/l)</u>	<u>FOOD PRODUCTS</u> <u>(pCi/kg. wet)</u>	<u>SEDIMENT</u> <u>(pCi/kg. dry)</u>
Gross Beta	4	0.01				
H-3	3000					
Mn-54	15		130			
Fe-59	30		260			
Co-58,60	15		130			
Zn-65	30		260			
Zr-Nb-95	15					
I-131	1 <sup>(4)</sup>	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	60	180
Ba-La-140	15			15		

TABLE A5-2 (Continued)

TABLE NOTATIONS

- (1) This list does not mean that only these nuclides are to be considered. Other peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Annual Radiological Environmental Operating Report pursuant to Control 6.9.1.3.
- (2) Required detection capabilities for thermoluminescent dosimeters used for environmental measurements shall be in accordance with the recommendations of Regulatory Guide 4.13.
- (3) The LLD is defined, for purposes of these specifications, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal.

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66s_b}{E * V * 2.22 * Y * e^{(-\lambda\Delta t)}}$$

Where:

LLD = the "a priori" lower limit of detection (picoCuries per unit mass or volume),

$s_b$  = the standard deviation of the background counting rate or of the counting rate of a blank sample, as appropriate (counts per minute),

E = the counting efficiency (counts per disintegration),

V = the sample size (units of mass or volume),

2.22 = the number of disintegrations per minute per picoCurie,

Y = the fractional radiochemical yield, when applicable,

$\lambda$  = the radioactive decay constant for the particular radionuclide ( $s^{-1}$ ), and

$\Delta t$  = the elapsed time between environmental collection, or end of the sample collecting period, and time of counting(s).

Typical values of E, V, Y, and  $\Delta t$  should be used in the calculation.



TABLE A5-2 (Continued)

TABLE NOTATIONS (Continued)

It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as an a posteriori (after the fact) limit for a particular measurement. Analyses shall be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally, background fluctuations, unavoidable small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors shall be identified and described in the Annual Radiological Environmental Operating Report pursuant to Control 6.9.1.3.

- (4) LLD for drinking water samples. If no drinking water pathway exists, the LLD of gamma isotopic analysis may be used.



TABLE A5-3

REPORTING LEVELS FOR RADIOACTIVITY CONCENTRATIONS IN ENVIRONMENTAL SAMPLES  
REPORTING LEVELS

<u>ANALYSIS</u>	<u>WATER</u> (pCi/l)	<u>AIRBORNE PARTICULATE</u> <u>OR GASES (pCi/m<sup>3</sup>)</u>	<u>FISH</u> (pCi/kg. wet)	<u>MILK</u> (pCi/l)	<u>FOOD PRODUCTS</u> (pCi/kg. wet)
H-3	30,000				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Zr-Nb-95	400				
I-131	2	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	

## 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

### 3/4.12.2 LAND USE CENSUS

As part of the Radiological Environmental Monitoring Program Control 3/4.12.2 requires that a land use census be conducted annually during the growing season to identify within a distance of 8 km (5 miles) the location in each of the 16 meteorological sectors of the nearest milk animal, the nearest residence, and the nearest garden of greater than 50 m<sup>2</sup> (500 ft<sup>2</sup>) producing broadleaf vegetation.

The land use census ensures that changes in the use of area beyond the SITE BOUNDARY are identified, and appropriate modifications to the monitoring program and dose assessment models are made, if necessary. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50.

For the purpose of conducting the land use census as required by Control Surveillance Requirement 4.12.2, station personnel should determine what survey methods will provide the necessary results considering the type of information to be collected and its use. For example, land use census results shall be obtained by using a survey method, or combination of methods, which may include, but are not limited to, door-to-door surveys (i.e., roadside identification of locations), aerial surveys, or by consulting local agricultural authorities.

Control 3.12.2.b requires that new locations identified from the census that yield a calculated dose or dose commitment 20% greater than at a location from which samples are currently being obtained be added within 30 days to the REMP. These new locations shall be added to the sampling program only if reliable sampling of the affected pathway(s) can be devised.

## 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

### 3/4.12.2 LAND USE CENSUS

#### CONTROLS

---

3.12.2 A Land Use Census shall be conducted and shall identify within a distance of 8 km (5 miles) the location in each of the 16 meteorological sectors of the nearest milk animal, the nearest residence, and the nearest garden\* of greater than 50 m<sup>2</sup> (500 ft<sup>2</sup>) producing broad leaf vegetation.

APPLICABILITY: At all times.

#### ACTION:

- a. With a Land Use Census identifying a location(s) that yields a calculated dose or dose commitment greater than the values currently being calculated in Control 4.11.2.3, pursuant to Control 6.9.1.4, identify the new location(s) in the next Semiannual Radioactive Effluent Release Report.
- b. With a Land Use Census identifying a location(s) that yields a calculated dose or dose commitment (via the same exposure pathway) 20% greater than at a location from which samples are currently being obtained in accordance with Control 3.12.1, add the new location(s) within 30 days to the Radiological Environmental Monitoring Program given in Part B of this manual. The sampling location(s) excluding the control station location, having the lowest calculated dose or dose commitment(s), via the same exposure pathway, may be deleted from this monitoring program after October 31 of the year in which this Land Use Census was conducted. Pursuant to Technical Specification 6.14, submit in the next Semiannual Radioactive Effluent Release Report documentation for a change to this manual including a revised figure(s) and table(s) for Part B of this manual reflecting the new location(s) with information supporting the change in sampling locations.
- c. The provisions of Control 3.0.3 are not applicable.

#### SURVEILLANCE REQUIREMENTS

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4.12.2 The Land Use Census shall be conducted at least once per 12 months using that information that will provide the best results, such as by a door-to-door survey, aerial survey, or by consulting local agriculture authorities, as described in this manual. The results of the Land Use Census shall be included in the Annual Radiological Environmental Operating Report pursuant to Control 6.9.1.3.

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\* Broad leaf vegetation sampling of at least three different kinds of vegetation may be performed at the SITE BOUNDARY in each of two different direction sectors with the highest predicted D/Qs in lieu of the garden census. Controls for broad leaf vegetation sampling in the REMP shall be followed, including analysis of control samples.

### 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

#### 3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

##### CONTROLS

---

3.12.3 Analyses shall be performed on all radioactive materials, supplied as part of an Interlaboratory Comparison Program that has been approved by the Commission, that correspond to samples required by the REMP.

APPLICABILITY: At all times.

##### ACTION:

- a. With analyses not being performed as required above, report the corrective actions taken to prevent a recurrence to the Commission in the Annual Radiological Environmental Operating Report pursuant to Control 6.9.1.3.
- b. The provisions of Control 3.0.3 are not applicable.

##### SURVEILLANCE REQUIREMENTS

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4.11.3 The Interlaboratory Comparison Program is described in this manual. A summary of the results obtained as part of the above required Interlaboratory Comparison Program shall be included in the Annual Radiological Environmental Operating Report pursuant to Control 6.9.1.3.

BASES FOR SECTIONS 3.0 and 4.0  
CONTROLS AND SURVEILLANCE REQUIREMENTS

NOTE

The BASES contained in the succeeding pages summarizes the reasons for the Controls in Section 3.0 and 4.0, but are not part of these Controls.

### 3/4.3 INSTRUMENTATION

#### BASES

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### 3/4.3.3 MONITORING INSTRUMENTATION

#### 3/4.3.3.10 RADIOACTIVE LIQUID EFFLUENT MONITORING INSTRUMENTATION

The radioactive liquid effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in liquid effluents during actual or potential releases of liquid effluents. The Alarm/Trip Setpoints for these instruments shall be calculated and adjusted in accordance with the methodology and parameters in this manual to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50.

#### 3/4.3.3.11 RADIOACTIVE GASEOUS EFFLUENT MONITORING INSTRUMENTATION

The radioactive gaseous effluent instrumentation is provided to monitor and control, as applicable, the releases of radioactive materials in gaseous effluent during actual or potential releases of gaseous effluents. The Alarm/Trip Setpoints for these instruments shall be calculated and adjusted in accordance with the methodology and parameters in this manual to ensure that the alarm/trip will occur prior to exceeding the limits of 10 CFR Part 20. The OPERABILITY and use of this instrumentation is consistent with the requirements of General Design Criteria 60, 63, and 64 of Appendix A to 10 CFR Part 50. The sensitivity of any noble gas activity monitors used to show compliance with the gaseous effluent release requirements of Control 3.11.2.2 shall be such that concentrations as low as  $1 \times 10^{-6}$   $\mu\text{Ci/cc}$  are measurable.

## 3/4.11 RADIOACTIVE EFFLUENTS

### BASES

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#### 3/4.11.1 LIQUID EFFLUENTS

##### 3/4.11.1.1 CONCENTRATION

This control is provided to ensure that the concentration of radioactive materials released in liquid waste effluents to UNRESTRICTED AREAS will be less than the concentration levels specified in 10 CFR Part 20, Appendix B, Table II, Column 2. This limitation provides additional assurance that the levels of radioactive materials in bodies of water in UNRESTRICTED AREAS will result in exposures within: (1) the Section II.A design objectives of Appendix I, 10 CFR Part 50, to a MEMBER OF THE PUBLIC, and (2) the limits of 10 CFR Part 20.106(e) to the population. The concentration limit for dissolved or entrained noble gases is based upon the assumption that Xe-135 is the controlling radioisotope and its MPC in air (submersion) was converted to an equivalent concentration in water using the methods described in International Commission on Radiological Protection (ICRP) Publication 2.

This control applies to the release of radioactive materials in liquid effluents from all units at the site.

The required detection capabilities for radioactive materials in liquid waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD, and other detection limits, can be found in HASL Procedures Manual, HASL-300 (revised annually); Currie, L. A., "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry," Anal. Chem. 40, 586-93 (1968); and Hartwell, J. K., "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report ARH-SA-215 (June 1975).

##### 3/4.11.1.2 DOSE

This control is provided to implement the requirements of Sections II.A, III.A, and IV.A of Appendix I, 10 CFR Part 50. The Control implements the guides set forth in Section II.A of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A. of Appendix I to assure that the releases of radioactive material in liquid effluents to UNRESTRICTED AREAS will be kept "as low as is reasonably achievable." The dose calculation methodology and parameters in the ODCM implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data, such that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The equations specified in this manual for calculating the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977; and Regulatory Guide 1.113, "Estimating Aquatic Dispersion of Effluents from Accidental and Routine Reactor Releases for the Purpose of Implementing Appendix I," April 1977.



## 3/4.11 RADIOACTIVE EFFLUENTS

### BASES

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#### 3/4.11.1.2 DOSE (Continued)

This control applies to the release of radioactive materials in liquid effluents from each unit at the site.

#### 3/4.11.1.3 LIQUID WASTE PROCESSING SYSTEM

The OPERABILITY of the Liquid Waste Processing System ensures that this system will be available for use whenever liquid effluents require treatment prior to release to the environment. The requirement that the appropriate portions of this system be used when specified provides assurance that the releases of radioactive materials in liquid effluents will be kept "as low as is reasonably achievable." This control implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the Liquid Waste Processing System were specified as a suitable fraction of the dose design objectives set forth in Section II.A of Appendix I, 10 CFR Part 50, for liquid effluents.

This control applies to the release of radioactive materials in liquid effluents from each unit at the site.

#### 3/4.11.2 GASEOUS EFFLUENTS

##### 3/4.11.2.1 DOSE RATE

This control is provided to ensure that the dose at any time at and beyond the SITE BOUNDARY from gaseous effluents from all units on the site will be within the annual dose limits of 10 CFR Part 20 to UNRESTRICTED AREAS. The annual dose limits are the doses associated with the concentrations of 10 CFR Part 20, Appendix B, Table II, Column 1. These limits provide reasonable assurance that radioactive material discharged in gaseous effluents will not result in the exposure of a MEMBER OF THE PUBLIC in an UNRESTRICTED AREA, either within or outside the SITE BOUNDARY, to annual average concentrations exceeding the limits specified in Appendix B, Table II of 10 CFR Part 20 (10 CFR Part 20.106(b)). For MEMBERS OF THE PUBLIC who may at times be within the SITE BOUNDARY, the occupancy of that MEMBER OF THE PUBLIC will usually be sufficiently low to compensate for any increase in the atmospheric diffusion factor above that for the SITE BOUNDARY. Examples of calculations for such MEMBERS OF THE PUBLIC, with the appropriate occupancy factors, shall be given in this manual. The specified release rate limits restrict, at all times, the corresponding gamma and beta dose rates above background to a MEMBER OF THE PUBLIC at or beyond the SITE BOUNDARY to less than or equal to 500 mrems/year to the whole body or to less than or equal to 3000 mrems/year to the skin. These release rate limits also restrict, at all times, the corresponding thyroid dose rate above background to a child via the inhalation pathway to less than or equal to 1500 mrems/year.

## 3/4.11 RADIOACTIVE EFFLUENTS

### BASES

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#### 3/4.11.2.1 DOSE RATE (Continued)

This control applies to the release of radioactive materials in gaseous effluents from all units at the site.

The required detection capabilities for radioactive materials in gaseous waste samples are tabulated in terms of the lower limits of detection (LLDs). Detailed discussion of the LLD, and other detection limits can be found in HASL Procedures Manual, HASL-300 (revised annually); Currie, L. A., "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry," Anal. Chem. 40, 586-93 (1968); and Hartwell, J. K., "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report ARH-SA-215 (June 1975).

#### 3/4.11.2.2 DOSE - NOBLE GASES

This control is provided to implement the requirements of Sections II.B, III.A and IV.A of Appendix I, 10 CFR Part 50. The Control implements the guides set forth in Section II.B of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive material in gaseous effluents to UNRESTRICTED AREAS will be kept "as low as is reasonably achievable." The Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data such that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The dose calculation methodology and parameters established in this manual for calculating the doses due to the actual release rates of radioactive materials in liquid effluents are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977; and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors," Revision 1, July 1977. The ODCM equations provided for determining the air doses at and beyond the SITE BOUNDARY are based upon the historical average atmospheric conditions.

This control applies to the release of radioactive materials in gaseous effluents from each unit at the site.

### 3/4.11 RADIOACTIVE EFFLUENTS

#### BASES

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#### 3/4.11.2.3 DOSE - IODINE-131, IODINE-133, TRITIUM, AND RADIOACTIVE MATERIAL IN PARTICULATE FORM

This control is provided to implement the requirements of Sections II.C, III.A and IV.A of Appendix I, 10 CFR Part 50. The Controls are the guides set forth in Section II.C of Appendix I. The ACTION statements provide the required operating flexibility and at the same time implement the guides set forth in Section IV.A of Appendix I to assure that the releases of radioactive materials in gaseous effluents to UNRESTRICTED AREAS will be kept "as low as is reasonably achievable." The calculational methods specified in the Surveillance Requirements implement the requirements in Section III.A of Appendix I that conformance with the guides of Appendix I be shown by calculational procedures based on models and data, such that the actual exposure of a MEMBER OF THE PUBLIC through appropriate pathways is unlikely to be substantially underestimated. The calculational methodology and parameters for calculating the doses due to the actual release rates of the subject materials are consistent with the methodology provided in Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I," Revision 1, October 1977; and Regulatory Guide 1.111, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water Cooled Reactors," Revision 1, July 1977. These equations also provide for determining the actual doses based upon the historical average atmospheric conditions. The release rate controls for Iodine-131, Iodine-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days, are dependent upon the existing radionuclide pathways to man, in the areas at and beyond the SITE BOUNDARY. The pathways that were examined in the development of these calculations were: (1) individual inhalation of airborne radionuclides, (2) deposition of radionuclides onto green leafy vegetation with subsequent consumption by man, (3) deposition onto grassy areas where milk animals and meat producing animals graze with consumption of the milk and meat by man, and (4) deposition on the ground with subsequent exposure to man.

This control applies to the release of radioactive materials in gaseous effluents from each unit at the site.

#### 3/4.11.2.4 GASEOUS WASTE PROCESSING SYSTEM

The OPERABILITY of the GASEOUS WASTE PROCESSING SYSTEM ensures that the systems will be available for use whenever gaseous effluents require treatment prior to release to the environment. The requirement that the appropriate portions of the systems be used, when specified, provides reasonable assurance that the releases of radioactive materials in gaseous effluents will be kept "as low as is reasonably achievable." This control implements the requirements of 10 CFR Part 50.36a, General Design Criterion 60 of Appendix A to 10 CFR Part 50, and the design objective given in Section II.D of Appendix I to 10 CFR Part 50. The specified limits governing the use of appropriate portions of the system were specified as a suitable fraction of the dose design objectives set forth in Section II.B and II.C of Appendix I, 10 CFR Part 50, for gaseous effluents.

## 3/4.11 RADIOACTIVE EFFLUENTS

### BASES

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#### 3/4.11.2.4 GASEOUS WASTE PROCESSING SYSTEM

This Control applies to the release of radioactive material in gaseous effluents from each unit at the site.

#### 3/4.11.4 TOTAL DOSE

This control is provided to meet the dose limitation of 40 CFR Part 190 that have been incorporated into 10 CFR Part 20 by 46FR18525. The control requires the preparation and submittal of a Special Report whenever the calculated doses due to releases of radioactivity and to radiation from uranium fuel cycle sources exceed 25 mrems to the whole body or any organ, except the thyroid, which shall be limited to less than or equal to 75 mrems. For sites containing up to four reactors, it is highly unlikely that the resultant dose to a MEMBER OF THE PUBLIC will exceed the dose limits of 40 CFR Part 190 if the individual reactors remain within twice the dose design objectives of Appendix I, and if direct radiation doses from the reactor units and outside storage tanks are kept small. The Special Report will describe a course of action that should result in the limitation of the annual dose to a MEMBER OF THE PUBLIC to within the 40 CFR Part 190 limits. For the purposes of the Special Report, it may be assumed that the dose commitment to the MEMBER OF THE PUBLIC from other uranium fuel cycle sources is negligible, with the exception that dose contributions from other nuclear fuel cycle facilities at the same site or within a radius of 8 km must be considered. If the dose to any MEMBER OF THE PUBLIC is estimated to exceed the requirements of 40 CFR Part 190, the Special Report with a request for a variance (provided the release conditions resulting in violation of 40 CFR Part 190 have not already been corrected), in accordance with the provisions of 40 CFR Part 190.11 and 10 CFR Part 20.405c, is considered to be a timely request and fulfills the requirements of 40 CFR Part 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR Part 190 until NRC staff action is completed. The variance only relates to the limits of 40 CFR Part 190 and does not apply in any way to the other requirements for dose limitation of 10 CFR Part 20, as addressed in Controls 3.11.1.1 and 3.11.2.1. An individual is not considered a MEMBER OF THE PUBLIC during any period in which he/she is engaged in carrying out any operation that is part of the nuclear fuel cycle.

## 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

### BASES

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#### 3/4.12.1 MONITORING PROGRAM

The Radiological Environmental Monitoring Program required by this control provides representative measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposure of MEMBERS OF THE PUBLIC resulting from the plant operation. This monitoring program implements Section IV.B.2 of Appendix I to 10 CFR Part 50 and thereby supplements the Radiological Effluent Monitoring Program by verifying that the measurable concentrations of radioactive materials and levels of radiation are not higher than expected on the basis of the effluent measurements and the modeling of the environmental exposure pathways. Guidance for this monitoring program is provided by the Radiological Assessment Branch Technical Position on Environmental Monitoring. The initially specified monitoring program will be effective for at least the first 3 years of commercial operation. Following this period, program changes may be initiated based on operational experience.

The required detection capabilities for environmental sample analyses are tabulated in terms of the lower limits of detection (LLDs). The LLDs required by this manual are considered optimum for routine environmental measurements industrial laboratories. It should be recognized that the LLD is defined as an a priori (before the fact) limit representing the capability of a measurement system and not as an a posteriori (after the fact) limit for a particular measurement.

Detailed discussion of the LLD, and other detection limits, can be found in HASL Procedures Manual, HASL-300 (revised annually); Currie, L. A., "Limits for Qualitative Detection and Quantitative Determination - Application to Radiochemistry," Anal. Chem. 40, 586-93 (1968); and Hartwell, J. K., "Detection Limits for Radioanalytical Counting Techniques," Atlantic Richfield Hanford Company Report ARH-SA-215 (June 1975).

#### 3/4.12.2 LAND USE CENSUS

This control is provided to ensure that changes in the use of areas at and beyond the SITE BOUNDARY are identified and that modifications to the Radiological Environmental Monitoring Program given in the ODCM are made if required by the results of this census. The best information from the door-to-door survey, from aerial survey or from consulting with local agricultural authorities shall be used. This census satisfies the requirements of Section IV.B.3 of Appendix I to 10 CFR Part 50. Restricting the census to gardens of greater than 50 m<sup>2</sup> provides assurance that significant exposure pathways via leafy vegetables will be identified and monitored since a garden of this size is the minimum required to produce the quantity (26 kg/year) of leafy vegetables assumed in Regulatory Guide 1.109 for consumption by a child. To determine this minimum garden size, the following assumptions were made: (1) 20% of the garden was used for growing broad leaf vegetation (i.e., similar to lettuce and cabbage), and (2) a vegetation yield of 2 kg/m<sup>2</sup>.



## 3/4.12 RADIOLOGICAL ENVIRONMENTAL MONITORING

### BASES

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#### 3/4.12.3 INTERLABORATORY COMPARISON PROGRAM

The requirement for participation in an approved Interlaboratory Comparison Program is provided to ensure that independent checks on the precision and accuracy of the measurement of radioactive materials in environmental sample matrices are performed as part of the quality assurance program for environmental monitoring in order to demonstrate that the results are valid for the purposes of Section IV.B.2 of Appendix I to 10 CFR Part 50.

SECTION 5.0  
DESIGN FEATURES



## 5.0 DESIGN FEATURES

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### 5.1 SITE

#### 5.1.3 MAP DEFINING UNRESTRICTED AREAS AND SITE BOUNDARY FOR RADIOACTIVE GASEOUS AND LIQUID EFFLUENTS

5.1.3 Information regarding radioactive gaseous and liquid effluents, which will allow identification of structures and release points as well as definition of UNRESTRICTED AREAS within the SITE BOUNDARY that are accessible to MEMBERS OF THE PUBLIC, shall be as shown in Figures 5.1-3 and 5.1-4.

The definition of UNRESTRICTED AREA used in implementing these Controls has been expanded over that in 10 CFR Part 20.3(a)(17). The UNRESTRICTED AREA boundary may coincide with the Exclusion (fenced) Area boundary, as defined in 10 CFR Part 100.3(a), but the UNRESTRICTED AREA does not include areas over water bodies. The concept of UNRESTRICTED AREAS, established at or beyond the SITE BOUNDARY, is utilized in the Controls to keep levels of radioactive materials in liquid and gaseous effluents as low as is reasonably achievable, pursuant to 10 CFR Part 50.36a.

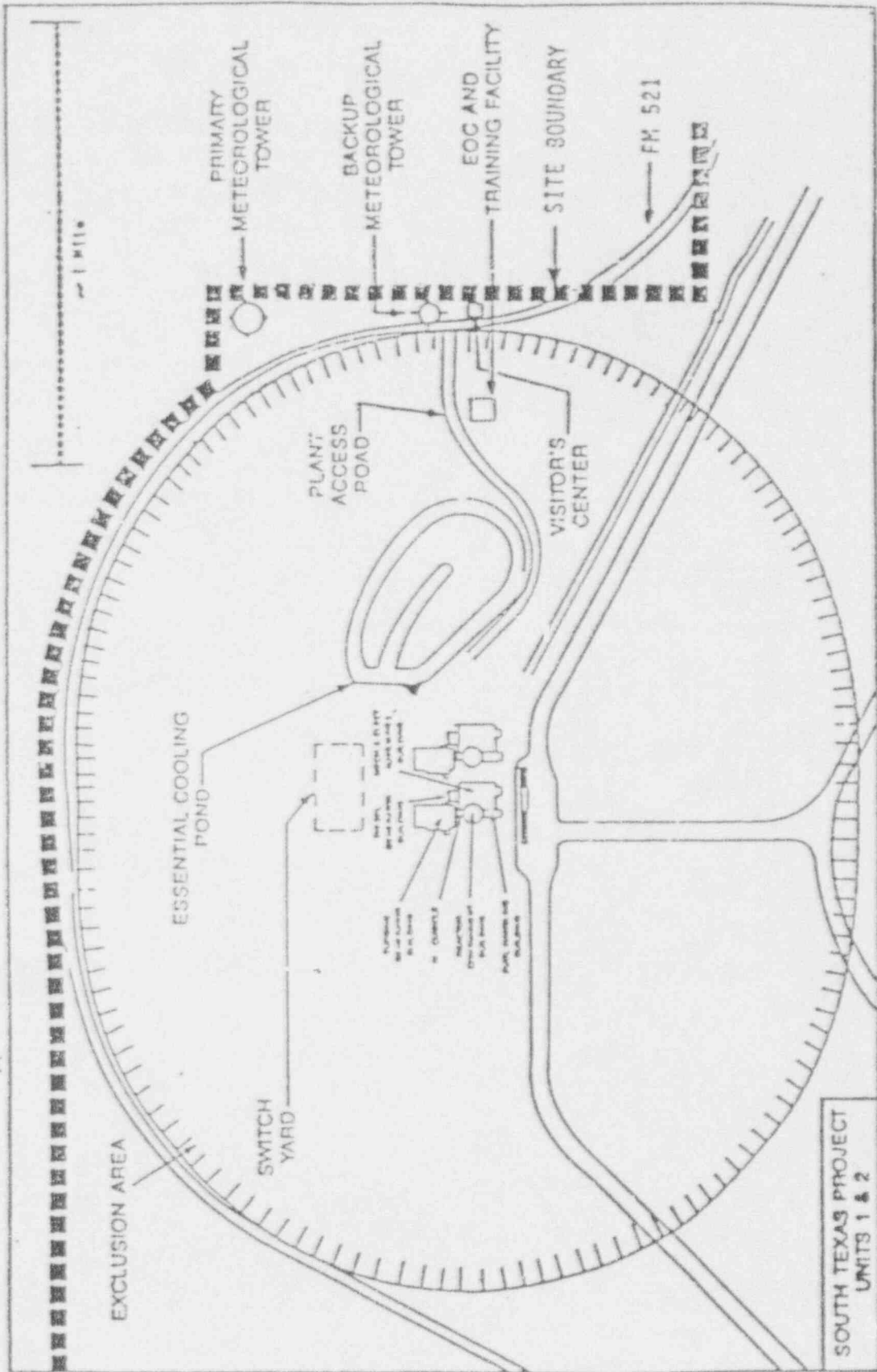


FIGURE 5.1-1  
EXCLUSION AREA

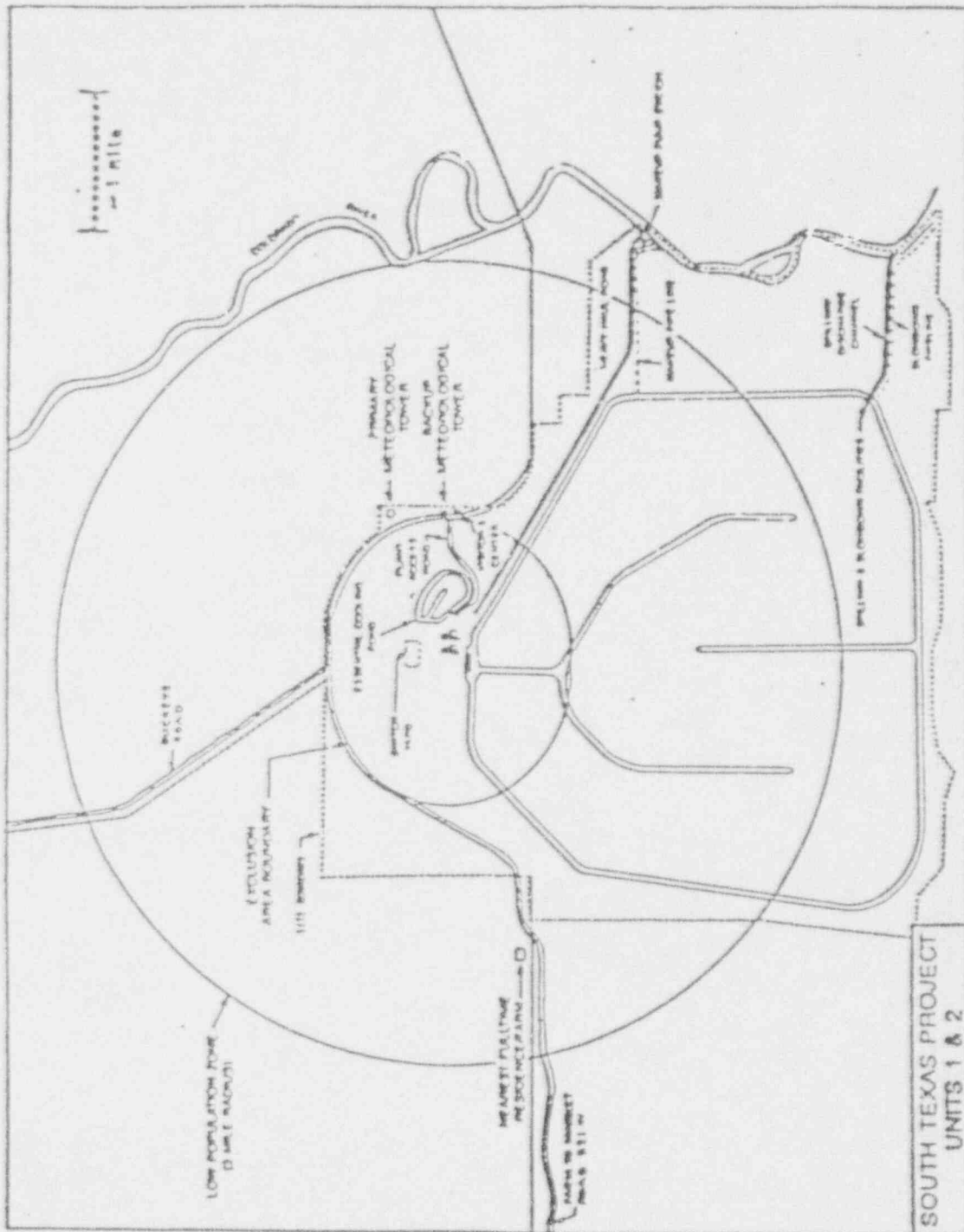


FIGURE 5.1-2

LOW POPULATION ZONE

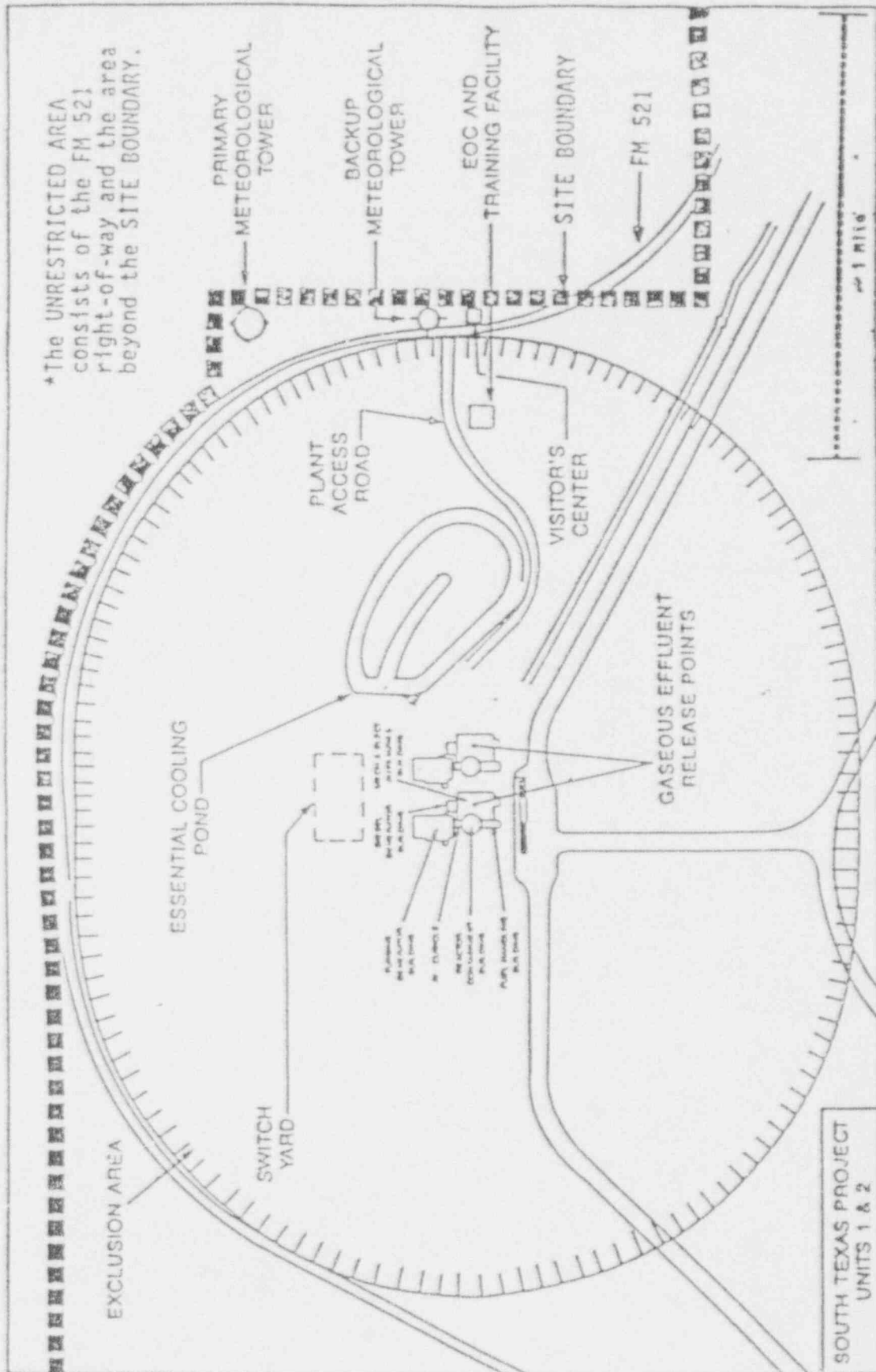


FIGURE 5.1-3

UNRESTRICTED AREA\* AND SITE BOUNDARY FOR RADIOACTIVE GASEOUS EFFLUENTS  
(SEE FIGURE 5.1-4 FOR COMPLETE SITE BOUNDARY)

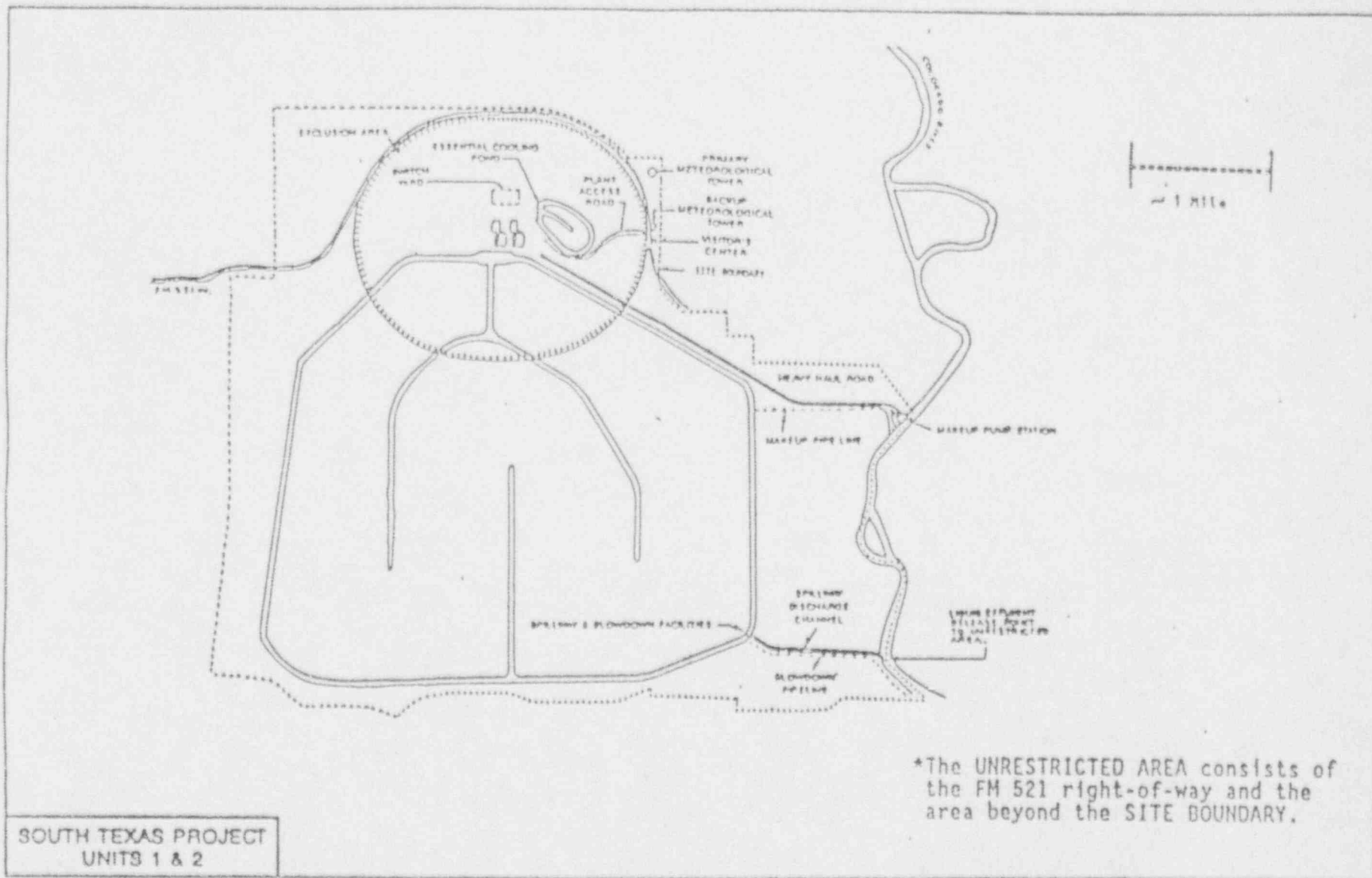


FIGURE 5.1-4

UNRESTRICTED AREA\* AND SITE BOUNDARY FOR RADIOACTIVE LIQUID EFFLUENTS

SECTION 6.0  
ADMINISTRATIVE CONTROLS



## 6.0 ADMINISTRATIVE CONTROLS

### 6.9.1.3 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT\*

6.9.1.3 Routine Annual Radiological Environmental Operating Reports covering the operation of the unit during the previous calendar year shall be submitted prior to May 1 of each year. The initial report shall be submitted prior to May 1 of the year following initial criticality.

The Annual Radiological Environmental Operating Reports shall include summaries, interpretations, and an analysis of trends of the results of the radiological environmental surveillance activities for the report period, including a comparison with preoperational studies, with operational controls, as appropriate, and with previous environmental surveillance reports, and an assessment of the observed impacts of the plant operation on the environment. The reports shall also include the results of the Land Use Census required by Control 3.12.2.

The Annual Radiological Environmental Operating Reports shall include the results of analysis of all radiological environmental samples and of all environmental radiation measurements taken during the period pursuant to the locations specified in the table and figures in this manual as well as summarized and tabulated results of these analyses and measurements in the format of the table in the Radiological Assessment Branch Technical Position, Revision 1, November 1979. In the event that some individual results are not available for inclusion with the report, the report shall be submitted noting and explaining the reasons for the missing results. The missing data shall be submitted as soon as possible in a supplementary report.

The reports shall also include the following: a summary description of the Radiological Environmental Monitoring Program; at least two legible maps\*\* covering all sampling locations keyed to a table giving distances and directions from the centerline of one reactor; the results of licensee participation in the Interlaboratory Comparison Program and the corrective action taken if the specified program is not being performed as required by Control 3.12.3; reason for not conducting the Radiological Environmental Monitoring Program as required by Control 3.12.1, and discussion of all deviations from the sampling schedule; discussion of environmental sample measurements that exceed the reporting levels but are not the result of plant effluents, pursuant to ACTION b. of Control 3.12.1; and discussion of all analyses in which the LLD required was not achievable.

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\* A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station.

\*\* One map shall cover stations near the SITE BOUNDARY; a second shall include the more distant stations.



## 6.0 ADMINISTRATIVE CONTROLS

### 6.9.1.4 SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT\*

6.9.1.4 Routine Semiannual Radioactive Effluent Release Reports covering the operation of the unit during the previous 6 months of operation shall be submitted within 60 days after January 1 and July 1 of each year. The period of the first report shall begin with the date of initial criticality.

The Semiannual Radioactive Effluent Release Reports shall include a summary of the quantities of radioactive liquid and gaseous effluents and solid waste released from the unit as outlined in Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," Revision 1, June 1974, with data summarized on a quarterly basis following the format of Appendix B thereof. For solid wastes, the format for Table 3 in Appendix B shall be supplemented with three additional categories: class of solid wastes (as defined by 10 CFR Part 61), type of container (e.g., LSA, Type A, Type B, Large Quantity) and SOLIDIFICATION agent or absorbent (e.g., cement, urea formaldehyde).

The Semiannual Radioactive Effluent Release Report to be submitted within 60 days after January 1 of each year shall include an annual summary of hourly meteorological data collected over the previous year. This annual summary may be either in the form of an hour-by-hour listing on magnetic tape of wind speed, wind direction, atmospheric stability, and precipitation (if measured), or in the form of joint frequency distributions of wind speed, wind direction, and atmospheric stability.\*\* This same report shall include an assessment of the radiation doses due to the radioactive liquid and gaseous effluents released from the unit or station during the previous calendar year. This same report shall also include 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 (Figures 5.1-3 and 5.1-4) during the report period. All assumptions used in making these assessments, i.e., specific activity, exposure time, and location, shall be included in these reports. The meteorological conditions concurrent with the time of release of radioactive materials in gaseous effluents, as determined by sampling frequency and measurement, shall be used for determining the gaseous pathway doses. The assessment of radiation doses shall be performed in accordance with the methodology and parameters in this manual.

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\* A single submittal may be made for a multiple unit station. The submittal should combine those sections that are common to all units at the station; however, for units with separate radwaste systems, the submittal shall specify the releases of radioactive material from each unit.

\*\* In lieu of submission with the Semiannual Radioactive Effluent Release Report, the licensee has the option of retaining this summary of required meteorological data on site in a file that shall be provided to the NRC upon request.

## 6.0 ADMINISTRATIVE CONTROLS

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### 6.9.1.4 SEMIANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT (Continued)

The Semiannual Radioactive Effluent Release Report to be submitted within 60 days after January 1 of each year shall also include an assessment of radiation doses to the likely most exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources, including doses from primary effluent pathways and direct radiation, for the previous calendar year to show conformance with 40 CFR Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operation." Acceptable methods for calculating the dose contribution from liquid and gaseous effluents are given in Regulatory Guide 1.109, Rev. 1, October 1977.

The Semiannual Radioactive Effluent Release Reports shall include a list and description of unplanned releases from the site to UNRESTRICTED AREAS of radioactive materials in gaseous and liquid effluents made during the reporting period.

The Semiannual Radioactive Effluent Release Reports shall include any changes made during the reporting period to the PROCESS CONTROL PROGRAM and to the ODCM, pursuant to Technical Specifications 6.13 and 6.14, respectively, as well as any major change to Liquid and Gaseous Radwaste Treatment Systems pursuant to Control 6.15. It shall also include a listing of new locations for dose calculations and/or environmental monitoring identified by the Land Use Census pursuant to Control 3.12.2.

The Semiannual Radioactive Effluent Release Reports shall also include the following: an explanation as to why the inoperability of liquid or gaseous effluent monitoring instrumentation was not corrected within the time specified in Control 3.3.3.10 or 3.3.3.11, respectively; and description of the events leading to liquid holdup tanks or gas storage tanks exceeding the limits of Technical Specification 3.11.1.4 or 3.11.2.6, respectively.

## 6.0 ADMINISTRATIVE CONTROLS

### 6.15 MAJOR CHANGES TO LIQUID AND GASEOUS RADWASTE TREATMENT SYSTEMS\*

#### 6.15.1 Licensee-initiated major changes to the Radwaste Treatment Systems (liquid and gaseous):

- a. Shall be reported to the Commission in the Semiannual Radioactive Effluent Release Report for the period in which the evaluation was reviewed by the PORC. The discussion of each change shall contain:
  1. A summary of the evaluation that led to the determination that the change could be made in accordance with 10 CFR Part 50.59;
  2. Sufficient detailed information to totally support the reason for the change without benefit of additional or supplemental information;
  3. A detailed description of the equipment, components, and processes involved and the interfaces with other plant systems;
  4. An evaluation of the change, which shows the predicted releases of radioactive materials in liquid and gaseous effluents that differ from those previously predicted in the License application and amendments thereto;
  5. An evaluation of the change, which shows the expected maximum exposures to a MEMBER OF THE PUBLIC in the UNRESTRICTED AREA and to the general population that differ from those previously estimated in the License application and amendments thereto;
  6. A comparison of the predicted releases of radioactive materials, in liquid and gaseous effluents, to the actual releases for the period prior to when the change is to be made;
  7. An estimate of the exposure to plant operating personnel as a result of the change; and
  8. Documentation of the fact that the change was reviewed and found acceptable by the PORC.
- b. Shall become effective upon review and acceptance by the PORC.

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\* Licensees may choose to submit the information called for in this Control as part of the annual FSAR update.

STPEGS ODCM

PART B

RADIOLOGICAL CALCULATIONAL METHODS AND PARAMETERS

## 1.0 Introduction

### 1.1 Purpose

Part B of the Off-site Dose Calculation Manual (ODCM) provides the methods and parameters used to calculate off-site doses due to routine radioactive liquid and gaseous effluent releases. This ODCM is a supporting document to the Technical Specifications for the South Texas Project Electric Generating Station (STPEGS) and meets the following identified needs:

- a. Section 3.1 of this ODCM describes the methods approved for setting alarm points on liquid monitors to ensure that the concentrations of radioactive liquid effluents released to the UNRESTRICTED AREA are limited to the concentration limits of 10CFR20, Appendix B, Table II;
- b. Section 3.2 describes the methods approved for setting alarm points on gaseous monitors to ensure that the dose rate from radioactive noble gas effluents released to the UNRESTRICTED AREA do not exceed the values specified in Part A, Control 3/4.11.2.1 of this ODCM;
- c. Sections 4.1 to 4.4 describe the methods approved for calculating doses and dose rates to the maximum exposed MEMBER OF THE PUBLIC in the UNRESTRICTED AREA for comparison with the Control limits of Part A of the ODCM;
- d. Section 4.5 describes the methods approved for calculating the total dose from the uranium fuel cycle to the maximum exposed MEMBER OF THE PUBLIC for comparison with the limits of 40CFR190;
- e. Section 4.6 describes the method approved for calculating doses to MEMBERS OF THE PUBLIC who may visit STPEGS or travel within the site boundary;
- f. Section 5.0 describes the Radiological Environmental Monitoring Program (REMP) including the minimum sampling program and sample locations.

The models used in this ODCM are consistent with "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance With 10CFR50, Appendix I" (Regulatory Guide 1.109).

Changes to the methods contained in this document are reviewed and approved by the Plant Operations Review Committee (PORC) as required by Technical Specification 6.14 and revisions are forwarded to the NRC with the Semiannual Radioactive Effluent Release Report. However, the general methods presented should accommodate operational flexibility.

## 1.2 General Site Description

The South Texas Project Electric Generating Station (STPEGS) consists of two pressurized water reactor units situated on a 19-square mile site. The units are similar in design and operate independently with a minimum of shared systems. Each unit has its own liquid radioactive waste treatment system and its own ventilation system. Each unit consists of a reactor containment building, an attached fuel-handling and storage building, an attached mechanical electrical auxiliary building, and a detached turbine generator building.

The most notable common system is the cooling reservoir into which liquid radioactive effluents are discharged from both units. Also, the systems which monitor radioactive releases for each unit report their results to a common computer for the purposes of report generation and off-site dose calculation.

The site is relatively remote with the nearest resident over two miles from either unit and with the nearest community about four miles distant. The closest site boundary is nearly a mile from either unit.

The terrain is coastal plain with farm land and range predominating. The land rises slowly from sea level 10 miles south of the plant to an elevation of 45 feet 10 miles to the north. The only topographical relief consists of plant associated structures and shallow gullies. The methods discussed in this document for calculating off-site doses due to atmospheric releases were evaluated against this relatively simple terrain.

Dose calculations for liquid effluent releases include considerations for dilution and radioactive decay in the large cooling reservoir into which releases from both units are made. These dose estimates are based on off-site discharges from the reservoir to the Colorado River and the Little Robbins Slough area as a consequence of initial radioactive effluent releases into the reservoir.



## 2.0 Summary of Release Points and Detector System

### 2.1 Gaseous Release Points (UFSAR Section 11.3)

The sources of routine releases for each unit at STPEGS are:

- 1) Reactor Containment Building (RCB);
- 2) Mechanical-Electrical Auxiliary Building (MEAB);
- 3) Fuel-Handling Building (FHB);
- 4) Gaseous Waste Processing System (GWPS);
- 5) Turbine-Generator Building (TGB).

Only the first four sources contribute significantly to routine plant atmospheric releases. The effluents from the first four sources are routed to a common exhaust pipe located on the roof of each unit's MEAB. The effluent is monitored for noble gas, sampled for particulates and iodines by the detectors of RT-8010, and then exhausted horizontally at an elevation of 29 meters at an average flow rate of 5660 cubic meters per minute. Figure B2-1 summarizes the system installed at each unit.

Radioactive gaseous effluents from each TGB originate primarily in the condenser vacuum pumps. The exhaust from these pumps is monitored by noble gas detectors (monitor #RT-8027). These systems may exhaust onto the TGB roof with a dry gas flow rate of about 2 cubic meters per minute. Planned plant modifications may route this exhaust to the unit vent. This potential release route shall only be included in off-site dose calculations and semiannual effluent release summaries if activity due to plant operation is measured in this effluent. Figure B2-2 summarizes these systems.

Occasionally other atmospheric release points may be important, such as the main steam line atmospheric dumps, off-normal releases, and the gland steam condenser vents. If releases occur due to unusual operating circumstances, an estimate will be made of any unmonitored effluent releases prior to off-site dose calculation. These release estimates will be based on the mass of secondary coolant lost and the nuclide concentrations in the secondary coolant.

Releases to the atmosphere may be classified into two categories: continuous, and batch releases. Most releases from STPEGS are continuous with minor variations which are intermittent in nature and usually of relatively short duration (minutes to hours). These releases are considered "continuous" in the sense that they occur frequently, may be overlapping, and do not usually involve a significant fraction of the total activity released in a calendar quarter during any given hour. An example of such a release is the venting of containment to equalize pressure. However, those plant evolutions leading to a one-hour release exceeding approximately ten times the average one-hour release are considered a batch. An example of a batch release is the operation of the purge fans for a few hours to remove noble gases from containment for personnel protection reasons. Meteorological data associated with these infrequent periods of high release shall be reported separately as provided by Regulatory Guide 1.21, Rev. 1, section C.1.

### 2.2 Liquid Release Points (UFSAR Section 11.2)

The sources of liquid radioactive releases consist of equipment leaks and drains, valve leak-offs, pump seal leak-offs, floor drains, etc., from systems



containing reactor coolant in the RCB and MEAB plus liquid effluents from processes such as the laundry, hot showers, condensate polishing systems, boron recycle systems, etc.

Some of these systems are monitored for control of plant processes, and the radioactive liquid waste is eventually routed to the liquid radwaste processing system of each unit for treatment and release. Releases are by batch from each unit and are monitored prior to entering the Circulating Water System via the Open Loop Auxiliary Cooling Water System and hence the reservoir. The radioactive effluent released from each unit's liquid radioactive waste processing system is monitored during the release of each batch using a scintillation detector (monitor #RT-8038) mounted off-line from the discharge pipe.

Potentially contaminated liquid effluents from floor drains and the condensate polishing regeneration waste collection system in each TGB could also be a source of radioactive waste. The floor drain system effluents of each TGB are monitored continuously as are the condensate polishing system effluents.

Provided no activity is detected in the floor drain system effluents, they are combined with oily waste effluents and are discharged directly into the reservoir. The condensate polishing regeneration system normally discharges into a neutralization basin. If activity is measured during routine sampling of the Total Dissolved Solids Tank or if the system's in-line monitor detects activity in the regenerate waste effluent, the flow to the neutralization basin is isolated. Flow may then be diverted to the liquid radwaste processing system of the appropriate unit. If radioactive liquid wastes are processed through the neutralization basin or directly to the reservoir, an estimate of this unmonitored release shall be added to the routine liquid releases to the reservoir.

Liquid radioactive releases from either unit leave STPEGS from the reservoir to the Colorado River, the West Branch of the Colorado, or to the Little Robbins Slough area. Under normal circumstances all radioactive liquid effluents are treated and diluted into the 150,000 acre-foot (average fill height) reservoir prior to release from the site. From time-to-time planned releases are made to the Colorado River through the blowdown facilities provided. However, some releases are uncontrollable such as flow from the hydraulic relief wells surrounding the reservoir or flow over the spillway following unusually heavy rains.

Because of the large capacity of the reservoir, the radionuclide concentrations in these releases (planned or unplanned) are expected to be a small fraction of the concentration limits listed in Table II, Appendix B of the 10CFR20. The nuclide concentrations in waters released from the reservoir are estimated based on releases to the reservoir and radioactive decay. A routine monitoring program for the reservoir and relief well discharges is used as the basis for confirming that radionuclide concentrations released to the off-site environment are not larger than predicted by the model.

Release of contaminated secondary coolant directly to the storm drainage system at STPEGS is possible. Should such a release occur, an estimate of the off-site dose consequences shall be made and the release shall be documented.

### 2.3 Detector System and Instrument Responses

Three types of detectors are used in association with effluent monitors. All are sensitive to gamma rays; however, some are primarily sensitive to beta radiation. Those sensitive primarily to beta include the air particulate and noble gas detectors. Those sensitive primarily to gamma rays include the iodine in air detectors and the liquid release detectors.

The noble gas (normal range) detectors consist of plastic scintillators which respond primarily to beta particles. The response of these detectors is a function of beta energy as can be seen from Figure B2-3. These detectors are calibrated in uCi/cc for gases with beta emission spectra similar to that of Xe-133.

The air particulate detectors also consist of plastic scintillators which respond primarily to beta decay from particulates deposited on a filter paper. These detectors are calibrated in uCi/ml relative to Cs-137 betas with an overall response similar to that shown in Figure B2-4.

The iodine air channel detectors are NaI(Tl) scintillators in conjunction with a single channel analyzer adjusted to monitor the 364 KeV gamma of I-131. The iodine window of this detector is set  $\pm 5\%$  about the 364 KeV peak to minimize response to interfering radiation. The detectors are calibrated in uCi/cc of I-131 based on a Ba-133 calibration source.

The liquid effluent detectors are NaI(Tl) scintillators which are sized (1.5 by 1 inch) to be sensitive to a broad range of gamma emitters. These detectors are calibrated in uCi/ml relative to Cs-137 but have general gamma detection ability similar to that shown in Figure B2-5. The lower level discriminators for these detectors are set at about 100 KeV to eliminate detection of x-rays, low energy gammas as from Xe-133, and electronics noise in order to minimize the detector background count rates.

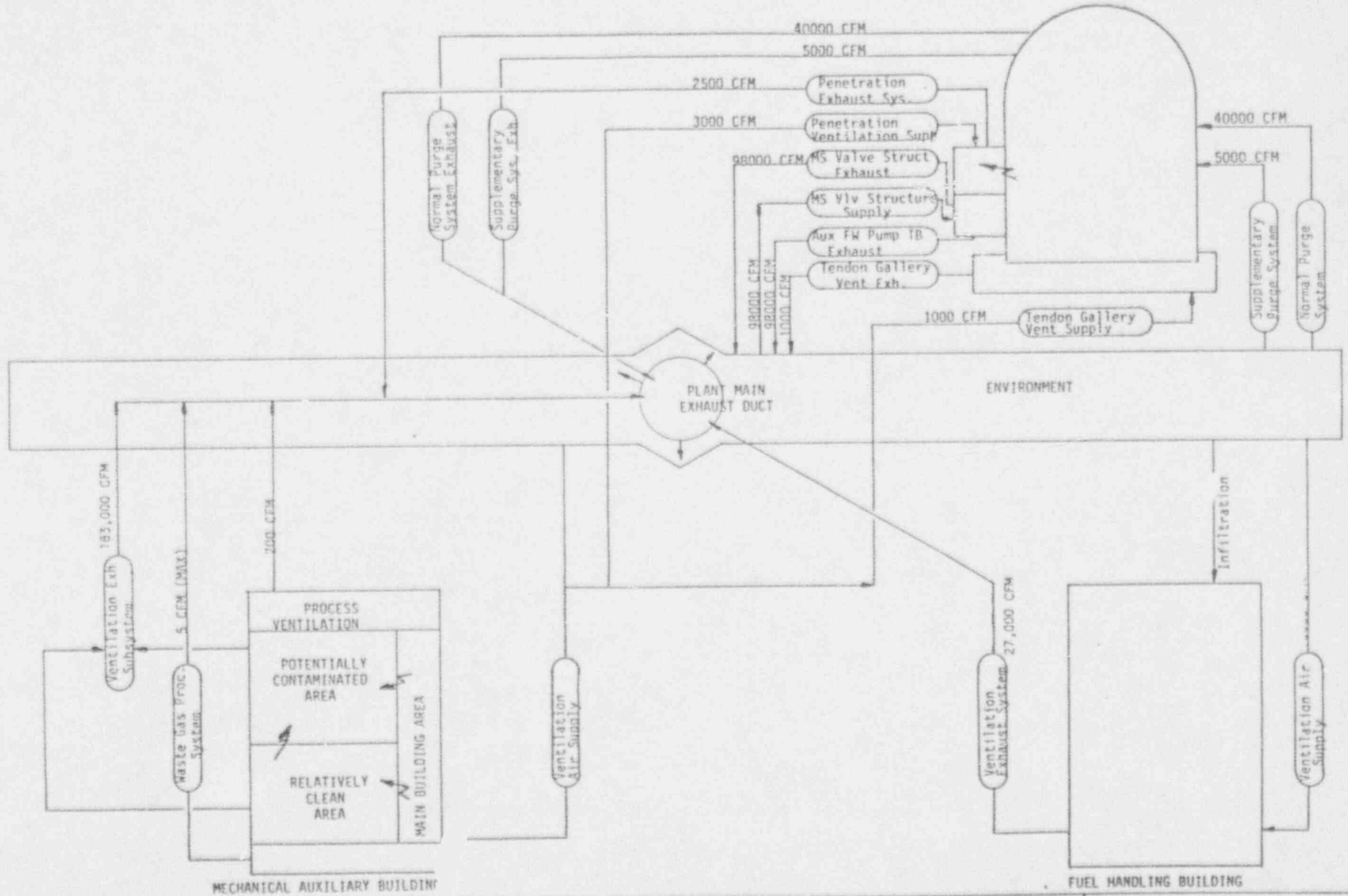


Figure B2-2: Turbine Building Ventilation System

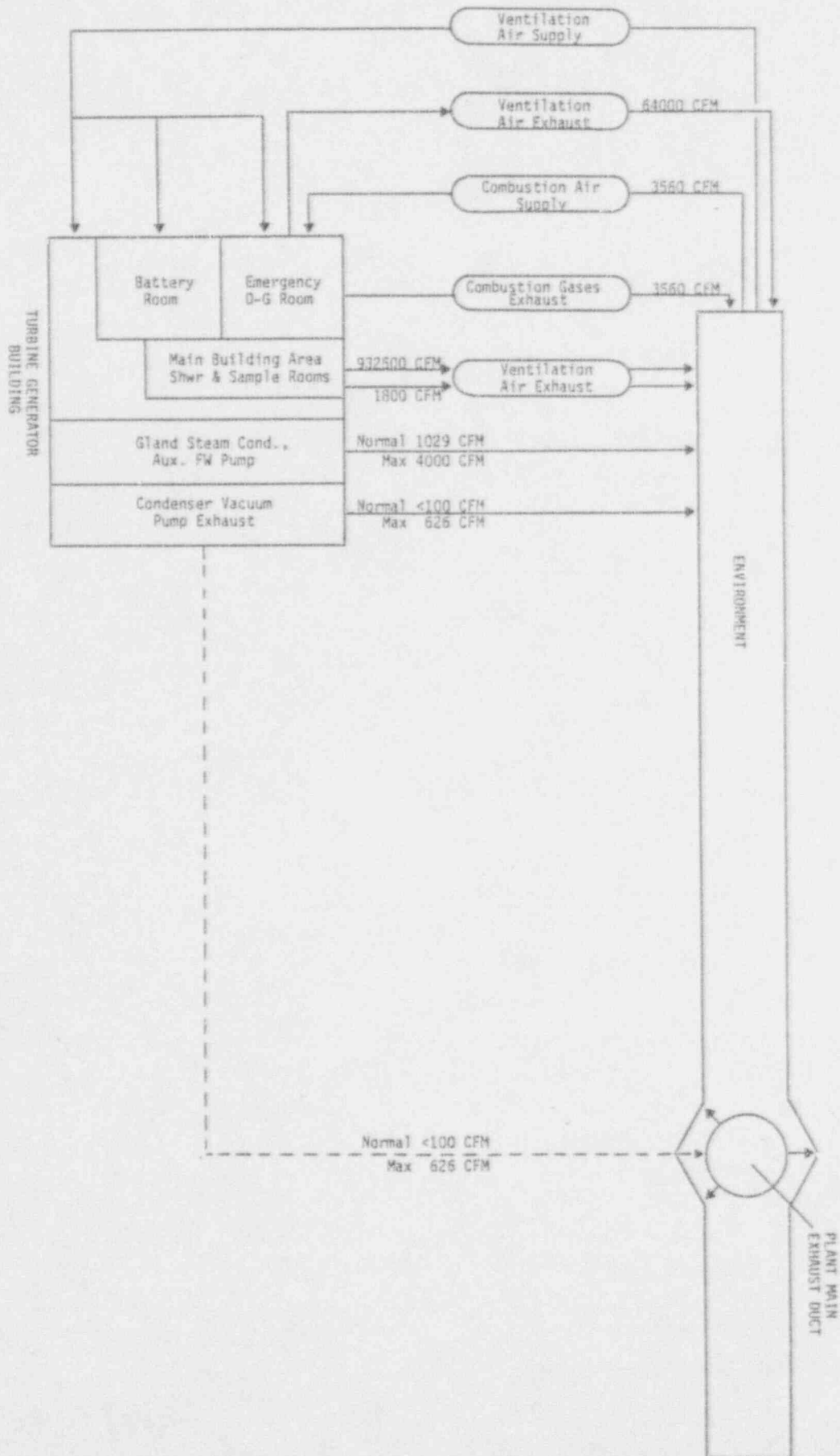
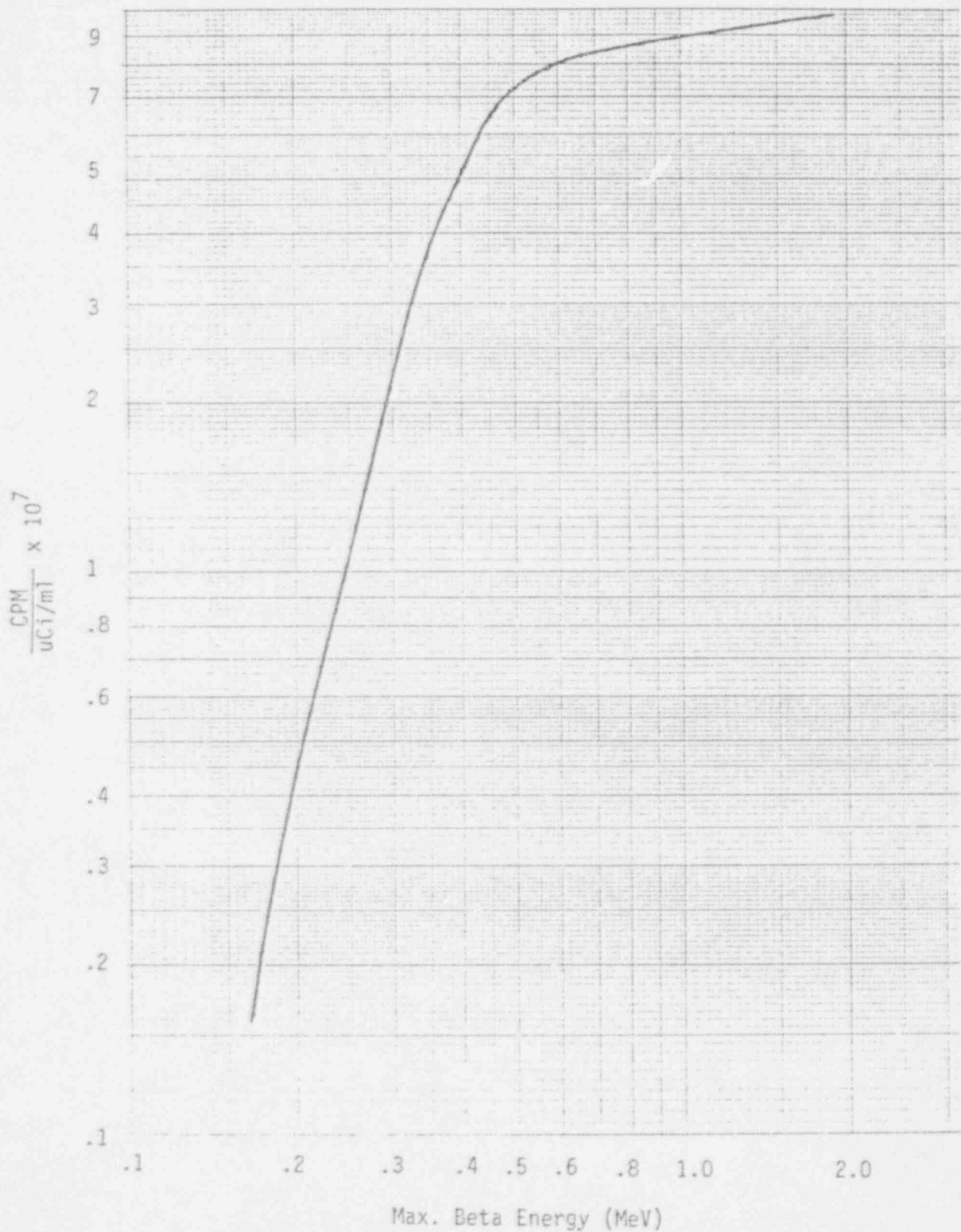


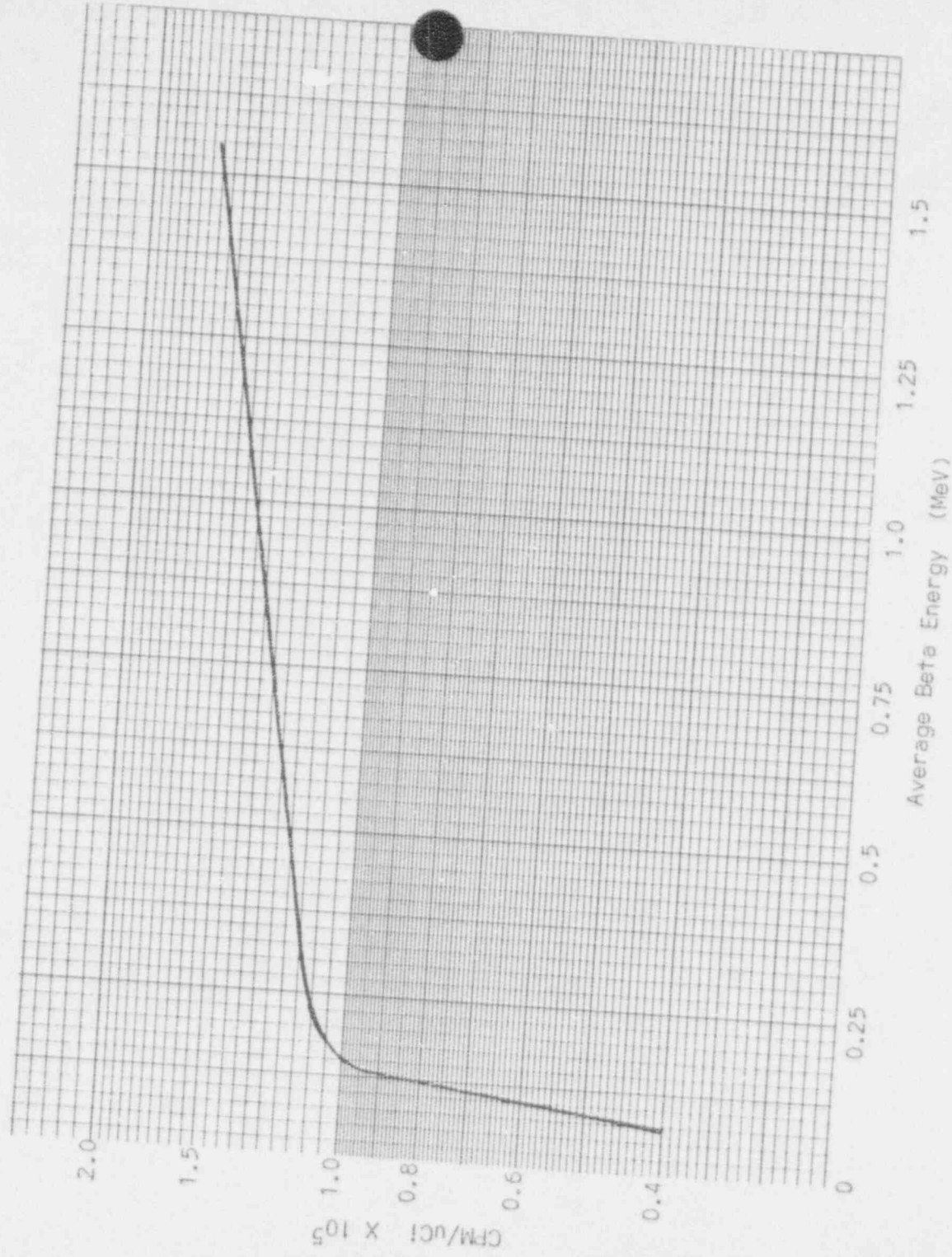
Figure B2-3 Energy Response Curve for the RD-52 Offline Beta Detector Operating at 760 mm Hg and 25°C  
 (Assuming one beta per disintegration)



(Curve shape from ODCM Rev. 3 but shifted by 1.18 to correspond to HL&P primary calibration measurements of 1989.)

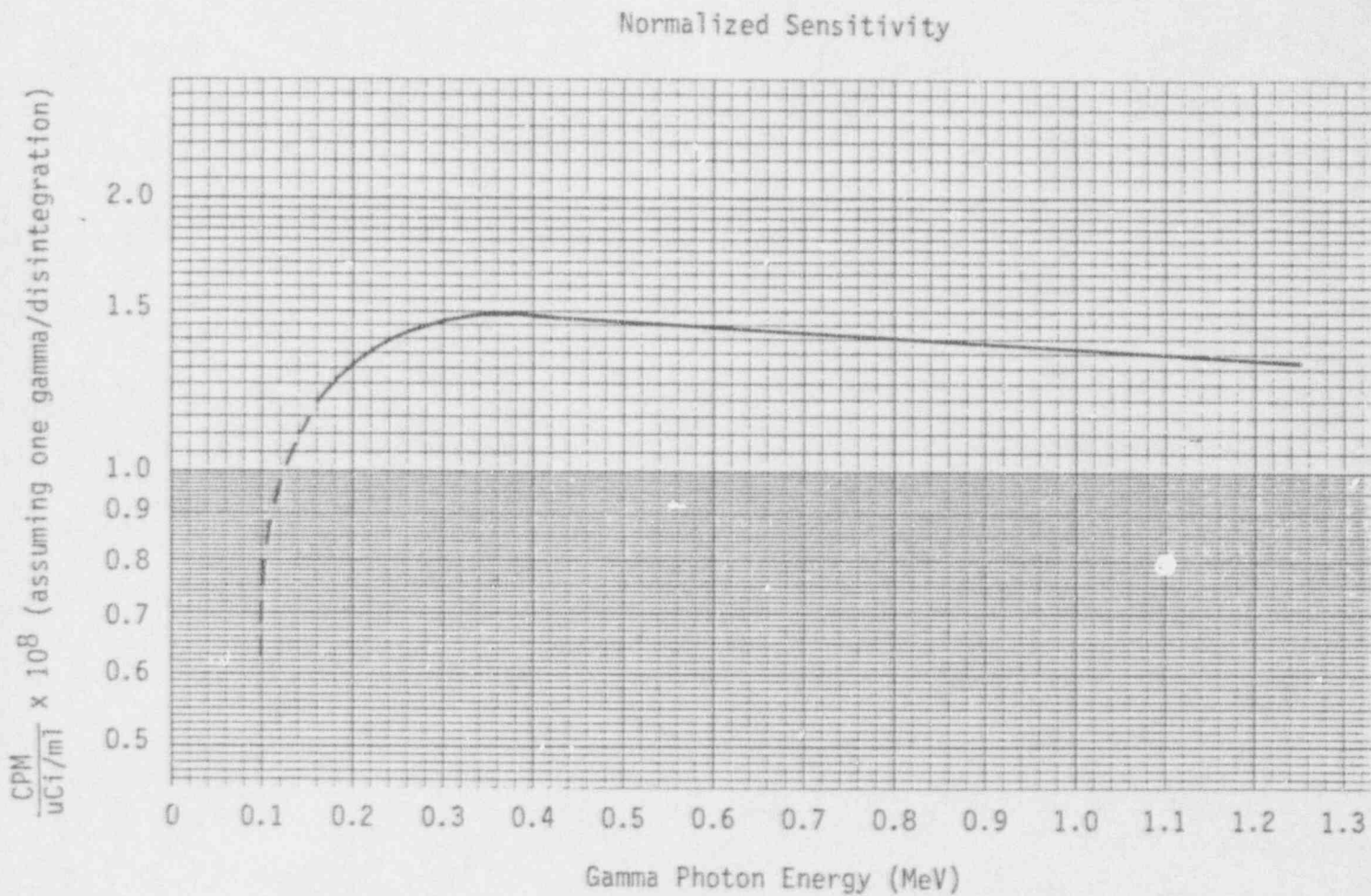


Figure B2-4 RD-56 Particulate Detector Energy Response to Betas  
(assuming one beta per disintegration)



(Copied from G. A. Technologies report EL-3296.)

Figure B2-5 Detector Energy Response to Gamma Radiation for the RD-53 Offline Gamma Detector



(Revised to reflect 1989 primary calibration)



### 3.0 Alarm Setpoint Adjustments

#### 3.1 Liquid Effluents

##### 3.1.1 Control Requirements

Control 3/4.11.1.1 of Part A of the ODCM requires that the concentration of radioactive material released at any time from the South Texas Project Electric Generating Station (STPEGS) to unrestricted areas be limited to the Maximum Permissible Concentrations (MPCs) in water. The MPCs are as indicated in 10CFR20, Appendix B, Table II, Column 2 for nuclides other than dissolved or entrained noble gases. Noble gas concentrations must be limited to 2.0E-04 uCi/ml.

##### 3.1.2 Interpretation

Liquid effluent releases from STPEGS are diluted by a 7000-acre reservoir. Plant releases are all routed into the cooling reservoir where substantial dilution and radioactive decay may occur before ultimate release from the site. The reservoir lies totally within the confines of the site and the use of its water is restricted to plant operation. No recreation, including hunting and fishing, is permitted on the reservoir. Liquid effluents diluted into the cooling reservoir may be released during:

- a) scheduled blowdown operations to the Colorado River,
- b) passive hydraulic relief well flow,
- c) dilution into the shallow ground water aquifer, or
- d) passive spillway releases following unusually heavy rains.

The blowdown releases will be planned; however, the other releases are not controlled by the operations staff. To assure that the provisions of Control 3/4.11.1.1 are satisfied, the concentrations of radionuclides in the reservoir shall be maintained at levels less than the release limits of 10CFR20, Appendix B, Table II, Column 2.

##### 3.1.3 Implementation

Concentrations of radionuclides in the cooling reservoir will be controlled such that the sum of the ratios of the MPCs, A, remains less than unity as indicated in Equation 3.1a below:

$$A = \frac{C_1}{MPC_1} + \frac{C_2}{MPC_2} + \dots + \frac{C_i}{MPC_i} < 1 \quad \text{Eq. 3.1a}$$

where  $C_1, C_2, \dots, C_i$  are the measured nuclide concentrations of a representative sample of reservoir water (uCi/ml);

$MPC_1, MPC_2, \dots, MPC_i$  are the associated maximum permissible concentrations of those nuclides which contribute at least 90% to the total dose.

Consequently any releases from the reservoir to the off-site environment will meet the requirements of Control 3/4.11.1.1.

In order to assure that the concentration of radionuclides in the reservoir never exceeds an effective concentration of one MPC, the dilution afforded by the circulating coolant and auxiliary cooling water flows must be estimated. The dilution of liquid radioactive waste discharges into the circulating coolant from each unit is calculated as indicated below:

$$A = [DF_r * A_r] + [DF_c * A_c] \quad \text{Eq. 3.1b}$$

$$DF_r = \frac{F_r}{F_c + F_r} \quad \text{Eq. 3.1c}$$

$$DF_c = \frac{F_c}{F_c + F_r} \quad \text{Eq. 3.1d}$$

where:

A = fraction of an MPC in the circulating coolant as it reenters the reservoir; A < 1.0.

DF<sub>r</sub> = dilution factor for radioactive waste

A<sub>r</sub> = fraction of an MPC permitted in the radioactive waste flow from the waste monitor tank, unitless factor;

DF<sub>c</sub> = dilution factor for circulating coolant

A<sub>c</sub> = fraction of an MPC in the circulating coolant before addition of the radioactive waste stream as measured periodically for the reservoir, unitless factor;

F<sub>r</sub> = flow rate of radioactive waste as determined by the rated pump capacity of the radioactive waste discharge, gal/min;

F<sub>c</sub> = flow rate of circulating coolant and the open loop auxiliary cooling water, normally 4.5E5 gal/min (4.5E5 is 1/2 the normal circulating coolant flow of each unit since liquid radioactive waste is discharged into only one of two 138" lines). F<sub>c</sub> may be determined by multiplying the number of circulating coolant pumps operating by the rated pump capacity;

The very large dilution factors afforded by the circulating coolant will not be routinely used to allow high concentrations of liquid radioactive waste to be discharged from the plant. Under no circumstances should activity be discharged to the reservoir such that the fraction of an MPC, A, of the diluted waste stream exceeds "one" as described by Eq. 3.1b.

If the value of "A" in equation 3.1b is set to its limiting value of 1, the terms in Eq. 3.1b above can be rearranged as shown below:

$$A_r = \left[ \frac{F_c}{F_r} * (1 - A_c) \right] + 1 \quad \text{Eq. 3.1e}$$

The fraction of an MPC the radioactive waste stream may assume can be calculated from the actual values of  $F_c$ ,  $F_r$ , and  $A_c$  appropriate at the time of the release. A conservative estimate of  $A_r$  appropriate for limiting routine releases to the reservoir can be estimated assuming that the radioactive waste stream flow is at its nominal value, the flow of dilution water is at its minimum, and that the reservoir is virtually unpolluted. In this case the values for each variable above become:

$$F_c = 113,000 \text{ gpm (one circulating coolant water pump)}$$

$$F_r = 250 \text{ gpm (nominal flow rate limit or radioactive waste discharge pump)}$$

$$A_c = 0 \text{ (reflecting good radioactive release management)}$$

Hence, Eq. 3.1b can be solved for  $A_r$  as:

$$A_r = [113,000/250 * (1-0)] + 1 = 453$$

This suggests that for normal operation with a "clean" reservoir, the administrative limit for releases should limit discharge concentrations to no more than about 453 times the effective MPC of the radioactive waste stream.

The radioactive waste stream itself is characterized by a mixture of radionuclides at concentrations  $C_1, C_2, \dots, C_j$ . The effective MPC of this waste stream can be estimated from the radiochemical analysis of the waste monitor tank prior to release using the following formula for effective MPC:

$$MPC_{\text{eff}} = \frac{\sum C_j}{\sum (C_j / MPC_j)} \quad \text{Eq. 3.1f}$$

where

$$\sum C_j = \text{sum of the concentrations in the waste monitor tank, uCi/ml}$$

$$C_j = \text{concentrations of individual radionuclides, "j", in the mixture, uCi/ml}$$

$$MPC_j = \text{maximum permissible concentrations listed in 10CFR20, Appendix B, Table II, column 2, for each radionuclide, "j", uCi/ml}$$

$$MPC_{\text{eff}} = \text{effective MPC, uCi/ml}$$

The limiting concentration, LC, indicated by the liquid waste monitor, RT8038, may be estimated by multiplying the value of  $MPC_{\text{eff}}$  from Eq. 3.1f by the factor  $A_r$  from Eq. 3.1e.

$$LC = A_r * MPC_{eff}$$

Eq. 3.1g

The following example uses the average mixture of radionuclides measured in the liquid effluent released during August 1988:

Nuclide	Concentration, C (uCi/ml)	MPC (uCi/ml)	Concentration/MPC (C/MPC)	Er (cpm)/(uCi/ml)	C * Er (cpm)
H-3	1.74E-02	3E-03	5.8E+00	0	0
Cr-51	4.22E-08	2E-03	2.1E-05	1.45E+07	6.12E-01
Mn-54	2.80E-08	1E-04	2.8E-04	1.40E+08	5.91E+00
Co-58	1.01E-06	1E-04	1.0E-02	1.83E+08	1.85E+02
Zr-95	3.41E-08	6E-05	5.7E-04	1.40E+08	4.77E+00
Nb-95	3.41E-08	1E-04	3.4E-04	1.40E+08	4.77E+00
Co-60	2.20E-08	5E-05	4.4E-04	2.65E+08	5.83E+00
Xe-133	3.96E-05	2E-04	2.0E-01	0	0
Xe-135	2.48E-07	2E-04	1.2E-03	1.31E+08	3.25E+01
	1.74E-02		6.0E+00		2.39E+02

$$MPC_{eff} = (\sum C_j) / (\sum (C_j / MPC_j)) = 1.74E-02 / 6.0E+00$$

$$= 2.9E-03 \text{ uCi/ml}$$

The limiting indicated release concentrations in this example can be estimated using Eq. 3.1g as shown below:

$$LC = 453 * 2.9E-03 \text{ uCi/ml} = 1.3E+00 \text{ uCi/ml}$$

Note that radionuclides were included in the calculation which could not be detected by the RD-53 monitor. Examples of such nuclides include H-3, C-14, P-32, Fe-55, Tc-99, Sr-90, and most alpha emitters. Also note that no provision was made for the detector background, uncertainty in instrument response, or any safety factor in this calculation. Plant implementing procedures shall provide instructions for inclusion of background in the setpoint estimation and shall have provisions for cleaning the detector if the background becomes large enough to interfere with measurements.

The limiting indicated concentration calculated in Eq. 3.1g above should include these final adjustments as shown below to yield the alarm setpoint:

$$\text{alarm setpoint} = (LC) * SF + \text{bkg} \quad \text{Eq. 3.1h}$$

where

SF = safety factor which includes the error margin calculated for this monitor. If the effluent monitors are assumed to be accurate to about 25%, the error margin may be estimated as:  $1 - 0.25 = 0.75$ . An appropriate safety factor therefore might be set at about 0.6.

bkg = detector background in uCi/ml

For the example chosen above and assuming  $bkg = 0$ , this calculation would look like

$$\begin{aligned} \text{alarm setpoint} &= 1.3E+00 \text{ uCi/ml} * 0.6 + 0 \text{ uCi/ml} \\ &= 7.8E-01 \text{ uCi/ml} \end{aligned}$$

The RT8038 liquid monitor detector is calibrated to Cs-137 but its response to other radionuclides differs somewhat from the calibration nuclide. Since the alarm setpoint calculated in Eq. 3.1h above assumes the RT8038 detector accurately measures the nuclide mix present, a release specific calibration factor must be estimated in accordance with Eq. 3.1i below:

$$\text{calibration factor} = (\sum(C_j * Er_j)) / (\sum C_j) \quad \text{Eq. 3.1i}$$

where  $Er_j$  = relative detector responses for each of the "j" nuclides as listed in Table B3-1, (cpm)/(uCi/ml)

$C_j$  = the concentration of the "j" nuclides in the specific release, (uCi/ml)

This release specific calibration factor must be used in conjunction with the release specific alarm setpoint calculated in Eq. 3.1h. For example, the calibration factor corresponding to the alarm setpoint of 7.8E-01 calculated earlier would be estimated using Eq. 3.1i and the data from the table of August 1988 effluents.

$$\begin{aligned} \text{calibration factor} &= (\sum C_j * Er_j) / (\sum C_j) \quad \text{Eq. 3.1i} \\ &= (2.39E+02) / (1.74E-02) \\ &= 1.38E+04(\text{cpm}) / (\text{uCi/ml}) \end{aligned}$$

The detector response function is not as precisely known as this example would suggest; hence, 20-30% differences between estimated calibration factors are not significant.

### 3.2 Gaseous Effluents

#### 3.2.1 Control Requirements

Control 3/4.11.2.1 of Part A of the ODCM requires that the dose rates at the site boundary and beyond from noble gases be no greater than to 500 mrem/year total body and 3000 mrem/year to the skin. Furthermore, dose rates due to I-131, I-133, H-3, and all radionuclides in particulate form with half-lives greater than eight days shall be less than or equal to 1500 mrem/year to any organ.

#### 3.2.2 Interpretation

In order to help ensure that these limits are not exceeded, the alarm setpoints for the MEAB/RCB common exhaust noble gas monitors are to be calculated such that the nearest off-site receptor would not be exposed to noble gas concentrations likely to produce a dose rate greater than this Control from the combined releases from Units 1 and 2. Iodines, tritium,

and all other radionuclides contributing to organ doses are not considered for purposes of setting alarm points since they are sampled and not monitored.

### 3.2.3 Implementation

The nearest site boundary is about a mile from either unit, hence a factor to relate the release to the concentration at the site boundary is necessary. UFSAR Tables 2.3-25 and 2.3-27 contain 2-hour and annual average X/Q values at the site boundary in each of 16 sectors. Logarithmic interpolation provides an estimate of  $5.3E-06(\text{sec}/\text{m}^3)$  for the 500 hour X/Q in the NNW sector. This value of X/Q shall be used to provide estimates of dilution for the purpose of setting alarm points for routine releases.

The most prevalent radioactive gas present in the effluent may be used to control emissions when the noble gas effluent is dominated by a single nuclide. If no single nuclide dominates, then release alarm setpoints should be based on the average mixture found.

The dose rate to individuals at the site boundary may be estimated using the equations of section B4.4.2 (Eq. 4.4d for whole body dose rate and Eq. 4.4e for skin dose rate). Therefore, the limits of Control 3/4.11.2.1 may be expressed in terms of the following equations for each noble gas:

$$\text{whole body dose rate} = Dr_{\text{gamma}} * 8760 < 0.5 \text{ rem/y} \quad \text{Eq. 3.2a}$$

$$\text{skin dose rate} = Dr_{\text{skin}} * 8760 < 3 \text{ rem/y} \quad \text{Eq. 3.2b}$$

where 8760 = units conversion factor (hr/yr)  
 $Dr_{\text{gamma}}$  = dose rate calculated in Eq. 4.4d, rem/hr  
 $Dr_{\text{skin}}$  = dose rate calculated in Eq. 4.4e, rem/hr

with  $X/Q = 5.3E-06 (\text{sec}/\text{m}^3)$ ;  $S_f = 1.0$ ;  $Q_j = 1(\text{uCi})$  in Eq. 4.4d and 4.4e  
 (sec)

Hence, there exist release rates,  $Q_j$ , for each noble gas which would correspond to the whole body (500 mrem/yr) and skin (3000 mrem/yr) limits of Eqs. 3.2a and 3.2b. Furthermore, if the release rate is divided by the unit vent flow rate, the limiting stack concentration may be estimated for each noble gas as indicated below and as listed in Table B3-3:

$$\begin{aligned} (\text{limiting stack concentrations})_{\text{wb}} &= LC_{\text{wb}} = Q_j/F \\ &= \frac{0.5}{Dr_{\text{gamma}} * 8760 * F} (\text{uCi/cc}) \quad \text{Eq. 3.2c} \end{aligned}$$

$$\begin{aligned} (\text{limiting stack concentrations})_{\text{skin}} &= LC_{\text{skin}} = Q_j/F \\ &= \frac{3.0}{Dr_{\text{skin}} * 8760 * F} (\text{uCi/cc}) \quad \text{Eq. 3.2d} \end{aligned}$$



where F = unit vent flow rate ( 200,000 scfm = 9.4E+07 cc/sec)  
 0.5 = whole body dose rate limit, rem/yr  
 3.0 = skin dose rate limit, rem/yr

As for the liquid monitor, a safety factor should be included to afford operators an opportunity to take corrective action should a release threaten to exceed the Control limit. However, an allocation factor is also necessary to assure that the off-site dose rate due to effluents from other potential release points do not combine to exceed the Control limit. Errors associated with the effluent monitoring must also be considered in estimating the setpoint. Lastly, the detector background should be included in the alarm setpoint calculation. The setpoint calculation should therefore resemble Eq. 3.2e as shown below:

$$\text{alarm setpoint} = [(LC) * SF * AF] + \text{bkg} \quad \text{Eq. 3.2e}$$

where LC = either the whole body or skin limiting stack concentration, whichever is less, uCi/cc

SF = safety factor which includes an error margin calculated for this monitor (Bechtel calculation 9ZC6008 documents the RD-52 detector statistical accuracy to be about 40%. Hence, the safety factor may be estimated as:  $1 - 0.4 = 0.6$ ). The resulting safety factor should be somewhat smaller to allow action to be taken to prevent exceeding the Control limits. Hence, an appropriate safety factor might be 0.3.

AF = allocation factor (ex: 0.5 or half for each unit)

bkg = detector background, uCi/cc

#### EXAMPLE CALCULATION

The routine release point alarm setting should be limited to the value listed for Xe-133 in Table B3-3. However, a calculation for a release with several noble gases could be made as shown below if a very precise estimate of the limit were necessary.

Given: Nuclide	Measured Concentration, C (uCi/cc)	Limiting Concentration, LC (uCi/cc)		C/LC	
		whole body	skin	whole body	skin
		Ar-41	1.0E-05	1.14E-04	4.63E-04
Kr-85	5.0E-07	6.24E-02	4.44E-03	8.01E-06	1.13E-04
Xe-133	4.0E-06	3.42E-03	8.64E-03	<u>1.17E-03</u> 8.89E-02	<u>4.63E-04</u> 2.22E-02



The fraction of the limiting concentration for both whole body and skin exposures is estimated as the sum of the ratios of the measured release concentrations divided by the corresponding limiting concentrations from Table B3-3. These values are listed in the table above under the column "C/LC." In this example, the sum for the whole body exposure is more limiting than for the skin (normal result). This sum represents the fraction of the limiting concentration for the current release. The limiting concentration for each nuclide in the mixture could be increased by the factor listed in the column "C/Σ(C/LC)" below.

<u>C/Σ(C/LC)</u>	<u>Re</u>	<u>(C/Σ(C/LC))*Re</u>
1.12E-04	2.65	2.94E-04
5.62E-06	2.41	1.35E-05
<u>4.50E-04</u>	1.00	<u>4.50E-04</u>
1.63E-04		LC <sub>eff</sub> = 3.56E-04

Since the monitor does not respond to all radionuclides the same, the product of value "C/Σ(C/LC)" and "Re" (the relative response from Table B3-2) yields the monitor response to each nuclide in the mixture at their respective maximum concentrations, column "C/Σ(C/LC) \* Re." The sum of these concentrations, LC<sub>eff</sub>, is the effective limiting concentration indicated at the monitor when the whole body or skin dose rate at the site boundary equals 500 mrem/yr or 3000 mrem/yr, respectively.

$$LC_{eff} = \sum_i ((C_i / \sum(C_i / LC_i)) * Re) \quad \text{Eq. 3.2f}$$

The alarm setpoint would be estimated in accordance with Equation 3.2e as shown below where LC<sub>eff</sub> is used in place of LC:

$$\begin{aligned} \text{alarm setpoint} &= [3.56E-04 \text{ uCi/cc} * 0.5 * 0.3] + 0 \text{ uCi/cc} \\ &= 5.4E-05 \text{ uCi/cc} \end{aligned}$$

The alert setpoint may be chosen at any value, but typically might be set at about 80% of the alarm limit.

Note that the limiting release concentration (1.63E-04 uCi/cc) is about 46% of the indicated limiting concentration (3.560E-04 uCi/cc) in this example because the monitor is calibrated to Xe-133 rather than to Ar-41, the most prevalent radionuclide in the effluent.

If the alarm setpoint calculated using this method is too conservative to permit a short-term release, the setpoint may be recalculated using the anticipated X/Q during the release period using the best available forecast data and Equation 4.4d of Section B4.4. If no concurrent release from Unit 2 is projected, the allocation factor in Equation 3.2e could be increased to unity and the safety factor could be increased to perhaps 0.5 if the release were closely monitored. Equation 4.4d used to calculate the sector average X/Q would not provide conservative X/Q estimates and, hence, the release would require close monitoring to assure compliance with the Control limit.

Some process control monitors exist within the plant which are used to limit the effluent from particular parts of the plant should they threaten to cause the unit vent monitor to exceed its alarm setpoint. Although these process monitor setpoints are not required to be set in accordance with the ODCM, these alarm setpoints could be related to the unit vent alarm setpoint based on their contribution to the unit vent exhaust rate. For example, the containment supplemental purge line could have its setpoint calculated as:

$$(\text{alarm})_{\text{purge}} = \frac{\text{unit vent flow}}{\text{supp. purge flow}} * (\text{U.V. alarm setting}) * \text{AF}' \quad \text{Eq. 3.2g}$$

where unit vent flow rate = 200,000 scfm = 94 M<sup>3</sup>/sec

supp. purge flow = 5,000 scfm = 2.4 M<sup>3</sup>/sec

U.V. alarm setting = current unit vent alarm setpoint

AF' = additional allocation factor (note: the sum of all allocation factors shall be 1.0)

For example: 0.2 for supplemental purge  
 0.2 for purge line  
 0.2 for fuel handling building  
 0.2 for waste gas process system  
 0.2 for remainder of plant

Although Control 3/4.11.2.1 requires periodic confirmation that the off-site dose rates calculated for particulates, tritium, and iodine do not exceed 1500 mrem/year to any organ, alarm/trip setpoints are not practicable to apply when considering instantaneous iodine and particulate dose rates. NUREG-0133 acknowledges that for practical reasons such alarm setpoints could not be set unambiguously.

Although the above method is suitable for the common MEAB/RCB exhaust system, two other monitored atmospheric exhausts are not addressed. The condenser vacuum pumps may exhaust to the roof of TGB or to the unit vent. This alarm setpoint is dictated by plant safety considerations and is more conservative than off-site dose criteria. The flow (dry gas) through this exhaust is only about 2 (cubic meters/minute) and hence would not contribute significantly to the off-site dose unless the concentration of noble gas was exceedingly high, higher in fact than levels HL&P would permit to be exhausted onto the top level of the turbine building. The setpoint for this detector is adjusted to assure the safety of plant personnel if exhausts to the TGB roof. Any releases from this exhaust whether routed to the unit vent or not will be included in monthly off-site dose calculations and will be reported in conformance with Regulatory Guide 1.21.

The other potential release is through the main atmospheric steam dumps which may release activity contained in the secondary coolant following turbine trips at greater than 50% power. These events are not frequent and the radiation monitoring system is not capable of accurately measuring this type of release. The Semiannual Effluent Release Report will contain estimates for such releases based on the measured nuclide concentrations in the secondary coolant and the estimated mass of coolant vented. For example:

release of nuclide "i" = Flowrate \* Time \* Concentration

where Flowrate = estimated steam vent rate, lbs/sec

Time = duration of release, sec

Concentration = concentration of nuclide "i", uCi/lbs.

Plant operation with the RT8010B alarm set using the methods of this section and with the 500 hour X/Q shall demonstrate that the off-site dose rate does not exceed the Control 3/4.11.2.1 limits. If an unusual operating situation arises such that the release rate approaches or exceeds the RT8010B alarm setpoint, the actual dose rate shall be calculated using actual meteorological and release data with the methods of ODCM Part B, Section 4.3. The real time dose rate may be used to demonstrate compliance with Control 3.11.2.1.

Table B3-1: Liquid Release Detector, RD-53, Response to  
1 uCi/ml of Each Nuclide

<u>Nuclide</u> <u>(uCi/ml)</u>	<u>Count Rate</u> <u>Response (Er)</u> <u>(cpm)/(uCi/ml)</u>
Be-7	1.50E+07
Sc-46	2.74E+08
Cr-51	1.45E+07
Mn-54	1.40E+08
Co-57	9.78E+07
Co-58	1.83E+08
Fe-59	1.38E+08
Co-60	2.65E+08
Zn-65	7.26E+07
Kr-85	6.24E+07
Kr-85m	1.07E+08
Rb-86	1.18E+07
Kr-87	8.86E+07
Kr-88	8.49E+07
Sr-91	1.90E+08
Zr-95	1.40E+08
Nb-95	1.40E+08
Zr-97	1.64E+08
Nb-97	1.42E+08
Mo-99	2.74E+08
Tc-99m	9.82E+07
Ag-110m	4.38E+08
Sn-113	9.86E+07
Sb-122	1.09E+08
Sb-124	2.49E+08
Sb-125	1.21E+08
Te-129m	4.12E+06
I-130	4.72E+08
Xe-131m	2.35E+06
I-131	1.43E+08
Te-131m	2.48E+08
Te-132	1.19E+08
Xe-133	0
Xe-133m	1.41E+07
I-133	1.45E+08
Cs-134	3.17E+08
Xe-135	1.31E+08
Xe-135m	1.16E+08
I-135	1.79E+08
Cs-136	3.90E+08
Cs-137	1.71E+08
Xe-138	1.24E+08
Ba-140	4.65E+07
La-140	2.74E+08
Ce-144	1.13E+07
Hf-181	2.00E+08
W-187	1.11E+08

Table B3-1: Liquid Release Detector, RD-53, Response to  
1 uCi/ml of Each Nuclide  
(Continued)

The response of the RD-53 detectors to different radionuclides can be estimated using the gamma emissions from each radionuclide and the monitor's most recent calibration data (detection efficiencies used in this example are from Figure B2-5). The estimated response values listed above were estimated as shown below:

$$Er = \frac{\text{detected cpm}}{\text{uCi/ml of nuclide}} = \text{Eff}_1 * n_1 + \text{Eff}_2 * n_2 + \dots + \text{Eff}_i * n_i$$

where  $\text{Eff}_i$  = gamma detection efficiency for each gamma of energy class "i" from Figure B2-5 (cpm)/(uCi/ml),

$n_i$  = frequency of gamma energy class "i" emission per decay.

Pure beta emitters and alpha emitters produce zero response on this instrument. Gamma emitters with energies less than 100 KeV should produce little or no response on this monitor.

Example Calculations for Entrained Noble Gases

Nuclide	Gamma Energy (keV)	Detection Efficiency (cpm)/(uCi/ml)	Gamma Fraction	Er (cpm)/(uCi/ml)
Kr-85m	151	$1.15 \times 10^8$	0.755	8.68+07
	304	$1.46 \times 10^8$	0.140	<u>2.04E+07</u>
Total =				1.07E+08
Xe-131m	164	$1.20 \times 10^8$	0.0196	2.35E+06
Xe-133	81	0	0.371	0
Xe-133m	233	$1.37 \times 10^8$	0.103	1.61E+07
Xe-135	250	$1.40 \times 10^8$	0.903	1.264E+08
	608	$1.44 \times 10^8$	0.0291	<u>4.2E+06</u>
Total =				1.31E+08
Xe-135m	527	$1.45 \times 10^8$	0.800	1.16E+08

Table B3-2: Noble Gas Detector, RD-52, Response to 1 uCi/cc of Each Nuclide

Nuclide	Count Rate Response (E)	Indicated Response (Re)
	$\frac{\text{cpm}}{\text{uCi/cc}}$	$\frac{\text{uCi/cc (Xe-133 Equivalent)}}{\text{uCi/cc}}$
Ar-41	9.4E+07	2.6
Kr-85m	6.9E+07	1.9
Kr-85	8.55E+07	2.4
Kr-87	9.9E+07	2.8
Kr-88	8.3E+07	2.3
Kr-89	1.0E+08	2.8
Kr-90	1.0E+08	2.8
Xe-131m	5.5E+05	0.015
Xe-133m	4.8E+06	0.14
Xe-133	3.55E+07	1.0
Xe-135m	1.5E+07	0.42
Xe-135	8.9E+07	2.5
Xe-137	1.0E+08	2.8
Xe-138	1.0E+08	2.8

The RD-52 beta radiation detectors are used in the RT8010B gaseous radioactive effluent discharge monitor. The response of the detector to different radionuclides can be estimated using the beta emissions from each radionuclide and the monitor's most recent calibration (beta detection efficiencies used in this example are from Figure B2-3). The response values in the column labeled "Count Rate Response (E)" were calculated as shown below:

$$E = \text{detector cpm}/(\text{uCi/cc}) = \text{Eff}_1 * n_1 + \text{Eff}_2 * n_2 + \dots + \text{Eff}_i * n_i$$

where  $\text{Eff}_i$  = beta detection efficiency each beta of energy class "i" from Figure B2-3 (cpm per uCi/cc),

$n_i$  = frequency of beta energy class "i" emission per decay.

The efficiency of detection factor relative to Xe-133,  $\text{Re}$ , may be calculated from the above efficiency as follows:

$$\text{Re} = E / \frac{\text{cpm}}{\text{uCi/cc}} \text{ of reference nuclide}$$

The reference nuclide is the radionuclide with which the detector was calibrated and the one for which 1 uCi/cc indicated by the monitor actually corresponds to 1 uCi/cc in the sample line. Most other radionuclides will only approximately reflect a 1 uCi/cc monitor response when 1 uCi/cc is in the sample line. Thus, the "Indicated Detector Response (Re)" column shows how well the RT8010B monitor estimates the concentrations of each radionuclide potentially in the gaseous effluent stream.



Example Calculations for Noble Gas Releases

<u>Nuclide</u>	<u>Beta Energy max (keV)</u>	<u>Detection Efficiency (cpm)/(uCi/ml)</u>	<u>Beta Fraction</u>	<u>E (cpm)/(uCi/cc)</u>
Ar-41	1200	9.4E+07	1.00	9.4E+07
Kr-85m	820	8.8E+07	0.78	6.9E+07
Kr-85	670	8.55E+07	1.00	8.55E+07
Kr-87	3800	1.0E+08	0.73	7.3E+07
	1300	9.6E+07	0.27	<u>2.6E+07</u> 9.9E+07
Kr-88	2800	1.0E+08	0.20	2.0E+07
	900	9.0E+07	0.12	1.1E+07
	520	7.6E+07	0.68	<u>5.2E+07</u> 8.3E+07
Kr-89	4000	1.0E+08	1.00	1.0E+08
Kr-90	2800	1.0E+08	1.00	1.0E+08
Xe-131m	130	0.0E+00	0.58	0.0E+00
	160	1.3E+06	0.42	<u>5.5E+05</u> 5.5E+05
Xe-133m	200	4.2E+06	0.62	2.6E+06
	230	7.8E+06	0.28	<u>2.2E+06</u> 4.8E+06
Xe-133	350	3.55E+07	1.00	3.55E+07
Xe-135m	500	7.3E+07	0.20	1.5E+07
Xe-135	910	9.0E+07	0.97	8.7E+07
	550	7.8E+07	0.03	<u>2.3E+06</u> 8.9E+07
Xe-137	4000	1.0E+08	0.67	6.7E+07
	3600	1.0E+08	0.33	<u>3.3E+07</u> 1.0E+08
Xe-138	2400	1.0E+08	1.00	1.0E+08



Example Calculations for Noble Gas Releases

<u>Nuclide</u>	<u>Detection Efficiency (cpm)/(uCi/cc)</u>	<u>Reference Nuclide (cpm)/(uCi/cc)</u>	<u>Re uCi/cc Xe-133/cpm uCi/cc/cpm</u>
Ar-41	9.4E+07	3.55E+07	2.6
Kr-85m	6.9E+07	"	1.9
Kr-85	8.55E+07	"	2.4
Kr-87	9.9E+07	"	2.8
Kr-88	8.3E+07	"	2.3
Kr-89	1.0E+08	"	2.8
Kr-90	1.0E+08	"	2.8
Xe-131m	5.5E+05	"	0.015
Xe-133m	4.8E+06	"	0.14
Xe-133	3.55E+07	"	1.0
Xe-135m	1.5E+07	"	0.42
Xe-135	8.9E+07	"	2.5
Xe-137	1.0E+08	"	2.8
Xe-138	1.0E+08	"	2.8

Table B3-3: Noble Gas Detector, RD-52, Response to Single Nuclide

Nuclide	Limiting Stack Concentration		Limiting Count Rate (cpm)	Indicated Response (uCi/cc Xe-133)
	Whole Body (uCi/cc)	Skin (uCi/cc)		
Ar-41	1.14E-04	4.63E-04	1.1E+04	3.0E-04
Kr-85m	8.59E-04	2.13E-03	5.9E+04	1.7E-03
Kr-85	6.24E-02	4.44E-03	3.8E+05	1.1E-02
Kr-87	1.70E-04	3.64E-04	1.2E+04	4.7E-04
Kr-88	6.84E-05	3.13E-04	5.7E+03	1.6E-04
Kr-89	6.05E-05	2.06E-04	6.1E+03	1.7E-04
Kr-90	6.44E-05	2.38E-04	6.4E+03	1.8E-04
Xe-131m	1.10E-02	9.29E-03	5.1E+03	1.9E-04
Xe-133m	4.00E-03	4.44E-03	1.9E+04	5.6E-04
Xe-133	3.42E-03	8.64E-03	1.2E+05	3.4E-03
Xe-135m	3.22E-04	1.36E-03	4.8E+03	1.4E-04
Xe-135	5.55E-04	1.51E-03	4.9E+04	1.4E-03
Xe-137	7.08E-04	4.35E-04	4.4E+04	1.2E-03
Xe-138	1.14E-04	4.20E-04	1.1E+04	3.2E-04

NOTE: The limiting stack concentrations for whole body and skin listed above were calculated using Equations 3.2c and 3.2d. The limiting count rate and indicated response are calculated using the more restrictive limiting stack concentration as shown below:

$$\text{Limiting Count Rate} = \text{Stack Concentration} * E$$

$$\text{Indicated Response} = \text{Stack Concentration} * Re$$

#### 4.0 Off-site Dose Calculations

##### 4.1 Liquid Releases

###### 4.1.1 Control Requirements

Control 3.11.1.2 of Part A of the ODCM requires that cumulative dose contribution estimates be calculated once every 31 days. The cumulative dose contributions should consider the dose or dose commitment to a MEMBER OF THE PUBLIC from radionuclides in liquid effluent releases. Such releases are limited to ensure that projected doses from each unit are:

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

If the above dose guides are not met, a report must be filed with the NRC Region IV office as required by 10CFR50, Appendix I.

###### 4.1.2 Implementation of Control 3.11.1.2

In order to satisfy the requirements of Control 3.11.1.2, the individuals who suffer the maximum total body and organ doses due to liquid effluent releases are identified. The appropriate total body and organ doses, Dose(a,j), are calculated once a month for fish ingestion and shoreline exposure for each potentially exposed individual (Little Robbins area, Colorado River, and Matagorda Bay/Gulf). These doses are summed for both pathways at each location and compared with the limits of Control 3.11.1.2.

$$\text{Dose}(a,j) = \sum_{\text{path } i} \sum Q(i) * R(a,i,j)_{\text{pathway}} \text{ (mrem)} \quad \text{Eq. 4.1a}$$

where  $Q_i$  and  $R(a,i,j)$  are described in Table B4-2 and where the values for  $R(a,i,j)$  are taken from Table B4-7.

##### 4.2 Liquid Exposure Dose Model

###### 4.2.1 Pathways for Radionuclide Ingestion by Man

Radionuclides which have been released from either unit, mix with the water of the reservoir. These nuclides are expected to be further diluted into the Colorado River with blowdown operations or releases via the spillway overflow (following unusually heavy rains). Water containing trace amounts of radionuclides may diffuse through the bottom of the reservoir and become mixed with shallow ground water. Hydraulic relief wells about the reservoir perimeter may include in their discharge some of this diluted radionuclide-bearing water. These discharges enter the Colorado River, the West Branch Colorado River, and Little Robbins Slough (composed of both branches of Little Robbins Slough; sometimes called West Little Robbins Slough and East Fork Little Robbins Slough). These streams discharge into Matagorda Bay.

4.2.1.1 Colorado River Environment The Colorado River is used primarily for sport fishing and occasionally for barge traffic. No municipal water supplies lie downstream from the plant discharge structure and none are likely to be developed because of the high salt content of the river in this area. A few water use permits allow irrigation of crop land with water taken downstream from the plant, but these permits are seldom (if ever) exercised.

STPEGS possesses Environmental Protection Agency and Texas Department of Water Resources permits which allow the plant to discharge cooling reservoir water only if the river flow exceeds 800 cfs. The average flow rate of the Colorado is about 600 cfs which means blowdown can only occur in rainy periods when river flow is higher than 800 cfs (about 40% of the time). Because such planned discharges and any unplanned spillway releases are likely to occur only during rainy periods, no irrigation is likely with water bearing plant-released radionuclides even if the other water use permits were active. Therefore, no individual or population dose estimates are made on the basis of irrigation with surface water containing radionuclides originating from STPEGS reservoir releases.

The only credible pathway available for internal exposure is the consumption of sea trout, red drum, flounder, catfish, crabs, and shrimp taken from the river by sports fishermen.

Since two small communities are built on the river, one near the discharge facility (Selkirk Island) and the other about seven miles downstream (Matagorda), external exposure is also possible due to shoreline deposits. A number of recreational cabins and trailers also line the east shore of the river south of Matagorda to the Gulf of Mexico (see Figures B4-1 and B4-2).

4.2.1.2 Little Robbins Slough Environment Little Robbins Slough drains through a marsh accessible to local land owners only. Freshwater fish may be taken from ponds in this area for sport. However, the annual take is normally small and limited to a few families. Also, some cattle graze in areas where water from Little Robbins Slough might be ingested, and the meat from such animals might be eaten by the land owner or others in the local community. No firm data regarding average annual consumption are available.

4.2.1.3 Matagorda Bay and the Gulf of Mexico The Colorado River, West Branch Colorado, Little Robbins Slough, and the East Fork Little Robbins Slough all discharge into Matagorda Bay which connects to the Gulf of Mexico as shown in Figure B4-1. Because these bodies of water are connected by natural and man-made channels and the resulting circulation patterns are unknown, no mixing models are available to predict concentrations. However, the average flows of these discharges into Matagorda Bay are small compared with the volume of Matagorda Bay water moved to the Gulf of Mexico by tide action. The Matagorda Bay concentration of radionuclides determines the doses due to saltwater pathways and may be assumed to be determined by the ratio of the activity reaching the bay each day and the volume of water moved by tide action (193,820 acre-ft/day).

Internal dose from nuclides reaching Matagorda Bay, or the Gulf of Mexico is due to the consumption of sea trout, red drum, and flounder by sports fishermen, and crabs, shrimp, and oysters taken both commercially and by sportsmen.

Since the town of Palacios is built on the shores of Matagorda Bay, external exposure due to shoreline deposits is possible.

#### 4.2.2 Model for Reservoir Related Radionuclide Decay and Release Off-site

A generally conservative calculation of the off-site dose is accomplished using off-site liquid effluent releases estimated according to the method described in this section.

Table B4-1 lists fractions as calculated by this method for each radionuclide anticipated to be released to the reservoir. These fractions represent the portion of a particular liquid effluent release from the plant which will eventually leave the site. These fractions are different for each release route from the reservoir and consist of the product of the variable "Floss" and one or more of the variables "fc, fwc, flrs, and felrs" as described below.

##### 4.2.2.1 Development of Annual Average Liquid Off-site Release Estimates Based on Releases to the Reservoir

###### Assumptions:

1. The reservoir is always well mixed.
2. Nuclides released to the reservoir decay for 14 days before becoming available for transport out of the reservoir (transport time to the blow down structure with both units at full power).
3. Releases to the reservoir approximate a continuous release.
4. This model assumes that only 5% of the radioactive materials (100% of tritium) released to the reservoir remain in solution.  
REFERENCE: EPRI STPEGS MCR Bottom Sediment Characterization Study, 1991, by Richard E. Lockwood (HL&P) and David R. Blankinship (Texas A&M University).
5. The reservoir volume is fixed at 150,000 AF.
6. The seepage rate is 5700 AF/y to the shallow aquifer.
7. The evaporation rate is 38,592 AF/y.
8. The blowdown rate is 3400 AF/y to the Colorado River.
9. Relief well flow to the Colorado River is 1027 AF/y.
10. Relief well flow to the W. Branch Colorado River is 174 AF/y.
11. Relief well flow to the Little Robbins Slough is 2210 AF/y.
12. Relief well flow to E. Fork Little Robbins Slough is 494 AF/y.

NOTE: Data for items 9, 10, 11, and 12 are from a memo from K. R. Cope to G. E. Williams (October 15, 1992).

##### 4.2.2.2 Liquid Off-site Effluent Release Estimates for Nonvolatile Radionuclides (Evaporation of Tritium and Water Omitted)

Y = loss rate due to seepage and blowdown  
= 9100 AF/y per 150,000 AF = 6.067E-2 per year  
= 1.662E-4 per day

Yr = loss rate due to radioactive decay  
= 0.693/(nuclide half-life in days)

fc = fraction of loss reaching the Colorado River  
= (1027 AF/y + 3400 AF/y) per 9100 AF/y \* 0.05 fraction in water  
= 2.432E-2

fwc = fraction of loss reaching the W. Branch Colorado  
= 174 AF/y per 9100 AF/y \* 0.05 fraction in water = 9.560E-4

flrs = fraction of loss reaching the Little Robbins Slough  
= 2210 AF/y per 9100 AF/y \* 0.05 fraction in water = 1.214E-2

felrs = fraction of loss reaching the E. Fork of Little Robbins Slough  
= 494 AF/y per 9100 AF/y \* 0.05 fraction in water = 2.714E-3

Floss = fraction of activity which eventually leaves STPEGS following  
release to the reservoir  
=  $\frac{Y}{Y + Yr} * \text{EXP}[-Yr*14]$  (See Appendix to Part B, Section 4)

Ai = activity discharged to the reservoir by nuclide in a given  
release (Ci)

Qc, Qwc, Qlrs, Qelrs = releases at each discharge point from STPEGS by  
nuclide (less 14 days of decay, Ci)

Colorado River: Qc = Ai \* fc \* Floss  
W. Branch Colorado: Qwc = Ai \* fwc \* Floss  
Little Robbins Slough: Qlrs = Ai \* flrs \* Floss  
E. Fork Little Robbins Slough: Qelrs = Ai \* felrs \* Floss

#### 4.2.2.3 Tritium Off-site Releases in Liquid Effluents (Evaporative Losses Included)

Y = 47,690 AF/y per 150,000 AF = 0.3180 per year  
= 8.712E-04 per day

Yr = 0.693/4506 days = 1.54E-04 per day

fc = (1027 AF/y + 3400 AF/y) per 47,690 AF/y = 9.283E-2

fwc = 174 AF/y per 47,690 AF/y = 3.649E-3

flrs = 2210 AF/y per 47,690 AF/y = 4.634E-2

felrs = 494 AF/y per 47,690 AF/y = 1.036E-2

Floss = 8.712E-04 / (8.712E-04 + 1.54E-04) = 0.8498



Ai = tritium activity released to the reservoir

Qc, Qwc, etc. = calculated as previously described

#### 4.2.3 Off-site Doses from Liquid Effluents

Liquid pathway doses are calculated using the total integrated nuclide releases (Qc, Qwc, etc.). These releases are diluted into the annual average flow of the receiving body of water. Resulting doses will generally overestimate the true off-site values since the activity would normally leave STPEGS over several years and hence would be diluted by substantially more than one year's flow volume once off-site. For example, 50% of the activity contained in the reservoir water is released approximately every 11 years (evaporation excluded); hence, no more than 5.9% of a very long-lived nuclide would leave the site via liquid pathways in any one year. Nevertheless, the projected dose for each release is estimated based upon the assumption that all the activity destined to leave the reservoir does so in the current year. These doses are summed to calculate the month's contribution to the committed dose to the MEMBER OF THE PUBLIC suffering the greatest dose due to liquid releases. This individual's dose is determined by the consumption of fish and marine invertebrates plus shoreline exposure along the Colorado River, Matagorda Bay or the Little Robbins Slough as calculated below.

4.2.3.1 Fish Ingestion Pathway The pathway dose factors for an individual who ingests saltwater fish, crabs, and shrimp from the Colorado River, Matagorda Bay, or freshwater fish from the Little Robbins Slough area are calculated using Equation 4.2a where the parameter descriptions are in Table B4-2 and the parameter values are as listed in Table B4-3. The resulting pathway dose factors are tabulated in Table B4-7.

$$R(a,i,j)_{\text{pathway}} = 1100 * \frac{U}{M*F} * \sum_i N(i)*B(i) * D(a,i,j) * \text{Exp}[-Y(i)*T] \quad \text{Eq. 4.2a} \\ \text{(mrem/Ci)}$$

4.2.3.2 Shoreline Deposition Pathway Individuals who live in the area could be exposed to accumulations of contaminated silt deposited along the Colorado River bank, along Little Robbins Slough, or on the shores of Matagorda Bay. The pathway dose factors from these potential shoreline deposits are calculated using Equation 4.2b with the parameters described in Table B4-2 and with values as listed in Table B4-3. The resulting pathway dose factors are compiled in Table B4-7.

$$R(a,i,j)_{\text{shore exposure}} = 110,000 * \frac{U_b*W}{M*F} * \sum_i N(i) * T(i) * D(a,i,j) \\ * \text{Exp}[-Y(i)*T] * (1 - \text{Exp}[-Y(i)*T_b]) \quad \text{(mrem/Ci)} \quad \text{Eq. 4.2b}$$

### 4.3 Gaseous Releases

#### 4.3.1 Control Requirements

Control 3.11.2.1 of Part A of the ODCM requires that the instantaneous dose rate in unrestricted areas due to radioactive materials released in gaseous effluents from the site be limited to the following values:



- a. The dose rate limit for noble gases must be less than 500 mrem/yr to the total body and less than 3000 mrem/yr to the skin, and
- b. The dose rate limit for all radionuclides other than noble gases with half-lives greater than 8 days be less than 1500 mrem/yr to any organ.

These requirements stem from the NRC desire for nuclear power plants to operate at a small fraction of the radiological protection limits of 10CFR20.

Control 3.11.2.2 of Part A of the ODCM also requires that the air dose in areas at or beyond the site boundary due to noble gases released in gaseous effluents shall be limited to the following:

- a. During any calendar quarter to less than or equal to 5 mrad for gamma radiation and 10 mrad for beta radiation, and
- b. During any calendar year to less than or equal to 10 mrad for gamma radiation and 20 mrad for beta radiation.

Control 3.11.2.3 further limits the dose to a MEMBER OF THE PUBLIC from I-131, I-133, tritium, and radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released to areas at or beyond the site boundary as follows:

- a. During any calendar quarter to less than or equal to 7.5 mrems to any organ, and
- b. During any calendar year to less than or equal to 15 mrems to any organ.

These last two requirements stem from HL&P's commitment to operate STPEGS within the guidelines described in 10CFR50, Appendix I, for maintaining doses to the public as low as reasonably achievable.

#### 4.3.2 Implementation of Control 3.11.2.1

4.3.2.1 Noble Gases All gaseous effluent releases from STPEGS are assumed to be ground level due to the proximity of each unit's vent to the roof. For the purpose of demonstrating that off-site dose rates have not exceeded the dose rate limits of this Control, the atmospheric dispersion factor, X/Q, may be assumed to be  $5.3E-06$  sec/cubic meter. This represents the 500 hour average X/Q at the site boundary and occurs in the NNW sector. When possible, actual hourly X/Q values coupled with hourly release data are used in place of composite release data and historical average X/Qs.

The hourly average dose rate to the whole body due to noble gas releases may be estimated using Equation 4.4d.

The hourly average dose rate to the skin due to noble gas releases may be estimated using Equation 4.4e of this section provided the shielding factor, Sf, equals 1.0 for the purpose of determining compliance with Control 3.11.2.1. If release data such as 1 minute, 15 minutes, or peak value following an alarm are available, this data should be used with the actual hourly average X/Q to evaluate compliance with Control 3.11.2.1.

4.3.2.2 Iodine and Particulates The maximum dose rate to the critical organ, j, in the critical age group, a, due to particulate releases may be estimated as follows:

$$\begin{aligned} \text{Dose rate}(a,j) = & X/Q * \sum_i R(a,i,j)_{\text{inhalation}} * Q(i) \\ & + D/Q * \sum_i \sum_{\text{path}} (R(a,i,j)_{\text{pathway}}) * Q(i) \quad (\text{mrem/hr}) \end{aligned} \quad \text{Eq. 4.3a}$$

where  $Q(i)$  = release rate of nuclide "i" (Ci/hr),

$X/Q$  =  $5.3E-06$  (sec/m<sup>3</sup>) (or actual estimate of X/Q for H3 and C14 or depleted X/Q for particulates and iodines at the time of release),

$D/Q$  =  $8.4E-09$  (1 /m<sup>2</sup>) (or actual estimate of D/Q at the exposure location),

$R(a,i,j)_{\text{pathway}}$  = pathway dose factors from Table B4-7 (mrem-m<sup>3</sup>/Ci-sec).

The highest organ dose so calculated may be used for demonstrating compliance with Control 3.11.2.1. However, only pathways confirmed by the land use census need be considered (e.g. cow-milk-infant pathway need not be considered in the absence of the cow).

#### 4.3.3 Implementation of Control 3.11.2.2

NUREG-0133 allows HL&P to use the highest calculated annual average X/Q for STPEGS to calculate doses for comparison with the quarterly and annual dose limits. However, NUREG-0133 recommends the use of the highest 500-hour average X/Q for doses due to short-term releases. HL&P normally has available hourly average X/Q values for each sector plus time-dated release information. When possible, these hourly X/Q values coupled with hourly release data are used in place of composite release data and historical average X/Qs.

The historical dispersion values which may be used for calculations in place of historical averages are:

annual average releases =  $1.1E-06$  (seconds per cubic meter)

500 hour or shorter releases =  $5.3E-06$  (seconds per cubic meter)

4.3.3.1 Noble Gases The noble gas releases averaged over a calendar quarter or a calendar year result in a dose to air at the site boundary as calculated using Equations 4.4f for gamma radiation and Equation 4.4h for beta radiation.

#### 4.3.4 Implementation of Control 3.11.2.3

4.3.4.1 Iodines, Tritium, and Particulates The dose to a MEMBER OF THE PUBLIC stationed at or beyond the site boundary (Table B4-6) due to radioiodine and particulate releases is estimated using Equation 4.4i and the appropriate pathway dose factor from Table B4-7. The historical dispersion values (X/Q and depleted X/Q) may be used in place of actual data if necessary as described in part 4.3.3 above.

#### 4.4 Gaseous Dose Models and Dose Formulas

##### 4.4.1 Dispersion Calculation Methods

If current meteorological data are used to estimate dispersion, X/Q, in place of the historical values, calculations for routine releases use the sector-average version of the equations for atmospheric relative concentration. These calculations are made in accordance with the methodology in NRC Regulatory Guide 1.111 and are all based on ground level releases.

4.4.1.1 X/Q Calculation The sector average X/Q for a given hour is calculated using:

$$X/Q = \frac{2.03}{U_{mn} * D_{xqc} * S_{mn}} \quad (\text{sec}/\text{m}^3) \quad \text{Eq. 4.4a}$$

where  $S_{mn} = [sz^2 + (H_{con}^2/2*\pi)]^{1/2}$

or  $S_{mn} = sz * (3)^{1/2}$ ; whichever is less;

and  $H_{con}$  = building height (meters),

$sz$  = vertical dispersion coefficient (meters),

$S_{mn}$  = dispersion coefficient with building wake factor included (meters)

$D_{xqc}$  = downwind distance to the receptor (meters),

$U_{mn}$  = hourly average wind speed (meters/second),

2.03 =  $(2/\pi)^{1/2}$  divided by the sector width in radians,  $(2*\pi/16)$ .

where  $\pi = 3.14$

4.4.1.2 Depleted X/Q Calculation X/Q values are used in conjunction with tritium and noble gases released. However, the downwind concentrations for particulates and radioiodines will be affected by ground deposition. X/Q values used for calculating inhalation doses from particulates and radioiodines must be modified by the ground depletion factors of Table B4-4 (from Figure 2 of NRC Regulatory Guide 1.111).

$$(X/Q)_{\text{depl}} = (X/Q) * (\text{ground depletion factor}) \quad (\text{sec}/\text{m}^3) \quad \text{Eq. 4.4b}$$

4.4.1.3 Ground Deposition Ground deposition is calculated using the deposition factors of Table B4-4 (also from Regulatory Guide 1.111, Figures 6-9).

$$(D/Q) = \frac{(\text{deposition factor})}{D_{xqc} * 0.3927} \quad (1/\text{m}^2) \quad \text{Eq. 4.4c}$$

where 0.3927 = radians in one sector or  $(2 * \pi)/16$ ,  
 $D_{xqc}$  = down wind distance (meters).

Deposition calculated by multiplying this term, D/Q, by the release rate, Q, will yield values independent of atmospheric stability as indicated in NRC Regulatory Guide 1.111.

#### 4.4.2 Submersion Dose From Noble Gases

The methods used to estimate doses due to noble gases are those of Regulatory Guide 1.109. The whole body and skin doses from submersion in a cloud of noble gas may be calculated by multiplying the appropriate dose factor for the plume pathway from Table B4-7 by the dispersion, X/Q. An equivalent calculation can be accomplished using the formulas described in the following three subsections:

##### 4.4.2.1 Whole Body Dose Rate

$$Dr_{\text{gamma}} = 0.114 * X/Q * \sum_i (Q_i * Dfi_{\text{gamma}}) * S_f \quad (\text{rem/hr}) \quad \text{Eq. 4.4d}$$

where 0.114 = conversion factor from (mrem-m<sup>3</sup>)/(pCi-yr) to (rem-m<sup>3</sup>)/(uCi-hr)

X/Q = from Equation 4.4a (sec/m<sup>3</sup>)

Q<sub>i</sub> = isotope "i" release rate (uCi/sec) from monitors #RT-8010B and #RT-8027

Dfi = gamma dose to tissue conversion factor for nuclide gamma "i" from Table B-1 of Regulatory Guide 1.109 (mrem-m<sup>3</sup>/pCi-yr)

S<sub>f</sub> = shielding factor (0.7)

4.4.2.2 Skin Dose Rate from Noble Gases Skin dose rate is calculated based on both the beta emissions and gammas coming from the noble gas cloud surrounding the receptor.

$$Dr_{\text{skin}} = 1.11 * S_f * Dr_{\text{gamma(air)}} + Dr_{\text{beta(skin)}} \quad (\text{rem})/h \quad \text{Eq. 4.4e}$$

$$\text{where } Dr_{\text{gamma(air)}} = 0.114 * X/Q * \sum_i Q_i * Dfi_{\text{gamma(air)}} \quad (\text{rad})/h \quad \text{Eq. 4.4f}$$

$$\text{and } Dr_{\text{beta(skin)}} = 0.114 * X/Q * \sum_i Q_i * Dfi_{\text{beta(skin)}} \quad (\text{rem})/h \quad \text{Eq. 4.4g}$$

S<sub>f</sub> = shielding factor = .7

Dfi<sub>beta(skin)</sub> = beta dose to tissue conversion factor from Table B-1, Regulatory Guide 1.109 (mrem-m<sup>3</sup>/pCi-yr),

Dfi<sub>gamma(air)</sub> = gamma dose to air conversion factor from Table B-1, Regulatory Guide 1.109 (mrad-m<sup>3</sup>/pCi-yr),

1.11 = ratio of the mass stopping powers for electrons in air to tissue.

The gamma dose rate to air is calculated here as an intermediate step in calculating the total dose rate to skin from noble gases. However, this gamma dose rate to air value,  $D_r \text{ gamma}(\text{air})$  from Equation 4.4f may be used to demonstrate compliance with the first part of Control 3.11.2.2 if multiplied by the release duration in hours.

4.4.2.3 Beta Dose to Air from Noble Gases Beta dose to air at the site boundary is a required dose calculation in Control 3.11.2.2 and is calculated as indicated below:

$$D_{\text{beta}(\text{air})} = 0.114 * X/Q * \sum_i Q_i * D_{fi_{\text{beta}(\text{air})}} * T \quad (\text{rad}) \quad \text{Eq. 4.4h}$$

where  $D_{fi_{\text{beta}(\text{air})}}$  = beta dose to air conversion factor from Table B-1, Regulatory Guide 1.109 (mrad-m<sup>3</sup>/pCi-yr),

0.114 = conversion factor from (mrad-m<sup>3</sup>/pCi-yr) to (rad-m<sup>3</sup>/uCi-hr),

X/Q = from Equation 4.4a (sec/m<sup>3</sup>),

$Q_i$  = isotope "i" release rate (uCi/sec) from monitors #RT-8010B and #RT-8027.

T = release duration (hours)

#### 4.4.3 Dose Due to Deposited and Inhaled Radionuclides

The dose delivered to the individual with the highest potential exposure due to airborne radioactive particles is calculated in accordance with NRC Regulatory Guide 1.109. The dose by ingestion pathways is the product of the ground deposition, D/Q, from Equation 4.4c and the pathway dose factor for the appropriate organ and nuclide from Table B4-7 as follows:

$$\text{Dose}_{(\text{pathway})} = (D/Q) * \sum_i Q_i * R(a,i,j) \quad (\text{mrem}) \quad \text{Eq. 4.4i}$$

where  $Q_i$  = integrated release of nuclide "i" stored by plant computer from monitors #RT-8010B and #RT-8027 (Ci),

D/Q = ground deposition (1/m<sup>2</sup>),

R(a,i,j) = age, nuclide, and organ specific dose factor for a given pathway (mrem-m<sup>2</sup>/Ci).

The ground deposition is calculated at the site boundary in each of the 16 wind direction sectors. However, since some cattle may graze on-site outside the exclusion area, the meat pathway doses are calculated at the exclusion area fence or the reservoir embankment whichever is further from the units.

For inhalation of particles, the depleted X/Q from Equation 4.4b is substituted for D/Q in Equation 4.4i. For both ingestion and inhalation of H-3 and C-14, X/Q from Equation 4.4a is substituted for D/Q in Equation 4.4i.

The exposure pathway dependent dose factors, R(a,i,j), of Table B4-7 were generated using a code similar to NRC's GASPAR routine as described in NUREG-0597. These dose factors were calculated for the pathways, organs, and age groups below:

<u>Pathways</u>	<u>Organs</u>	<u>Age Groups</u>
inhalation	total body	infant
meat ingestion	G.I. tract	child
milk ingestion	bone	teen
vegetation ingestion	liver	adult
ground shine	kidney	
	thyroid	
	lung	
	skin	

These or similarly calculated dose factors may be used in all dose calculations referencing Table B4-7.

#### 4.5 Control 3.11.1.3

The liquid waste processing system shall be operable and appropriate portions of the system shall be used to reduce releases of radioactivity when the projected doses due to the liquid effluent, from each unit, to unrestricted areas would exceed 0.06 mrem to the whole body or 0.2 mrem to any organ in a 31-day period.

Doses due to liquid effluent releases shall be estimated prior to release of each batch from the radioactive waste monitor tanks. The 31-day dose projection shall be calculated as shown below:

$$\text{31-day dose projection} = \frac{31}{\text{days}} * (\text{accumulated dose}) \quad \text{mrem} \quad \text{Eq. 4.5a}$$

where  $31 =$  days in the averaging period

$\text{days} =$  integer number of days into the quarter (greater than or equal to 1 but less than or equal to 92)

$\text{accumulated dose} =$  sum of doses from releases in the current quarter (mrem) and the projected release

Implementing procedures shall provide a suitable safety factor to assure that errors in a projected release are unlikely to result in exceeding the conditions of Control 3.11.1.3. Since this operating condition is applied to each unit separately, the safety factor need not consider concurrent releases from both units.

#### 4.6 Control 3.11.2.4



The gaseous waste processing system shall be operable and appropriate portions of this system shall be used to reduce releases of radioactivity when the projected doses in 31 days due to gaseous effluent releases from each unit to areas at or beyond the site boundary would exceed:

- 0.2 mrad to air from gamma radiation, or
- 0.4 mrad to air from beta radiation, or
- 0.3 mrem to any organ of a MEMBER OF THE PUBLIC.

Unit vent air samples are analyzed weekly for each unit. The average concentrations of the radionuclides so measured may be used to calculate the unit specific doses from releases that week. These average weekly doses plus doses from any special or batch releases during the week may be used in Eq. 4.5a to project the doses of Control 3.11.2.4 over the subsequent 31-day period. If an unusually large release is planned, add this projected dose to the average 31-day doses to confirm that the operating constraints of Control 3.11.2.4 are satisfied. These constraints pertain to each unit separately, and the dose projections from the two units need not be summed when determining operating constraints imposed by this Control. A suitable safety factor may be applied to the dose projections to provide for normal variations in the anticipated release rates as provided in implementing procedures.

#### 4.7 Control 3.11.4 Dose Calculations

If the annual dose or dose commitment to a MEMBER OF THE PUBLIC due to releases of liquid or gaseous effluents exceeds twice the limits of Controls 3.11.1.2.a, 3.11.1.2.b, 3.11.2.2.a, 3.11.2.2.b, 3.11.2.3.a, or 3.11.2.3.b, Control 3.11.4 requires that the total dose from the uranium fuel cycle be calculated.

Since no mining, milling, or waste disposal activities exist within 50 miles of STPEGS, only direct radiation from plant structures need be added to that calculated for effluents to obtain the total dose. Direct radiation from the plant and plant structures is estimated based on ambient radiation measurements made in the proximity of each potential source within a direct line of sight to the critical receptor location. TLD measurements within the protected area may provide the estimate of direct radiation following background subtraction. This measured dose rate may be adjusted to compensate for air attenuation and distance to the critical receptor location. The direct radiation dose shall be added to the doses previously calculated for radioactive effluents for comparison with the limits of 40CFR Part 190.

#### 4.8 Dose to MEMBERS OF THE PUBLIC On-Site

MEMBERS OF THE PUBLIC who visit STPEGS may be subject to direct radiation exposure at extremely low levels. MEMBERS OF THE PUBLIC are permitted within the site boundary while traveling along Farm to Market Highway #521. MEMBERS OF THE PUBLIC are also allowed access to the visitor's center which is within the site boundary on FM #521.

The design basis dose rate at the exterior walls of site structures is 0.5 mrem/hr and the highway and visitor's center are almost 1500 meters from the closest site structure containing radioactive materials. Therefore, the maximum dose rates to MEMBERS OF THE PUBLIC visiting the site would generally



not exceed 0.0005 mrem/hr of direct radiation. TLD measurements within the protected area may provide an estimate of the direct radiation to visitors following background subtraction. Nominal visits of a few hours duration to the visitor's center, or daily trips past the site on FM #521, or short (less than one hour) tours on-site would lead to an annual maximum dose to a MEMBER OF THE PUBLIC of less than 1 mrem/yr.

Examples:

The on-site exposure to a MEMBER OF THE PUBLIC who must drive past the plant twice a day (to work and home again) 250 days per year is calculated as follows:

$$0.0005 \frac{\text{mrem}}{\text{hr}} * 0.085 \frac{\text{hr}}{\text{trip}} * 2 \frac{\text{trips}}{\text{day}} * 250 \frac{\text{days}}{\text{yr}} = 0.02 \frac{\text{mrem}}{\text{yr}}$$

The dose to a MEMBER OF THE PUBLIC at the visitor's center is calculated as:

$$0.0005 \frac{\text{mrem}}{\text{hr}} * 2 \frac{\text{hr}}{\text{visit}} * 2 \frac{\text{visits}}{\text{yr}} = 0.002 \frac{\text{mrem}}{\text{yr}}$$

The maximum dose to a MEMBER OF THE PUBLIC touring the site is estimated as:

$$0.5 \frac{\text{mrem}}{\text{hr}} * 0.5 \frac{\text{hr}}{\text{tour}} * 2 \frac{\text{tours}}{\text{yr}} = 0.5 \frac{\text{mrem}}{\text{yr}}$$

#### 4.9 Population Dose Estimation

Doses to the population are calculated in a manner similar to that described for individuals with two exceptions. The dose factors are taken from Table B4-11, and the doses calculated for each population group are summed. The  $R(\text{all}, i, j)$  age adjusted dose factors for atmospheric pathways of Table B4-11 were calculated using the equations of Regulatory Guide 1.109 in the GASPAR code along with default consumption/use factors. The values for  $R(\text{all}, i, j)$  appearing in Table B4-11 for liquid releases are the age adjusted dose factors for the general population calculated as  $[0.71 * R(\text{adult}, i, j) + 0.11 * R(\text{teen}, i, j) + 0.18 * R(\text{child}, i, j)]$ .  $R(a, j, i)$  are calculated from Eq. 4.2a and Eq. 4.2b using data from Table B4.8.

Population doses due to liquid effluents are calculated in the manner of Equation 4.9a for each member of the population. The resulting organ doses are then multiplied by the number of individuals residing within 50 miles of STPEGS. If sufficient quantities of a particular food are produced within 50 miles of STPEGS to feed the 300,000 inhabitants of this region, the population for that pathway is reduced to the number who could consume the average amount of that food without exhausting the locally produced supply. For example, since only about 220,000 Kg of saltwater sport fish are taken in Matagorda Bay and the Colorado River each year, only 37,000 individuals may be assumed to consume  $5.9 \text{ Kg} = (0.71 * 6.9 + 0.11 * 5.2 + 0.18 * 2.2)$  per year of fish each to account for this mass. In order to account for recreation on both the Colorado River and Matagorda Bay, half the population is assumed to use each of these waters. All crustaceans ( $8.9 \text{ E}+06 \text{ Kg}$ ) per year are assumed to be taken from Matagorda Bay.

Equation 4.9a:

$$\text{pop. dose}_{\text{liq}} = \sum_{\text{path}=\text{p}} \text{population}_p \sum_{\text{nuclide } i} Q(i) * R(\text{all}, i, j)$$

where

population = population within 50 miles exposed to each pathway, P  
 $Q(i)^P$  = release by nuclide, i (Ci)  
 R(all, i, j) = are taken from Table B4-11 for j=whole body or thyroid

Population doses due to gaseous effluents are calculated in a two step process. The population within 50 miles of STPEGS is listed by sector and distance in Table B4-10. The population dose is calculated by first calculating the X/Q, depleted X/Q, and D/Q for each distance and sector. The product of the dose factors from Table B4-11 and X/Q (for the plume pathway), depleted X/Q (for the particulate and iodine inhalation pathway), or D/Q (for the ingestion pathways) for a given distance/sector group gives the dose to each member of that group. The product of these doses by the number of individuals in the group gives the dose to each group. The sum over all groups within 50 miles gives the total population dose. Since Regulatory Guide 1.109 only addresses the total body and thyroid doses for the general population, only the population doses for these two organs are reported.

Equation 4.9b:

$$\text{pop. dose}_{\text{air}} = T * \sum_s \text{pop}(s) * [ X/Q(s) * \sum_i R(\text{all}, i, j)_{\text{plume}} * Q(i) + X/Q_d(s) * \sum_i R(\text{all}, i, j)_{\text{inhalation}} * Q(i) + D/Q(s) * \sum_i \sum_{\text{path}} R(\text{all}, i, j)_{\text{path}} * Q(i) ]$$

where

T = time period covered by the calculation (hours)  
 pop(s) = number of people in distance/sector group "s" from Table B4-10  
 X/Q(s) = X/Q for distance/sector "s" per Eq. 4.4a (sec/m<sup>3</sup>)  
 X/Q<sub>d</sub>(s) = depleted X/Q for distance/sector "s" per Eq. 4.4b (sec/m<sup>3</sup>)  
 Note: X/Q(s) substituted for X/Q<sub>d</sub>(s) for H-3 and C-14<sub>3</sub>  
 R(all, j, i) = dose factors from Table B4-11 for each pathway (mrem-m<sup>3</sup>/Ci-sec for plume and inhalation pathways; mrem-m<sup>2</sup>/Ci for all other pathways)  
 Q(i) = release rate of nuclide "i" (Ci/sec)  
 D/Q(s) = deposition for distance/sector "s" per Eq. 4.4c (1/m<sup>2</sup>)

Table B4-1: Radionuclide Fractions Leaving STPEGS Via Liquid Routes

<u>Nuclide</u>	<u>Half-life (days)</u>	<u>Colorado River</u>	<u>Matagorda Bay</u>	<u>Little Robbins Slough Area</u>
H3	4.51E+03	7.87E-02	1.30E-01	4.81E-02
C14	2.09E+06	2.43E-02	4.01E-02	1.48E-02
NA24	6.25E-01	6.61E-13	1.09E-12	4.04E-13
P32	1.43E+01	4.22E-05	6.96E-05	2.57E-05
CR51	2.78E+01	1.13E-04	1.87E-04	6.93E-05
MN54	3.13E+02	1.64E-03	2.71E-03	1.00E-03
MN56	1.07E-01	0.00E+00	0.00E+00	0.00E+00
FE55	9.86E+02	4.60E-03	7.60E-03	2.81E-03
FE59	4.46E+01	2.07E-04	3.42E-04	1.27E-04
CO58	7.08E+01	3.54E-04	5.84E-04	2.16E-04
CO60	1.93E+03	7.64E-03	1.26E-02	4.67E-03
NI63	3.50E+04	2.17E-02	3.59E-02	1.33E-02
NI65	1.05E-01	0.00E+00	0.00E+00	0.00E+00
CU64	5.29E-01	3.33E-14	5.49E-14	2.03E-14
ZN65	2.45E+02	1.30E-03	2.14E-03	7.92E-04
ZN69	3.96E-02	0.00E+00	0.00E+00	0.00E+00
BR83	9.96E-02	0.00E+00	0.00E+00	0.00E+00
BR84	2.20E-02	0.00E+00	0.00E+00	0.00E+00
BR85	1.99E-03	0.00E+00	0.00E+00	0.00E+00
RB86	1.86E+01	6.43E-05	1.06E-04	3.93E-05
RB88	1.23E-02	0.00E+00	0.00E+00	0.00E+00
RB89	1.05E-02	0.00E+00	0.00E+00	0.00E+00
SR89	5.06E+01	2.41E-04	3.97E-04	1.47E-04
SR90	1.04E+04	1.74E-02	2.86E-02	1.06E-02
SR91	3.96E-01	5.14E-17	8.48E-17	3.14E-17
SR92	1.13E-01	0.00E+00	0.00E+00	0.00E+00
Y90	2.67E+00	4.14E-07	6.83E-07	2.53E-07
Y91M	3.45E-02	0.00E+00	0.00E+00	0.00E+00
Y91	5.85E+01	2.85E-04	4.70E-04	1.74E-04
Y92	1.47E-01	0.00E+00	0.00E+00	0.00E+00
Y93	4.21E-01	2.40E-16	3.96E-16	1.46E-16
ZR95	6.40E+01	3.16E-04	5.22E-04	1.93E-04
ZR97	7.04E-01	4.27E-12	7.05E-12	2.61E-12
NB95	3.51E+01	1.54E-04	2.54E-04	9.42E-05
MO99	2.75E+00	4.71E-07	7.77E-07	2.88E-07
TC99M	2.51E-01	2.42E-23	4.00E-23	1.48E-23
TC101	9.86E-03	0.00E+00	0.00E+00	0.00E+00
RU103	3.93E+01	1.78E-04	2.93E-04	1.09E-04
RU105	1.85E-01	1.86E-29	2.99E-29	1.14E-29
RU106	3.68E+02	1.92E-03	3.17E-03	1.17E-03
AG110M	2.51E+02	1.33E-03	2.19E-03	8.12E-04
TE125M	5.80E+01	2.82E-04	4.66E-04	1.72E-04
TE127M	1.09E+02	5.67E-04	9.35E-04	3.46E-04
TE127	3.90E-01	3.50E-17	5.77E-17	2.14E-17
TE129M	3.36E+01	1.46E-04	2.40E-04	8.89E-05
TE129	4.84E-02	0.00E+00	0.00E+00	0.00E+00
TE131M	1.25E+00	3.10E-09	5.12E-09	1.90E-09
TE131	1.74E-02	0.00E+00	0.00E+00	0.00E+00
TE132	3.26E+00	9.68E-07	1.60E-06	5.91E-07

Table B4-1: Radionuclide Fractions Leaving STPEGS Via Liquid Routes  
(cont'd)

<u>Nuclide</u>	<u>Half-life (days)</u>	<u>Colorado River</u>	<u>Matagorda Bay</u>	<u>Little Robbins Slough Area</u>
I130	5.15E-01	1.96E-14	3.23E-14	1.19E-14
I131	8.04E+00	1.40E-05	2.31E-05	8.56E-06
I132	9.60E-02	0.00E+00	0.00E+00	0.00E+00
I133	8.67E-01	6.99E-11	1.15E-10	4.27E-11
I134	3.66E-02	0.00E+00	0.00E+00	0.00E+00
I135	2.75E-01	7.64E-22	1.26E-21	4.67E-22
CS134	7.52E+02	3.67E-03	3.67E-03	0.00E+00
CS136	1.31E+01	3.64E-05	3.64E-05	0.00E+00
CS137	1.10E+04	1.76E-02	1.76E-02	0.00E+00
CS138	2.24E-02	0.00E+00	0.00E+00	0.00E+00
BA139	5.74E-02	0.00E+00	0.00E+00	0.00E+00
BA140	1.28E+01	3.48E-05	5.74E-05	2.12E-05
BA141	1.27E-02	0.00E+00	0.00E+00	0.00E+00
BA142	7.42E-03	0.00E+00	0.00E+00	0.00E+00
LA140	1.68E+00	3.03E-08	4.99E-08	1.85E-08
LA142	6.43E-02	0.00E+00	0.00E+00	0.00E+00
CE141	3.25E+01	1.39E-04	2.30E-04	8.52E-05
CE143	1.38E+00	6.91E-09	1.14E-08	4.22E-09
CE144	2.83E+02	1.49E-03	2.47E-03	9.13E-04
PR143	1.36E+01	3.85E-05	6.36E-05	2.35E-05
PR144	1.20E-02	0.00E+00	0.00E+00	0.00E+00
ND147	1.11E+01	2.68E-05	4.42E-05	1.64E-05
W187	9.96E-01	3.41E-10	5.62E-10	2.08E-10
NP239	2.35E+00	2.20E-07	3.62E-07	1.34E-07

\*Note: Cesium isotopes diffusing through the soil to enter the Little Robbins Slough area are assumed to be trapped in the soil.

All other calculations were made according to the methods of Section B4.1 where the above listed pathway values correspond to the following:

$$\begin{aligned} \text{Colorado River} &= Q_c/A_i, \\ \text{Matagorda Bay} &= (Q_c + Q_{lrs} + Q_{elrs} + Q_{wc})/A_i, \\ \text{Little Robbins Slough} &= (Q_{lrs} + Q_{elrs})/A_i. \end{aligned}$$

Values less than 1.00E-30 are rounded to 0.00E+00 since such small fractions do not contribute to off-site doses significantly.

Table B4-2: Liquid Dose Pathway Factor Description

- U = annual intake of fish, kg/y (note 1)  
U<sub>b</sub> = annual use factor for shoreline exposure, hr/y  
M = dilution factor; all flow rates are normalized to that of the Little Robbins Slough area  
F = flow rate of the Little Robbins Slough area, cfs (note 2)  
Q(i) = release of nuclide "i" from the reservoir, Ci  
N(i) = fractional release of nuclide "i" from the reservoir to a given pathway as listed in Table B4-1  
B(i) = bioaccumulation factor for nuclide "i" to a given pathway, (note 3)  
[pCi in fish/kg of fish]/[pCi in water/kg of water]  
D(a,i,j) = dose factor for nuclide "i", organ "j", age "a", mrem/pCi or mrem/hr per pCi/m<sup>2</sup> (note 4)  
Y(i) = decay constant for nuclide "i", 1/hour  
T(i) = half-life of nuclide "i", days  
T = average transit time from release to ingestion of fish by man; or to deposition in sediment, hr (note 5)  
T<sub>b</sub> = time period during which sediment is exposed to contaminated water, hr.  
W = shoreline width factor  
R(a,i,j) = dose to organ "j" for a particular release from nuclide "i" and age group "a" (mrem/Ci)

Note 1: Little Robbins Slough area is assumed to contain freshwater fish only while the Colorado River and Matagorda Bay/Gulf of Mexico are assumed to yield saltwater fish and invertebrates as per Regulatory Guide 1.109.

Note 2: The average rainfall over the Little Robbins Slough drainage area results in approximately 14.56 cfs flow rate through the marsh to Intracoastal Waterway which is available to dilute the approximately 3.73 cfs flow into Little Robbins Slough from the relief wells (STP ER Table 2.5-2).

Note 3: Bioaccumulation factors for saltwater fish and invertebrates are taken from Table A-1 of Regulatory Guide 1.109; saltwater values are used with the Colorado River, Matagorda Bay/Gulf of Mexico, and fresh water values for the lakes along Little Robbins Slough.

Note 4: The dose factors for Equation 4.2a are taken from Table E-11 of Regulatory Guide 1.109 whereas the dose factors for Equation 4.2b come from Table E-6 of Regulatory Guide 1.109.

Note 5: The average time between nuclide release to the unrestricted aquatic environment and fish consumption comes from Table D-1 of Regulatory Guide 1.109. No delay is assumed between release and contamination of sediment for Equation 4.2b because the delay between release and soil exposure is likely to be short compared to the half-lives of the nuclides potentially present.



Table B4-3: Liquid Parameter Values for Eq. 4.2a and 4.2b

Parameter	Parameter Value				
U	Adult	Teen	Child	Infant	
Colorado River	21	16	6.9	0	kg/y saltwater fish
	5	3.8	1.7	0	kg/y saltwater invertebrate
Matagorda Bay	21	16	6.9	0	kg/y saltwater fish
	5	3.8	1.7	0	kg/y saltwater invertebrate
Little Robbins area	21	16	6.9	0	kg/y freshwater fish
Ub	Adult	Teen	Child	Infant	
Colorado River	12	67	14	0	hr/y
Matagorda Bay	12	67	14	0	hr/y
Little Robbins area	12	67	14	0	hr/y
M					
Colorado River	1.00				
Matagorda Bay	163				
Little Robbins area	0.0305				
F	600	cfs			
N(i)					
Colorado River	values by nuclide "i" and pathway from				
Matagorda Bay	Table B4-1				
Little Robbins area					
T					
fish ingestion	24	hr			
shoreline exposure	0	hr			
Tb	1.31E+05	hr			
W					
Colorado River	0.2				
Matagorda Bay	0.5				
Little Robbins area	0.2				
B(i)	nuclide specific from Table A-1, Regulatory Guide 1.109				
D(a,i,j)	nuclide specific from Table E-11 or E-6, Regulatory Guide 1.109				

Table B4-4: Pathways for Calculating Individual Doses from Liquid Effluent Releases

<u>PATHWAYS</u>	<u>RECEPTOR LOCATIONS</u>		
	<u>Colorado River</u>	<u>Matagorda Bay</u>	<u>Little Robbins</u>
Shore Exposure	X	X	X
Salt Water Fish Ingestion	X	X	
Salt Water Invertebrate Ingestion	X	X	
Fresh Water Fish Ingestion			X



Table B4-5: Particle Depletion and Deposition Factors  
for Ground Level Releases

Distance (meters)	Depletion	Deposition (1/meter)
200	0.970	1.2E-04
500	0.936	8.0E-05
1000	0.900	5.4E-05
2000	0.860	3.2E-05
3000	0.832	2.6E-05
6000	0.770	1.5E-05
10,000	0.714	9.9E-06
30,000	0.590	4.5E-06
50,000	0.517	3.0E-06
80,000	0.440	2.0E-06

Table B4-6: Distances to Gaseous Dose Pathway  
Receptors for Individuals (meters)

<u>DIRECTION</u>	<u>PATHWAYS</u>				<u>RECEPTOR</u>
	<u>PLUME</u>	<u>VEGETATION</u>	<u>MEAT</u>	<u>MILK</u>	
N	1400	1400	1400	1400	Site Boundary
	5600	5600	5600	0	Nearest Person*
NNE	1500	1500	1400	1500	Site Boundary
	8000	8000	8000	0	Nearest Person
NE	1600	1600	1400	1600	Site Boundary
	8000	8000	8000	0	Nearest Person
ENE	1600	1600	1600	1600	Site Boundary
	8000	8000	8000	0	Nearest Person
E	1600	1600	1400	1600	Site Boundary
	8000	8000	8000	0	Nearest Person
ESE	1900	1900	1400	1900	Site Boundary
	5600	5600	5600	0	Nearest Person
SE	5600	5600	5600	5600	Site Boundary
	5600	5600	5600	0	Nearest Person
SSE	6000	6000	5800	6000	Site Boundary
	0	0	0	0	Nearest Person
S	5900	5900	5700	5900	Site Boundary
	0	0	0	0	Nearest Person
SSW	6000	6000	5500	6000	Site Boundary
	8000	8000	8000	0	Nearest Person
SW	3900	3900	3400	3900	Site Boundary
	7200	7200	7200	0	Nearest Person
WSW	2880	2880	1940	2880	Site Boundary
	4000	4000	4000	0	Nearest Person
W	2160	2160	2000	2160	Site Boundary
	7200	7200	7200	0	Nearest Person
WNW	1850	1850	1800	1850	Site Boundary
	6400	6400	6400	7400	Nearest Person
NW	1720	1720	1690	1720	Site Boundary
	7200	7200	7200	0	Nearest Person
NNW	1540	1540	1500	1540	Site Boundary
	5600	5600	5600	0	Nearest Person

\* Nearest person may be changed for purposes of dose calculations without changing this table. If the distance to the nearest person was greater than 8000 meters, 8000 meters was used as a default value.

Table B4-7: Pathway Dose Factors

NOTES:

Liquid Pathway Dose Factors

This table consists of two sections. The first is a listing of pathway dose factors by nuclide and pathway for liquid effluents. These factors were calculated using the equations and methods of Part B, Section 4.2 of the ODCM. The product of a particular factor and a quantity of activity (Ci) released to the reservoir will yield the dose (mrem) to an individual at each of the locations and for each of the pathways specified.

The liquid dose factors for cesium isotopes were set to zero for pathways associated with relief well discharges into the Little Robbins Slough area in order to conform with the assumptions made in the UFSAR, Appendix 11.A, regarding the transportability of cesium in soil.

The units for all liquid dose factors are (mrem/Ci).

The factors used by the computer codes which perform these calculations may differ by a few percent due to round-off errors. Furthermore, for nuclides with vanishing small factors (typically less than  $1.0E-20$  mrem/Ci) very large computational differences may exist, but these have no impact on the dose calculations and are inconsequential.

Gaseous Pathway Dose Factors

The second section of this table consists of a listing by nuclide of the gaseous pathway dose factors. These factors were calculated using a code similar to GASPAR and are based on the methods of Regulatory Guide 1.109.

The units used for noble gases, tritium, and all nuclides for the inhalation pathway are (mrem- $m^3$ /Ci-sec). The product of this pathway dose factor, the release (Ci), and the appropriate depleted X/Q (sec/ $m^3$ ) or X/Q (for noble gases, tritium - see 14) yields the dose in (mrem).

The units used for all other nuclides in all other pathways are (mrem- $m^2$ /Ci). The product of this pathway dose factor, the release (Ci), and the appropriate D/Q yields the dose (mrem) over the release period.

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : H3

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.73E-06	5.73E-06	0.00E+00	5.73E-06	5.73E-06	5.73E-06	5.73E-06
TEEN:	4.41E-06	4.41E-06	0.00E+00	4.41E-06	4.41E-06	4.41E-06	4.41E-06
CHILD:	3.64E-06	3.64E-06	0.00E+00	3.64E-06	3.64E-06	3.64E-06	3.64E-06
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.86E-07	2.86E-07	0.00E+00	2.86E-07	2.86E-07	2.86E-07	2.86E-07
TEEN:	2.20E-07	2.20E-07	0.00E+00	2.20E-07	2.20E-07	2.20E-07	2.20E-07
CHILD:	1.82E-07	1.82E-07	0.00E+00	1.82E-07	1.82E-07	1.82E-07	1.82E-07
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.90E-09	2.90E-09	0.00E+00	2.90E-09	2.90E-09	2.90E-09	2.90E-09
TEEN:	2.23E-09	2.23E-09	0.00E+00	2.23E-09	2.23E-09	2.23E-09	2.23E-09
CHILD:	1.84E-09	1.84E-09	0.00E+00	1.84E-09	1.84E-09	1.84E-09	1.84E-09
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.04E-08	7.04E-08	0.00E+00	7.04E-08	7.04E-08	7.04E-08	7.04E-08
TEEN:	5.41E-08	5.41E-08	0.00E+00	5.41E-08	5.41E-08	5.41E-08	5.41E-08
CHILD:	4.63E-08	4.63E-08	0.00E+00	4.63E-08	4.63E-08	4.63E-08	4.63E-08
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.13E-10	7.13E-10	0.00E+00	7.13E-10	7.13E-10	7.13E-10	7.13E-10
TEEN:	5.47E-10	5.47E-10	0.00E+00	5.47E-10	5.47E-10	5.47E-10	5.47E-10
CHILD:	4.69E-10	4.69E-10	0.00E+00	4.69E-10	4.69E-10	4.69E-10	4.69E-10
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : C14

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.89E-02	4.89E-02	2.45E-01	4.89E-02	4.89E-02	4.89E-02	4.89E-02
TEEN:	5.33E-02	5.33E-02	2.66E-01	5.33E-02	5.33E-02	5.33E-02	5.33E-02
CHILD:	6.85E-02	6.85E-02	3.42E-01	6.85E-02	6.85E-02	6.85E-02	6.85E-02
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.56E-04	9.56E-04	4.78E-03	9.56E-04	9.56E-04	9.56E-04	9.56E-04
TEEN:	1.04E-03	1.04E-03	5.20E-03	1.04E-03	1.04E-03	1.04E-03	1.04E-03
CHILD:	1.34E-03	1.34E-03	6.69E-03	1.34E-03	1.34E-03	1.34E-03	1.34E-03
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.67E-06	9.67E-06	4.84E-05	9.67E-06	9.67E-06	9.67E-06	9.67E-06
TEEN:	1.05E-05	1.05E-05	5.27E-05	1.05E-05	1.05E-05	1.05E-05	1.05E-05
CHILD:	1.35E-05	1.35E-05	6.77E-05	1.35E-05	1.35E-05	1.35E-05	1.35E-05
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.77E-04	1.77E-04	8.85E-04	1.77E-04	1.77E-04	1.77E-04	1.77E-04
TEEN:	1.92E-04	1.92E-04	9.61E-04	1.92E-04	1.92E-04	1.92E-04	1.92E-04
CHILD:	2.56E-04	2.56E-04	1.28E-03	2.56E-04	2.56E-04	2.56E-04	2.56E-04
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.79E-06	1.79E-06	8.96E-06	1.79E-06	1.79E-06	1.79E-06	1.79E-06
TEEN:	1.95E-06	1.95E-06	9.73E-06	1.95E-06	1.95E-06	1.95E-06	1.95E-06
CHILD:	2.59E-06	2.59E-06	1.30E-05	2.59E-06	2.59E-06	2.59E-06	2.59E-06
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NA24

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROEBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.86E-14	2.86E-14	2.86E-14	2.86E-14	2.86E-14	2.86E-14	2.86E-14
TEEN:	2.95E-14	2.95E-14	2.95E-14	2.95E-14	2.95E-14	2.95E-14	2.95E-14
CHILD:	3.20E-14	3.20E-14	3.20E-14	3.20E-14	3.20E-14	3.20E-14	3.20E-14
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.56E-19	9.56E-19	9.56E-19	9.56E-19	9.56E-19	9.56E-19	9.56E-19
TEEN:	9.86E-19	9.86E-19	9.86E-19	9.86E-19	9.86E-19	9.86E-19	9.86E-19
CHILD:	1.07E-18	1.07E-18	1.07E-18	1.07E-18	1.07E-18	1.07E-18	1.07E-18
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	1.09E-20	1.09E-20	1.09E-20	1.09E-20	1.09E-20	1.09E-20	1.09E-20
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.46E-19	6.46E-19	6.46E-19	6.46E-19	6.46E-19	6.46E-19	6.46E-19
TEEN:	6.64E-19	6.64E-19	6.64E-19	6.64E-19	6.64E-19	6.64E-19	6.64E-19
CHILD:	7.49E-19	7.49E-19	7.49E-19	7.49E-19	7.49E-19	7.49E-19	7.49E-19
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	9.10E-17	1.06E-16
TEEN:	5.08E-16	5.89E-16
CHILD:	1.06E-16	1.23E-16
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	4.54E-18	5.27E-18
TEEN:	2.54E-17	2.94E-17
CHILD:	5.30E-18	6.15E-18
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.15E-19	1.33E-19
TEEN:	6.42E-19	7.45E-19
CHILD:	1.34E-19	1.56E-19
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : P32

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.31E-02	6.72E-02	5.98E-01	3.72E-02	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.52E-02	5.47E-02	6.51E-01	4.03E-02	0.00E+00	0.00E+00	0.00E+00
CHILD:	3.24E-02	2.32E-02	8.39E-01	3.93E-02	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.35E-04	9.73E-04	8.65E-03	5.38E-04	0.00E+00	0.00E+00	0.00E+00
TEEN:	3.66E-04	7.93E-04	9.43E-03	5.84E-04	0.00E+00	0.00E+00	0.00E+00
CHILD:	4.69E-04	3.36E-04	1.22E-02	5.69E-04	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.39E-06	9.85E-06	8.76E-05	5.45E-06	0.00E+00	0.00E+00	0.00E+00
TEEN:	3.70E-06	8.02E-06	9.55E-05	5.91E-06	0.00E+00	0.00E+00	0.00E+00
CHILD:	4.74E-06	3.40E-06	1.23E-04	5.76E-06	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	8.24E-05	2.40E-04	2.13E-03	1.33E-04	0.00E+00	0.00E+00	0.00E+00
TEEN:	8.98E-05	1.95E-04	2.32E-03	1.44E-04	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.19E-04	8.56E-05	3.10E-03	1.45E-04	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	8.34E-07	2.43E-06	2.16E-05	1.34E-06	0.00E+00	0.00E+00	0.00E+00
TEEN:	9.09E-07	1.97E-06	2.35E-05	1.45E-06	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.21E-06	8.67E-07	3.14E-05	1.47E-06	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CR51

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.54E-08	1.14E-05	0.00E+00	0.00E+00	1.00E-08	2.71E-08	6.02E-08
TEEN:	4.68E-08	7.86E-06	0.00E+00	0.00E+00	1.03E-08	2.60E-08	6.68E-08
CHILD:	4.99E-08	2.65E-06	0.00E+00	0.00E+00	7.57E-09	2.77E-08	5.06E-08
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.53E-09	1.14E-06	0.00E+00	0.00E+00	9.99E-10	2.71E-09	6.02E-09
TEEN:	4.67E-09	7.85E-07	0.00E+00	0.00E+00	1.02E-09	2.60E-09	6.67E-09
CHILD:	4.98E-09	2.64E-07	0.00E+00	0.00E+00	7.56E-10	2.77E-09	5.05E-09
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.59E-11	1.15E-08	0.00E+00	0.00E+00	1.01E-11	2.74E-11	6.09E-11
TEEN:	4.73E-11	7.95E-09	0.00E+00	0.00E+00	1.04E-11	2.63E-11	6.76E-11
CHILD:	5.04E-11	2.68E-09	0.00E+00	0.00E+00	7.65E-12	2.80E-11	5.11E-11
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.40E-09	1.36E-06	0.00E+00	0.00E+00	1.19E-09	3.23E-09	7.16E-09
TEEN:	5.55E-09	9.33E-07	0.00E+00	0.00E+00	1.22E-09	3.08E-09	7.92E-09
CHILD:	6.14E-09	3.26E-07	0.00E+00	0.00E+00	9.31E-10	3.41E-09	6.22E-09
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.46E-11	1.37E-08	0.00E+00	0.00E+00	1.20E-11	3.27E-11	7.25E-11
TEEN:	5.62E-11	9.44E-09	0.00E+00	0.00E+00	1.23E-11	3.12E-11	8.02E-11
CHILD:	6.21E-11	3.30E-09	0.00E+00	0.00E+00	9.43E-12	3.45E-11	6.30E-11
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	6.11E-09	7.22E-09
TEEN:	3.41E-08	4.03E-08
CHILD:	7.12E-09	8.42E-09
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	3.05E-10	3.60E-10
TEEN:	1.70E-09	2.01E-09
CHILD:	3.56E-10	4.20E-10
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	7.72E-12	9.12E-12
TEEN:	4.31E-11	5.09E-11
CHILD:	9.00E-12	1.06E-11
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : MN54

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.41E-04	7.08E-03	0.00E+00	2.31E-03	6.88E-04	0.00E+00	0.00E+00
TEEN:	4.51E-04	4.66E-03	0.00E+00	2.27E-03	6.78E-04	0.00E+00	0.00E+00
CHILD:	4.74E-04	1.49E-03	0.00E+00	1.78E-03	4.99E-04	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.03E-05	4.86E-04	0.00E+00	1.59E-04	4.72E-05	0.00E+00	0.00E+00
TEEN:	3.10E-05	3.20E-04	0.00E+00	1.56E-04	4.66E-05	0.00E+00	0.00E+00
CHILD:	3.25E-05	1.02E-04	0.00E+00	1.22E-04	3.42E-05	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.07E-07	4.92E-06	0.00E+00	1.61E-06	4.78E-07	0.00E+00	0.00E+00
TEEN:	3.13E-07	3.24E-06	0.00E+00	1.58E-06	4.72E-07	0.00E+00	0.00E+00
CHILD:	3.29E-07	1.04E-06	0.00E+00	1.24E-06	3.47E-07	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.24E-06	8.42E-05	0.00E+00	2.75E-05	8.18E-06	0.00E+00	0.00E+00
TEEN:	5.35E-06	5.53E-05	0.00E+00	2.70E-05	8.05E-06	0.00E+00	0.00E+00
CHILD:	5.83E-06	1.84E-05	0.00E+00	2.19E-05	6.14E-06	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.31E-08	8.52E-07	0.00E+00	2.78E-07	8.28E-08	0.00E+00	0.00E+00
TEEN:	5.41E-08	5.60E-07	0.00E+00	2.73E-07	8.14E-08	0.00E+00	0.00E+00
CHILD:	5.90E-08	1.86E-07	0.00E+00	2.22E-07	6.21E-08	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.63E-05	3.08E-05
TEEN:	1.47E-04	1.72E-04
CHILD:	3.06E-05	3.59E-05
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.31E-06	1.54E-06
TEEN:	7.32E-06	8.58E-06
CHILD:	1.53E-06	1.79E-06
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	3.32E-08	3.89E-08
TEEN:	1.85E-07	2.17E-07
CHILD:	3.87E-08	4.54E-08
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : MN56

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : FE55

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.57E-04	3.87E-04	9.76E-04	6.74E-04	0.00E+00	0.00E+00	3.76E-04
TEEN:	1.69E-04	3.14E-04	1.02E-03	7.24E-04	0.00E+00	0.00E+00	4.59E-04
CHILD:	2.20E-04	1.32E-04	1.34E-03	7.11E-04	0.00E+00	0.00E+00	4.02E-04
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.35E-04	5.79E-04	1.46E-03	1.01E-03	0.00E+00	0.00E+00	5.63E-04
TEEN:	2.53E-04	4.70E-04	1.53E-03	1.09E-03	0.00E+00	0.00E+00	6.88E-04
CHILD:	3.30E-04	1.97E-04	2.01E-03	1.07E-03	0.00E+00	0.00E+00	6.02E-04
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.38E-06	5.86E-06	1.48E-05	1.02E-05	0.00E+00	0.00E+00	5.70E-06
TEEN:	2.56E-06	4.75E-06	1.55E-05	1.10E-05	0.00E+00	0.00E+00	6.97E-06
CHILD:	3.34E-06	2.00E-06	2.03E-05	1.08E-05	0.00E+00	0.00E+00	6.10E-06
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.74E-04	9.19E-04	2.32E-03	1.60E-03	0.00E+00	0.00E+00	8.94E-04
TEEN:	4.01E-04	7.44E-04	2.42E-03	1.72E-03	0.00E+00	0.00E+00	1.09E-03
CHILD:	5.42E-04	3.24E-04	3.30E-03	1.75E-03	0.00E+00	0.00E+00	9.89E-04
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.78E-06	9.31E-06	2.35E-05	1.62E-05	0.00E+00	0.00E+00	9.05E-06
TEEN:	4.06E-06	7.53E-06	2.45E-05	1.74E-05	0.00E+00	0.00E+00	1.10E-05
CHILD:	5.49E-06	3.28E-06	3.34E-05	1.77E-05	0.00E+00	0.00E+00	1.00E-05
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : FES9

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.15E-05	5.35E-04	6.83E-05	1.60E-04	0.00E+00	0.00E+00	4.48E-05
TEEN:	6.34E-05	3.88E-04	7.04E-05	1.64E-04	0.00E+00	0.00E+00	5.18E-05
CHILD:	6.88E-05	1.44E-04	8.53E-05	1.38E-04	0.00E+00	0.00E+00	4.00E-05
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.22E-05	8.01E-04	1.02E-04	2.40E-04	0.00E+00	0.00E+00	6.72E-05
TEEN:	9.50E-05	5.82E-04	1.05E-04	2.46E-04	0.00E+00	0.00E+00	7.76E-05
CHILD:	1.03E-04	2.15E-04	1.28E-04	2.07E-04	0.00E+00	0.00E+00	5.99E-05
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.33E-07	8.11E-06	1.04E-06	2.43E-06	0.00E+00	0.00E+00	6.80E-07
TEEN:	9.62E-07	5.89E-06	1.07E-06	2.49E-06	0.00E+00	0.00E+00	7.85E-07
CHILD:	1.04E-06	2.18E-06	1.29E-06	2.09E-06	0.00E+00	0.00E+00	6.07E-07
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.46E-04	1.27E-03	1.62E-04	3.82E-04	0.00E+00	0.00E+00	1.07E-04
TEEN:	1.50E-04	9.21E-04	1.67E-04	3.90E-04	0.00E+00	0.00E+00	1.23E-04
CHILD:	1.69E-04	3.54E-04	2.10E-04	3.40E-04	0.00E+00	0.00E+00	9.85E-05
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.48E-06	1.29E-05	1.64E-06	3.86E-06	0.00E+00	0.00E+00	1.08E-06
TEEN:	1.52E-06	9.33E-06	1.69E-06	3.94E-06	0.00E+00	0.00E+00	1.24E-06
CHILD:	1.71E-06	3.58E-06	2.12E-06	3.44E-06	0.00E+00	0.00E+00	9.97E-07
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	6.52E-07	7.66E-07
TEEN:	3.64E-06	4.28E-06
CHILD:	7.61E-07	8.94E-07
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	3.26E-08	3.83E-08
TEEN:	1.82E-07	2.14E-07
CHILD:	3.80E-08	4.46E-08
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	8.24E-10	9.68E-10
TEEN:	4.60E-09	5.41E-09
CHILD:	9.62E-10	1.13E-09
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : C058

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.26E-05	2.04E-04	0.00E+00	1.01E-05	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.31E-05	1.38E-04	0.00E+00	1.00E-05	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.45E-05	4.66E-05	0.00E+00	7.99E-06	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.25E-06	2.04E-05	0.00E+00	1.01E-06	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.30E-06	1.38E-05	0.00E+00	9.99E-07	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.44E-06	4.66E-06	0.00E+00	7.98E-07	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.28E-08	2.06E-07	0.00E+00	1.02E-08	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.33E-08	1.39E-07	0.00E+00	1.01E-08	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.47E-08	4.71E-08	0.00E+00	8.08E-09	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.37E-06	4.85E-05	0.00E+00	2.39E-06	0.00E+00	0.00E+00	0.00E+00
TEEN:	5.47E-06	3.27E-05	0.00E+00	2.37E-06	0.00E+00	0.00E+00	0.00E+00
CHILD:	6.02E-06	1.15E-05	0.00E+00	1.97E-06	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.43E-08	4.91E-07	0.00E+00	2.42E-08	0.00E+00	0.00E+00	0.00E+00
TEEN:	5.54E-08	3.31E-07	0.00E+00	2.40E-08	0.00E+00	0.00E+00	0.00E+00
CHILD:	6.09E-08	1.16E-07	0.00E+00	1.99E-08	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.55E-06	1.81E-06
TEEN:	8.63E-06	1.01E-05
CHILD:	1.80E-06	2.11E-06
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	7.72E-08	9.04E-08
TEEN:	4.31E-07	5.05E-07
CHILD:	9.00E-08	1.05E-07
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.95E-09	2.29E-09
TEEN:	1.09E-08	1.29E-08
CHILD:	2.28E-09	2.67E-09
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : C060

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.39E-03	1.18E-02	0.00E+00	6.30E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.42E-03	8.21E-03	0.00E+00	6.31E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.51E-03	2.84E-03	0.00E+00	5.12E-04	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.39E-04	1.18E-03	0.00E+00	6.30E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.42E-04	8.20E-04	0.00E+00	6.30E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.51E-04	2.83E-04	0.00E+00	5.11E-05	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.41E-06	1.20E-05	0.00E+00	6.37E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.44E-06	8.30E-06	0.00E+00	6.38E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.53E-06	2.87E-06	0.00E+00	5.18E-07	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.31E-04	2.82E-03	0.00E+00	1.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	3.37E-04	1.95E-03	0.00E+00	1.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	3.72E-04	6.98E-04	0.00E+00	1.26E-04	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.35E-06	2.85E-05	0.00E+00	1.52E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	3.41E-06	1.97E-05	0.00E+00	1.51E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	3.76E-06	7.06E-06	0.00E+00	1.28E-06	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	1.90E-03	2.23E-03	
TEEN:	1.06E-02	1.25E-02	
CHILD:	2.21E-03	2.60E-03	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	9.48E-05	1.11E-04	
TEEN:	5.29E-04	6.22E-04	
CHILD:	1.11E-04	1.30E-04	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	2.40E-06	2.82E-06	
TEEN:	1.34E-05	1.58E-05	
CHILD:	2.80E-06	3.29E-06	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NI63

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.31E-03	3.15E-03	2.18E-01	1.51E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	7.66E-03	2.54E-03	2.26E-01	1.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.01E-02	1.07E-03	2.96E-01	1.59E-02	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.65E-04	1.57E-04	1.09E-02	7.54E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	3.82E-04	1.27E-04	1.13E-02	7.97E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.03E-04	5.33E-05	1.48E-02	7.92E-04	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.69E-06	1.59E-06	1.10E-04	7.63E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	3.87E-06	1.28E-06	1.14E-04	8.07E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.09E-06	5.40E-07	1.50E-04	8.01E-06	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.17E-04	9.36E-05	6.47E-03	4.49E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.27E-04	7.53E-05	6.70E-03	4.73E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	3.10E-04	3.28E-05	9.11E-03	4.88E-04	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.20E-06	9.48E-07	6.55E-05	4.54E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.30E-06	7.62E-07	6.78E-05	4.79E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	3.14E-06	3.33E-07	9.22E-05	4.94E-06	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NI65

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CU64

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.35E-17	2.45E-15	0.00E+00	2.88E-17	7.26E-17	0.00E+00	0.00E+00
TEEN:	1.43E-17	2.35E-15	0.00E+00	3.03E-17	7.67E-17	0.00E+00	0.00E+00
CHILD:	1.68E-17	1.31E-15	0.00E+00	2.78E-17	6.73E-17	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.05E-18	1.64E-15	0.00E+00	1.93E-17	4.86E-17	0.00E+00	0.00E+00
TEEN:	9.54E-18	1.57E-15	0.00E+00	2.03E-17	5.13E-17	0.00E+00	0.00E+00
CHILD:	1.12E-17	8.74E-16	0.00E+00	1.86E-17	4.50E-17	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.16E-20	1.66E-17	0.00E+00	1.95E-19	4.92E-19	0.00E+00	0.00E+00
TEEN:	9.65E-20	1.59E-17	0.00E+00	2.05E-19	5.19E-19	0.00E+00	0.00E+00
CHILD:	1.14E-19	8.85E-18	0.00E+00	1.89E-19	4.56E-19	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.46E-18	9.92E-16	0.00E+00	1.16E-17	2.93E-17	0.00E+00	0.00E+00
TEEN:	5.75E-18	9.47E-16	0.00E+00	1.22E-17	3.09E-17	0.00E+00	0.00E+00
CHILD:	7.03E-18	5.46E-16	0.00E+00	1.16E-17	2.81E-17	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.53E-20	1.00E-17	0.00E+00	1.18E-19	2.97E-19	0.00E+00	0.00E+00
TEEN:	5.82E-20	9.59E-18	0.00E+00	1.24E-19	3.13E-19	0.00E+00	0.00E+00
CHILD:	7.12E-20	5.53E-18	0.00E+00	1.18E-19	2.85E-19	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.32E-19	2.63E-19
TEEN:	1.30E-18	1.47E-18
CHILD:	2.71E-19	3.07E-19
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.16E-20	1.32E-20
TEEN:	6.48E-20	7.35E-20
CHILD:	1.35E-20	1.53E-20
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZN65

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.39E-02	1.93E-02	9.64E-03	3.07E-02	2.05E-02	0.00E+00	0.00E+00
TEEN:	1.42E-02	1.29E-02	8.75E-03	3.04E-02	1.94E-02	0.00E+00	0.00E+00
CHILD:	1.49E-02	4.20E-03	8.97E-03	2.39E-02	1.51E-02	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.93E-04	9.65E-04	4.82E-04	1.53E-03	1.02E-03	0.00E+00	0.00E+00
TEEN:	7.07E-04	6.42E-04	4.37E-04	1.52E-03	9.70E-04	0.00E+00	0.00E+00
CHILD:	7.42E-04	2.10E-04	4.48E-04	1.19E-03	7.52E-04	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.01E-06	9.77E-06	4.88E-06	1.55E-05	1.04E-05	0.00E+00	0.00E+00
TEEN:	7.16E-06	6.50E-06	4.42E-06	1.53E-05	9.82E-06	0.00E+00	0.00E+00
CHILD:	7.51E-06	2.12E-06	4.53E-06	1.21E-05	7.61E-06	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.12E-03	5.75E-03	2.87E-03	9.12E-03	6.10E-03	0.00E+00	0.00E+00
TEEN:	4.20E-03	3.81E-03	2.59E-03	9.00E-03	5.76E-03	0.00E+00	0.00E+00
CHILD:	4.57E-03	1.29E-03	2.76E-03	7.35E-03	4.63E-03	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.17E-05	5.82E-05	2.90E-05	9.23E-05	6.18E-05	0.00E+00	0.00E+00
TEEN:	4.25E-05	3.86E-05	2.62E-05	9.11E-05	5.83E-05	0.00E+00	0.00E+00
CHILD:	4.63E-05	1.31E-05	2.79E-05	7.44E-05	4.69E-05	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.12E-05	1.29E-05
TEEN:	6.24E-05	7.18E-05
CHILD:	1.30E-05	1.50E-05
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	5.58E-07	6.42E-07
TEEN:	3.12E-06	3.58E-06
CHILD:	6.51E-07	7.49E-07
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.41E-08	1.62E-08
TEEN:	7.89E-08	9.07E-08
CHILD:	1.65E-08	1.90E-08
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZN69

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BR83

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BR84

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BR85

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RB86

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.39E-04	3.97E-04	0.00E+00	2.01E-03	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.02E-03	3.21E-04	0.00E+00	2.17E-03	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.29E-03	1.35E-04	0.00E+00	2.10E-03	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.95E-07	8.23E-08	0.00E+00	4.18E-07	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.11E-07	6.65E-08	0.00E+00	4.49E-07	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.68E-07	2.80E-08	0.00E+00	4.36E-07	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.97E-09	8.33E-10	0.00E+00	4.23E-09	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.14E-09	6.73E-10	0.00E+00	4.55E-09	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.71E-09	2.84E-10	0.00E+00	4.41E-09	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.49E-08	4.01E-08	0.00E+00	2.04E-07	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.03E-07	3.23E-08	0.00E+00	2.19E-07	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.35E-07	1.41E-08	0.00E+00	2.20E-07	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.60E-10	4.06E-10	0.00E+00	2.06E-09	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.04E-09	3.27E-10	0.00E+00	2.21E-09	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.37E-09	1.43E-10	0.00E+00	2.23E-09	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	6.65E-09	7.60E-09	
TEEN:	3.71E-08	4.24E-08	
CHILD:	7.76E-09	8.86E-09	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	3.32E-10	3.79E-10	
TEEN:	1.85E-09	2.12E-09	
CHILD:	3.87E-10	4.43E-10	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	8.40E-12	9.60E-12	
TEEN:	4.69E-11	5.36E-11	
CHILD:	9.80E-12	1.12E-11	
INFANT:	0.00E+00	0.00E+00	



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : R888

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RB89

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR89

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.85E-05	2.71E-04	1.69E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	5.27E-05	2.19E-04	1.84E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	6.80E-05	9.22E-05	2.38E-03	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.62E-07	9.03E-07	5.63E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.75E-07	7.30E-07	6.13E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.26E-07	3.07E-07	7.93E-06	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.64E-09	9.14E-09	5.70E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.78E-09	7.39E-09	6.20E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.29E-09	3.11E-09	8.02E-08	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.85E-07	2.15E-06	1.34E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	4.17E-07	1.73E-06	1.45E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.58E-07	7.56E-07	1.95E-05	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.89E-09	2.18E-08	1.36E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	4.22E-09	1.75E-08	1.47E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.65E-09	7.65E-09	1.98E-07	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	6.00E-11	6.97E-11
TEEN:	3.35E-10	3.89E-10
CHILD:	7.01E-11	8.13E-11
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	3.00E-12	3.48E-12
TEEN:	1.67E-11	1.94E-11
CHILD:	3.50E-12	4.06E-12
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	7.59E-14	8.81E-14
TEEN:	4.24E-13	4.92E-13
CHILD:	8.85E-14	1.03E-13
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR90

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.47E-01	8.79E-02	3.04E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.27E-01	7.13E-02	2.54E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.69E-01	3.02E-02	2.24E+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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.49E-03	2.93E-04	1.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.09E-03	2.37E-04	8.45E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.89E-03	1.01E-04	7.47E-03	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.52E-05	2.96E-06	1.03E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.11E-05	2.40E-06	8.56E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.92E-05	1.02E-06	7.56E-05	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.92E-03	6.97E-04	2.41E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	4.96E-03	5.63E-04	2.01E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	4.66E-03	2.48E-04	1.84E-02	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.99E-05	7.05E-06	2.44E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	5.02E-05	5.70E-06	2.03E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	4.72E-05	2.51E-06	1.86E-04	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR91

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.72E-20	5.56E-18	1.17E-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	5.04E-20	5.75E-18	1.27E-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	6.13E-20	3.59E-18	1.67E-18	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	1.85E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	1.91E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	1.19E-20	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	4.41E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	4.54E-20	1.00E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	2.94E-20	1.33E-20	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR92

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y90

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.59E-12	6.28E-07	5.92E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.73E-12	5.30E-07	6.42E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.22E-12	2.37E-07	8.31E-11	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.93E-14	3.13E-08	2.96E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	8.64E-14	2.65E-08	3.21E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.11E-13	1.18E-08	4.15E-12	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	8.03E-16	3.17E-10	2.99E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	8.75E-16	2.68E-10	3.25E-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.12E-15	1.20E-10	4.20E-14	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.55E-13	2.99E-07	2.82E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	8.21E-13	2.51E-07	3.05E-11	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.09E-12	1.16E-07	4.09E-11	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.64E-15	3.02E-09	2.85E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	8.31E-15	2.54E-09	3.09E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.11E-14	1.18E-09	4.14E-13	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.15E-14	2.54E-14
TEEN:	1.20E-13	1.42E-13
CHILD:	2.50E-14	2.96E-14
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.07E-15	1.27E-15
TEEN:	5.98E-15	7.07E-15
CHILD:	1.25E-15	1.48E-15
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	2.71E-17	3.20E-17
TEEN:	1.51E-16	1.79E-16
CHILD:	3.16E-17	3.74E-17
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y91M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y91

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.05E-08	4.21E-04	7.65E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	2.23E-08	3.41E-04	8.31E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	2.87E-08	1.43E-04	1.07E-06	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.02E-09	2.10E-05	3.82E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.11E-09	1.70E-05	4.15E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.43E-09	7.14E-06	5.36E-08	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.03E-11	2.13E-07	3.87E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.13E-11	1.72E-07	4.20E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.45E-11	7.23E-08	5.43E-10	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.73E-09	2.00E-04	3.64E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.06E-08	1.62E-04	3.94E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.41E-08	7.04E-05	5.28E-07	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.85E-11	2.03E-06	3.68E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.07E-10	1.64E-06	3.99E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.43E-10	7.12E-07	5.35E-09	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	3.52E-09	3.96E-09
TEEN:	1.97E-08	2.21E-08
CHILD:	4.11E-09	4.62E-09
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.76E-10	1.98E-10
TEEN:	9.82E-10	1.10E-09
CHILD:	2.05E-10	2.31E-10
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	4.45E-12	5.01E-12
TEEN:	2.48E-11	2.80E-11
CHILD:	5.19E-12	5.84E-12
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y92

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y93

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	7.57E-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	7.94E-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	4.98E-17	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	3.78E-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	3.96E-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	2.48E-18	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	3.83E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	4.01E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	2.52E-20	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	3.60E-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	3.77E-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	2.45E-17	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	3.65E-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	3.81E-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	2.48E-19	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZR95

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.25E-09	2.46E-05	2.42E-08	7.76E-09	1.22E-08	0.00E+00	0.00E+00	0.00E+00
TEEN:	5.42E-09	1.82E-05	2.50E-08	7.88E-09	1.16E-08	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.93E-09	6.95E-06	3.03E-08	6.67E-09	9.54E-09	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.59E-08	7.44E-05	7.32E-08	2.35E-08	3.68E-08	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.64E-08	5.50E-05	7.56E-08	2.38E-08	3.50E-08	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.80E-08	2.10E-05	9.18E-08	2.02E-08	2.89E-08	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.61E-10	7.53E-07	7.41E-10	2.38E-10	3.73E-10	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.66E-10	5.57E-07	7.65E-10	2.41E-10	3.55E-10	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.82E-10	2.13E-07	9.29E-10	2.04E-10	2.92E-10	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.51E-09	7.09E-06	6.97E-09	2.24E-09	3.51E-09	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.56E-09	5.23E-06	7.18E-09	2.27E-09	3.33E-09	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.77E-09	2.07E-06	9.04E-09	1.99E-09	2.85E-09	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.53E-11	7.17E-08	7.06E-11	2.26E-11	3.55E-11	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.58E-11	5.29E-08	7.27E-11	2.29E-11	3.37E-11	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.79E-11	2.10E-08	9.16E-11	2.01E-11	2.88E-11	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	8.92E-07	1.03E-06	
TEEN:	4.98E-06	5.78E-06	
CHILD:	1.04E-06	1.21E-06	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	4.45E-08	5.17E-08	
TEEN:	2.49E-07	2.88E-07	
CHILD:	5.20E-08	6.03E-08	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	1.13E-09	1.31E-09	
TEEN:	6.29E-09	7.30E-09	
CHILD:	1.31E-09	1.53E-09	
INFANT:	0.00E+00	0.00E+00	



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZR97

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.30E-19	4.27E-13	6.83E-18	1.38E-18	2.08E-18	0.00E+00	0.00E+00
TEEN:	6.69E-19	3.93E-13	7.34E-18	1.45E-18	2.20E-18	0.00E+00	0.00E+00
CHILD:	7.96E-19	2.04E-13	9.33E-18	1.35E-18	1.94E-18	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.91E-18	1.29E-12	2.07E-17	4.17E-18	6.30E-18	0.00E+00	0.00E+00
TEEN:	2.02E-18	1.19E-12	2.22E-17	4.40E-18	6.66E-18	0.00E+00	0.00E+00
CHILD:	2.41E-18	6.18E-13	2.82E-17	4.08E-18	5.86E-18	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.93E-20	1.31E-14	2.09E-19	4.22E-20	6.38E-20	0.00E+00	0.00E+00
TEEN:	2.05E-20	1.20E-14	2.25E-19	4.45E-20	6.75E-20	0.00E+00	0.00E+00
CHILD:	2.44E-20	6.26E-15	2.86E-19	4.13E-20	5.93E-20	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.82E-19	1.23E-13	1.97E-18	3.97E-19	6.00E-19	0.00E+00	0.00E+00
TEEN:	1.92E-19	1.13E-13	2.11E-18	4.18E-19	6.33E-19	0.00E+00	0.00E+00
CHILD:	2.37E-19	6.09E-14	2.78E-18	4.02E-19	5.78E-19	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	1.25E-15	1.99E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	1.14E-15	2.14E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	6.17E-16	2.82E-20	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.46E-16	1.70E-16
TEEN:	8.15E-16	9.48E-16
CHILD:	1.70E-16	1.98E-16
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	7.28E-18	8.48E-18
TEEN:	4.07E-17	4.73E-17
CHILD:	8.50E-18	9.89E-18
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.84E-19	2.15E-19
TEEN:	1.03E-18	1.20E-18
CHILD:	2.15E-19	2.50E-19
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NB95

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.50E-06	7.34E-02	2.17E-05	1.21E-05	1.20E-05	0.00E+00	0.00E+00
TEEN:	6.69E-06	5.19E-02	2.19E-05	1.21E-05	1.18E-05	0.00E+00	0.00E+00
CHILD:	7.19E-06	1.86E-02	2.58E-05	1.01E-05	9.45E-06	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.25E-07	3.67E-03	1.09E-06	6.04E-07	5.97E-07	0.00E+00	0.00E+00
TEEN:	3.34E-07	2.59E-03	1.09E-06	6.07E-07	5.88E-07	0.00E+00	0.00E+00
CHILD:	3.59E-07	9.29E-04	1.29E-06	5.03E-07	4.72E-07	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.29E-09	3.71E-05	1.10E-08	6.12E-09	6.04E-09	0.00E+00	0.00E+00
TEEN:	3.38E-09	2.63E-05	1.11E-08	6.14E-09	5.95E-09	0.00E+00	0.00E+00
CHILD:	3.64E-09	9.41E-06	1.31E-08	5.09E-09	4.78E-09	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.58E-10	2.91E-06	8.62E-10	4.79E-10	4.74E-10	0.00E+00	0.00E+00
TEEN:	2.64E-10	2.05E-06	8.66E-10	4.80E-10	4.65E-10	0.00E+00	0.00E+00
CHILD:	2.95E-10	7.63E-07	1.06E-09	4.13E-10	3.88E-10	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.61E-12	2.95E-08	8.72E-12	4.85E-12	4.80E-12	0.00E+00	0.00E+00
TEEN:	2.68E-12	2.08E-08	8.76E-12	4.86E-12	4.71E-12	0.00E+00	0.00E+00
CHILD:	2.99E-12	7.73E-09	1.07E-11	4.18E-12	3.92E-12	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.43E-07	2.86E-07
TEEN:	1.36E-06	1.60E-06
CHILD:	2.84E-07	3.34E-07
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.22E-08	1.43E-08
TEEN:	6.79E-08	7.98E-08
CHILD:	1.42E-08	1.67E-08
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	3.08E-10	3.62E-10
TEEN:	1.72E-09	2.02E-09
CHILD:	3.59E-10	4.22E-10
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : M099

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.31E-09	2.82E-08	0.00E+00	1.22E-08	2.75E-08	0.00E+00	0.00E+00
TEEN:	7.47E-09	2.32E-08	0.00E+00	1.30E-08	2.97E-08	0.00E+00	0.00E+00
CHILD:	3.05E-09	1.02E-08	0.00E+00	1.23E-08	2.63E-08	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.16E-10	1.41E-09	0.00E+00	6.07E-10	1.37E-09	0.00E+00	0.00E+00
TEEN:	1.23E-10	1.16E-09	0.00E+00	6.47E-10	1.48E-09	0.00E+00	0.00E+00
CHILD:	1.52E-10	5.09E-10	0.00E+00	6.16E-10	1.31E-09	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.17E-12	1.42E-11	0.00E+00	6.15E-12	1.39E-11	0.00E+00	0.00E+00
TEEN:	1.25E-12	1.17E-11	0.00E+00	6.55E-12	1.50E-11	0.00E+00	0.00E+00
CHILD:	1.54E-12	5.15E-12	0.00E+00	6.23E-12	1.33E-11	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.75E-11	3.35E-10	0.00E+00	1.45E-10	3.27E-10	0.00E+00	0.00E+00
TEEN:	2.93E-11	2.75E-10	0.00E+00	1.54E-10	3.52E-10	0.00E+00	0.00E+00
CHILD:	3.75E-11	1.25E-10	0.00E+00	1.52E-10	3.24E-10	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.78E-13	3.39E-12	0.00E+00	1.46E-12	3.31E-12	0.00E+00	0.00E+00
TEEN:	2.97E-13	2.79E-12	0.00E+00	1.56E-12	3.56E-12	0.00E+00	0.00E+00
CHILD:	3.80E-13	1.27E-12	0.00E+00	1.54E-12	3.28E-12	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.17E-11	2.51E-11
TEEN:	1.21E-10	1.40E-10
CHILD:	2.53E-11	2.93E-11
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.08E-12	1.25E-12
TEEN:	6.04E-12	7.00E-12
CHILD:	1.26E-12	1.46E-12
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	2.74E-14	3.17E-14
TEEN:	1.53E-13	1.77E-13
CHILD:	3.20E-14	3.70E-14
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TC99M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TC101

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RU103

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.07E-07	2.91E-05	2.49E-07	0.00E+00	9.50E-07	0.00E+00	0.00E+00
TEEN:	1.12E-07	2.18E-05	2.61E-07	0.00E+00	9.22E-07	0.00E+00	0.00E+00
CHILD:	1.24E-07	8.36E-06	3.23E-07	0.00E+00	8.14E-07	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.61E-09	4.35E-07	3.73E-09	0.00E+00	1.42E-08	0.00E+00	0.00E+00
TEEN:	1.67E-09	3.27E-07	3.92E-09	0.00E+00	1.38E-08	0.00E+00	0.00E+00
CHILD:	1.86E-09	1.25E-07	4.84E-09	0.00E+00	1.22E-08	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.63E-11	4.41E-09	3.78E-11	0.00E+00	1.44E-10	0.00E+00	0.00E+00
TEEN:	1.69E-11	3.31E-09	3.97E-11	0.00E+00	1.40E-10	0.00E+00	0.00E+00
CHILD:	1.88E-11	1.27E-09	4.90E-11	0.00E+00	1.23E-10	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.28E-07	3.46E-05	2.96E-07	0.00E+00	1.13E-06	0.00E+00	0.00E+00
TEEN:	1.33E-07	2.59E-05	3.10E-07	0.00E+00	1.09E-06	0.00E+00	0.00E+00
CHILD:	1.53E-07	1.03E-05	3.98E-07	0.00E+00	1.00E-06	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.29E-09	3.50E-07	3.00E-09	0.00E+00	1.14E-08	0.00E+00	0.00E+00
TEEN:	1.34E-09	2.62E-07	3.14E-09	0.00E+00	1.11E-08	0.00E+00	0.00E+00
CHILD:	1.55E-09	1.04E-07	4.03E-09	0.00E+00	1.01E-08	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.22E-07	2.59E-07
TEEN:	1.24E-06	1.44E-06
CHILD:	2.59E-07	3.02E-07
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.11E-08	1.29E-08
TEEN:	6.18E-08	7.21E-08
CHILD:	1.29E-08	1.51E-08
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	2.80E-10	3.27E-10
TEEN:	1.56E-09	1.83E-09
CHILD:	3.27E-10	3.81E-10
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RU105

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RU106

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.15E-06	2.63E-03	4.07E-05	0.00E+00	7.86E-05	0.00E+00	0.00E+00
TEEN:	5.57E-06	2.12E-03	4.42E-05	0.00E+00	8.52E-05	0.00E+00	0.00E+00
CHILD:	7.10E-06	8.85E-04	5.69E-05	0.00E+00	7.68E-05	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.71E-08	3.95E-05	6.10E-07	0.00E+00	1.18E-06	0.00E+00	0.00E+00
TEEN:	8.34E-08	3.18E-05	6.62E-07	0.00E+00	1.28E-06	0.00E+00	0.00E+00
CHILD:	1.06E-07	1.33E-05	8.52E-07	0.00E+00	1.15E-06	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.81E-10	3.99E-07	6.17E-09	0.00E+00	1.19E-08	0.00E+00	0.00E+00
TEEN:	8.45E-10	3.21E-07	6.70E-09	0.00E+00	1.29E-08	0.00E+00	0.00E+00
CHILD:	1.08E-09	1.34E-07	8.63E-09	0.00E+00	1.16E-08	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.12E-06	3.13E-03	4.84E-05	0.00E+00	9.34E-05	0.00E+00	0.00E+00
TEEN:	6.61E-06	2.51E-03	5.24E-05	0.00E+00	1.01E-04	0.00E+00	0.00E+00
CHILD:	8.73E-06	1.09E-03	7.00E-05	0.00E+00	9.45E-05	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.20E-08	3.17E-05	4.90E-07	0.00E+00	9.46E-07	0.00E+00	0.00E+00
TEEN:	6.69E-08	2.54E-05	5.31E-07	0.00E+00	1.02E-06	0.00E+00	0.00E+00
CHILD:	8.84E-08	1.10E-05	7.08E-07	0.00E+00	9.57E-07	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	9.36E-06	1.12E-05
TEEN:	5.23E-05	6.27E-05
CHILD:	1.09E-05	1.31E-05
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	4.67E-07	5.61E-07
TEEN:	2.61E-06	3.13E-06
CHILD:	5.45E-07	6.54E-07
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.18E-08	1.42E-08
TEEN:	6.61E-08	7.93E-08
CHILD:	1.38E-08	1.66E-08
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : AG110M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	5.29E-05	6.18E-05	
TEEN:	2.96E-04	3.45E-04	
CHILD:	6.18E-05	7.21E-05	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	2.64E-06	3.08E-06	
TEEN:	1.48E-05	1.72E-05	
CHILD:	3.08E-06	3.60E-06	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	6.69E-08	7.81E-08	
TEEN:	3.74E-07	4.36E-07	
CHILD:	7.81E-08	9.11E-08	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE125M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.09E-05	9.20E-04	2.30E-04	8.35E-05	9.37E-04	6.93E-05	0.00E+00
TEEN:	3.35E-05	7.40E-04	2.51E-04	9.04E-05	0.00E+00	7.01E-05	0.00E+00
CHILD:	4.29E-05	3.11E-04	3.22E-04	8.73E-05	0.00E+00	9.04E-05	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.85E-08	1.15E-06	2.88E-07	1.04E-07	1.17E-06	8.65E-08	0.00E+00
TEEN:	4.19E-08	9.24E-07	3.13E-07	1.13E-07	0.00E+00	8.75E-08	0.00E+00
CHILD:	5.36E-08	3.88E-07	4.02E-07	1.09E-07	0.00E+00	1.13E-07	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.90E-10	1.16E-08	2.91E-09	1.06E-09	1.18E-08	8.76E-10	0.00E+00
TEEN:	4.24E-10	9.36E-09	3.17E-09	1.14E-09	0.00E+00	8.86E-10	0.00E+00
CHILD:	5.43E-10	3.93E-09	4.07E-09	1.10E-09	0.00E+00	1.14E-09	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.18E-08	2.74E-06	6.85E-07	2.48E-07	2.79E-06	2.06E-07	0.00E+00
TEEN:	9.95E-08	2.20E-06	7.44E-07	2.68E-07	0.00E+00	2.08E-07	0.00E+00
CHILD:	1.32E-07	9.56E-07	9.91E-07	2.69E-07	0.00E+00	2.78E-07	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.29E-10	2.77E-08	6.93E-09	2.51E-09	2.82E-08	2.09E-09	0.00E+00
TEEN:	1.01E-09	2.22E-08	7.53E-09	2.71E-09	0.00E+00	2.10E-09	0.00E+00
CHILD:	1.34E-09	9.68E-09	1.00E-08	2.72E-09	0.00E+00	2.82E-09	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	5.05E-09	6.92E-09
TEEN:	2.82E-08	3.86E-08
CHILD:	5.89E-09	8.08E-09
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	2.52E-10	3.46E-10
TEEN:	1.41E-09	1.93E-09
CHILD:	2.94E-10	4.03E-10
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	6.38E-12	8.75E-12
TEEN:	3.56E-11	4.88E-11
CHILD:	7.44E-12	1.02E-11
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE127M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.43E-04	3.92E-03	1.18E-03	4.20E-04	4.78E-03	3.00E-04	0.00E+00	
TEEN:	1.52E-04	3.19E-03	1.28E-03	4.54E-04	5.19E-03	3.04E-04	0.00E+00	
CHILD:	1.96E-04	1.34E-03	1.65E-03	4.44E-04	4.70E-03	3.94E-04	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	

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.79E-07	4.92E-06	1.47E-06	5.25E-07	5.96E-06	3.75E-07	0.00E+00	
TEEN:	1.90E-07	3.98E-06	1.60E-06	5.67E-07	5.47E-06	3.80E-07	0.00E+00	
CHILD:	2.44E-07	1.67E-06	2.06E-06	5.54E-07	5.87E-06	4.92E-07	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	

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.81E-09	4.98E-08	1.49E-08	5.31E-09	6.04E-08	3.80E-09	0.00E+00	
TEEN:	1.92E-09	4.03E-08	1.62E-08	5.74E-09	6.55E-08	3.85E-09	0.00E+00	
CHILD:	2.47E-09	1.69E-08	2.08E-08	5.61E-09	5.94E-08	4.98E-09	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	

FOR PATHWAY: SALTWATER INVERT. BRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.26E-07	1.17E-05	3.49E-06	1.25E-06	1.42E-05	8.93E-07	0.00E+00	
TEEN:	4.51E-07	9.45E-06	3.79E-06	1.35E-06	1.54E-05	9.02E-07	0.00E+00	
CHILD:	6.02E-07	4.11E-06	5.07E-06	1.37E-06	1.45E-05	1.21E-06	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	

FOR PATHWAY: SALTWATER INVERT. BRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.31E-07	1.19E-07	3.54E-08	1.26E-08	1.44E-07	9.04E-09	0.00E+00	
TEEN:	4.57E-07	9.57E-08	3.84E-08	1.36E-08	1.56E-07	9.13E-09	0.00E+00	
CHILD:	6.09E-07	4.16E-08	5.13E-08	1.38E-08	1.46E-07	1.23E-08	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	

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	5.99E-10	7.07E-10	
TEEN:	3.34E-09	3.95E-09	
CHILD:	6.98E-10	8.25E-10	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	2.99E-11	3.53E-11	
TEEN:	1.67E-10	1.97E-10	
CHILD:	3.49E-11	4.12E-11	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	7.57E-13	8.94E-13	
TEEN:	4.22E-12	4.99E-12	
CHILD:	8.83E-13	1.04E-12	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE127

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.34E-20	1.58E-17	2.00E-19	7.20E-20	8.16E-19	1.48E-19	0.00E+00
TEEN:	4.72E-20	1.69E-17	2.19E-19	7.77E-20	8.88E-19	1.51E-19	0.00E+00
CHILD:	6.05E-20	1.10E-17	2.82E-19	7.60E-20	8.02E-19	1.95E-19	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	1.97E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	2.11E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	1.37E-20	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	0.00E+00	4.70E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	5.02E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	3.39E-20	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE129M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	8.00E-05	2.55E-03	5.06E-04	1.89E-04	2.11E-03	1.74E-04	0.00E+00
TEEN:	8.64E-05	2.05E-03	5.46E-04	2.03E-04	2.28E-03	1.76E-04	0.00E+00
CHILD:	1.09E-04	8.58E-04	7.04E-04	1.96E-04	2.07E-03	2.27E-04	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.99E-08	3.18E-06	6.31E-07	2.35E-07	2.63E-06	2.17E-07	0.00E+00
TEEN:	1.08E-07	2.56E-06	6.82E-07	2.53E-07	2.85E-06	2.20E-07	0.00E+00
CHILD:	1.36E-07	1.07E-06	8.78E-07	2.45E-07	2.58E-06	2.83E-07	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.01E-09	3.22E-08	6.39E-09	2.38E-09	2.67E-08	2.19E-09	0.00E+00
TEEN:	1.09E-09	2.59E-08	6.90E-09	2.56E-09	2.89E-08	2.23E-09	0.00E+00
CHILD:	1.38E-09	1.08E-08	8.89E-09	2.48E-09	2.61E-08	2.87E-09	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.38E-07	7.57E-06	1.50E-06	5.61E-07	6.27E-06	5.16E-07	0.00E+00
TEEN:	2.56E-07	6.08E-06	1.62E-06	6.01E-07	6.77E-06	5.22E-07	0.00E+00
CHILD:	3.36E-07	2.64E-06	2.16E-06	6.04E-07	6.35E-06	6.98E-07	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.41E-09	7.66E-08	1.52E-08	5.68E-09	6.35E-08	5.23E-09	0.00E+00
TEEN:	2.59E-09	6.15E-08	1.64E-08	6.08E-09	6.86E-08	5.29E-09	0.00E+00
CHILD:	3.40E-09	2.67E-08	2.19E-08	6.12E-09	6.43E-08	7.06E-09	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	3.32E-08	3.88E-08
TEEN:	1.85E-07	2.16E-07
CHILD:	3.87E-08	4.52E-08
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.66E-09	1.94E-09
TEEN:	9.25E-09	1.08E-08
CHILD:	1.93E-09	2.26E-09
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	4.19E-11	4.90E-11
TEEN:	2.34E-10	2.73E-10
CHILD:	4.89E-11	5.71E-11
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE129

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE131M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.88E-10	4.62E-08	9.51E-10	4.65E-10	4.71E-09	7.37E-10	0.00E+00
TEEN:	4.09E-10	3.93E-08	1.02E-09	4.90E-10	5.11E-09	7.37E-10	0.00E+00
CHILD:	4.79E-10	1.82E-08	1.30E-09	4.50E-10	4.35E-09	9.25E-10	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.84E-13	5.77E-11	1.19E-12	5.81E-13	5.88E-12	9.20E-13	0.00E+00
TEEN:	5.10E-13	4.91E-11	1.28E-12	6.12E-13	6.38E-12	9.20E-13	0.00E+00
CHILD:	5.98E-13	2.28E-11	1.62E-12	5.62E-13	5.44E-12	1.15E-12	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.90E-15	5.84E-13	1.20E-14	5.88E-15	5.96E-14	9.31E-15	0.00E+00
TEEN:	5.17E-15	4.97E-13	1.29E-14	6.19E-15	6.46E-14	9.32E-15	0.00E+00
CHILD:	6.05E-15	2.31E-13	1.64E-14	5.69E-15	5.50E-14	1.17E-14	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.15E-12	1.37E-10	2.83E-12	1.38E-12	1.40E-11	2.19E-12	0.00E+00
TEEN:	1.21E-12	1.17E-10	3.03E-12	1.45E-12	1.52E-11	2.19E-12	0.00E+00
CHILD:	1.47E-12	5.61E-11	4.00E-12	1.38E-12	1.34E-11	2.85E-12	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.17E-14	1.39E-12	2.86E-14	1.40E-14	1.42E-13	2.22E-14	0.00E+00
TEEN:	1.23E-14	1.18E-12	3.07E-14	1.47E-14	1.53E-13	2.21E-14	0.00E+00
CHILD:	1.49E-14	5.68E-13	4.05E-14	1.40E-14	1.36E-13	2.88E-14	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.87E-13	3.39E-13
TEEN:	1.60E-12	1.89E-12
CHILD:	3.35E-13	3.95E-13
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.43E-14	1.69E-14
TEEN:	8.01E-14	9.44E-14
CHILD:	1.67E-14	1.97E-14
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	3.63E-16	4.28E-16
TEEN:	2.03E-15	2.39E-15
CHILD:	4.23E-16	4.99E-16
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE131

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE132

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.69E-07	1.86E-05	6.08E-07	3.93E-07	3.79E-06	4.34E-07	0.00E+00
TEEN:	3.82E-07	1.29E-05	6.12E-07	4.06E-07	3.90E-06	4.28E-07	0.00E+00
CHILD:	4.28E-07	3.57E-06	8.01E-07	3.54E-07	3.29E-06	5.16E-07	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.61E-10	2.32E-08	7.59E-10	4.91E-10	4.73E-09	5.42E-10	0.00E+00
TEEN:	4.77E-10	1.61E-08	8.01E-10	5.07E-10	4.87E-09	5.35E-10	0.00E+00
CHILD:	5.34E-10	4.45E-09	1.00E-09	4.42E-10	4.11E-09	6.44E-10	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.67E-12	2.35E-10	7.68E-12	4.97E-12	4.79E-11	5.49E-12	0.00E+00
TEEN:	4.83E-12	1.63E-10	8.11E-12	5.13E-12	4.93E-11	5.41E-12	0.00E+00
CHILD:	5.41E-12	4.51E-11	1.01E-11	4.48E-12	4.16E-11	6.52E-12	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.10E-09	5.53E-08	1.81E-09	1.17E-09	1.13E-08	1.29E-09	0.00E+00
TEEN:	1.13E-09	3.82E-08	1.90E-09	1.20E-09	1.16E-08	1.27E-09	0.00E+00
CHILD:	1.32E-09	1.10E-08	2.46E-09	1.09E-09	1.01E-08	1.59E-09	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.11E-11	5.60E-10	1.83E-11	1.18E-11	1.14E-10	1.31E-11	0.00E+00
TEEN:	1.15E-11	3.86E-10	1.93E-11	1.22E-11	1.17E-10	1.29E-11	0.00E+00
CHILD:	1.33E-11	1.11E-10	2.49E-11	1.10E-11	1.02E-10	1.61E-11	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	4.73E-11	5.56E-11
TEEN:	2.64E-10	3.10E-10
CHILD:	5.51E-11	6.49E-11
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	2.36E-12	2.78E-12
TEEN:	1.32E-11	1.55E-11
CHILD:	2.75E-12	3.24E-12
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSUR - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	5.97E-14	7.03E-14
TEEN:	3.33E-13	3.92E-13
CHILD:	6.97E-14	8.20E-14
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I130  
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## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.18E-17	1.13E-16	4.45E-17	1.31E-16	2.05E-16	1.11E-14	0.00E+00
TEEN:	5.33E-17	1.03E-16	4.62E-17	1.34E-16	2.06E-16	1.09E-14	0.00E+00
CHILD:	5.88E-17	5.33E-17	5.64E-17	1.14E-16	1.70E-16	1.26E-14	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.72E-18	3.76E-18	1.48E-18	4.37E-18	6.82E-18	3.70E-16	0.00E+00
TEEN:	1.78E-18	3.42E-18	1.54E-18	4.45E-18	6.85E-18	3.63E-16	0.00E+00
CHILD:	1.96E-18	1.78E-18	1.88E-18	3.90E-18	5.68E-18	4.18E-16	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.74E-20	3.81E-20	1.50E-20	4.42E-20	6.90E-20	3.75E-18	0.00E+00
TEEN:	1.80E-20	3.46E-20	1.56E-20	4.50E-20	6.93E-20	3.67E-18	0.00E+00
CHILD:	1.98E-20	1.80E-20	1.90E-20	3.84E-20	5.75E-20	4.23E-18	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.05E-18	4.48E-18	1.76E-18	5.20E-18	8.11E-18	4.41E-16	0.00E+00
TEEN:	2.11E-18	4.06E-18	1.82E-18	5.28E-18	8.13E-18	4.31E-16	0.00E+00
CHILD:	2.41E-18	2.19E-18	2.31E-18	4.68E-18	6.99E-18	5.15E-16	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.08E-20	4.53E-20	1.78E-20	5.26E-20	8.21E-20	4.46E-18	0.00E+00
TEEN:	2.13E-20	4.11E-20	1.85E-20	5.35E-20	8.23E-20	4.36E-18	0.00E+00
CHILD:	2.44E-20	2.21E-20	2.34E-20	4.73E-20	7.08E-20	5.22E-18	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.24E-18	1.51E-18
TEEN:	6.93E-18	8.42E-18
CHILD:	1.45E-18	1.76E-18
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	6.20E-20	7.53E-20
TEEN:	3.46E-19	4.20E-19
CHILD:	7.23E-20	8.78E-20
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	1.06E-20
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I131

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.07E-07	2.34E-07	6.19E-07	8.85E-07	1.52E-06	2.90E-04	0.00E+00
TEEN:	4.99E-07	1.84E-07	6.63E-07	9.28E-07	1.00E-06	2.71E-04	0.00E+00
CHILD:	4.80E-07	7.53E-08	8.41E-07	8.45E-07	1.39E-06	2.80E-04	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.69E-08	7.77E-09	2.06E-08	2.95E-08	5.05E-08	9.65E-06	0.00E+00
TEEN:	1.66E-08	6.11E-09	2.21E-08	3.09E-08	5.32E-08	9.02E-06	0.00E+00
CHILD:	1.60E-08	2.51E-09	2.80E-08	2.81E-08	4.62E-08	9.31E-06	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.71E-10	7.87E-11	2.09E-10	2.98E-10	5.11E-10	9.77E-08	0.00E+00
TEEN:	1.68E-10	6.19E-11	2.23E-10	3.13E-10	5.38E-10	9.13E-08	0.00E+00
CHILD:	1.62E-10	2.54E-11	2.83E-10	2.85E-10	4.68E-10	9.42E-08	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.01E-08	9.25E-09	2.45E-08	3.51E-08	6.01E-08	1.15E-05	0.00E+00
TEEN:	1.97E-08	7.26E-09	2.62E-08	3.67E-08	6.32E-08	1.07E-05	0.00E+00
CHILD:	1.97E-08	3.09E-09	3.45E-08	3.47E-08	5.69E-08	1.15E-05	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.03E-10	9.37E-11	2.48E-10	3.55E-10	6.09E-10	1.16E-07	0.00E+00
TEEN:	2.00E-10	7.35E-11	2.65E-10	3.71E-10	6.39E-10	1.08E-07	0.00E+00
CHILD:	1.99E-10	3.12E-11	3.49E-10	3.51E-10	5.76E-10	1.16E-07	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.78E-09	3.38E-09
TEEN:	1.55E-08	1.89E-08
CHILD:	3.25E-09	3.94E-09
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.39E-10	1.69E-10
TEEN:	7.76E-10	9.42E-10
CHILD:	1.62E-10	1.97E-10
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	3.52E-12	4.27E-12
TEEN:	1.96E-11	2.38E-11
CHILD:	4.10E-12	4.98E-12
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I132

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : 1133

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.74E-13	8.07E-13	5.16E-13	8.98E-13	1.57E-12	1.32E-10	0.00E+00
TEEN:	2.88E-13	7.15E-13	5.57E-13	9.45E-13	1.66E-12	1.32E-10	0.00E+00
CHILD:	3.31E-13	3.53E-13	7.07E-13	8.75E-13	1.46E-12	1.63E-10	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.12E-15	2.69E-14	1.72E-14	2.99E-14	5.22E-14	4.40E-12	0.00E+00
TEEN:	9.59E-15	2.38E-14	1.85E-14	3.15E-14	5.52E-14	4.39E-12	0.00E+00
CHILD:	1.10E-14	1.17E-14	2.36E-14	2.91E-14	4.85E-14	5.41E-12	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.23E-17	2.72E-16	1.74E-16	3.03E-16	5.28E-16	4.45E-14	0.00E+00
TEEN:	9.71E-17	2.41E-16	1.88E-16	3.18E-16	5.58E-16	4.45E-14	0.00E+00
CHILD:	1.12E-16	1.19E-16	2.38E-16	2.95E-16	4.91E-16	5.48E-14	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADL:	1.09E-14	3.20E-14	2.05E-14	3.56E-14	6.21E-14	5.23E-12	0.00E+00
TEEN:	1.14E-14	2.83E-14	2.20E-14	3.74E-14	6.55E-14	5.21E-12	0.00E+00
CHILD:	1.36E-14	1.45E-14	2.90E-14	3.59E-14	5.98E-14	6.67E-12	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.10E-16	3.24E-16	2.07E-16	3.60E-16	6.29E-16	5.30E-14	0.00E+00
TEEN:	1.15E-16	2.86E-16	2.23E-16	3.78E-16	6.63E-16	5.28E-14	0.00E+00
CHILD:	1.37E-16	1.46E-16	2.94E-16	3.63E-16	6.05E-16	6.75E-14	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.98E-15	2.41E-15
TEEN:	1.10E-14	1.34E-14
CHILD:	2.31E-15	2.81E-15
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	9.87E-17	1.20E-16
TEEN:	5.51E-16	6.71E-16
CHILD:	1.15E-16	1.40E-16
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	2.50E-18	3.04E-18
TEEN:	1.40E-17	1.70E-17
CHILD:	2.92E-18	3.55E-18
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I134

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I135

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS134

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.83E-04	1.46E-05	3.51E-04	8.35E-04	2.70E-04	0.00E+00	8.97E-05	
TEEN:	3.93E-04	1.05E-05	3.60E-04	8.47E-04	2.69E-04	0.00E+00	1.03E-04	
CHILD:	1.50E-04	3.84E-06	4.34E-04	7.12E-04	2.21E-04	0.00E+00	7.92E-05	
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.19E-06	8.97E-08	2.15E-06	5.13E-06	1.66E-06	0.00E+00	5.51E-07	
TEEN:	2.41E-06	6.46E-08	2.21E-06	5.20E-06	1.65E-06	0.00E+00	6.31E-07	
CHILD:	9.22E-07	2.36E-08	2.66E-06	4.37E-06	1.35E-06	0.00E+00	4.86E-07	
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.02E-04	2.18E-06	5.22E-05	1.24E-04	4.02E-05	0.00E+00	1.34E-05	
TEEN:	5.83E-05	1.56E-06	5.34E-05	1.26E-04	4.00E-05	0.00E+00	1.53E-05	
CHILD:	2.31E-05	5.91E-07	6.68E-05	1.10E-04	3.40E-05	0.00E+00	1.22E-05	
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.24E-07	1.33E-08	3.21E-07	7.63E-07	2.47E-07	0.00E+00	8.19E-08	
TEEN:	3.58E-07	9.60E-09	3.28E-07	7.72E-07	2.45E-07	0.00E+00	9.36E-08	
CHILD:	1.42E-07	3.63E-09	4.10E-07	6.73E-07	2.09E-07	0.00E+00	7.48E-08	
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	1.45E-05	1.69E-05	
TEEN:	8.08E-05	9.43E-05	
CHILD:	1.69E-05	1.97E-05	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	2.22E-07	2.59E-07	
TEEN:	1.24E-06	1.45E-06	
CHILD:	2.59E-07	3.02E-07	
INFANT:	0.00E+00	0.00E+00	



Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS136

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.85E-07	1.55E-07	3.47E-07	1.37E-06	7.61E-07	0.00E+00	1.04E-07
TEEN:	9.21E-07	1.10E-07	3.48E-07	1.37E-06	7.46E-07	0.00E+00	1.18E-07
CHILD:	7.31E-07	3.97E-08	4.11E-07	1.13E-06	6.02E-07	0.00E+00	8.97E-08
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.04E-09	9.54E-10	2.13E-09	8.39E-09	4.67E-09	0.00E+00	6.40E-10
TEEN:	5.65E-09	6.77E-10	2.14E-09	8.41E-09	4.58E-09	0.00E+00	7.22E-10
CHILD:	4.49E-09	2.44E-10	2.52E-09	6.93E-09	3.69E-09	0.00E+00	5.51E-10
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.47E-07	2.31E-08	5.16E-08	2.04E-07	1.13E-07	0.00E+00	1.55E-08
TEEN:	1.37E-07	1.64E-08	5.17E-08	2.04E-07	1.11E-07	0.00E+00	1.75E-08
CHILD:	1.13E-07	6.11E-09	6.33E-08	1.74E-07	9.27E-08	0.00E+00	1.38E-08
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	8.99E-10	1.42E-10	3.16E-10	1.25E-09	6.95E-10	0.00E+00	9.53E-11
TEEN:	8.39E-10	1.00E-10	3.17E-10	1.25E-09	6.80E-10	0.00E+00	1.07E-10
CHILD:	6.91E-10	3.75E-11	3.88E-10	1.07E-09	5.68E-10	0.00E+00	8.48E-11
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	3.16E-09	3.58E-09
TEEN:	1.76E-08	2.00E-08
CHILD:	3.68E-09	4.18E-09
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	4.84E-11	5.49E-11
TEEN:	2.70E-10	3.06E-10
CHILD:	5.65E-11	6.40E-11
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS137

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.94E-03	5.73E-05	2.16E-03	2.96E-03	1.00E-03	0.00E+00	3.34E-04
TEEN:	1.07E-03	4.39E-05	2.32E-03	3.08E-03	1.05E-03	0.00E+00	4.08E-04
CHILD:	4.12E-04	1.75E-05	2.92E-03	2.79E-03	9.10E-04	0.00E+00	3.27E-04
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.19E-05	3.51E-07	1.33E-05	1.82E-05	6.16E-06	0.00E+00	2.05E-06
TEEN:	6.59E-06	2.69E-07	1.42E-05	1.89E-05	6.43E-06	0.00E+00	2.50E-06
CHILD:	2.53E-06	1.07E-07	1.79E-05	1.71E-05	5.58E-06	0.00E+00	2.01E-06
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.88E-04	8.53E-06	3.22E-04	4.40E-04	1.49E-04	0.00E+00	4.97E-05
TEEN:	1.59E-04	6.51E-06	3.44E-04	4.58E-04	1.56E-04	0.00E+00	6.05E-05
CHILD:	6.35E-05	2.69E-06	4.49E-04	4.30E-04	1.40E-04	0.00E+00	5.04E-05
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.77E-06	5.23E-08	1.98E-06	2.70E-06	9.17E-07	0.00E+00	3.05E-07
TEEN:	9.78E-07	3.99E-08	2.11E-06	2.81E-06	9.55E-07	0.00E+00	3.71E-07
CHILD:	3.89E-07	1.65E-08	2.76E-06	2.64E-06	8.60E-07	0.00E+00	3.09E-07
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.05E-04	1.22E-04
TEEN:	5.84E-04	6.81E-04
CHILD:	1.22E-04	1.42E-04
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.60E-06	1.87E-06
TEEN:	8.96E-06	1.05E-05
CHILD:	1.87E-06	2.18E-06
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS138

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA139

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	
TEEN:	0.00E+00	0.00E+00	
CHILD:	0.00E+00	0.00E+00	
INFANT:	0.00E+00	0.00E+00	

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA140

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.35E-07	4.25E-06	2.06E-06	2.59E-09	8.81E-10	0.00E+00	1.48E-09
TEEN:	1.42E-07	3.39E-06	2.20E-06	2.69E-09	9.13E-10	0.00E+00	1.81E-09
CHILD:	1.62E-07	1.41E-06	2.77E-06	2.43E-09	7.91E-10	0.00E+00	1.45E-09
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.69E-08	5.30E-07	2.57E-07	3.23E-10	1.17E-10	0.00E+00	1.85E-10
TEEN:	1.77E-08	4.23E-07	2.74E-07	3.36E-10	1.14E-10	0.00E+00	2.26E-10
CHILD:	2.02E-08	1.75E-07	3.46E-07	3.03E-10	9.81E-11	0.00E+00	1.81E-10
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.71E-10	5.37E-09	2.61E-09	3.27E-12	1.11E-12	0.00E+00	1.87E-12
TEEN:	1.79E-10	4.28E-09	2.78E-09	3.40E-12	1.15E-12	0.00E+00	2.29E-12
CHILD:	2.05E-10	1.78E-09	3.51E-09	3.07E-12	1.00E-12	0.00E+00	1.83E-12
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.02E-08	1.26E-06	6.13E-07	7.70E-10	2.62E-10	0.00E+00	4.41E-10
TEEN:	4.20E-08	1.01E-06	6.52E-07	7.99E-10	2.71E-10	0.00E+00	5.37E-10
CHILD:	4.98E-08	4.32E-07	8.53E-07	7.47E-10	2.43E-10	0.00E+00	4.46E-10
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.07E-10	1.28E-08	6.20E-09	7.79E-12	2.65E-12	0.00E+00	4.46E-12
TEEN:	4.25E-10	1.02E-08	6.60E-09	8.08E-12	2.74E-12	0.00E+00	5.44E-12
CHILD:	5.04E-10	4.37E-09	8.64E-09	7.57E-12	2.46E-12	0.00E+00	4.51E-12
INFANT:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	8.22E-09	9.40E-09
TEEN:	4.59E-08	5.25E-08
CHILD:	9.59E-09	1.10E-08
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	4.11E-10	4.69E-10
TEEN:	2.29E-09	2.62E-09
CHILD:	4.79E-10	5.47E-10
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.04E-11	1.19E-11
TEEN:	5.80E-11	6.63E-11
CHILD:	1.21E-11	1.39E-11
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA141

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA142

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : LA140

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.29E-13	3.57E-08	9.65E-13	4.86E-13	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.34E-13	2.89E-08	1.02E-12	5.03E-13	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.51E-13	1.25E-08	1.28E-12	4.48E-13	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.42E-15	1.78E-09	4.82E-14	2.43E-14	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.68E-15	1.44E-09	5.11E-14	2.51E-14	0.00E+00	0.00E+00	0.00E+00
CHILD:	7.54E-15	6.23E-10	6.40E-14	2.24E-14	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.50E-17	1.80E-11	4.88E-16	2.46E-16	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.76E-17	1.46E-11	5.17E-16	2.54E-16	0.00E+00	0.00E+00	0.00E+00
CHILD:	7.63E-17	6.31E-12	6.48E-16	2.26E-16	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.11E-14	1.70E-08	4.59E-13	2.31E-13	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.35E-14	1.37E-08	4.86E-13	2.39E-13	0.00E+00	0.00E+00	0.00E+00
CHILD:	7.43E-14	6.14E-09	6.30E-13	2.20E-13	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	6.19E-16	1.72E-10	4.65E-15	2.34E-15	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.43E-16	1.39E-10	4.92E-15	2.42E-15	0.00E+00	0.00E+00	0.00E+00
CHILD:	7.52E-16	6.22E-11	6.38E-15	2.23E-15	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	6.72E-12	7.61E-12
TEEN:	3.75E-11	4.25E-11
CHILD:	7.84E-12	8.88E-12
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	3.35E-13	3.80E-13
TEEN:	1.87E-12	2.12E-12
CHILD:	3.91E-13	4.43E-13
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	8.49E-15	9.62E-15
TEEN:	4.74E-14	5.37E-14
CHILD:	9.90E-15	1.12E-14
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : LA142

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	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
CHILD:	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CE141

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	7.56E-11	2.55E-06	9.85E-10	6.66E-10	3.09E-10	0.00E+00	0.00E+00
TEEN:	8.18E-11	2.04E-06	1.07E-09	7.12E-10	3.35E-10	0.00E+00	0.00E+00
CHILD:	1.02E-10	8.54E-07	1.37E-09	6.85E-10	3.00E-10	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.77E-11	1.27E-06	4.92E-10	3.33E-10	1.55E-10	0.00E+00	0.00E+00
TEEN:	4.08E-11	1.02E-06	5.33E-10	3.56E-10	1.67E-10	0.00E+00	0.00E+00
CHILD:	5.08E-11	4.27E-07	6.86E-10	3.42E-10	1.50E-10	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.82E-13	1.29E-08	4.98E-12	3.37E-12	1.56E-12	0.00E+00	0.00E+00
TEEN:	4.14E-13	1.03E-08	5.39E-12	3.60E-12	1.69E-12	0.00E+00	0.00E+00
CHILD:	5.14E-13	4.32E-09	6.94E-12	3.46E-12	1.52E-12	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.39E-10	1.82E-05	7.03E-09	4.75E-09	2.21E-09	0.00E+00	0.00E+00
TEEN:	5.82E-10	1.45E-05	7.59E-09	5.07E-09	2.39E-09	0.00E+00	0.00E+00
CHILD:	7.51E-10	6.31E-06	1.01E-08	5.05E-09	2.22E-09	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.46E-12	1.94E-07	7.11E-11	4.81E-11	2.23E-11	0.00E+00	0.00E+00
TEEN:	5.89E-12	1.47E-07	7.68E-11	5.13E-11	2.41E-11	0.00E+00	0.00E+00
CHILD:	7.60E-12	6.38E-08	1.03E-10	5.12E-11	2.24E-11	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.20E-08	2.48E-08
TEEN:	1.23E-07	1.38E-07
CHILD:	2.56E-08	2.89E-08
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.10E-09	1.24E-09
TEEN:	6.12E-09	6.90E-09
CHILD:	1.28E-09	1.44E-09
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	2.77E-11	3.13E-11
TEEN:	1.55E-10	1.75E-10
CHILD:	3.24E-11	3.65E-11
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CE143

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.35E-16	1.47E-10	5.31E-15	3.93E-12	1.73E-15	0.00E+00	0.00E+00
TEEN:	4.69E-16	1.26E-10	5.77E-15	4.20E-12	1.88E-15	0.00E+00	0.00E+00
CHILD:	5.81E-16	5.87E-11	7.40E-15	4.01E-12	1.68E-15	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.17E-16	7.33E-11	2.65E-15	1.96E-12	8.64E-16	0.00E+00	0.00E+00
TEEN:	2.34E-16	6.30E-11	2.88E-15	2.10E-12	9.40E-16	0.00E+00	0.00E+00
CHILD:	2.90E-16	2.93E-11	3.69E-15	2.00E-12	8.40E-16	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.20E-18	7.42E-13	2.69E-17	1.99E-14	8.74E-18	0.00E+00	0.00E+00
TEEN:	2.37E-18	6.37E-13	2.91E-17	2.12E-14	9.51E-18	0.00E+00	0.00E+00
CHILD:	2.94E-18	2.97E-13	3.74E-17	2.03E-14	8.50E-18	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.10E-15	1.05E-09	3.79E-14	2.80E-11	1.23E-14	0.00E+00	0.00E+00
TEEN:	3.33E-15	8.97E-10	4.10E-14	2.99E-11	1.34E-14	0.00E+00	0.00E+00
CHILD:	4.29E-15	4.33E-10	5.46E-14	2.96E-11	1.24E-14	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.14E-17	1.06E-11	3.84E-16	2.84E-13	1.25E-16	0.00E+00	0.00E+00
TEEN:	3.38E-17	9.08E-12	4.15E-16	3.02E-13	1.36E-16	0.00E+00	0.00E+00
CHILD:	4.34E-17	4.39E-12	5.53E-16	3.00E-13	1.26E-16	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.84E-13	2.09E-13
TEEN:	1.03E-12	1.17E-12
CHILD:	2.15E-13	2.44E-13
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	9.20E-15	1.05E-14
TEEN:	5.14E-14	5.84E-14
CHILD:	1.07E-14	1.22E-14
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	2.33E-16	2.65E-16
TEEN:	1.30E-15	1.48E-15
CHILD:	2.72E-16	3.09E-16
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL Dose Factors for Liquid Effluents -- FOR ISOTOPE : CE144

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.01E-08	1.90E-04	5.61E-07	2.34E-07	1.39E-07	0.00E+00	0.00E+00
TEEN:	3.28E-08	1.53E-04	6.09E-07	2.52E-07	1.51E-07	0.00E+00	0.00E+00
CHILD:	4.19E-08	6.42E-05	7.85E-07	2.46E-07	1.36E-07	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.50E-08	9.47E-05	2.80E-07	1.17E-07	6.94E-08	0.00E+00	0.00E+00
TEEN:	1.64E-08	7.65E-05	3.04E-07	1.26E-07	7.52E-08	0.00E+00	0.00E+00
CHILD:	2.09E-08	3.21E-05	3.92E-07	1.23E-07	6.81E-08	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.52E-10	9.59E-07	2.84E-09	1.19E-09	7.03E-10	0.00E+00	0.00E+00
TEEN:	1.66E-10	7.75E-07	3.08E-09	1.27E-09	7.61E-10	0.00E+00	0.00E+00
CHILD:	2.12E-10	3.25E-07	3.97E-09	1.24E-09	6.89E-10	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.15E-07	1.35E-03	4.00E-06	1.67E-06	9.92E-07	0.00E+00	0.00E+00
TEEN:	2.33E-07	1.09E-03	4.34E-06	1.79E-06	1.07E-06	0.00E+00	0.00E+00
CHILD:	3.09E-07	4.74E-04	5.80E-06	1.82E-06	1.01E-06	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.17E-09	1.37E-05	4.05E-08	1.69E-08	1.00E-08	0.00E+00	0.00E+00
TEEN:	2.36E-09	1.10E-05	4.39E-08	1.82E-08	1.08E-08	0.00E+00	0.00E+00
CHILD:	3.13E-09	4.80E-06	5.87E-08	1.84E-08	1.02E-08	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	1.19E-06	1.30E-06
TEEN:	6.66E-06	7.70E-06
CHILD:	1.39E-06	1.61E-06
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	5.96E-08	6.89E-08
TEEN:	3.33E-07	3.85E-07
CHILD:	6.95E-08	8.04E-08
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.51E-09	1.74E-09
TEEN:	8.42E-09	9.73E-09
CHILD:	1.76E-09	2.03E-09
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : PR143

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	3.22E-10	2.84E-05	6.49E-09	2.60E-09	1.50E-09	0.00E+00	0.00E+00
TEEN:	3.51E-10	2.32E-05	7.04E-09	2.81E-09	1.63E-09	0.00E+00	0.00E+00
CHILD:	4.52E-10	9.83E-06	9.11E-09	2.74E-09	1.48E-09	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.61E-11	1.42E-06	3.24E-10	1.30E-10	7.51E-11	0.00E+00	0.00E+00
TEEN:	1.75E-11	1.16E-06	3.52E-10	1.40E-10	8.16E-11	0.00E+00	0.00E+00
CHILD:	2.26E-11	4.91E-07	4.55E-10	1.37E-10	7.40E-11	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.63E-13	1.44E-08	3.28E-12	1.32E-12	7.60E-13	0.00E+00	0.00E+00
TEEN:	1.77E-13	1.17E-08	3.56E-12	1.42E-12	8.26E-13	0.00E+00	0.00E+00
CHILD:	2.29E-13	4.97E-09	4.61E-12	1.38E-12	7.49E-13	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.53E-10	1.35E-05	3.09E-09	1.24E-09	7.15E-10	0.00E+00	0.00E+00
TEEN:	1.66E-10	1.10E-05	3.34E-09	1.33E-09	7.75E-10	0.00E+00	0.00E+00
CHILD:	2.23E-10	4.84E-06	4.48E-09	1.35E-09	7.29E-10	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.55E-12	1.37E-07	3.13E-11	1.25E-11	7.24E-12	0.00E+00	0.00E+00
TEEN:	1.68E-12	1.11E-07	3.38E-11	1.35E-11	7.85E-12	0.00E+00	0.00E+00
CHILD:	2.25E-12	4.90E-08	4.54E-11	1.36E-11	7.38E-12	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00



Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : PR144

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T.	BODY	SKIN
ADULT:	0.00E+00	0.00E+00	0.00E+00
TEEN:	0.00E+00	0.00E+00	0.00E+00
CHILD:	0.00E+00	0.00E+00	0.00E+00
INFANT:	0.00E+00	0.00E+00	0.00E+00

Table B4-7: Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ND147

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	2.11E-10	1.69E-05	3.05E-09	3.52E-09	2.06E-09	0.00E+00	0.00E+00
TEEN:	2.26E-10	1.36E-05	3.47E-09	3.77E-09	2.21E-09	0.00E+00	0.00E+00
CHILD:	2.79E-10	5.70E-06	4.44E-09	3.60E-09	1.98E-09	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.05E-11	8.45E-07	1.52E-10	1.76E-10	1.03E-10	0.00E+00	0.00E+00
TEEN:	1.13E-11	6.79E-07	1.73E-10	1.83E-10	1.10E-10	0.00E+00	0.00E+00
CHILD:	1.39E-11	2.85E-07	2.22E-10	1.80E-10	9.86E-11	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.07E-13	8.55E-09	1.54E-12	1.78E-12	1.04E-12	0.00E+00	0.00E+00
TEEN:	1.14E-13	6.87E-09	1.75E-12	1.90E-12	1.12E-12	0.00E+00	0.00E+00
CHILD:	1.41E-13	2.88E-09	2.25E-12	1.82E-12	9.99E-13	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.00E-10	8.05E-06	1.45E-09	1.68E-09	9.80E-10	0.00E+00	0.00E+00
TEEN:	1.07E-10	6.45E-06	1.64E-09	1.79E-09	1.05E-09	0.00E+00	0.00E+00
CHILD:	1.37E-10	2.81E-06	2.19E-09	1.77E-09	9.72E-10	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.02E-12	8.15E-08	1.47E-11	1.70E-11	9.92E-12	0.00E+00	0.00E+00
TEEN:	1.08E-12	6.53E-08	1.66E-11	1.81E-11	1.06E-11	0.00E+00	0.00E+00
CHILD:	1.39E-12	2.84E-08	2.21E-11	1.79E-11	9.84E-12	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	2.61E-09	3.13E-09
TEEN:	1.46E-08	1.75E-08
CHILD:	3.05E-09	3.66E-09
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	1.30E-10	1.56E-10
TEEN:	7.28E-10	8.74E-10
CHILD:	1.52E-10	1.83E-10
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	3.30E-12	3.96E-12
TEEN:	1.24E-11	2.21E-11
CHILD:	3.85E-12	4.62E-12
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

## INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOP ISOTOPE : W187

## FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.73E-12	4.43E-09	1.62E-11	1.35E-11	0.00E+00	0.00E+00	0.00E+00
TEEN:	4.99E-12	3.85E-09	1.75E-11	1.42E-11	0.00E+00	0.00E+00	0.00E+00
CHILD:	5.88E-12	1.84E-09	2.21E-11	1.31E-11	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

## FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.90E-15	5.53E-12	2.02E-14	1.69E-14	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.23E-15	4.81E-12	2.18E-14	1.78E-14	0.00E+00	0.00E+00	0.00E+00
CHILD:	7.35E-15	2.30E-12	2.76E-14	1.64E-14	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

## FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	5.98E-17	5.60E-14	2.07E-16	1.71E-16	0.00E+00	0.00E+00	0.00E+00
TEEN:	6.31E-17	4.87E-14	2.21E-16	1.80E-16	0.00E+00	0.00E+00	0.00E+00
CHILD:	7.44E-17	2.33E-14	2.80E-16	1.66E-16	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

## FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.41E-15	1.32E-12	4.81E-15	4.02E-15	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.48E-15	1.14E-12	5.18E-15	4.22E-15	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.81E-15	5.67E-13	6.81E-15	4.03E-15	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

## FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	1.42E-17	1.33E-14	4.87E-17	4.07E-17	0.00E+00	0.00E+00	0.00E+00
TEEN:	1.50E-17	1.16E-14	5.24E-17	4.28E-17	0.00E+00	0.00E+00	0.00E+00
CHILD:	1.83E-17	5.74E-15	6.89E-17	4.08E-17	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

## FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	9.26E-15	1.08E-14
TEEN:	5.17E-14	6.01E-14
CHILD:	1.08E-14	1.26E-14
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	4.63E-16	5.37E-16
TEEN:	2.58E-15	3.00E-15
CHILD:	5.40E-16	6.27E-16
INFANT:	0.00E+00	0.00E+00

## FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	1.17E-17	1.36E-17
TEEN:	6.54E-17	7.59E-17
CHILD:	1.37E-17	1.59E-17
INFANT:	0.00E+00	0.00E+00

Table B4-7a Continued

INDIVIDUAL DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NP239

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	8.13E-14	3.02E-08	1.50E-12	1.47E-13	4.60E-13	0.00E+00	0.00E+00
TEEN:	8.85E-14	2.56E-08	1.69E-12	1.59E-13	5.00E-13	0.00E+00	0.00E+00
CHILD:	1.10E-13	1.15E-08	2.17E-12	1.56E-13	4.51E-13	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

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.06E-15	1.51E-09	7.49E-14	7.36E-15	2.30E-14	0.00E+00	0.00E+00
TEEN:	4.42E-15	1.28E-09	8.44E-14	7.96E-15	2.50E-14	0.00E+00	0.00E+00
CHILD:	5.48E-15	5.77E-10	1.09E-13	7.79E-15	2.25E-14	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

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	4.11E-17	1.53E-11	7.58E-16	7.45E-17	2.32E-16	0.00E+00	0.00E+00
TEEN:	4.47E-17	1.30E-11	8.54E-16	8.05E-17	2.53E-16	0.00E+00	0.00E+00
CHILD:	5.55E-17	5.84E-12	1.10E-15	7.89E-17	2.28E-16	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

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.66E-16	3.59E-10	1.78E-14	1.75E-15	5.47E-15	0.00E+00	0.00E+00
TEEN:	1.05E-15	3.04E-10	2.00E-14	1.89E-15	5.93E-15	0.00E+00	0.00E+00
CHILD:	1.35E-15	1.42E-10	2.67E-14	1.92E-15	5.55E-15	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

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ADULT:	9.78E-18	3.64E-12	1.80E-16	1.77E-17	5.53E-17	0.00E+00	0.00E+00
TEEN:	1.06E-17	3.08E-12	2.03E-16	1.91E-17	6.00E-17	0.00E+00	0.00E+00
CHILD:	1.37E-17	1.44E-12	2.71E-16	1.94E-17	5.62E-17	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

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ADULT:	4.31E-12	5.00E-12
TEEN:	2.41E-11	2.79E-11
CHILD:	5.03E-12	5.83E-12
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ADULT:	2.15E-13	2.49E-13
TEEN:	1.20E-12	1.39E-12
CHILD:	2.51E-13	2.91E-13
INFANT:	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ADULT:	5.45E-15	6.31E-15
TEEN:	3.04E-14	3.53E-14
CHILD:	6.36E-15	7.37E-15
INFANT:	0.00E+00	0.00E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: H3

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.180E-01	4.180E+01	0.000E+00	4.180E+01	4.180E+01	4.180E+01	4.180E+01	0.000E+00
TEEN	4.780E+01	4.780E+01	0.000E+00	4.780E+01	4.780E+01	4.780E+01	4.780E+01	0.000E+00
CHILD	7.410E+01	7.410E+01	0.000E+00	7.410E+01	7.410E+01	7.410E+01	7.410E+01	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.040E+00	6.040E+00	0.000E+00	6.040E+00	6.040E+00	6.040E+00	6.040E+00	0.000E+00
TEEN	3.600E+00	3.600E+00	0.000E+00	3.600E+00	3.600E+00	3.600E+00	3.600E+00	0.000E+00
CHILD	4.350E+00	4.350E+00	0.000E+00	4.350E+00	4.350E+00	4.350E+00	4.350E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.420E+01	1.420E+01	0.000E+00	1.420E+01	1.420E+01	1.420E+01	1.420E+01	0.000E+00
TEEN	1.850E+01	1.850E+01	0.000E+00	1.850E+01	1.850E+01	1.850E+01	1.850E+01	0.000E+00
CHILD	2.930E+01	2.930E+01	0.000E+00	2.930E+01	2.930E+01	2.930E+01	2.930E+01	0.000E+00
INFANT	4.440E+01	4.440E+01	0.000E+00	4.440E+01	4.440E+01	4.440E+01	4.440E+01	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.900E+01	2.900E+01	0.000E+00	2.900E+01	2.900E+01	2.900E+01	2.900E+01	0.000E+00
TEEN	3.780E+01	3.780E+01	0.000E+00	3.780E+01	3.780E+01	3.780E+01	3.780E+01	0.000E+00
CHILD	5.970E+01	5.970E+01	0.000E+00	5.970E+01	5.970E+01	5.970E+01	5.970E+01	0.000E+00
INFANT	9.060E+01	9.060E+01	0.000E+00	9.060E+01	9.060E+01	9.060E+01	9.060E+01	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.010E+01	4.010E+01	0.000E+00	4.010E+01	4.010E+01	4.010E+01	4.010E+01	0.000E+00
TEEN	4.030E+01	4.030E+01	0.000E+00	4.030E+01	4.030E+01	4.030E+01	4.030E+01	0.000E+00
CHILD	3.570E+01	3.570E+01	0.000E+00	3.570E+01	3.570E+01	3.570E+01	3.570E+01	0.000E+00
INFANT	2.050E+01	2.050E+01	0.000E+00	2.050E+01	2.050E+01	2.050E+01	2.050E+01	0.000E+00



Table E4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: C14

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.680E+03	5.680E+03	2.840E+04	5.680E+03	5.680E+03	5.680E+03	5.680E+03	0.000E+00
TEEN	9.220E+03	9.220E+03	4.610E+04	9.220E+03	9.220E+03	9.220E+03	9.220E+03	0.000E+00
CHILD	2.220E+04	2.220E+04	1.110E+05	2.220E+04	2.220E+04	2.220E+04	2.220E+04	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.110E+03	2.110E+03	1.060E+04	2.110E+03	2.110E+03	2.110E+03	2.110E+03	0.000E+00
TEEN	1.780E+03	1.780E+03	8.910E+03	1.780E+03	1.780E+03	1.780E+03	1.780E+03	0.000E+00
CHILD	3.350E+03	3.350E+03	1.680E+04	3.350E+03	3.350E+03	3.350E+03	3.350E+03	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.300E+03	2.300E+03	1.150E+04	2.300E+03	2.300E+03	2.300E+03	2.300E+03	0.000E+00
TEEN	4.250E+03	4.250E+03	2.120E+04	4.250E+03	4.250E+03	4.250E+03	4.250E+03	0.000E+00
CHILD	1.040E+04	1.040E+04	5.220E+04	1.040E+04	1.040E+04	1.040E+04	1.040E+04	0.000E+00
INFANT	2.180E+04	2.180E+04	1.020E+05	2.180E+04	2.180E+04	2.180E+04	2.180E+04	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.300E+03	2.300E+03	1.150E+04	2.300E+03	2.300E+03	2.300E+03	2.300E+03	0.000E+00
TEEN	4.250E+03	4.250E+03	2.120E+04	4.250E+03	4.250E+03	4.250E+03	4.250E+03	0.000E+00
CHILD	1.040E+04	1.040E+04	5.220E+04	1.040E+04	1.040E+04	1.040E+04	1.040E+04	0.000E+00
INFANT	2.180E+04	2.180E+04	1.020E+05	2.180E+04	2.180E+04	2.180E+04	2.180E+04	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.080E+02	1.080E+02	5.760E+02	1.080E+02	1.080E+02	1.080E+02	1.080E+02	0.000E+00
TEEN	1.540E+02	1.540E+02	8.240E+02	1.540E+02	1.540E+02	1.540E+02	1.540E+02	0.000E+00
CHILD	2.130E+02	2.130E+02	1.140E+03	2.130E+02	2.130E+02	2.130E+02	2.130E+02	0.000E+00
INFANT	1.680E+02	1.680E+02	8.390E+02	1.680E+02	1.680E+02	1.680E+02	1.680E+02	0.000E+00



Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: AR41

PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	3.140E+02
TEEN	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	3.140E+02
CHILD	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	3.140E+02
INFANT	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	3.140E+02

PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR83M

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	9.390E-02	4.750E-01
TEEN	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	9.390E-02	4.750E-01
CHILD	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	9.390E-02	4.750E-01
INFANT	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	1.680E-03	9.390E-02	4.750E-01

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR85M

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.660E+01	7.660E+01
TEEN	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.660E+01	7.660E+01
CHILD	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.660E+01	7.660E+01
INFANT	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.600E+01	2.660E+01	7.660E+01

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b. Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR85

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	9.500E-01	4.290E+01
TEEN	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	9.500E-01	4.290E+01
CHILD	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	9.500E-01	4.290E+01
INFANT	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	3.570E-01	9.500E-01	4.290E+01

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR87

PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.350E+02	4.600E+02
TEEN	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.350E+02	4.600E+02
CHILD	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.350E+02	4.600E+02
INFANT	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.310E+02	1.350E+02	4.600E+02

PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00



Table E4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR88

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.270E+02	4.500E+02
TEEN	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.270E+02	4.500E+02
CHILD	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.270E+02	4.500E+02
INFANT	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.260E+02	3.270E+02	4.500E+02

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00



Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR89

PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.720E+02	7.460E+02
TEEN	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.720E+02	7.460E+02
CHILD	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.720E+02	7.460E+02
INFANT	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.680E+02	3.720E+02	7.460E+02

PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KR90

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.490E+02	6.330E+02
TEEN	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.490E+02	6.330E+02
CHILD	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.490E+02	6.330E+02
INFANT	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.460E+02	3.490E+02	6.330E+02

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: XE131M

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.380E+00	1.890E+01
TEEN	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.380E+00	1.890E+01
CHILD	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.380E+00	1.890E+01
INFANT	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.030E+00	2.380E+00	1.890E+01

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: XE135M

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	6.030E+00	3.960E+01
TEEN	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	6.030E+00	3.960E+01
CHILD	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	6.030E+00	3.960E+01
INFANT	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	5.570E+00	6.030E+00	3.960E+01

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00



Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: XE133

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.860E+00	1.840E+01
TEEN	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.860E+00	1.840E+01
CHILD	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.860E+00	1.840E+01
INFANT	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.520E+00	6.860E+00	1.840E+01
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: XE135M

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.950E+01	1.050E+02
TEEN	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.950E+01	1.050E+02
CHILD	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.950E+01	1.050E+02
INFANT	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.920E+01	6.950E+01	1.050E+02

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00



Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: XE135

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.090E+01	1.060E+02
TEEN	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.090E+01	1.060E+02
CHILD	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.090E+01	1.060E+02
INFANT	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.020E+01	4.090E+01	1.060E+02

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: KEJ37

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.540E+01	4.240E+02
TEEN	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.540E+01	4.240E+02
CHILD	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.540E+01	4.240E+02
INFANT	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.150E+01	3.540E+01	4.240E+02

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: XE138

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.980E+02	3.580E+02
TEEN	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.980E+02	3.580E+02
CHILD	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.980E+02	3.580E+02
INFANT	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.960E+02	1.980E+02	3.580E+02
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CR51

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.690E+05
TEEN	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.690E+05
CHILD	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.690E+05
INFANT	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.430E+05	1.690E+05

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.390E+03	3.500E+05	0.000E+00	0.000E+00	3.060E+02	8.310E+02	1.840E+03	0.000E+00
TEEN	1.850E+03	3.100E+05	0.000E+00	0.000E+00	4.050E+02	1.030E+03	2.640E+03	0.000E+00
CHILD	3.510E+03	1.860E+05	0.000E+00	0.000E+00	5.320E+02	1.950E+03	3.560E+03	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.910E+02	4.810E+04	0.000E+00	0.000E+00	4.210E+01	1.140E+02	2.540E+02	0.000E+00
TEEN	1.530E+02	2.570E+04	0.000E+00	0.000E+00	3.350E+01	8.490E+01	2.180E+02	0.000E+00
CHILD	2.380E+02	1.260E+04	0.000E+00	0.000E+00	3.610E+01	1.320E+02	2.420E+02	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	7.740E+02	1.950E+05	0.000E+00	0.000E+00	1.700E+02	4.620E+02	1.030E+03	0.000E+00
TEEN	1.350E+03	2.270E+05	0.000E+00	0.000E+00	2.960E+02	7.510E+02	1.930E+03	0.000E+00
CHILD	2.760E+03	1.460E+05	0.000E+00	0.000E+00	4.180E+02	1.530E+03	2.790E+03	0.000E+00
INFANT	4.370E+03	1.270E+05	0.000E+00	0.000E+00	6.220E+02	2.850E+03	5.540E+03	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	9.280E+01	2.330E+04	0.000E+00	0.000E+00	2.050E+01	5.550E+01	1.230E+02	0.000E+00
TEEN	1.620E+02	2.720E+04	0.000E+00	0.000E+00	3.550E+01	9.010E+01	2.310E+02	0.000E+00
CHILD	3.310E+02	1.750E+04	0.000E+00	0.000E+00	5.020E+01	1.840E+02	3.350E+02	0.000E+00
INFANT	5.240E+02	1.530E+04	0.000E+00	0.000E+00	7.470E+01	3.420E+02	6.650E+02	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.170E+00	1.050E+02	0.000E+00	0.000E+00	7.230E-01	1.890E+00	4.560E+02	0.000E+00
TEEN	4.290E+00	9.510E+01	0.000E+00	0.000E+00	9.740E-01	2.380E+00	6.640E+02	0.000E+00
CHILD	4.890E+00	3.440E+01	0.000E+00	0.000E+00	7.710E-01	2.710E+00	5.380E+02	0.000E+00
INFANT	2.840E+00	1.130E+01	0.000E+00	0.000E+00	4.190E-01	1.820E+00	4.070E+02	0.000E+00



Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: MN54

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.960E+07
TEEN	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.960E+07
CHILD	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.960E+07
INFANT	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.230E+07	4.960E+07

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.770E+06	2.840E+07	0.000E+00	9.270E+06	2.760E+06	0.000E+00	0.000E+00	0.000E+00
TEEN	2.670E+06	2.760E+07	0.000E+00	1.350E+07	4.010E+06	0.000E+00	0.000E+00	0.000E+00
CHILD	5.240E+06	1.650E+07	0.000E+00	1.970E+07	5.520E+06	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.230E+04	6.790E+05	0.000E+00	2.220E+05	6.600E+04	0.000E+00	0.000E+00	0.000E+00
TEEN	3.350E+04	3.470E+05	0.000E+00	1.690E+05	5.040E+04	0.000E+00	0.000E+00	0.000E+00
CHILD	5.150E+04	1.620E+05	0.000E+00	1.930E+05	5.420E+04	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.380E+04	6.220E+05	0.000E+00	2.030E+05	6.050E+04	0.000E+00	0.000E+00	0.000E+00
TEEN	6.710E+04	6.940E+05	0.000E+00	3.380E+05	1.010E+05	0.000E+00	0.000E+00	0.000E+00
CHILD	1.350E+05	4.250E+05	0.000E+00	5.060E+05	1.420E+05	0.000E+00	0.000E+00	0.000E+00
INFANT	2.130E+05	3.460E+05	0.000E+00	9.420E+05	2.090E+05	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

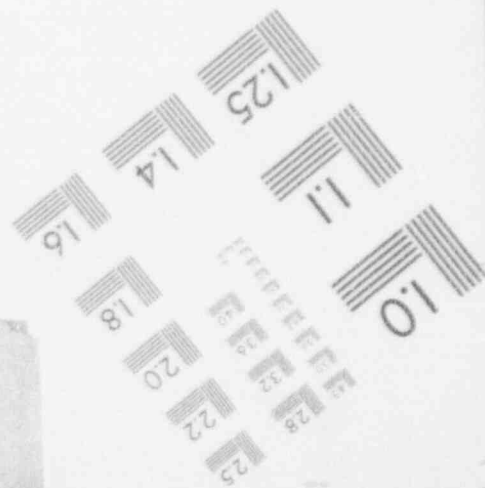
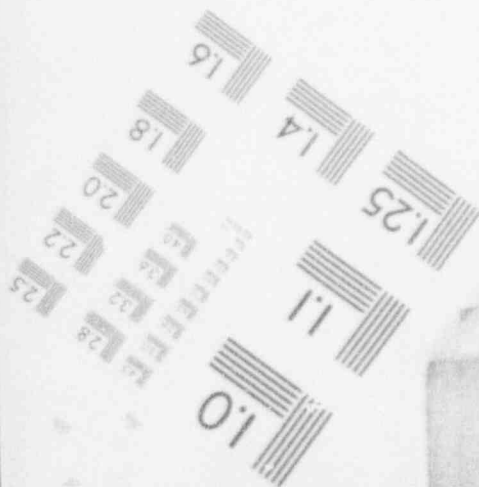
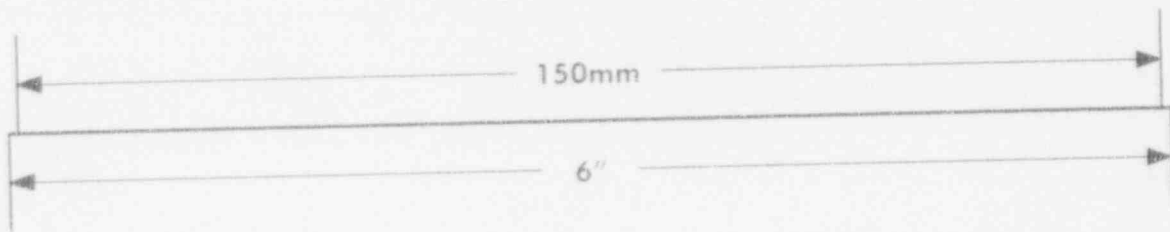
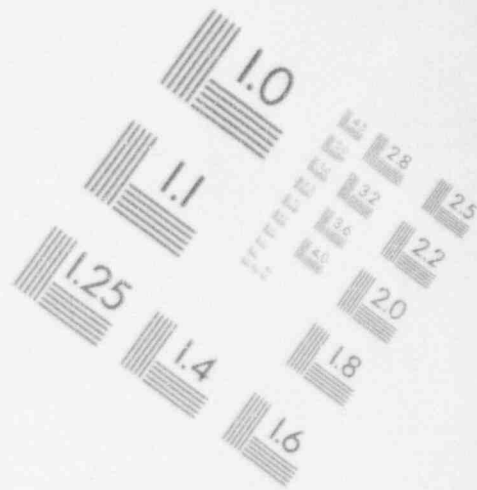
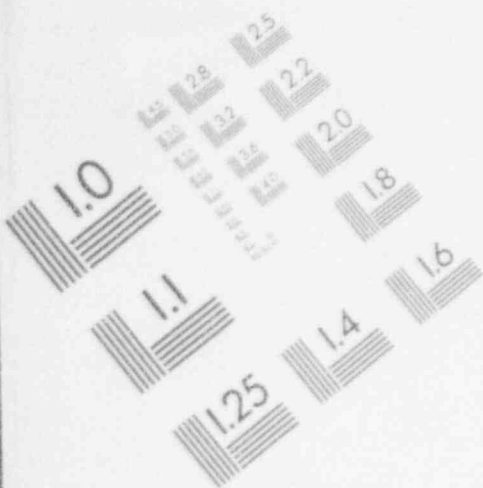
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.650E+03	7.470E+04	0.000E+00	2.440E+04	7.250E+03	0.000E+00	0.000E+00	0.000E+00
TEEN	8.050E+03	8.330E+04	0.000E+00	4.060E+04	1.210E+04	0.000E+00	0.000E+00	0.000E+00
CHILD	1.620E+04	5.100E+04	0.000E+00	6.080E+04	1.700E+04	0.000E+00	0.000E+00	0.000E+00
INFANT	2.560E+04	4.150E+04	0.000E+00	1.130E+05	2.500E+04	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.000E+02	2.450E+03	0.000E+00	1.260E+03	3.120E+02	0.000E+00	4.440E+04	0.000E+00
TEEN	2.660E+02	2.120E+03	0.000E+00	1.620E+03	4.030E+02	0.000E+00	6.290E+04	0.000E+00
CHILD	3.010E+02	7.260E+02	0.000E+00	1.360E+03	3.180E+02	0.000E+00	5.000E+04	0.000E+00
INFANT	1.580E+02	2.240E+02	0.000E+00	8.030E+02	1.580E+02	0.000E+00	3.170E+04	0.000E+00

# 1

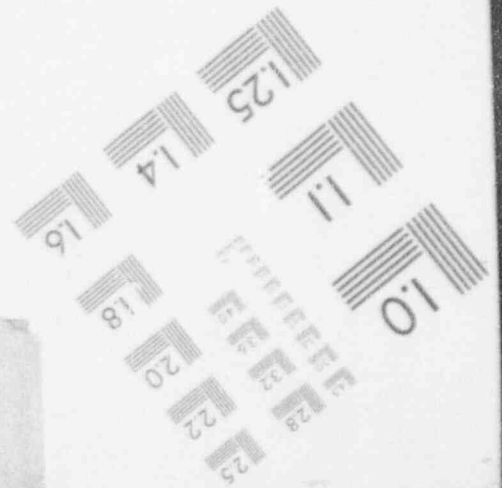
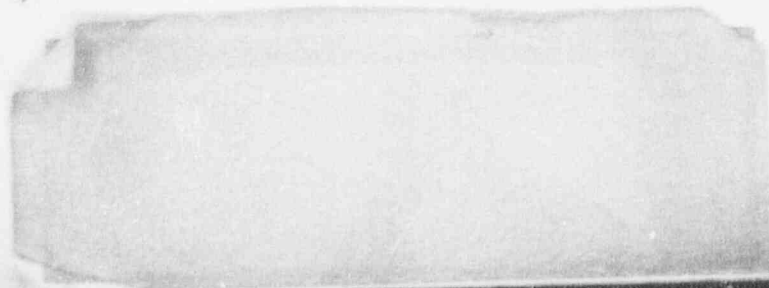
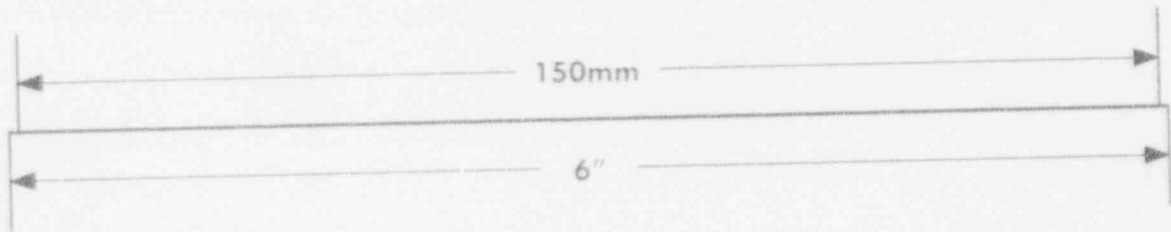
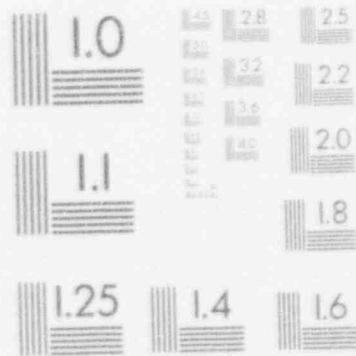
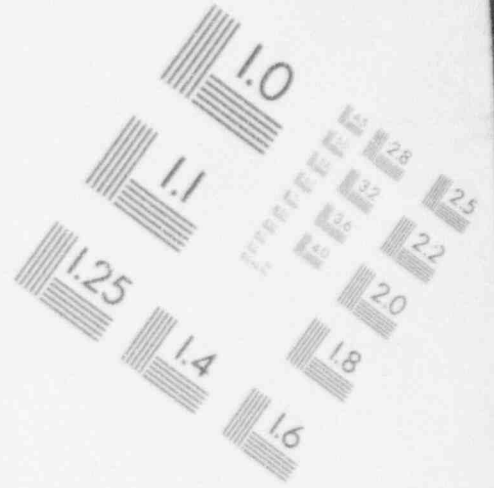
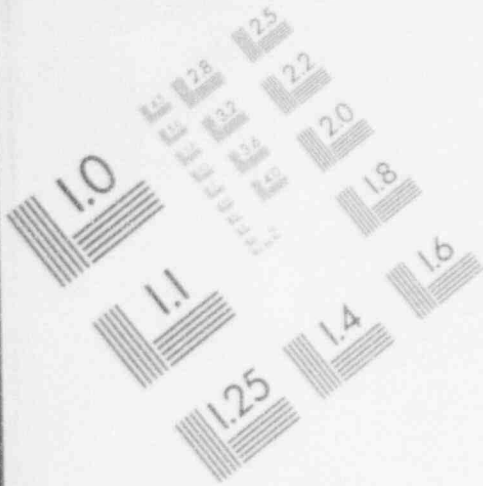
## IMAGE EVALUATION TEST TARGET (MT-3)





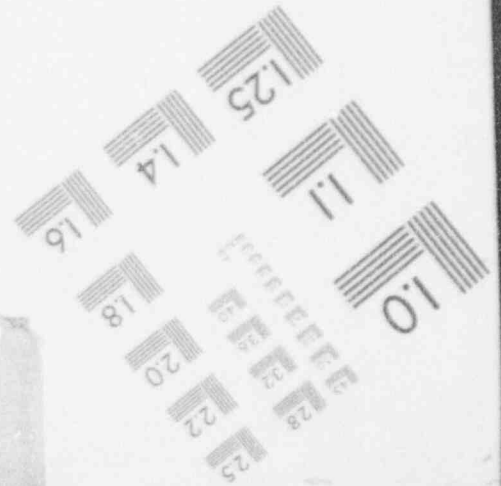
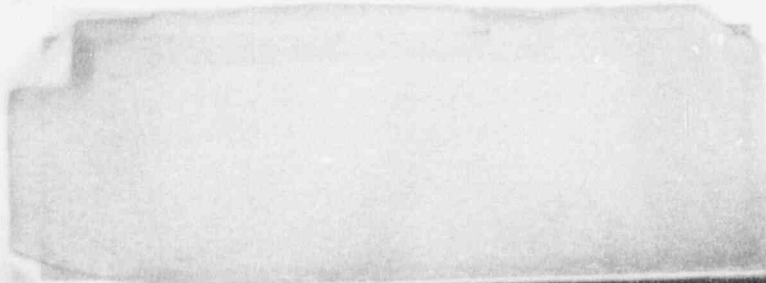
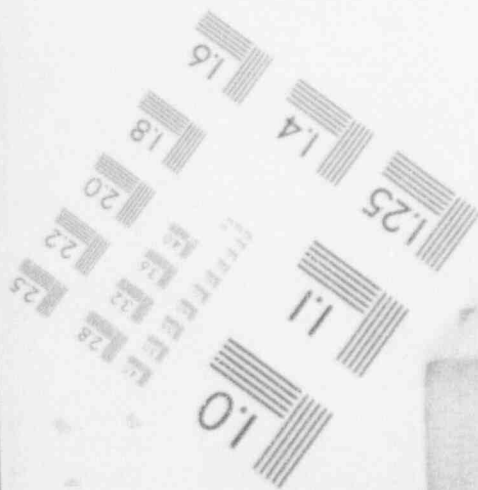
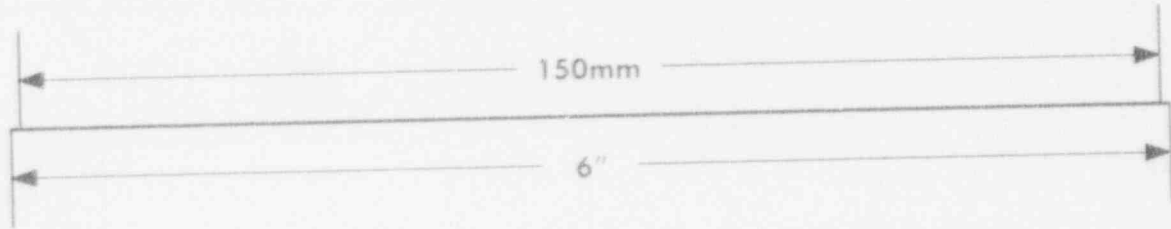
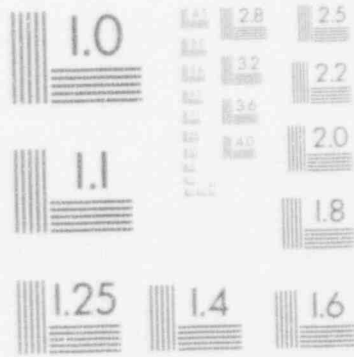
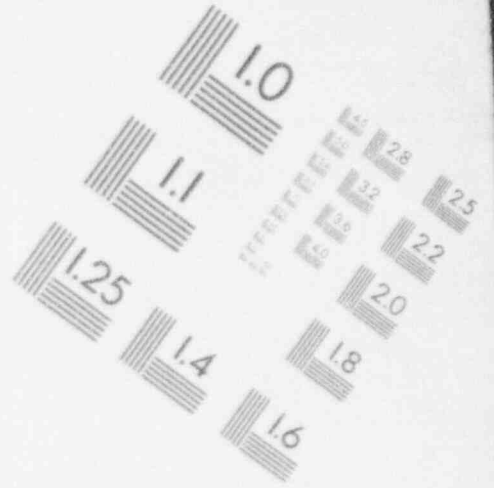
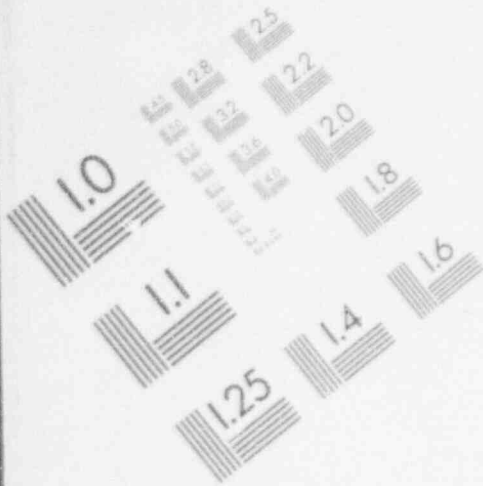
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## IMAGE EVALUATION TEST TARGET (MT-3)



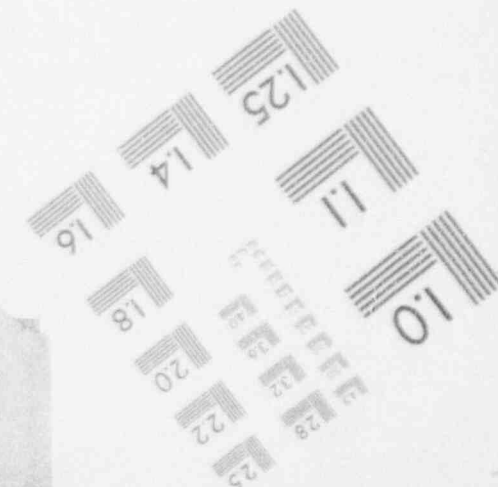
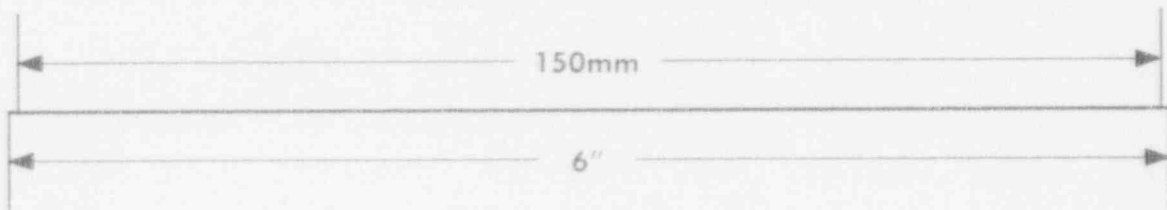
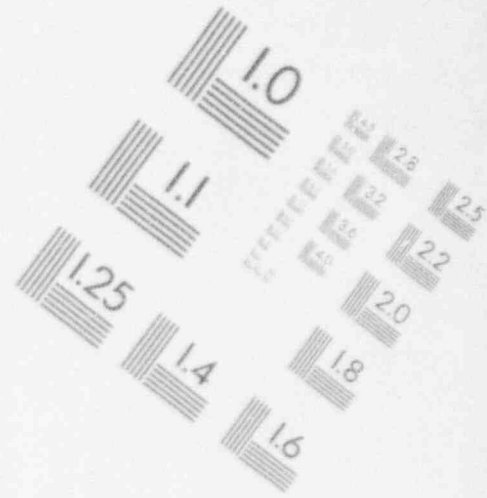
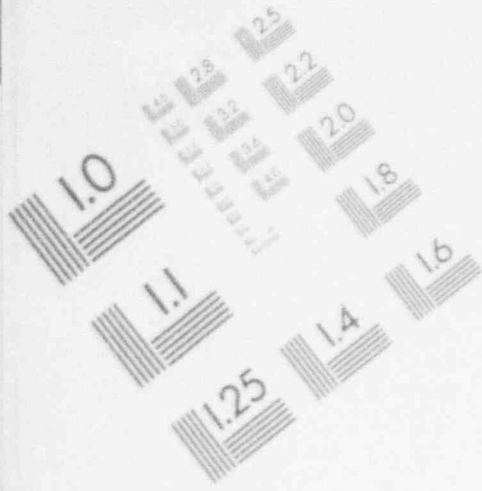
# 1

## IMAGE EVALUATION TEST TARGET (MT-3)



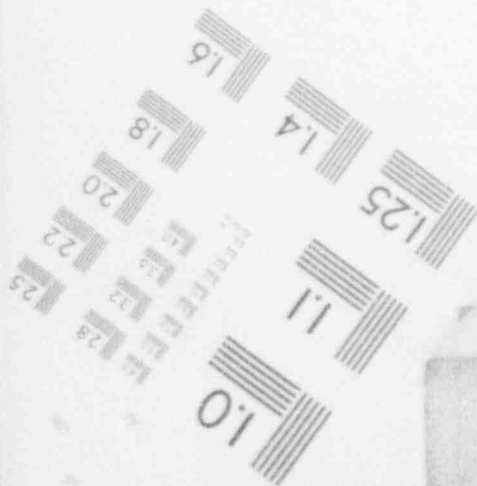
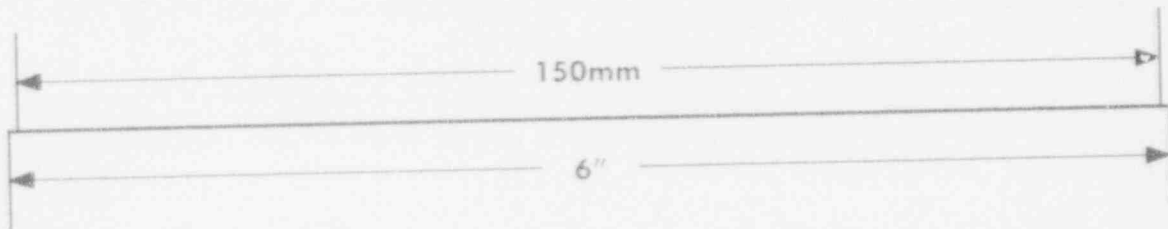
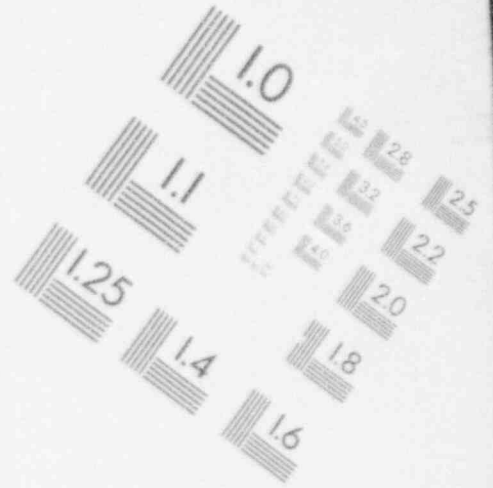
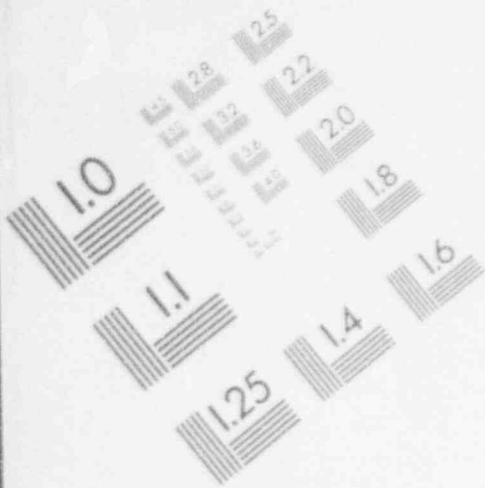
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## IMAGE EVALUATION TEST TARGET (MT-3)



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## IMAGE EVALUATION TEST TARGET (MT-3)

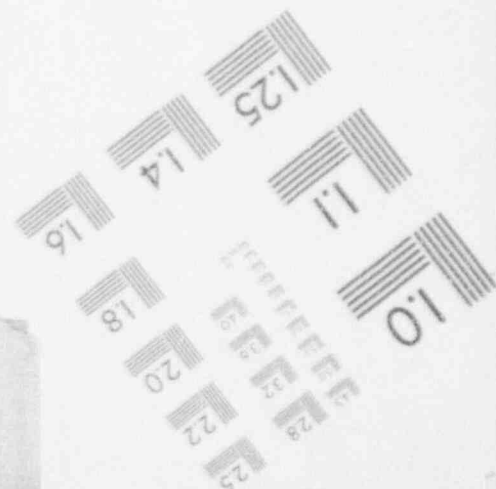
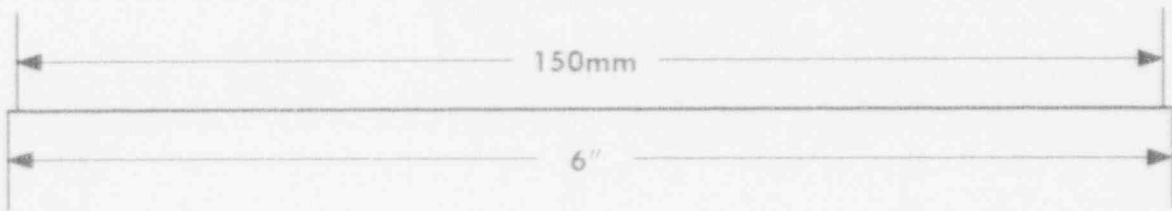
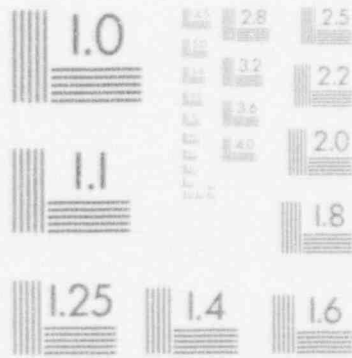
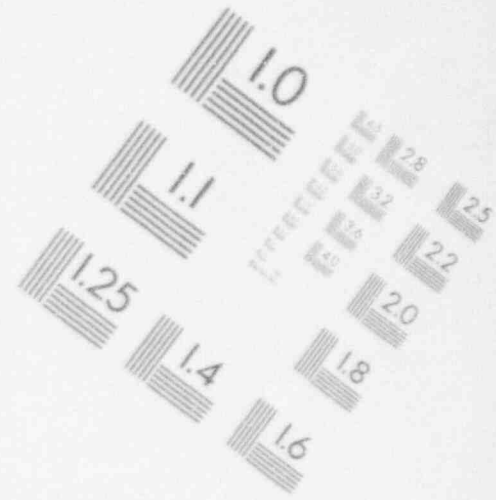
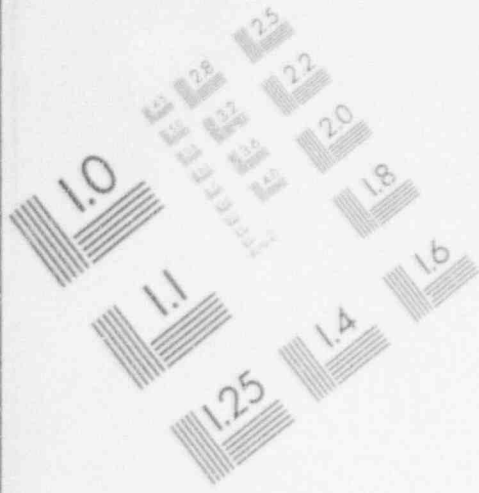


Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: FES9

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	9.800E+06
TEEN	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	9.800E+06
CHILD	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	9.800E+06
INFANT	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	8.340E+06	9.800E+06
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.560E+06	2.920E+07	3.730E+06	8.760E+06	0.000E+00	0.000E+00	2.450E+06	0.000E+00
TEEN	4.780E+06	2.930E+07	5.300E+06	1.240E+07	0.000E+00	0.000E+00	3.900E+06	0.000E+00
CHILD	9.470E+06	1.980E+07	1.170E+07	1.900E+07	0.000E+00	0.000E+00	5.510E+06	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.220E+06	5.410E+07	6.900E+06	1.620E+07	0.000E+00	0.000E+00	4.530E+06	0.000E+00
TEEN	4.970E+06	3.040E+07	5.510E+06	1.290E+07	0.000E+00	0.000E+00	4.060E+06	0.000E+00
CHILD	7.890E+06	1.650E+07	9.780E+06	1.580E+07	0.000E+00	0.000E+00	4.590E+06	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.950E+05	6.040E+06	7.710E+05	1.810E+06	0.000E+00	0.000E+00	5.070E+05	0.000E+00
TEEN	1.210E+06	7.430E+06	1.350E+06	3.140E+06	0.000E+00	0.000E+00	9.910E+05	0.000E+00
CHILD	2.520E+06	5.260E+06	3.120E+06	5.050E+06	0.000E+00	0.000E+00	1.460E+06	0.000E+00
INFANT	4.010E+06	4.860E+06	5.830E+06	1.020E+07	0.000E+00	0.000E+00	3.010E+06	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	9.040E+03	7.860E+04	1.000E+04	2.360E+04	0.000E+00	0.000E+00	6.590E+03	0.000E+00
TEEN	1.580E+04	9.660E+04	1.750E+04	4.090E+04	0.000E+00	0.000E+00	1.290E+04	0.000E+00
CHILD	3.270E+04	6.840E+04	4.060E+04	6.570E+04	0.000E+00	0.000E+00	1.900E+04	0.000E+00
INFANT	5.220E+04	6.320E+04	7.580E+04	1.320E+05	0.000E+00	0.000E+00	3.910E+04	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.350E+02	5.960E+03	3.730E+02	8.800E+02	0.000E+00	0.000E+00	3.220E+04	0.000E+00
TEEN	4.540E+02	5.660E+03	5.050E+02	1.170E+03	0.000E+00	0.000E+00	4.840E+04	0.000E+00
CHILD	5.290E+02	2.240E+03	6.560E+02	1.060E+03	0.000E+00	0.000E+00	4.020E+04	0.000E+00
INFANT	3.000E+02	7.960E+02	4.300E+02	7.460E+02	0.000E+00	0.000E+00	3.220E+04	0.000E+00



Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CO58

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.360E+07
TEEN	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.360E+07
CHILD	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.360E+07
INFANT	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.160E+07	1.360E+07
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.020E+06	1.830E+07	0.000E+00	9.020E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	2.950E+06	1.760E+07	0.000E+00	1.280E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	5.780E+06	1.100E+07	0.000E+00	1.890E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.030E+06	9.300E+06	0.000E+00	4.590E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	8.160E+05	7.300E+06	0.000E+00	3.540E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	1.270E+06	2.410E+06	0.000E+00	4.130E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.660E+05	2.410E+06	0.000E+00	1.190E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	4.610E+05	2.750E+06	0.000E+00	2.000E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	9.350E+05	1.780E+06	0.000E+00	3.050E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	1.520E+06	1.520E+06	0.000E+00	6.110E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.190E+04	2.890E+05	0.000E+00	1.420E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	5.530E+04	3.310E+05	0.000E+00	2.400E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	1.120E+05	2.140E+05	0.000E+00	3.660E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	1.830E+05	1.830E+05	0.000E+00	7.330E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.570E+01	3.370E+03	0.000E+00	5.020E+01	0.000E+00	0.000E+00	2.940E+04	0.000E+00
TEEN	3.800E+01	3.020E+03	0.000E+00	6.570E+01	0.000E+00	0.000E+00	4.260E+04	0.000E+00
CHILD	1.000E+02	1.090E+03	0.000E+00	5.620E+01	0.000E+00	0.000E+00	3.510E+04	0.000E+00
INFANT	5.770E+01	3.530E+02	0.000E+00	3.870E+01	0.000E+00	0.000E+00	2.460E+04	0.000E+00

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: C060

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	7.740E+08
TEEN	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	7.740E+08
CHILD	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	7.740E+08
INFANT	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	6.580E+08	7.740E+08

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.110E+07	9.420E+07	0.000E+00	5.020E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	1.680E+07	9.720E+07	0.000E+00	7.460E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.350E+07	6.290E+07	0.000E+00	1.140E+07	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.980E+06	3.390E+07	0.000E+00	1.800E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	3.150E+06	1.820E+07	0.000E+00	1.400E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	4.900E+06	9.200E+06	0.000E+00	1.660E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.680E+05	7.390E+06	0.000E+00	3.930E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	1.500E+06	8.680E+06	0.000E+00	6.660E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.050E+06	9.730E+06	0.000E+00	1.030E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	4.990E+06	5.030E+06	0.000E+00	2.110E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.040E+05	8.870E+05	0.000E+00	4.720E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	1.800E+05	1.040E+06	0.000E+00	8.000E+04	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.660E+05	6.880E+05	0.000E+00	1.240E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	5.090E+05	6.030E+05	0.000E+00	2.540E+05	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.690E+02	9.030E+03	0.000E+00	3.650E+02	0.000E+00	0.000E+00	1.890E+05	0.000E+00
TEEN	6.290E+02	8.220E+03	0.000E+00	4.790E+02	0.000E+00	0.000E+00	7.760E+05	0.000E+00
CHILD	7.180E+02	3.050E+03	0.000E+00	4.160E+02	0.000E+00	0.000E+00	2.240E+05	0.000E+00
INFANT	3.730E+02	1.010E+03	0.000E+00	2.540E+02	0.000E+00	0.000E+00	1.450E+05	0.000E+00

Table E4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: ZN65

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.630E+07
TEEN	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.630E+07
CHILD	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.630E+07
INFANT	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.290E+07	2.630E+07

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.740E+07	2.430E+07	1.210E+07	3.860E+07	2.580E+07	0.000E+00	0.000E+00	0.000E+00
TEEN	2.620E+07	2.380E+07	1.620E+07	5.630E+07	3.600E+07	0.000E+00	0.000E+00	0.000E+00
CHILD	5.150E+07	1.450E+07	3.110E+07	8.280E+07	5.220E+07	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.390E+07	1.940E+07	9.700E+06	3.090E+07	2.060E+07	0.000E+00	0.000E+00	0.000E+00
TEEN	1.100E+07	1.000E+07	6.820E+06	2.370E+07	1.520E+07	0.000E+00	0.000E+00	0.000E+00
CHILD	1.700E+07	4.790E+06	1.020E+07	2.730E+07	1.720E+07	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.380E+07	7.490E+07	3.740E+07	1.190E+08	7.960E+07	0.000E+00	0.000E+00	0.000E+00
TEEN	9.300E+07	8.440E+07	5.740E+07	1.990E+08	1.280E+08	0.000E+00	0.000E+00	0.000E+00
CHILD	1.870E+08	5.270E+07	1.130E+08	3.000E+08	1.890E+08	0.000E+00	0.000E+00	0.000E+00
INFANT	2.390E+08	4.380E+08	1.510E+08	5.190E+08	2.520E+08	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.450E+06	8.990E+06	4.490E+06	1.430E+07	9.550E+06	0.000E+00	0.000E+00	0.000E+00
TEEN	1.120E+07	1.010E+07	6.890E+06	2.390E+07	1.530E+07	0.000E+00	0.000E+00	0.000E+00
CHILD	2.240E+07	6.330E+06	1.350E+07	3.600E+07	2.270E+07	0.000E+00	0.000E+00	0.000E+00
INFANT	2.870E+07	5.260E+07	1.820E+07	6.230E+07	3.020E+07	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.480E+03	1.690E+03	1.030E+03	3.270E+03	2.190E+03	0.000E+00	2.740E+04	0.000E+00
TEEN	1.980E+03	1.480E+03	1.220E+03	4.240E+03	2.740E+03	0.000E+00	3.930E+04	0.000E+00
CHILD	2.230E+03	5.170E+02	1.350E+03	3.590E+03	2.260E+03	0.000E+00	3.160E+04	0.000E+00
INFANT	9.850E+02	1.630E+03	6.120E+02	1.980E+03	1.030E+03	0.000E+00	2.050E+04	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: SR89

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	7.680E+02
TEEN	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	7.680E+02
CHILD	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	7.680E+02
INFANT	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	6.620E+02	7.680E+02

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	8.770E+06	4.900E+07	3.060E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	1.330E+07	5.530E+07	4.640E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.150E+07	4.270E+07	1.100E+09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.410E+05	1.540E+06	8.380E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	2.030E+05	8.430E+05	7.080E+06	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.820E+05	5.180E+05	1.340E+07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.160E+06	6.470E+06	4.030E+07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	2.130E+06	8.850E+06	7.430E+07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	5.250E+06	7.120E+06	1.840E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	1.000E+07	7.190E+06	3.500E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.430E+06	1.360E+07	8.470E+07	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	4.470E+06	1.860E+07	1.560E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	1.100E+07	1.500E+07	3.860E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	2.110E+07	1.510E+07	7.340E+08	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.760E+02	1.110E+04	9.640E+03	0.000E+00	0.000E+00	0.000E+00	4.440E+04	0.000E+00
TEEN	3.960E+02	1.180E+04	1.380E+04	0.000E+00	0.000E+00	0.000E+00	7.660E+04	0.000E+00
CHILD	5.470E+02	5.300E+03	1.900E+04	0.000E+00	0.000E+00	0.000E+00	6.840E+04	0.000E+00
INFANT	5.820E+02	2.030E+03	1.260E+04	0.000E+00	0.000E+00	0.000E+00	6.440E+04	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: SR90

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.280E+10	1.510E+09	5.230E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	1.600E+10	1.820E+09	6.490E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	2.730E+10	1.450E+09	1.090E+11	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.810E+08	4.480E+07	1.550E+09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	2.480E+08	2.820E+07	1.000E+09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.290E+08	1.750E+07	1.300E+09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.430E+09	1.690E+08	5.840E+09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	2.040E+09	2.320E+08	8.250E+09	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	3.530E+09	1.880E+08	1.390E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	3.860E+09	1.890E+08	1.520E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.010E+09	3.540E+08	1.230E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	4.280E+09	4.860E+08	1.730E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	7.420E+09	3.940E+08	2.930E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	8.110E+09	3.980E+08	3.190E+10	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.930E+05	2.290E+04	3.140E+06	0.000E+00	0.000E+00	0.000E+00	3.040E+05	0.000E+00
TEEN	2.120E+05	2.420E+04	3.420E+06	0.000E+00	0.000E+00	0.000E+00	5.220E+05	0.000E+00
CHILD	2.040E+05	1.090E+04	3.200E+06	0.000E+00	0.000E+00	0.000E+00	4.680E+05	0.000E+00
INFANT	8.210E+04	4.150E+03	1.300E+06	0.000E+00	0.000E+00	0.000E+00	3.560E+05	0.000E+00

Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: ZR95

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	8.670E+06
TEEN	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	8.670E+06
CHILD	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	8.670E+06
INFANT	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	7.480E+06	8.670E+06

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	7.480E+03	3.500E+07	3.450E+04	1.110E+04	1.730E+04	0.000E+00	0.000E+00	0.000E+00
TEEN	1.100E+04	3.880E+07	5.050E+04	1.590E+04	2.340E+04	0.000E+00	0.000E+00	0.000E+00
CHILD	2.210E+04	2.500E+07	1.130E+05	2.490E+04	3.560E+04	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.030E+04	4.820E+07	4.740E+04	1.520E+04	2.390E+04	0.000E+00	0.000E+00	0.000E+00
TEEN	8.240E+03	2.770E+07	3.800E+04	1.200E+04	1.760E+04	0.000E+00	0.000E+00	0.000E+00
CHILD	1.320E+04	1.550E+07	6.740E+04	1.480E+04	2.120E+04	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.180E+00	2.430E+04	2.390E+01	7.660E+00	1.200E+01	0.000E+00	0.000E+00	0.000E+00
TEEN	9.060E+00	3.040E+04	4.180E+01	1.320E+01	1.940E+01	0.000E+00	0.000E+00	0.000E+00
CHILD	1.900E+01	2.220E+04	9.700E+01	2.130E+01	3.050E+01	0.000E+00	0.000E+00	0.000E+00
INFANT	2.980E+01	2.090E+04	1.720E+02	4.200E+01	4.520E+01	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.220E-01	2.910E+03	2.870E+00	9.190E-01	1.440E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	1.090E+00	3.650E+03	5.010E+00	1.580E+00	2.320E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	2.280E+00	2.670E+03	1.160E+01	2.560E+00	3.660E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	3.570E+00	2.510E+03	2.070E+01	5.040E+00	5.430E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	7.380E+02	4.770E+03	3.400E+03	1.090E+03	1.720E+03	0.000E+00	5.600E+04	0.000E+00
TEEN	9.990E+02	4.720E+03	4.620E+03	1.450E+03	2.140E+03	0.000E+00	8.520E+04	0.000E+00
CHILD	1.170E+03	1.940E+03	6.020E+03	1.330E+03	1.890E+03	0.000E+00	7.070E+04	0.000E+00
INFANT	6.440E+02	6.860E+02	3.660E+03	8.830E+02	9.850E+02	0.000E+00	5.550E+04	0.000E+00



Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: SB124

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CS134

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.090E+06	2.090E+06	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.440E+08
TEEN	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.440E+08
CHILD	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.440E+08
INFANT	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.090E+08	2.440E+08

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.730E+08	5.830E+06	1.400E+08	3.330E+08	1.080E+08	0.000E+00	3.580E+07	0.000E+00
TEEN	2.330E+08	6.240E+06	2.130E+08	5.020E+08	1.590E+08	0.000E+00	6.090E+07	0.000E+00
CHILD	1.670E+08	4.260E+06	4.810E+08	7.900E+08	2.450E+08	0.000E+00	8.790E+07	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.080E+07	6.590E+05	1.580E+07	3.770E+07	1.220E+07	0.000E+00	4.050E+06	0.000E+00
TEEN	1.370E+07	3.680E+05	1.260E+07	2.960E+07	9.410E+06	0.000E+00	3.590E+06	0.000E+00
CHILD	7.680E+06	1.960E+05	2.220E+07	3.640E+07	1.130E+07	0.000E+00	4.050E+06	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.650E+08	5.670E+06	1.360E+08	3.240E+08	1.050E+08	0.000E+00	3.480E+07	0.000E+00
TEEN	2.580E+08	6.920E+06	2.360E+08	5.560E+08	1.770E+08	0.000E+00	6.750E+07	0.000E+00
CHILD	1.890E+08	4.820E+06	5.450E+08	8.940E+08	2.770E+08	0.000E+00	9.940E+07	0.000E+00
INFANT	1.850E+08	4.450E+06	8.780E+08	1.640E+09	4.210E+08	0.000E+00	1.730E+08	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	7.940E+08	1.700E+07	4.080E+08	9.710E+08	3.140E+08	0.000E+00	1.040E+08	0.000E+00
TEEN	7.740E+08	2.070E+07	7.090E+08	1.670E+09	5.300E+08	0.000E+00	2.020E+08	0.000E+00
CHILD	5.660E+08	1.450E+07	1.630E+09	2.680E+09	8.310E+08	0.000E+00	2.980E+08	0.000E+00
INFANT	4.960E+08	1.330E+07	2.630E+09	4.910E+09	1.260E+09	0.000E+00	5.180E+08	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.310E+04	3.300E+02	1.180E+04	2.690E+04	9.100E+03	0.000E+00	3.090E+03	0.000E+00
TEEN	1.740E+04	3.090E+02	1.590E+04	3.580E+04	1.190E+04	0.000E+00	4.640E+03	0.000E+00
CHILD	7.120E+03	1.220E+02	2.060E+04	3.210E+04	1.050E+04	0.000E+00	3.840E+03	0.000E+00
INFANT	2.380E+03	4.230E+01	1.260E+04	2.230E+04	6.040E+03	0.000E+00	2.530E+03	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CS136

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	5.210E+06
TEEN	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	5.210E+06
CHILD	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	5.210E+06
INFANT	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	4.600E+06	5.210E+06
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.660E+06	5.770E+05	1.290E+06	5.090E+06	2.830E+06	0.000E+00	3.880E+05	0.000E+00
TEEN	3.490E+06	4.170E+05	1.320E+06	5.190E+06	2.620E+06	0.000E+00	4.450E+05	0.000E+00
CHILD	4.410E+06	2.400E+05	2.480E+06	6.820E+06	3.630E+06	0.000E+00	5.420E+05	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.030E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	9.890E+05	1.560E+05	3.480E+05	1.370E+06	7.640E+05	0.000E+00	1.050E+05	0.000E+00
TEEN	7.170E+05	8.590E+04	2.710E+05	1.070E+06	5.810E+05	0.000E+00	9.150E+04	0.000E+00
CHILD	9.330E+05	4.520E+04	4.680E+05	1.290E+06	6.850E+05	0.000E+00	1.020E+05	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.160E+07	3.410E+06	7.610E+06	3.000E+07	1.670E+07	0.000E+00	2.290E+06	0.000E+00
TEEN	3.420E+07	4.100E+06	1.300E+07	5.100E+07	2.770E+07	0.000E+00	4.370E+06	0.000E+00
CHILD	5.200E+07	2.820E+06	2.920E+07	8.040E+07	4.280E+07	0.000E+00	6.380E+06	0.000E+00
INFANT	6.270E+07	2.550E+06	5.710E+07	1.680E+08	6.690E+07	0.000E+00	1.370E+07	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.490E+07	1.020E+07	2.280E+07	9.010E+07	5.010E+07	0.000E+00	6.870E+06	0.000E+00
TEEN	1.030E+08	1.230E+07	3.890E+07	1.530E+08	8.320E+07	0.000E+00	1.31E+07	0.000E+00
CHILD	1.560E+08	8.470E+06	8.770E+07	2.410E+08	1.280E+08	0.000E+00	1.910E+07	0.000E+00
INFANT	1.880E+08	7.650E+06	1.710E+08	5.040E+08	2.010E+08	0.000E+00	4.110E+07	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.500E+03	3.700E+02	1.240E+03	4.640E+03	2.710E+03	0.000E+00	3.800E+02	0.000E+00
TEEN	4.340E+03	3.450E+02	1.630E+03	6.140E+03	3.500E+03	0.000E+00	5.630E+02	0.000E+00
CHILD	2.680E+03	1.330E+02	2.060E+03	5.420E+03	3.030E+03	0.000E+00	4.610E+02	0.000E+00
INFANT	1.680E+03	4.530E+01	1.530E+03	4.260E+03	1.790E+03	0.000E+00	3.730E+02	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CS137

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.670E+08
TEEN	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.670E+08
CHILD	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.670E+08
INFANT	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.150E+08	3.670E+08

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.960E+08	5.790E+06	2.190E+08	2.990E+08	1.020E+08	0.000E+00	3.380E+07	0.000E+00
TEEN	1.620E+08	6.800E+06	3.490E+08	4.640E+08	1.580E+08	0.000E+00	6.130E+07	0.000E+00
CHILD	1.180E+08	4.930E+06	8.230E+08	7.880E+08	2.570E+08	0.000E+00	9.240E+07	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.990E+07	5.880E+05	2.220E+07	3.040E+07	1.030E+07	0.000E+00	3.430E+06	0.000E+00
TEEN	8.540E+06	3.490E+05	1.840E+07	2.450E+07	8.350E+06	0.000E+00	3.240E+06	0.000E+00
CHILD	4.800E+06	2.030E+05	3.390E+07	3.250E+07	1.060E+07	0.000E+00	3.810E+06	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.680E+08	4.970E+06	1.880E+08	2.570E+08	6.720E+07	0.000E+00	2.900E+07	0.000E+00
TEEN	1.580E+08	6.450E+06	3.410E+08	4.530E+08	1.540E+08	0.000E+00	5.990E+07	0.000E+00
CHILD	1.160E+08	4.790E+06	8.210E+08	7.860E+08	2.560E+08	0.000E+00	9.210E+07	0.000E+00
INFANT	1.090E+08	4.790E+06	1.310E+09	1.530E+09	4.120E+08	0.000E+00	1.670E+08	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.050E+08	1.490E+07	5.640E+08	7.710E+08	2.620E+08	0.000E+00	8.700E+07	0.000E+00
TEEN	4.740E+08	1.930E+07	1.020E+09	1.360E+09	4.630E+08	0.000E+00	1.800E+08	0.000E+00
CHILD	3.480E+08	1.480E+07	2.460E+09	2.360E+09	7.680E+08	0.000E+00	2.760E+08	0.000E+00
INFANT	3.260E+08	1.440E+07	3.930E+09	4.600E+09	1.230E+09	0.000E+00	5.000E+08	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.760E+04	2.660E+02	1.520E+04	1.970E+04	7.050E+03	0.000E+00	2.380E+03	0.000E+00
TEEN	9.870E+03	2.690E+02	2.130E+04	2.690E+04	9.640E+03	0.000E+00	3.830E+03	0.000E+00
CHILD	4.070E+03	1.150E+02	2.870E+04	2.620E+04	8.950E+03	0.000E+00	3.300E+03	0.000E+00
INFANT	1.440E+03	4.230E+01	1.740E+04	1.940E+04	5.460E+03	0.000E+00	2.260E+03	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: BA140

PATHWAY: PLUME								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: GROUND								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	7.160E+05
TEEN	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	7.160E+05
CHILD	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	7.160E+05
INFANT	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	6.270E+05	7.160E+05
PATHWAY: VEGETABLE								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.540E+05	7.990E+06	3.880E+06	4.870E+03	1.660E+03	0.000E+00	2.790E+03	0.000E+00
TEEN	2.690E+05	6.430E+06	4.170E+06	5.110E+03	1.730E+03	0.000E+00	3.430E+03	0.000E+00
CHILD	4.870E+05	4.230E+06	8.350E+06	7.310E+03	2.380E+03	0.000E+00	4.360E+03	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: MEAT								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.460E+04	1.710E+06	8.330E+05	1.050E+03	3.560E+02	0.000E+00	5.990E+02	0.000E+00
TEEN	4.440E+04	1.060E+06	6.880E+05	8.440E+02	2.860E+02	0.000E+00	5.670E+02	0.000E+00
CHILD	7.420E+04	6.440E+05	1.270E+06	1.110E+03	3.620E+02	0.000E+00	6.640E+02	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
PATHWAY: COW MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.100E+04	1.600E+06	7.790E+05	9.780E+02	3.330E+02	0.000E+00	5.600E+02	0.000E+00
TEEN	9.060E+04	2.170E+06	1.410E+06	1.720E+03	5.840E+02	0.000E+00	1.160E+03	0.000E+00
CHILD	1.980E+05	1.720E+06	3.390E+06	2.970E+03	9.680E+02	0.000E+00	1.770E+03	0.000E+00
INFANT	3.600E+05	1.720E+06	6.980E+06	6.980E+03	1.660E+03	0.000E+00	4.290E+03	0.000E+00
PATHWAY: GOAT MILK								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.120E+03	1.920E+05	9.350E+04	1.170E+02	3.990E+01	0.000E+00	6.720E+01	0.000E+00
TEEN	1.090E+04	2.600E+05	1.690E+05	2.070E+02	7.010E+01	0.000E+00	1.390E+02	0.000E+00
CHILD	2.360E+04	2.060E+05	4.070E+05	3.570E+02	1.160E+02	0.000E+00	2.130E+02	0.000E+00
INFANT	4.320E+04	2.060E+05	8.380E+05	8.380E+02	1.990E+02	0.000E+00	5.150E+02	0.000E+00
PATHWAY: INHALATION								
	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	8.140E+01	6.920E+03	1.240E+03	1.550E+00	5.300E-01	0.000E+00	4.030E+04	0.000E+00
TEEN	1.120E+02	7.250E+03	1.730E+03	2.130E+00	7.230E-01	0.000E+00	6.440E+04	0.000E+00
CHILD	1.370E+02	3.230E+03	2.350E+03	2.050E+00	6.700E-01	0.000E+00	5.520E+04	0.000E+00
INFANT	9.190E+01	1.220E+03	1.780E+03	1.780E+00	4.260E-01	0.000E+00	5.060E+04	0.000E+00

Table B4-7b Continued

INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CE141

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.700E+05
TEEN	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.700E+05
CHILD	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.700E+05
INFANT	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.170E+05	4.700E+05

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.500E+02	1.520E+07	5.860E+03	3.970E+03	1.840E+03	0.000E+00	0.000E+00	0.000E+00
TEEN	6.450E+02	1.610E+07	6.410E+03	5.620E+03	2.640E+03	0.000E+00	0.000E+00	0.000E+00
CHILD	1.440E+03	1.210E+07	1.950E+04	9.730E+03	4.270E+03	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.870E+01	9.890E+05	3.750E+02	2.530E+02	1.180E+02	0.000E+00	0.000E+00	0.000E+00
TEEN	2.410E+01	6.010E+05	3.150E+02	2.100E+02	9.890E+01	0.000E+00	0.000E+00	0.000E+00
CHILD	4.390E+01	3.690E+05	5.920E+02	2.950E+02	1.300E+02	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	9.910E+00	3.340E+05	1.290E+02	8.740E+01	4.060E+01	0.000E+00	0.000E+00	0.000E+00
TEEN	1.820E+01	4.520E+05	2.370E+02	1.580E+02	7.450E+01	0.000E+00	0.000E+00	0.000E+00
CHILD	4.320E+01	3.630E+05	5.830E+02	2.910E+02	1.280E+02	0.000E+00	0.000E+00	0.000E+00
INFANT	8.300E+01	3.640E+05	1.160E+03	7.050E+02	2.170E+02	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.190E+00	4.010E+04	1.550E+01	1.050E+01	4.870E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	2.180E+00	5.430E+04	2.840E+01	1.900E+01	8.930E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	5.180E+00	4.360E+04	7.000E+01	3.490E+01	1.530E+01	0.000E+00	0.000E+00	0.000E+00
INFANT	9.960E+00	4.370E+04	1.390E+02	8.460E+01	2.610E+01	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.840E+01	3.800E+03	6.310E+02	4.290E+02	1.990E+02	0.000E+00	1.150E+04	0.000E+00
TEEN	6.870E+01	4.010E+03	9.000E+02	6.010E+02	2.810E+02	0.000E+00	1.950E+04	0.000E+00
CHILD	9.180E+01	1.790E+03	1.240E+03	6.190E+02	2.710E+02	0.000E+00	1.720E+04	0.000E+00
INFANT	6.300E+01	6.830E+02	8.790E+02	5.280E+02	1.660E+02	0.000E+00	1.640E+04	0.000E+00



Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: CE144

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.450E+06
TEEN	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.450E+06
CHILD	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.450E+06
INFANT	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.120E+06	2.450E+06

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.090E+04	3.210E+08	9.480E+05	3.960E+05	2.350E+05	0.000E+00	0.000E+00	0.000E+00
TEEN	8.170E+04	3.820E+08	1.520E+06	6.290E+05	3.760E+05	0.000E+00	0.000E+00	0.000E+00
CHILD	1.950E+05	2.990E+08	3.660E+06	1.150E+06	6.360E+05	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.870E+03	1.180E+07	3.480E+04	1.460E+04	8.640E+03	0.000E+00	0.000E+00	0.000E+00
TEEN	1.580E+03	7.380E+06	2.940E+04	1.210E+04	7.260E+03	0.000E+00	0.000E+00	0.000E+00
CHILD	2.950E+03	4.520E+06	5.530E+04	1.740E+04	9.610E+03	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.590E+02	2.890E+06	8.550E+03	3.570E+03	2.120E+03	0.000E+00	0.000E+00	0.000E+00
TEEN	8.460E+02	3.960E+06	1.570E+04	6.510E+03	3.890E+03	0.000E+00	0.000E+00	0.000E+00
CHILD	2.070E+03	3.170E+06	3.880E+04	1.220E+04	6.730E+03	0.000E+00	0.000E+00	0.000E+00
INFANT	3.110E+03	3.190E+06	5.560E+04	2.280E+04	9.200E+03	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.510E+01	3.470E+05	1.030E+03	4.290E+02	2.540E+02	0.000E+00	0.000E+00	0.000E+00
TEEN	1.010E+02	4.750E+05	1.890E+03	7.810E+02	4.670E+02	0.000E+00	0.000E+00	0.000E+00
CHILD	2.480E+02	3.810E+05	4.660E+03	1.460E+03	8.080E+02	0.000E+00	0.000E+00	0.000E+00
INFANT	3.740E+02	3.830E+05	6.670E+03	2.730E+03	1.100E+03	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.830E+03	2.590E+04	1.090E+05	4.540E+04	2.690E+04	0.000E+00	2.460E+05	0.000E+00
TEEN	6.320E+03	2.740E+04	1.550E+05	6.420E+04	3.830E+04	0.000E+00	4.240E+05	0.000E+00
CHILD	1.150E+04	1.230E+04	2.150E+05	6.710E+04	3.720E+04	0.000E+00	3.790E+05	0.000E+00
INFANT	5.590E+03	4.700E+03	1.010E+05	3.840E+04	1.700E+04	0.000E+00	3.120E+05	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: 1131

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	3.190E+05
TEEN	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	3.190E+05
CHILD	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	3.190E+05
INFANT	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	2.630E+05	3.190E+05

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.000E+06	4.630E+05	1.230E+06	1.750E+06	3.010E+06	5.750E+08	0.000E+00	0.000E+00
TEEN	8.770E+05	3.230E+05	1.170E+06	1.630E+06	2.810E+06	4.770E+08	0.000E+00	0.000E+00
CHILD	1.240E+06	1.940E+05	2.170E+06	2.180E+06	3.580E+06	7.220E+08	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.320E+05	6.070E+04	1.610E+05	2.300E+05	3.940E+05	7.540E+07	0.000E+00	0.000E+00
TEEN	1.010E+05	3.700E+04	1.340E+05	1.870E+05	3.220E+05	5.460E+07	0.000E+00	0.000E+00
CHILD	1.420E+05	2.220E+04	2.480E+05	2.490E+05	4.090E+05	8.240E+07	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.630E+06	1.670E+06	4.420E+06	6.730E+06	1.080E+07	2.070E+09	0.000E+00	0.000E+00
TEEN	6.040E+06	2.220E+06	8.020E+06	1.120E+07	1.930E+07	3.280E+09	0.000E+00	0.000E+00
CHILD	1.110E+07	1.740E+06	1.950E+07	1.960E+07	3.210E+07	6.470E+09	0.000E+00	0.000E+00
INFANT	2.100E+07	1.710E+06	4.060E+07	4.790E+07	5.590E+07	1.570E+10	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	4.550E+06	2.000E+06	5.310E+06	7.590E+06	1.300E+07	2.490E+09	0.000E+00	0.000E+00
TEEN	7.240E+06	2.670E+06	9.630E+06	1.350E+07	2.320E+07	3.930E+09	0.000E+00	0.000E+00
CHILD	1.330E+07	2.090E+06	2.340E+07	2.350E+07	3.860E+07	7.770E+09	0.000E+00	0.000E+00
INFANT	2.530E+07	2.050E+06	4.880E+07	5.740E+07	6.710E+07	1.690E+10	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	6.490E+02	1.990E+02	7.990E+02	1.130E+03	1.940E+03	3.780E+05	0.000E+00	0.000E+00
TEEN	8.370E+02	2.060E+02	1.120E+03	1.560E+03	2.660E+03	4.640E+05	0.000E+00	0.000E+00
CHILD	8.640E+02	9.010E+01	1.520E+03	1.520E+03	2.500E+03	5.150E+05	0.000E+00	0.000E+00
INFANT	6.210E+02	3.360E+01	1.200E+03	1.410E+03	1.640E+03	4.700E+05	0.000E+00	0.000E+00

Table B4-7b Continued

## INDIVIDUAL DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE: 1133

## PATHWAY: PLUME

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
TEEN	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
CHILD	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: GROUND

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	4.560E+04
TEEN	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	4.560E+04
CHILD	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	4.560E+04
INFANT	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	3.750E+04	4.560E+04

## PATHWAY: VEGETABLE

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.680E+04	4.960E+04	3.180E+04	5.520E+04	9.640E+04	8.120E+06	0.000E+00	0.000E+00
TEEN	1.530E+04	3.790E+04	2.950E+04	5.000E+04	8.780E+04	6.990E+06	0.000E+00	0.000E+00
CHILD	2.520E+04	2.680E+04	5.380E+04	6.650E+04	1.110E+05	1.240E+07	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: MEAT

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	5.050E-03	8.990E-03	5.750E-03	1.000E-02	1.740E-02	1.470E+00	0.000E+00	0.000E+00
TEEN	2.490E-03	6.170E-03	4.810E-03	8.160E-03	1.430E-02	1.140E+00	0.000E+00	0.000E+00
CHILD	4.180E-03	4.450E-03	8.930E-03	1.100E-02	1.840E-02	2.050E+00	0.000E+00	0.000E+00
INFANT	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00	0.000E+00

## PATHWAY: COW MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.140E+04	9.270E+04	5.930E+04	1.030E+05	1.800E+05	1.520E+07	0.000E+00	0.000E+00
TEEN	5.800E+04	1.390E+05	1.080E+05	1.840E+05	3.220E+05	2.560E+07	0.000E+00	0.000E+00
CHILD	1.230E+05	1.310E+05	2.630E+05	3.250E+05	5.420E+05	6.040E+07	0.000E+00	0.000E+00
INFANT	2.370E+05	1.370E+05	5.550E+05	8.090E+05	9.510E+05	1.470E+08	0.000E+00	0.000E+00

## PATHWAY: GOAT MILK

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	3.770E+04	1.110E+05	7.110E+04	1.240E+05	2.160E+05	1.820E+07	0.000E+00	0.000E+00
TEEN	6.720E+04	1.670E+05	1.300E+05	2.200E+05	3.870E+05	3.080E+07	0.000E+00	0.000E+00
CHILD	1.480E+05	1.570E+05	3.160E+05	3.900E+05	6.510E+05	7.250E+07	0.000E+00	0.000E+00
INFANT	2.840E+05	1.640E+05	6.670E+05	9.710E+05	1.140E+06	1.770E+08	0.000E+00	0.000E+00

## PATHWAY: INHALATION

	T. BODY	GI	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ADULT	1.430E+02	2.610E+02	2.740E+02	4.690E+02	8.190E+02	6.820E+04	0.000E+00	0.000E+00
TEEN	1.970E+02	3.270E+02	3.850E+02	6.490E+02	1.140E+03	9.260E+04	0.000E+00	0.000E+00
CHILD	2.440E+02	1.740E+02	5.250E+02	6.440E+02	1.070E+03	1.220E+05	0.000E+00	0.000E+00
INFANT	1.780E+02	6.830E+01	4.200E+02	6.080E+02	7.100E+02	1.130E+05	0.000E+00	0.000E+00

Table B4-8: Liquid Parameter Values for Eq. 4.2a and 4.2b  
Population Dose Estimates

Parameter	Parameter Value				
U	Adult	Teen	Child	Infant	
Colorado River	6.9	5.2	2.2	0	kg/y saltwater fish
	1	0.75	0.33	0	kg/y saltwater invertebrate
Matagorda Bay	6.9	5.2	2.2	0	kg/y saltwater fish
	1	0.75	0.33	0	kg/y saltwater invertebrate
Ub	Adult	Teen	Child	Infant	
Colorado River	8.3	47	9.5	0	hr/y
Matagorda Bay	8.3	47	9.5	0	hr/y
M					
Colorado River	1.00				
Matagorda Bay	163				
F					
Colorado River	600 cfs				
N(i)					
Colorado River	values by nuclide "i" and pathway from Table B4-1				
Matagorda Bay					
T					
fish ingestion	168 hr				
shell fish ingestion	240 hr				
shoreline exposure	0 hr				
Tb	1.31E+05 hr				
W					
Colorado River	0.2				
Matagorda Bay	0.5				
B(i)	nuclide specific from Table A-1, Regulatory Guide 1.109				
D(a,i,j)	nuclide specific from Table E-11 or E-6, Regulatory Guide 1.109				

Table B4-9: Pathways for Calculating Population  
Doses from Liquid Effluents

<u>PATHWAYS</u>	<u>NUMBER OF RECEPTORS AT LOCATIONS:</u>		
	<u>Colorado River</u>	<u>Matagorda Bay</u>	<u>Little Robbins</u>
Shore Exposure	151,500	151,500	0
Salt Water Fish Ingestion	18,500	18,500	0
Salt Water Invertebrate Ingestion	0	303,000	0

Table B4-10a: Population Distribution

Direction	Distance (miles)									
	1 - 2	2 - 3	3 - 4	4 - 5	5 - 10	10 - 20	20 - 30	30 - 40	40 - 50	
N	0.	4.	0.	0.	30.	2,982.	1,867.	14,992.	5,947.	
NNE	0.	0.	0.	0.	90.	22,707.	2,298.	6,893.	7,719.	
NE	0.	0.	0.	0.	37.	2,810.	7,937.	21,189.	16,726.	
ENE	0.	0.	0.	3.	482.	1,889.	3,509.	21,856.	67,308.	
E	0.	0.	2.	0.	47.	864.	1,067.	0.	407.	
ESE	0.	0.	112.	82.	64.	233.	0.	0.	0.	
SE	0.	0.	51.	59.	461.	0.	0.	0.	0.	
SSE	0.	0.	0.	0.	149.	45.	0.	0.	0.	
S	0.	0.	0.	0.	0.	0.	0.	0.	0.	
SSW	0.	0.	0.	2.	7.	171.	0.	0.	0.	
SW	0.	0.	0.	13.	64.	220.	0.	2,027.	1,453.	
WSW	0.	6.	2.	21.	120.	5,334.	1,592.	14,096.	8,797.	
W	0.	0.	0.	12.	127.	642.	845.	1,922.	4,672.	
WNW	0.	0.	0.	32.	404.	732.	1,515.	8,805.	2,611.	
NW	0.	25.	0.	20.	245.	819.	1,430.	1,751.	2,579.	
NNW	0.	0.	12.	11.	7.	941.	4,967.	13,907.	3,592.	

The population distribution of this table reflects the estimated 1990 population within 50 miles of STPEGS from the UFSAR, Rev. 0, and is applicable for the plume, ground and inhalation pathways.



Table B4-10b: Vegetation Ingestion Pathway Population Distribution

Direction	Distance (miles)									
	1 - 2	2 - 3	3 - 4	4 - 5	5 - 10	10 - 20	20 - 30	30 - 40	40 - 50	
N	124.	207.	289.	372.	3,141.	6,778.	11,656.	3,472.	5,621.	
NNE	124.	207.	289.	322.	3,141.	7,109.	10,912.	7,522.	9,010.	
NE	124.	207.	289.	372.	3,141.	7,109.	4,877.	9,341.	11,656.	
ENE	107.	182.	256.	198.	2,067.	1,157.	1,405.	0.	0.	
E	107.	182.	256.	198.	2,067.	992.	1,323.	83.	0.	
ESE	107.	182.	256.	198.	2,067.	248.	0.	0.	0.	
SE	0.	0.	0.	198.	2,067.	0.	0.	0.	0.	
SSE	0.	0.	0.	0.	0.	0.	0.	0.	0.	
S	0.	0.	0.	0.	0.	0.	0.	0.	0.	
SSW	0.	0.	0.	0.	0.	827.	0.	0.	0.	
SW	0.	0.	0.	99.	827.	827.	0.	4,133.	7,109.	
WSW	41.	66.	99.	99.	827.	3,555.	0.	149.	9,010.	
W	41.	66.	99.	99.	827.	2,811.	0.	413.	3,224.	
WNW	41.	66.	99.	99.	827.	3,224.	0.	0.	248.	
NW	41.	66.	99.	100.	827.	5,621.	12,730.	17,277.	18,351.	
NNW	124.	207.	289.	372.	3,141.	6,778.	16,863.	23,229.	28,106.	

The population distribution of this table has been normalized to reflect the non-leafy vegetable (rice) production within 50 miles of STPEGS (Wyle Research Report WR 84-34, Table 13(a)).

Table B4-10c: Beef Ingestion Pathway Population Distribution

Direction	Distance (miles)									
	1 - 2	2 - 3	3 - 4	4 - 5	5 - 10	10 - 20	20 - 30	30 - 40	40 - 50	
N	36.	57.	83.	108.	877.	3,353.	6,344.	9,594.	13,669.	
NNE	36.	57.	83.	108.	877.	4,539.	6,551.	6,809.	18,930.	
NE	36.	57.	83.	108.	877.	4,539.	6,344.	7,376.	9,594.	
ENE	62.	103.	144.	139.	1,186.	5,364.	7,273.	7,376.	8,872.	
E	62.	103.	144.	139.	1,186.	4,849.	6,344.	1,805.	206.	
ESE	62.	103.	144.	139.	1,186.	1,135.	0.	0.	0.	
SE	0.	0.	0.	139.	1,186.	0.	0.	0.	0.	
SSE	0.	0.	0.	103.	928.	0.	0.	0.	0.	
S	0.	0.	0.	103.	928.	0.	0.	0.	0.	
SSW	0.	0.	0.	103.	928.	1,032.	0.	0.	0.	
SW	0.	0.	0.	103.	928.	464.	258.	4,745.	10,058.	
WSW	21.	36.	52.	67.	567.	2,115.	4,849.	2,631.	5,261.	
W	21.	36.	52.	67.	567.	2,218.	5,261.	6,912.	7,170.	
WNW	21.	36.	52.	67.	567.	2,424.	5,261.	7,376.	8,872.	
NW	21.	36.	52.	67.	567.	2,218.	6,344.	8,872.	12,637.	
NNW	36.	57.	83.	108.	877.	3,456.	6,757.	9,594.	13,823.	

The population distribution of this table has been normalized to reflect the Beef production within 50 miles of STPEGS (Wyle Research Report WR 84-34, Table 12(h)).

Table B4-11: Population Dose Factors

NOTES:

Liquid Pathway Dose Factors

This table consists of two sections. The first is a listing of pathway dose factors by nuclide and pathway for liquid effluents. The product of a particular factor and a quantity of activity (Ci) released to the reservoir will yield the dose (mrem) to an individual. The product of the pathway dose and the number of people exposed via the pathway determines the population dose from the pathway (man-mrem).

The units for all liquid dose factors are (mrem/Ci).

The factors used by the computer codes that perform these calculations may differ by a few percent due to round-off errors. Furthermore, for nuclides with vanishing small factors (typically less than  $1.0E-20$  mrem/Ci) very large computational differences may exist, but these have no impact on the dose calculations and are inconsequential.

Gaseous Pathway Dose Factors

The second section of this table consists of a listing by nuclide of the gaseous pathway dose factors. These factors were calculated using a code similar to GASPARD and are based on the methods of Regulatory Guide 1.109.

The units used for noble gases, tritium, and all nuclides for the inhalation pathway are (mrem- $m^3$ /Ci-sec). The product of this pathway dose factor, the release (Ci), and the appropriate depleted X/Q (sec/ $m^3$ ) or X/Q (for noble gases, tritium and carbon 14) yields the dose in (mrem) to a member of the general population at a given location.

The units used for all other nuclides in all other pathways are (mrem- $m^2$ /Ci). The product of this pathway dose factor, the release (Ci), and the appropriate D/Q yields the dose (mrem) to an individual at a given location.

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : H3

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.70E-06	1.70E-06	0.00E+00	1.70E-06	1.70E-06	1.70E-06	1.70E-06

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.50E-08	8.50E-08	0.00E+00	8.50E-08	8.50E-08	8.50E-08	8.50E-08

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.61E-10	8.61E-10	0.00E+00	8.61E-10	8.61E-10	8.61E-10	8.61E-10

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.28E-08	1.28E-08	0.00E+00	1.28E-08	1.28E-08	1.28E-08	1.28E-08

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.29E-10	1.29E-10	0.00E+00	1.29E-10	1.29E-10	1.29E-10	1.29E-10

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : C14

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.72E-02	1.72E-02	8.62E-02	1.72E-02	1.72E-02	1.72E-02	1.72E-02

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.37E-04	3.37E-04	1.68E-03	3.37E-04	3.37E-04	3.37E-04	3.37E-04

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.41E-06	3.41E-06	1.71E-05	3.41E-06	3.41E-06	3.41E-06	3.41E-06

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.83E-05	3.83E-05	1.91E-04	3.83E-05	3.83E-05	3.83E-05	3.83E-05

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.87E-07	3.87E-07	1.94E-06	3.87E-07	3.87E-07	3.87E-07	3.87E-07

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NA24

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.23E-17	1.23E-17	1.23E-17	1.23E-17	1.23E-17	1.23E-17	1.23E-17

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	9.69E-17	1.12E-16

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	4.84E-18	5.61E-18

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.22E-19	1.42E-19



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : P32

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.09E-03	1.42E-02	1.58E-01	9.24E-03	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.62E-05	2.05E-04	2.28E-03	1.34E-04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.93E-07	2.08E-06	2.31E-05	1.36E-06	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.15E-05	2.67E-05	2.98E-04	1.75E-05	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.17E-07	2.70E-07	3.02E-06	1.77E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CR51

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.30E-08	2.67E-06	0.00E+00	0.00E+00	2.70E-09	7.62E-09	1.67E-08

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.30E-09	2.66E-07	0.00E+00	0.00E+00	2.69E-10	7.61E-10	1.66E-09

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.32E-11	2.69E-09	0.00E+00	0.00E+00	2.73E-12	7.70E-12	1.68E-11

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.80E-10	1.79E-07	0.00E+00	0.00E+00	1.82E-10	5.14E-10	1.12E-09

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.90E-12	1.81E-09	0.00E+00	0.00E+00	1.84E-12	5.21E-12	1.14E-11

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	6.50E-09	7.68E-09

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.25E-10	3.84E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	8.22E-12	9.71E-12

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : MNS4  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.44E-04	1.88E-03	0.00E+00	7.13E-04	2.11E-04	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.91E-06	1.29E-04	0.00E+00	4.90E-05	1.45E-05	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.00E-07	1.31E-06	0.00E+00	4.96E-07	1.46E-07	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.04E-06	1.35E-05	0.00E+00	5.15E-06	1.52E-06	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.06E-08	1.37E-07	0.00E+00	5.21E-08	1.54E-08	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.80E-05	3.28E-05

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.40E-06	1.64E-06

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	3.53E-08	4.14E-08

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : MN56

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : FESS

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.51E-05	1.09E-04	3.40E-04	2.23E-04	0.00E+00	0.00E+00	1.27E-04

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.26E-05	1.63E-04	5.09E-04	3.34E-04	0.00E+00	0.00E+00	1.90E-04

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.36E-07	1.65E-06	5.15E-06	3.38E-06	0.00E+00	0.00E+00	1.92E-06

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.02E-05	1.57E-04	4.94E-04	3.24E-04	0.00E+00	0.00E+00	1.84E-04

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.12E-07	1.59E-06	5.00E-06	3.28E-06	0.00E+00	0.00E+00	1.86E-06

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : FE59

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.87E-05	1.34E-04	2.13E-05	4.67E-05	0.00E+00	0.00E+00	1.33E-05

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.81E-05	2.01E-04	3.19E-05	6.99E-05	0.00E+00	0.00E+00	1.99E-05

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.84E-07	2.03E-06	3.22E-07	7.08E-07	0.00E+00	0.00E+00	2.02E-07

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.60E-05	1.85E-04	2.96E-05	6.48E-05	0.00E+00	0.00E+00	1.85E-05

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.64E-07	1.87E-06	2.99E-07	6.56E-07	0.00E+00	0.00E+00	1.87E-07

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	6.94E-07	8.16E-07

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.47E-08	4.07E-08

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	8.77E-10	1.03E-09



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : C058

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.07E-06	5.21E-05	0.00E+00	2.98E-06	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.06E-07	5.20E-06	0.00E+00	2.98E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.14E-09	5.26E-08	0.00E+00	3.02E-09	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.99E-07	7.33E-06	0.00E+00	4.21E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.01E-08	7.42E-08	0.00E+00	4.27E-09	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	1.64E-06	1.93E-06

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	8.21E-08	9.62E-08

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.08E-09	2.44E-09

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : C060

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.61E-04	3.21E-03	0.00E+00	1.99E-04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.60E-05	3.21E-04	0.00E+00	1.98E-05	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.66E-07	3.25E-06	0.00E+00	2.01E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.70E-05	4.65E-04	0.00E+00	2.88E-05	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.79E-07	4.71E-06	0.00E+00	2.92E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.02E-03	2.39E-03

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.01E-04	1.19E-04

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.55E-06	3.00E-06

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NI63

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.56E-03	8.87E-04	7.59E-02	5.00E-03	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.28E-04	4.43E-05	3.79E-03	2.50E-04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.29E-06	4.48E-07	3.84E-05	2.53E-06	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.66E-05	1.61E-05	1.38E-03	9.10E-05	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.72E-07	1.63E-07	1.40E-05	9.21E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NI65

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CU64

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	2.82E-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	1.88E-19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.47E-19	2.80E-19

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	5.00E-21	7.54E-21

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZN65

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.52E-03	5.12E-03	3.03E-03	9.45E-03	6.24E-03	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.26E-04	2.56E-04	1.51E-04	4.72E-04	3.12E-04	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.28E-06	2.59E-06	1.53E-06	4.78E-06	3.15E-06	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.15E-04	9.20E-04	5.46E-04	1.70E-03	1.12E-03	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.25E-06	9.31E-06	5.52E-06	1.72E-05	1.14E-05	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	1.19E-05	1.37E-05

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	5.94E-07	6.83E-07

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.50E-08	1.73E-08



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZN69  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BR83

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BR84

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BR85

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RB86

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.64E-04	8.95E-05	0.00E+00	5.34E-04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.46E-08	1.85E-08	0.00E+00	1.11E-07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.53E-10	1.88E-10	0.00E+00	1.12E-09	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.46E-08	4.93E-09	0.00E+00	2.96E-08	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.48E-10	5.00E-11	0.00E+00	2.99E-10	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	7.08E-09	8.09E-09

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.53E-10	4.04E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	8.94E-12	1.02E-11

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RB88

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RB89

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR89

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.58E-05	7.04E-05	5.50E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.24E-08	2.34E-07	1.83E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.31E-10	2.37E-09	1.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.35E-08	3.26E-07	2.56E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.44E-10	3.30E-09	2.60E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	6.39E-11	7.42E-11

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.19E-12	3.70E-12

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	8.08E-14	9.38E-14

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR90

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.29E-01	2.48E-02	9.29E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.63E-04	8.25E-05	3.09E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.72E-06	8.35E-07	3.13E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.11E-03	1.20E-04	4.50E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.12E-05	1.21E-06	4.56E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR91

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : SR92

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y90

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.18E-13	3.78E-08	4.41E-12	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.90E-15	1.89E-09	2.20E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.98E-17	1.91E-11	2.23E-15	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.58E-14	5.04E-09	5.91E-13	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.60E-16	5.10E-11	5.98E-15	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.28E-14	2.70E-14

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.14E-15	1.35E-15

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.89E-17	3.41E-17



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y91M

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y91

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.72E-09	1.10E-04	2.51E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.36E-10	5.52E-06	1.25E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.40E-12	5.58E-08	1.27E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.89E-09	3.09E-05	7.07E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.91E-11	3.13E-07	7.16E-10	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	3.75E-09	4.22E-09

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.87E-10	2.11E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	4.74E-12	5.33E-12

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y92

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : Y93

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ZR95

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.65E-09	6.36E-06	7.76E-09	2.32E-09	3.56E-09	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.99E-09	1.92E-05	2.35E-08	7.02E-09	1.08E-08	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.05E-11	1.95E-07	2.38E-10	7.10E-11	1.09E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.82E-10	1.06E-06	1.33E-09	3.96E-10	6.08E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.85E-12	1.09E-08	1.34E-11	4.01E-12	6.15E-12	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	9.49E-07	1.10E-06

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	4.74E-08	5.50E-08

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.20E-09	1.39E-09

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : 2R97

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	3.42E-16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	1.03E-15	1.97E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	1.05E-17	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	3.14E-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	3.18E-20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	1.55E-16	1.81E-16

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	7.75E-18	9.02E-18

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.96E-19	2.28E-19



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NB95

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.93E-06	1.78E-02	6.52E-06	3.41E-06	3.33E-06	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.62E-08	8.90E-04	3.26E-07	1.70E-07	1.66E-07	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.74E-10	9.01E-06	3.30E-09	1.72E-09	1.69E-09	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.41E-11	4.06E-07	1.49E-10	7.78E-11	7.61E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.46E-13	4.11E-09	1.51E-12	7.88E-13	7.71E-13	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.59E-07	3.05E-07

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.29E-08	1.52E-08

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	3.27E-10	3.85E-10

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : M099

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.77E-10	1.76E-09	0.00E+00	8.83E-10	1.98E-09	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.84E-12	8.80E-11	0.00E+00	4.41E-11	9.90E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.95E-14	8.90E-13	0.00E+00	4.47E-13	1.00E-12	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.06E-13	6.00E-12	0.00E+00	3.02E-12	6.77E-12	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.13E-15	6.07E-14	0.00E+00	3.06E-14	6.86E-14	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.31E-11	2.67E-11

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.15E-12	1.33E-12

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.92E-14	3.38E-14



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TC99M

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TC101  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RU103

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.25E-08	7.24E-06	7.74E-08	0.00E+00	2.71E-07	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.87E-10	1.08E-07	1.16E-09	0.00E+00	4.06E-09	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.93E-12	1.10E-09	1.17E-11	0.00E+00	4.11E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.25E-08	4.97E-06	5.35E-08	0.00E+00	1.87E-07	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.27E-10	5.04E-08	5.41E-10	0.00E+00	1.89E-09	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.36E-07	2.75E-07

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.18E-08	1.38E-08

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.98E-10	3.48E-10



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RU105

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : RU106

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.79E-06	7.33E-04	1.42E-05	0.00E+00	2.55E-05	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.68E-08	1.10E-05	2.12E-07	0.00E+00	3.82E-07	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.71E-10	1.11E-07	2.15E-09	0.00E+00	3.87E-09	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.30E-06	5.28E-04	1.03E-05	0.00E+00	1.84E-05	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.31E-08	5.35E-06	1.04E-07	0.00E+00	1.87E-07	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	9.97E-06	1.20E-05

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	4.98E-07	5.97E-07

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.26E-08	1.51E-08

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : AG110M

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	5.64E-05	6.57E-05

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	2.81E-06	3.28E-06

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	7.12E-08	8.31E-08

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE125M  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.01E-05	2.41E-04	7.56E-05	2.58E-05	2.04E-04	2.22E-05	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.26E-08	3.01E-07	1.4E-08	3.22E-08	2.54E-07	2.77E-08	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.28E-10	3.05E-09	9.55E-10	3.26E-10	2.57E-09	2.81E-10	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.78E-08	4.22E-07	1.33E-07	4.53E-08	3.55E-07	3.91E-08	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.80E-10	4.27E-09	1.35E-09	4.59E-10	3.60E-09	3.95E-10	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	5.37E-09	7.37E-09

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	2.68E-10	3.68E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	6.79E-12	9.31E-12

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE127M

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.82E-05	1.07E-03	3.99E-04	1.35E-04	1.51E-03	9.97E-05	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.02E-08	1.33E-06	4.98E-07	1.68E-07	1.89E-06	1.24E-07	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.09E-10	1.35E-08	5.04E-09	1.70E-09	1.91E-08	1.26E-09	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.62E-08	1.90E-06	7.14E-07	2.40E-07	2.70E-06	1.70E-07	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.73E-10	1.92E-08	7.23E-09	2.43E-09	2.73E-08	1.80E-09	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	6.37E-10	7.53E-10

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.18E-11	3.76E-11

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	8.05E-13	9.52E-13

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE127

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE129M

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.48E-05	6.33E-04	1.57E-04	5.52E-05	6.12E-04	5.29E-05	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.09E-08	7.90E-07	1.96E-07	6.90E-08	7.64E-07	6.60E-08	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.13E-10	8.00E-09	1.99E-09	6.98E-10	7.73E-09	6.68E-10	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.24E-08	1.08E-06	2.69E-07	9.45E-08	1.05E-06	9.05E-08	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.29E-10	1.09E-08	2.73E-09	9.56E-10	1.06E-08	9.17E-10	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	3.53E-08	4.13E-08

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.76E-09	2.06E-09

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	4.46E-11	5.21E-11

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE129

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE131M  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.76E-12	4.75E-10	1.20E-11	5.46E-12	5.50E-11	9.03E-12	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.94E-15	5.93E-13	1.49E-14	6.81E-15	6.87E-14	1.13E-14	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	6.02E-17	6.01E-15	1.51E-16	6.89E-17	6.95E-16	1.14E-16	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.64E-15	1.63E-13	4.13E-15	1.88E-15	1.90E-14	3.12E-15	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.66E-17	1.65E-15	4.18E-17	1.90E-17	1.92E-16	3.16E-17	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	3.06E-13	3.60E-13

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.53E-14	1.80E-14

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	3.86E-16	4.55E-16

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE131  
-----

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : TE132

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.47E-08	1.40E-06	5.88E-08	3.54E-08	3.38E-07	4.08E-08	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.33E-11	1.74E-09	7.35E-11	4.41E-11	4.22E-10	5.10E-11	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.39E-13	1.77E-11	7.44E-13	4.47E-13	4.28E-12	5.16E-13	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.34E-11	1.34E-09	5.67E-11	3.40E-11	3.25E-10	3.93E-11	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.38E-13	1.35E-11	5.74E-13	3.44E-13	3.29E-12	3.98E-13	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	5.03E-11	5.92E-11

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	2.51E-12	2.96E-12

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	6.36E-14	7.48E-14

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : 1130  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	9.31E-21	0.00E+00	1.30E-20	2.01E-20	1.15E-18	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.82E-20	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	1.32E-18	1.60E-18

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	6.60E-20	8.01E-20

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I131

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.76E-08	3.90E-08	1.29E-07	1.72E-07	2.93E-07	5.57E-05	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.25E-09	1.30E-09	4.29E-09	5.72E-09	9.74E-09	1.85E-06	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.29E-11	1.31E-11	4.35E-11	5.79E-11	9.86E-11	1.88E-08	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.83E-09	7.27E-10	2.42E-09	3.22E-09	5.48E-09	1.04E-06	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.85E-11	7.36E-12	2.45E-11	3.26E-11	5.55E-11	1.06E-08	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.96E-09	3.60E-09

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.48E-10	1.80E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	3.74E-12	4.54E-12

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I132

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I133

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.71E-16	1.94E-15	1.50E-15	2.43E-15	4.21E-15	3.71E-13	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.57E-17	6.45E-17	4.98E-17	8.08E-17	1.40E-16	1.23E-14	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.60E-19	6.53E-19	5.04E-19	8.18E-19	1.42E-18	1.25E-16	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.70E-18	4.26E-18	3.31E-18	5.35E-18	9.27E-18	8.19E-16	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.72E-20	4.31E-20	3.35E-20	5.42E-20	9.39E-20	8.29E-18	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.10E-15	2.56E-15

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.05E-16	1.28E-16

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.66E-18	3.24E-18

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : 1134  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : I135

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS134  
 -----

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.81E-04	3.99E-06	1.19E-04	2.65E-04	8.49E-05	0.00E+00	2.90E-05

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.11E-06	2.45E-08	7.30E-07	1.62E-06	5.21E-07	0.00E+00	1.78E-07

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.64E-05	3.61E-07	1.08E-05	2.40E-05	7.70E-06	0.00E+00	2.63E-06

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.00E-07	2.21E-09	6.64E-08	1.47E-07	4.73E-08	0.00E+00	1.61E-08

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.54E-05	1.80E-05

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.36E-07	2.76E-07



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS136

FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.22E-07	3.10E-08	8.52E-08	3.15E-07	1.74E-07	0.00E+00	2.45E-08

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.36E-09	1.90E-10	5.22E-10	1.94E-09	1.07E-09	0.00E+00	1.51E-10

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.72E-08	2.40E-09	6.63E-09	2.45E-08	1.35E-08	0.00E+00	1.91E-09

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.06E-10	1.47E-11	4.07E-11	1.50E-10	8.29E-11	0.00E+00	1.17E-11

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.36E-09	3.81E-09

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	5.16E-11	5.84E-11

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS137  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.14E-04	1.59E-05	7.55E-04	9.60E-04	3.24E-04	0.00E+00	1.11E-04

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.15E-06	9.77E-08	4.63E-06	5.89E-06	1.99E-06	0.00E+00	6.82E-07

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.66E-05	1.45E-06	6.89E-05	8.74E-05	2.95E-05	0.00E+00	1.01E-05

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.86E-07	8.87E-09	4.22E-07	5.36E-07	1.81E-07	0.00E+00	6.21E-08

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.11E-04	1.30E-04

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.71E-06	1.99E-06

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CS138  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA139

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA140

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.31E-08	8.61E-07	5.19E-07	6.07E-10	2.05E-10	0.00E+00	3.57E-10

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.14E-09	1.07E-07	6.48E-08	7.57E-11	2.56E-11	0.00E+00	4.45E-11

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.19E-11	1.09E-09	6.56E-10	7.67E-13	2.59E-13	0.00E+00	4.51E-13

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.13E-09	1.33E-07	8.04E-08	9.38E-11	3.16E-11	0.00E+00	5.51E-11

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.19E-11	1.34E-09	8.14E-10	9.49E-13	3.20E-13	0.00E+00	5.58E-13

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	8.75E-09	1.00E-08

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	4.37E-10	4.99E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.11E-11	1.26E-11

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA141

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : BA142

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : LA140

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.65E-15	8.47E-10	2.82E-14	1.32E-14	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.82E-16	4.23E-11	1.41E-15	6.59E-16	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.84E-18	4.28E-13	1.42E-17	6.67E-18	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.08E-16	7.12E-11	2.38E-15	1.11E-15	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.12E-18	7.21E-13	2.41E-17	1.13E-17	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	7.15E-12	8.10E-12

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	3.57E-13	4.05E-13

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	9.03E-15	1.02E-14

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : LA142  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CE141

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.32E-11	6.30E-07	3.05E-10	1.94E-10	8.92E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.16E-11	3.15E-07	1.52E-10	9.67E-11	4.46E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.17E-13	3.18E-09	1.54E-12	9.79E-13	4.51E-13	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.53E-11	2.57E-06	1.25E-09	7.94E-10	3.65E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	9.64E-13	2.60E-08	1.27E-11	8.03E-12	3.70E-12	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.34E-08	2.63E-08

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.17E-09	1.32E-09

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.95E-11	3.33E-11

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CE143

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.36E-18	2.05E-12	9.09E-17	6.30E-14	2.76E-17	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.68E-18	1.02E-12	4.54E-17	3.15E-14	1.38E-17	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.72E-20	1.04E-14	4.60E-19	3.19E-16	1.39E-19	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.10E-18	1.97E-12	8.77E-17	6.07E-14	2.65E-17	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	7.19E-20	1.99E-14	8.87E-19	6.14E-16	2.69E-19	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	1.96E-13	2.23E-13

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	9.80E-15	1.11E-14

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	2.48E-16	2.82E-16

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : CE144

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.04E-08	5.26E-05	1.95E-07	7.67E-08	4.50E-08	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.22E-09	2.63E-05	9.73E-08	3.83E-08	2.25E-08	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.28E-11	2.66E-07	9.85E-10	3.88E-10	2.27E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.54E-08	2.27E-04	8.46E-07	3.33E-07	1.95E-07	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.59E-10	2.30E-06	8.56E-09	3.37E-09	1.97E-09	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	1.27E-06	1.47E-06

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	6.34E-08	7.33E-08

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.60E-09	1.86E-09



Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : PR143

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	8.36E-11	5.91E-06	1.68E-09	6.37E-10	3.64E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.17E-12	2.95E-07	8.41E-11	3.18E-11	1.82E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.22E-14	2.99E-09	8.52E-13	3.22E-13	1.84E-13	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.09E-11	1.47E-06	4.21E-10	1.59E-10	9.08E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.12E-13	1.49E-08	4.27E-12	1.61E-12	9.19E-13	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : PR144  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	0.00E+00	0.00E+00

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : ND147  
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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.03E-11	3.27E-06	7.49E-10	7.99E-10	4.62E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.51E-12	1.63E-07	3.74E-11	3.99E-11	2.31E-11	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.54E-14	1.65E-09	3.79E-13	4.04E-13	2.34E-13	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.22E-11	7.86E-07	1.81E-10	1.93E-10	1.11E-10	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.23E-13	7.95E-09	1.83E-12	1.95E-12	1.13E-12	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	2.78E-09	3.34E-09

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	1.39E-10	1.67E-10

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	3.51E-12	4.21E-12

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : W187

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.49E-14	1.96E-11	8.71E-14	6.78E-14	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.10E-17	2.45E-14	1.09E-16	8.47E-17	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	3.14E-19	2.48E-16	1.10E-18	8.57E-19	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	5.61E-19	4.41E-16	1.97E-18	1.53E-18	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	0.00E+00	4.46E-18	1.99E-20	1.55E-20	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	9.86E-15	1.15E-14

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	4.92E-16	5.72E-16

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	1.25E-17	1.45E-17

Table B4-11a Continued

POPULATION DOSE FACTORS FOR LIQUID EFFLUENTS -- FOR ISOTOPE : NP239

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FOR PATHWAY: FRESHWATER FISH - LITTLE ROBBINS SLOUGH

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	4.83E-15	1.47E-09	9.10E-14	8.34E-15	2.57E-14	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.41E-16	7.33E-11	4.54E-15	4.17E-16	1.28E-15	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER FISH - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	2.44E-18	7.42E-13	4.60E-17	4.22E-18	1.30E-17	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - COLORADO RIVER

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.45E-17	4.39E-12	2.74E-16	2.50E-17	7.71E-17	0.00E+00	0.00E+00

FOR PATHWAY: SALTWATER INVERTABRATES - MATAGORDA BAY

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG
ALL	1.47E-19	4.45E-14	2.77E-18	2.54E-19	7.81E-19	0.00E+00	0.00E+00

FOR PATHWAY: SHORELINE EXPOSURE - LITTLE ROBBINS SLOUGH

	T. BODY	SKIN
ALL	4.59E-12	5.32E-12

FOR PATHWAY: SHORELINE EXPOSURE - COLORADO RIVER

	T. BODY	SKIN
ALL	2.29E-13	2.66E-13

FOR PATHWAY: SHORELINE EXPOSURE - MATAGORDA BAY

	T. BODY	SKIN
ALL	5.80E-15	6.72E-15

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : H3

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.05E+01	2.05E+01	0.00E+00	2.05E+01	2.05E+01	2.05E+01	2.05E+01	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.69E+00	4.69E+00	0.00E+00	4.69E+00	4.69E+00	4.69E+00	4.69E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.01E+00	7.01E+00	0.00E+00	7.01E+00	7.01E+00	7.01E+00	7.01E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.90E+01	3.90E+01	0.00E+00	3.90E+01	3.90E+01	3.90E+01	3.90E+01	0.00E+00



Table B4-13b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : C14

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.82E+03	3.82E+03	1.91E+04	3.82E+03	3.82E+03	3.82E+03	3.82E+03	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.96E+03	1.96E+03	9.78E+03	1.96E+03	1.96E+03	1.96E+03	1.96E+03	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.67E+03	1.67E+03	8.37E+03	1.67E+03	1.67E+03	1.67E+03	1.67E+03	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.31E+02	1.31E+02	6.98E+02	1.31E+02	1.31E+02	1.31E+02	1.31E+02	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : AR41

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.40E+02	1.40E+02	1.40E+02	1.40E+02	1.40E+02	1.40E+02	1.40E+02	2.48E+02

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR83M

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	1.20E-03	9.34E-02	3.39E-01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR85M

FOR PATHWAY: PLUME

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.85E+01	1.92E+01	6.79E+01

FOR PATHWAY: GROUND

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR85

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	2.55E-01	8.48E-01	4.28E+01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR87

FOR PATHWAY: PLUME

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	9.35E+01	9.35E+01	9.35E+01	9.35E+01	9.35E+01	9.35E+01	9.35E+01	9.75E+01	4.16E+02

FOR PATHWAY: GROUND

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T.	BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR88

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.33E+02	2.33E+02	2.33E+02	2.33E+02	2.33E+02	2.33E+02	2.34E+02	3.43E+02

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR89

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.63E+02	2.67E+02	6.24E+02

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : KR90

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.47E+02	2.50E+02	5.18E+02

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE131M

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.45E+00	1.45E+00	1.45E+00	1.45E+00	1.45E+00	1.45E+00	1.80E+00	1.78E+01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE133M

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	3.98E+00	4.44E+00	3.73E+01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE133

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.66E+00	4.66E+00	4.66E+00	4.66E+00	4.66E+00	4.66E+00	5.00E+00	1.59E+01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE135M

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.94E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01	4.94E+01	4.97E+01	8.12E+01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE135

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.87E+01	2.87E+01	2.87E+01	2.87E+01	2.87E+01	2.87E+01	2.94E+01	9.25E+01

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE137

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.25E+01	2.25E+01	2.25E+01	2.25E+01	2.25E+01	2.25E+01	2.64E+01	4.13E+02

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : XE138

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.40E+02	1.40E+02	1.40E+02	1.40E+02	1.40E+02	1.40E+02	1.42E+02	2.93E+02

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : CS137

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.02E+05	1.02E+05	1.02E+05	1.02E+05	1.02E+05	1.02E+05	1.02E+05	1.20E+05

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.80E+03	2.96E+05	0.00E+00	0.00E+00	3.50E+02	1.04E+03	2.20E+03	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.67E+02	3.39E+04	0.00E+00	0.00E+00	3.44E+01	9.76E+01	2.12E+02	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.72E+02	7.00E+04	0.00E+00	0.00E+00	8.91E+01	2.70E+02	5.66E+02	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.56E+00	9.09E+01	0.00E+00	0.00E+00	7.52E-01	2.07E+00	4.91E+02	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : MN54

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.02E+07	3.02E+07	3.02E+07	3.02E+07	3.02E+07	3.02E+07	3.02E+07	3.55E+07

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.15E+06	1.20E+07	0.00E+00	5.35E+06	1.56E+06	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.67E+04	4.74E+05	0.00E+00	1.81E+05	5.33E+04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.45E+04	2.29E+05	0.00E+00	1.11E+05	3.23E+04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.22E+02	2.09E+03	0.00E+00	1.30E+03	3.20E+02	0.00E+00	4.71E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : FE59

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.96E+06	5.96E+06	5.96E+06	5.96E+06	5.96E+06	5.96E+06	5.96E+06	7.00E+06

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.45E+06	2.00E+07	4.01E+06	8.19E+06	0.00E+00	0.00E+00	2.36E+06	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.45E+06	3.86E+07	6.19E+06	1.35E+07	0.00E+00	0.00E+00	3.85E+06	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.36E+05	2.29E+06	5.10E+05	1.01E+06	0.00E+00	0.00E+00	2.94E+05	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.78E+02	5.23E+03	4.34E+02	9.38E+02	0.00E+00	0.00E+00	3.53E+04	0.00E+00



Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : C058

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	8.27E+06	8.27E+06	8.27E+06	8.27E+06	8.27E+06	8.27E+06	8.27E+06	9.68E+06

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.72E+06	1.02E+07	0.00E+00	6.85E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	8.95E+05	6.54E+06	0.00E+00	3.77E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.66E+05	8.87E+05	0.00E+00	6.48E+04	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.35E+01	2.91E+03	0.00E+00	5.26E+01	0.00E+00	0.00E+00	3.17E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : C060

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.70E+08	4.70E+08	4.70E+08	4.70E+08	4.70E+08	4.70E+08	4.70E+08	5.53E+08

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	6.74E+06	3.79E+07	0.00E+00	2.75E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.46E+06	2.39E+07	0.00E+00	1.48E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.52E+05	2.81E+06	0.00E+00	2.21E+05	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.25E+02	7.82E+03	0.00E+00	3.84E+02	0.00E+00	0.00E+00	2.03E+05	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : ZN65

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.63E+07	1.63E+07	1.63E+07	1.63E+07	1.63E+07	1.63E+07	1.63E+07	1.88E+07

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.16E+07	1.05E+07	7.54E+06	2.29E+07	1.49E+07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.21E+07	1.36E+07	8.11E+06	2.52E+07	1.67E+07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.39E+07	2.77E+07	2.17E+07	6.53E+07	4.24E+07	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.64E+03	1.48E+03	1.09E+03	3.40E+03	2.24E+03	0.00E+00	2.92E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : SR89

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.73E+02	4.73E+02	4.73E+02	4.73E+02	4.73E+02	4.73E+02	4.73E+02	5.48E+02

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	9.45E+06	3.35E+07	3.30E+08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.23E+05	9.84E+05	7.78E+06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	8.19E+05	2.63E+06	2.86E+07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.34E+02	1.01E+04	1.16E+04	0.00E+00	0.00E+00	0.00E+00	5.22E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : SR90

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	6.67E+09	6.48E+08	2.69E+10	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.06E+08	3.28E+07	1.24E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.64E+08	7.07E+07	3.07E+09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.95E+05	2.07E+04	3.15E+06	0.00E+00	0.00E+00	0.00E+00	3.56E+05	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : ZR95

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.34E+06	5.34E+06	5.34E+06	5.34E+06	5.34E+06	5.34E+06	5.34E+06	6.20E+06

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	6.69E+03	2.10E+07	3.21E+04	8.94E+03	1.35E+04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	9.04E+03	3.45E+07	4.26E+04	1.27E+04	1.95E+04	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.30E+00	9.41E+03	1.60E+01	4.32E+00	6.47E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	8.34E+02	4.23E+03	3.96E+03	1.16E+03	1.78E+03	0.00E+00	6.16E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : SB124

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00



Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : CS134

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.50E+08	1.75E+08

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.08E+08	2.44E+06	9.19E+07	1.90E+08	6.05E+07	0.00E+00	2.10E+07	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.14E+07	4.69E+05	1.42E+07	3.13E+07	1.00E+07	0.00E+00	3.42E+06	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	9.62E+07	2.20E+06	9.20E+07	1.86E+08	5.88E+07	0.00E+00	2.06E+07	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.95E+04	2.88E+02	1.37E+04	2.86E+04	9.57E+03	0.00E+00	3.37E+03	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : CS136

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.29E+06	3.29E+06	3.29E+06	3.29E+06	3.29E+06	3.29E+06	3.29E+06	3.72E+06

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.41E+06	6.57E+05	2.27E+06	7.85E+06	4.29E+06	0.00E+00	6.17E+05	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.98E+05	1.11E+05	3.08E+05	1.13E+06	6.25E+05	0.00E+00	8.81E+04	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.05E+07	1.19E+06	4.53E+06	1.53E+07	8.33E+06	0.00E+00	1.21E+06	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.58E+03	3.23E+02	1.42E+03	4.92E+03	2.83E+03	0.00E+00	4.13E+02	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : CS137

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.25E+08	2.62E+08

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.48E+07	2.42E+06	1.45E+08	1.72E+08	5.75E+07	0.00E+00	2.01E+07	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.37E+07	4.25E+05	2.04E+07	2.58E+07	8.68E+06	0.00E+00	2.97E+06	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	6.06E+07	2.01E+06	1.34E+08	1.54E+08	5.16E+07	0.00E+00	1.82E+07	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.14E+04	2.38E+02	1.81E+04	2.15E+04	7.61E+03	0.00E+00	2.69E+03	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : BA140

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.48E+05	4.48E+05	4.48E+05	4.48E+05	4.48E+05	4.48E+05	4.48E+05	5.12E+05

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.51E+05	9.60E+06	7.25E+06	7.88E+03	2.64E+03	0.00E+00	4.69E+03	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.86E+04	1.25E+06	7.63E+05	8.86E+02	2.99E+02	0.00E+00	5.20E+02	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.07E+04	5.97E+05	4.98E+05	5.26E+02	1.76E+02	0.00E+00	3.15E+02	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	9.39E+01	6.25E+03	1.48E+03	1.70E+00	5.71E-01	0.00E+00	4.56E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : CE141

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.98E+05	2.98E+05	2.98E+05	2.98E+05	2.98E+05	2.98E+05	2.98E+05	3.36E+05

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.87E+02	1.27E+07	7.77E+03	4.64E+03	2.11E+03	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.64E+01	7.07E+05	3.47E+02	2.19E+02	1.01E+02	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	6.76E+00	1.33E+05	8.97E+01	5.24E+01	2.38E+01	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	5.79E+01	3.44E+03	7.64E+02	4.80E+02	2.19E+02	0.00E+00	1.34E+04	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : CE144

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.51E+06	1.51E+06	1.51E+06	1.51E+06	1.51E+06	1.51E+06	1.51E+06	1.75E+06

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.74E+04	1.50E+08	6.99E+05	2.60E+05	1.50E+05	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.73E+03	8.61E+06	3.23E+04	1.26E+04	7.41E+03	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	3.31E+02	1.20E+06	6.19E+03	2.25E+03	1.30E+03	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.00E+03	2.34E+04	1.31E+05	5.08E+04	2.96E+04	0.00E+00	2.88E+05	0.00E+00

Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : I131

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.88E+05	1.88E+05	1.88E+05	1.88E+05	1.88E+05	1.88E+05	1.88E+05	2.28E+05

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.29E+06	4.40E+05	1.83E+06	2.27E+06	3.84E+06	7.37E+08	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.11E+05	4.41E+04	1.48E+05	1.96E+05	3.33E+05	6.36E+07	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.82E+06	5.78E+05	2.66E+06	3.22E+06	5.42E+06	1.04E+09	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	7.04E+02	1.79E+02	9.59E+02	1.25E+03	2.10E+03	4.11E+05	0.00E+00	0.00E+00



Table B4-11b Continued

POPULATION DOSE FACTORS FOR GASEOUS EFFLUENTS -- FOR ISOTOPE : I133

FOR PATHWAY: PLUME

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: GROUND

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.68E+04	2.68E+04	2.68E+04	2.68E+04	2.68E+04	2.68E+04	2.68E+04	3.26E+04

FOR PATHWAY: VEGETABLE

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.34E+00	4.96E+00	4.66E+00	7.06E+00	1.21E+01	1.13E+03	0.00E+00	0.00E+00

FOR PATHWAY: MEAT

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	2.72E-03	6.77E-03	5.29E-03	8.54E-03	1.48E-02	1.31E+00	0.00E+00	0.00E+00

FOR PATHWAY: COW MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	4.28E+03	8.45E+03	8.61E+03	1.27E+04	2.18E+04	2.06E+06	0.00E+00	0.00E+00

FOR PATHWAY: GOAT MILK

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

FOR PATHWAY: INHALATION

	T. BODY	GI-TRACT	BONE	LIVER	KIDNEY	THYROID	LUNG	SKIN
ALL AGES	1.66E+02	2.65E+02	3.29E+02	5.20E+02	8.92E+02	8.04E+04	0.00E+00	0.00E+00

APPENDIX TO PART B, SECTION 4

Model of the Release of Radioactive Materials from the STPEGS  
Reservoir for Use in Off-site Dose Calculations

Assumptions:

1. Activity released to the reservoir is not available for release off-site for two weeks, during which time it becomes mixed with previous releases. The mass flow of the reservoir water is such that it should take about two weeks for water to work its way around to the spillway. After one complete circuit of the reservoir (about three weeks), a given release should have mixed into a much larger volume of water than was the original batch release.

2. Batch releases of liquid effluents to the reservoir are made every day or two and are about the same magnitude and thus approximate a constant discharge rate (Ci/yr). This assumption along with the travel time of assumption #1 above helps assure that the radionuclides in the reservoir are fairly uniformly mixed.

3. The releases due to seepage and blowdown are constant and continuous (any release over the spillway is small and considered to be part of the routine blowdown activity). This assumption is accurate for the seepage, but is only accurate for blowdown if large averaging times are considered. The model is based on annual averages which helps to smooth the discrete blowdown operations each year to approximate a continuous activity.

4. The rate that radioactivity is lost from the reservoir is proportional to the amount of activity in the reservoir at any time. This assumption allows all losses from the reservoir to be treated mathematically the same way as radioactive decay. This assumption is accurate insofar as long averaging times allow discrete discharges to the reservoir and discrete releases from the reservoir off-site to approximate continuous processes.

5. Evaporation from the reservoir offers a release method for tritium and noble gases, but does not affect any other radionuclides.

6. The volume of the reservoir remains constant.

Mathematical Relations:

Estimation of Remaining Batch Discharge as a Function of Time

The remaining radioactivity,  $A(t)$ , for a given radionuclide as a function of time after a single discharge of plant effluent into the reservoir is related to the initial discharge activity,  $A_0$ , as described below:

$$A(t) = A_0 * e^{-(Y+Yr) * t}$$

where:

- Y = release rate constant for water from the reservoir;
- = (annual blowdown flow rate + seepage)/reservoir volume)
- = 2.427E-03 per year;

$Y_r$  = the radioactive decay rate for the given nuclide;  
=  $0.693/(\text{radioactive half-life in years})$ ;

$(Y+Y_r)$  = total loss rate (release plus radioactive) from the reservoir;

$t$  = time since discharge (less 14 days) in years;

$A_0$  = activity of a given radionuclide 14 days after discharge from the plant to the reservoir,  $C_i$ ;

$A(t)$  = current activity for a given radionuclide in the reservoir following a particular discharge event,  $C_i$ .

#### Reservoir Concentration

The concentration of a given radionuclide in the reservoir at a particular time since discharge is simply the activity remaining for the radionuclide,  $A(t)$ , divided by the reservoir volume,  $V$ .

$$\text{concentration} = A(t)/V$$

#### Release Rate From the Reservoir

The rate of release for a given nuclide from the reservoir is a function of time since discharge from the plant to the reservoir as shown below:

release rate = (activity in the reservoir) \* (release rate constant)

since  $Y$  = release rate constant (reservoir volumes per year)

and  $A(t)$  = amount of activity in the reservoir at time "t"

then

$$\text{release rate} = A(t) * Y$$

and substituting for  $A(t)$

$$\text{release rate} = Y * A_0 * e^{[-(Y + Y_r) * t]}$$

#### Integrated Release From the Reservoir

The total release during any period of time can be estimated by integrating the release rate function above and evaluating it for that time period.

$$\begin{aligned} \text{Total release} &= \int_{t=a}^b (\text{release rate}) dt \\ &= \int_{t=a}^b A_0 * Y * e^{[-(Y+Y_r) * t]} dt \end{aligned}$$

$$\begin{aligned}
&= \frac{A_0 * Y}{-(Y+Yr)} \int_{t=a}^b e^{[-(Y+Yr) * t]} dt \\
&= \frac{A_0 * Y}{-(Y+Yr)} * ( e^{[-(Y+Yr)*b]} - e^{[-(Y+Yr) * a]} ) \\
&= \frac{A_0 * Y}{(Y+Yr)} * ( e^{[-(Y+Yr) * a]} - e^{[-(Y+Yr) * b]} )
\end{aligned}$$

Example Release Calculation

Examples of how one would expect activity to leave STPEGS following a discharge to the reservoir from the plant follow. Three radionuclides are illustrated; a long-lived nuclide such as Cs-137; a nuclide of moderate half-life such as Co-60; and a short-lived nuclide such as Fe-59. The reservoir release rate constant is  $Y = 2.427E-03$  as described previously.

Value of integral from year "a" to year "b"  $Yr = *.**$

a	b	Yr=0.023 per year	Yr=0.125 per year	Yr=8.32 per year
0	1	0.0024 A <sub>0</sub>	0.0023 A <sub>0</sub>	2.92E-04 A <sub>0</sub>
1	2	0.0023 A <sub>0</sub>	0.0020 A <sub>0</sub>	0.000 A <sub>0</sub>
2	3	0.0023 A <sub>0</sub>	0.0018 A <sub>0</sub>	0.00 A <sub>0</sub>
3	4	0.0022 A <sub>0</sub>	0.0016 A <sub>0</sub>	0.00
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
19	20	0.0015 A <sub>0</sub>	0.0000 A <sub>0</sub>	0.00
.	.	.	.	.
.	.	.	.	.
.	.	.	.	.
Total =		$\frac{0.00}{0.095} A_0$	$\frac{0.000}{0.019} A_0$	$\frac{0.000}{2.92E-04} A_0$

Discussion:

Note from the table above that the release (and hence the off-site dose) following a plant discharge to the reservoir is spread out in time, particularly for the longer-lived nuclides. If we assume that all of a given nuclide which is destined to leave STPEGS does so in the first year, we would assign the dose associated with the release indicated in the last line of the table in the first year and omit the releases listed for subsequent years.

This method is generally conservative since for nuclides with half-lives greater than a couple of years, the dose estimate corresponding to the integrated release is several times larger than the true dose corresponding to the actual release in the first year. The only instance where the method might not be conservative is if in a given year a long-lived nuclide accounted for a large fraction of the 3-mrem limit.

If in the following year a short-lived nuclide accounted for the dose, the dose estimate in that second year might be only about 90% of the dose actually delivered that year. This is because the long-lived nuclide from the previous year would still be delivering off-site dose the second year even though the model assigned all that dose the first year. In turn, the short-lived nuclide would deliver virtually all its off-site dose in the year it was actually released to the reservoir.

Conclusion:

Considering the uncertainties in estimating off-site flow rates, the possibility of making a 10% error in the off-site doses in consecutive years seems unimportant. Therefore, the ODCM will assign all dose related to the integrated release from the reservoir for a given discharge into the reservoir in the year of the discharge to the reservoir. This integrated release is simply

$$\text{total release} = \frac{A_o * Y * (e^{[-(Y+Yr)*a]} - e^{[-(Y+Yr)*b]})}{(Y+Yr)}$$

evaluated with  $b = \text{infinity (years)}$  and  $a = 0 \text{ (years)}$ .

$$\text{total release} = A_o * \frac{Y}{Y + Yr}$$

This total release from the reservoir assumes that "a" above is measured from the time a radionuclide becomes available for release from the reservoir. Since 14 days must elapse before liquid effluents mix throughout the reservoir, an additional radioactive decay term,  $\text{EXP}[-Yr*14]$ , should be applied to be strictly correct mathematically. Hence the fraction, Floss, from a given release,  $A_i$ , which eventually leaves the site is

$$\text{Floss} = \frac{\text{total release from site}}{\text{initial release to reservoir}} = \frac{A_o * \frac{Y}{Y+Yr}}{A_i}$$

$$\text{since } A_o = A_i * \text{EXP}[-Yr*14]$$

$$\text{Floss} = \frac{\frac{Y * A_i * \text{EXP}[-Yr*14]}{Y+Yr}}{A_i} = \frac{Y}{Y+Yr} * \text{EXP}[-Yr*14]$$

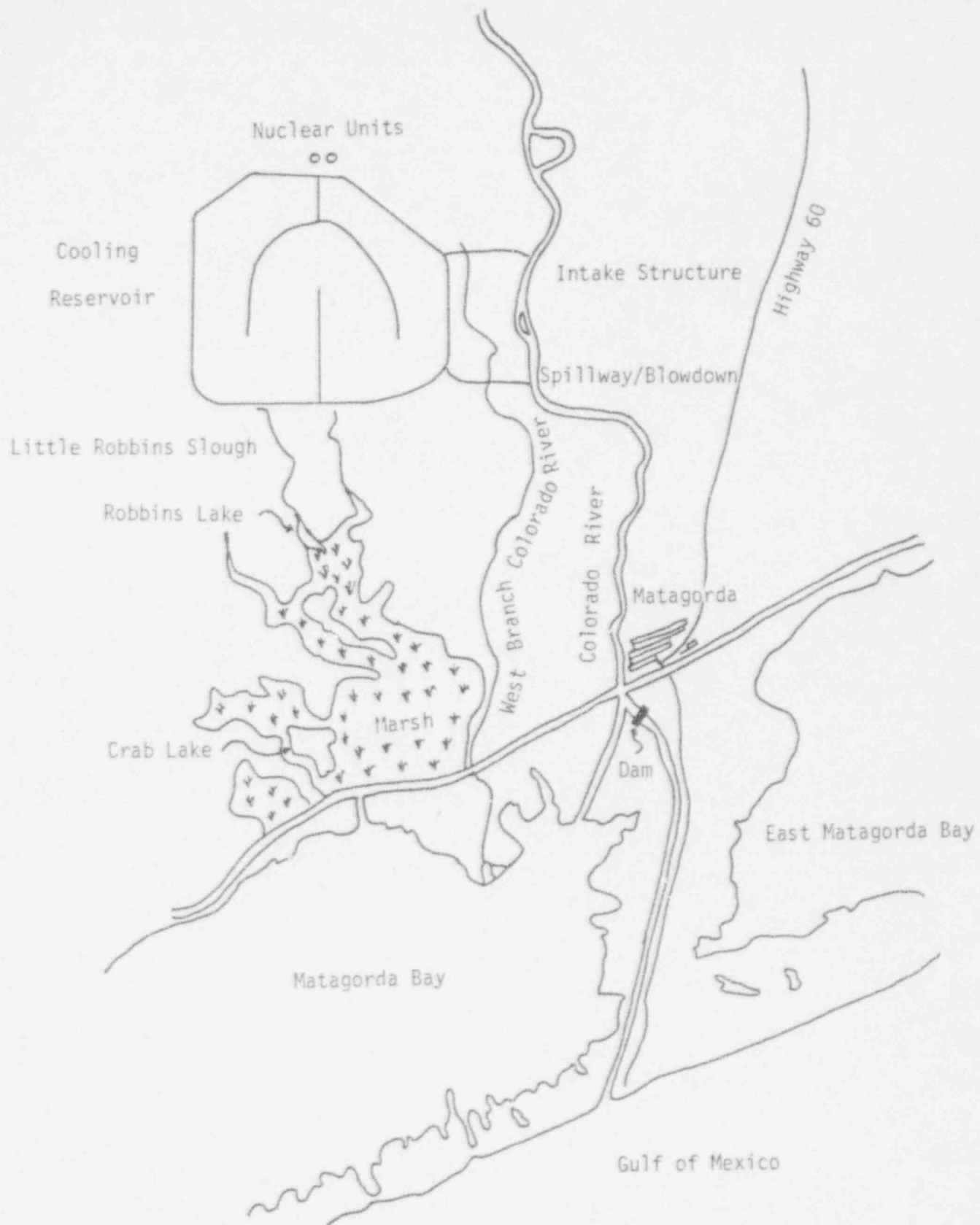



Figure B4-1: Lower Colorado River

  
 Statute Miles



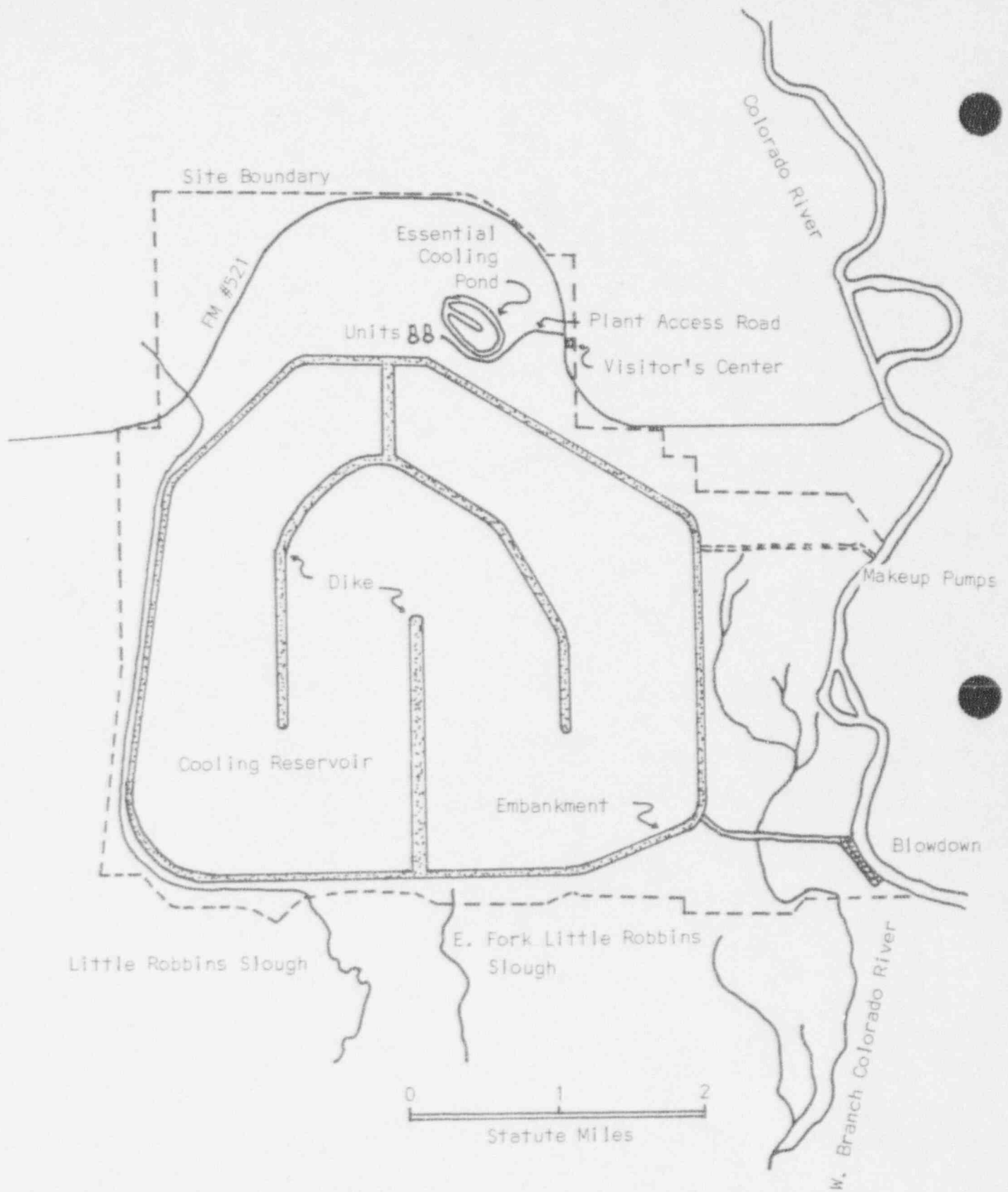


Figure B4-2 - STPEGS Site

## 5.0 Radiological Environmental Monitoring Program

The emphasis of the operational Radiological Environmental Monitoring Program is to verify source control at the plant. In meeting this objective, certain findings have been considered in formulating the operational Radiological Environmental Monitoring Program. Among these the most important in relation to critical exposure paths and population groups are the following:

As of the most recent land use census no commercial dairies exist within ten (10) miles of the plant nor any individual cows or goats within five (5) miles whose milk is consumed by humans; however, there are six ranches with about 3,600 head of beef cattle within a 10-mile radius.

There are extensive commercial crops grown, mainly rice, soybeans, grain sorghum, and cotton in the region immediately surrounding the plant. The major portion of irrigation in this region is from the canal and levee systems with water controlled by the Lower Colorado River Authority in Bay City. Alternate irrigation comes from deep water wells 300 ft. or greater in depth. Although three irrigation permits have been issued by the Lower Colorado River Authority for irrigation with Colorado River water taken downstream from the plant, these permits have not been exercised due to the brackish quality of the river in this area.

Local towns derive their drinking water from ground-water wells; there is no population consumption of water from the Colorado River below the plant.

There is substantial commercial harvesting of shellfish in Matagorda Bay, with the potential of harvesting fin fish as well depending on state controls. The Colorado River estuary is limited to sport fishing for human consumption and commercial fishing for bait species.

Prevailing winds are from the south to east-south-east.

### 5.1 Program Summary

The design and implementation of the Radiological Environmental Monitoring Program, related surveillance activities, sample analysis, and reporting is performed by Houston Lighting & Power Company. The monitoring program is a tiered system in which the level of surveillance is in part determined by effluent releases.

The minimum program is outlined in the following sections and in Table B5-1. The results of this program are routinely reported in the Annual Radiological Environmental Operating Report as indicated in Control 5.9.1.3.

In support of this report, a land use census will be conducted annually.

In the event plant releases result in environmental measurements exceeding Table A5-3 values or the results of an analysis indicate unexpected concentrations of radionuclides in the environment, a more vigorous sampling program may be instituted.

In the event of an incident involving large releases of activity from STPEGS, an intensive sampling program would be initiated. This program would include special studies as appropriate for the particular incident and might include special reporting.

The following paragraphs describe the general program instituted including the types of samples, the collection frequency, and the analysis to be accomplished on each sample type.

## 5.2 Sampling Program Description

### 5.2.1 Airborne Iodine and Particulates

Airborne iodine and particulates are sampled by continuous low volume air samplers (approximately 2.0 cfm) fitted with charcoal canisters. The air sampling network will consist of 5 stations. Three stations are located at the exclusion zone boundary, one each in the N, NNW, and NW sectors. Since all releases will be at ground level or from roof vents, the highest calculated off-site ground level concentration of airborne releases occurs at the site boundary regardless of wind direction. An air sampling system is located in the community of Bay City. A control station is located at least ten (10) miles west of the site in a minimal wind direction. The filters are changed weekly and analyzed.

### 5.2.2 Soil Sampling

Soil samples were collected from the same locations as airborne particulates as well as from two farms within five miles of the site for a total of seven locations. Soils are no longer routinely collected but samples may be taken if deemed necessary.

Sediment samples shall be collected semiannually at locations influenced by plant discharge water, at a control station, and in the cooling reservoir.

### 5.2.3 Ambient Radiation Measurements

Background ionizing radiation levels are measured by a network of approximately forty TLD stations. Two dosimeters are placed at each station and are collected and analyzed quarterly. The TLD stations are located adjacent to air monitoring stations and in generally concentric rings about the plant at one and five mile ranges in sixteen sectors. The balance of the stations are placed in special interest areas and control locations ten to fifteen miles from the site.

#### 5.2.4 Surface Water Sampling

Each unit discharges its liquid radioactive waste into the cooling reservoir. The radionuclides in the reservoir are assumed to mix uniformly and subsequent blowdown releases to the Colorado River may contain these radionuclides. The Colorado River is sampled continuously both above and below the plant discharge structure. In order to help affirm the liquid effluent pathway dose model, STPEGS also samples the reservoir near the spillway structure. Results of these samples may be compared with off-site measurements to help assess the adequacy of dose projection models. These composite samples are analyzed for gamma isotopes monthly and for tritium quarterly.

Radionuclides may also diffuse through the bottom of the reservoir and may be discharged to collection ditches which run into Little Robbins Slough. Grab samples are taken semiannually at locations near the site boundary where these surface flows enter off-site surface waters.

#### 5.2.5 Ground Water Sampling

Since seepage from the bottom of the reservoir is expected to occur, some chance exists for radionuclides to enter ground water. Two aquifers underlie the site: a shallow aquifer above about 90 feet, and a deeper one below about 300 feet. Drinking water used in the area is drawn from the aquifer below 300 feet which is separated from the shallow aquifer by an impermeable strata of clay. Due to the existence of one unfilled Sondex pipe that passes from the surface through the shallow and into the deep aquifer, the possibility exists for nuclides to migrate down this Sondex structure into the drinking water. Therefore, wells on-site are sampled and analyzed for tritium and gamma emitting nuclides from both the shallow and deep aquifers.

#### 5.2.6 Fish/Aquatic Wildlife

Radioactivity in the liquid effluent from the plant may be available to the fish of the Colorado River and Little Robbins Slough. The Colorado River is used by sports fishermen and hence, radionuclides may find their way into the human food chain. Fish and/or aquatic wildlife samples are taken twice annually downstream and at a control location beyond plant influence. Fish samples shall be taken in the main cooling reservoir as necessary to comply with STPEGS license agreements. These samples are analyzed for gamma emitting nuclides.

#### 5.2.7 Agricultural Products

The Lower Colorado River Authority which regulates the majority of irrigation water in the vicinity of STPEGS indicates that these waters originate upstream from the dam on the Colorado River near Bay City. Hence, plant liquid discharges do not affect local agriculture.

The broadleaf vegetation samples are taken monthly when available. HL&P collects broadleaf vegetation samples near the site boundary in each of the three highest predicted X/Q sectors in place of sampling private garden plots. Milk samples may be taken depending on the presence of milk animals and the success of obtaining samples. Gamma isotopic analysis is performed on the vegetation samples and iodine analyses will be performed if any milk samples

are identified and taken.

#### 5.2.8 Domestic Meat

At least one sample of meat is taken annually from farms located within ten miles of the plant. The flesh is subjected to gamma isotopic analysis.

#### 5.2.9 Game

Game is obtained on site or within ten miles of the site, when available. The edible tissue is analyzed for gamma-emitting radionuclides.

### 5.3 Sampling Frequency

The sampling frequencies given in Table B5-1 were selected so that the results of the radiological environmental monitoring may complement the results of the radiological effluent monitoring. In some cases the sampling frequency is determined by inherent characteristics of the medium; e.g., air filters can be run only 7-10 days before excessive pressure-drop arises.

### 5.4 Sample Station Locations

Table B5-2 identifies sample stations by an ID number, location, brief location description and type of media that might be collected. This list is not limiting and may be modified to satisfy requirements described in Table B5-1.

### 5.5 Quality Control

Control checks and tests are applied to the analytical operations by means of duplicate and/or split analyses of selected samples, and by the introduction of environmental samples such as provided through the USEPA Environmental Radioactivity Laboratory Intercomparison Studies Program. Analytical procedures are similar to those reported in HASL-300 or equivalent commercial practice.

### 5.6 Analytical Sensitivity

The detection sensitivities of the various program elements are listed in Table A5-2. Samples are analyzed as described in the program summary.

### 5.7 Data Presentation

Typically, reporting units are pCi/m<sup>3</sup> for air and pCi/kg for liquid and solid samples. The standard deviation of the net counting rate is computed using

the gross counting rate and the background rate. Suitable statistical methods are used to determine whether a count is significant as described in references 1 and 6.

#### 5.8 Routine Reporting Requirements

Reports on radiological environmental monitoring sample analyses are submitted in accordance with the requirements of Control 6.9.1.3. These reports are summaries of the results of the environmental activities and assessments of the observed impacts of plant operation on the environment.

TABLE B5-1

## MINIMUM OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Exposure Pathway and/or Sample Media	Collection			Analysis	
	Nominal Number of Sample Locations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
1. Direct Radiation (TLDs)	<p>Total Stations: 40</p> <p>16 Stations located in sixteen sectors approximately 1 mile from containment.</p> <p>16 Stations located in sixteen sectors 4-6 miles from containment.</p> <p>6 Stations located in special interest areas (e.g. school, population center) within a 14-mile radius of containment.</p> <p>2 Control Stations located in areas of minimal wind direction (W, ENE) 10-15 miles from containment.</p>	Continuous	Quarterly	Gamma	Quarterly
2. Airborne a. Radioiodine & Particulates	<p>Total Stations: 5 (5)</p> <p>3 Stations located at the exclusion zone, approximately 1 mile from containment in the N, NNW, and NW sectors.</p> <p>1 Station located in Bay City, 14 miles from containment.</p> <p>1 Control station located in a minimal wind direction (W) 11 miles from containment.</p>	Continuous	Weekly	<p>Radioiodine Canister: I-131</p> <p>Particulate Sample: Gross Beta Gamma-Isotopic</p>	<p>Weekly</p> <p>Weekly Quarterly Composite (by location)</p>



TABLE B5-1

MINIMUM OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM  
(cont'd)

Exposure Pathway and/or Sample Media	Collection			Analysis	
	Nominal Number of Sample Locations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
3. Waterborne a. Surface	<p><u>Total Stations:</u> 13 (7)</p> <p>1 <u>Station</u> located in reservoir at point of reservoir blowdown to Colorado River.</p> <p>1 <u>Control Station</u> located above the Site on the Colorado River not influenced by plant discharge.</p> <p>1 <u>Station</u> approximately 2 miles downstream from blowdown entrance into Colorado River.</p> <p>1 <u>Station</u> located near Site boundary in the Little Robbins Slough.</p> <p>1 <u>Station</u> located near Site boundary in the East Fork of Little Robbins Slough.</p> <p>1 <u>Station</u> located near Site boundary in the West Branch of the Colorado River.</p> <p>1 <u>Station</u> located in drainage ditch north of reservoir that empties into the Colorado River upstream of the reservoir makeup pumping facility.</p>	<p>Composite (grab, if composite not available)</p> <p>Grab</p>	<p>Monthly</p> <p>Semiannually</p>	<p>Gamma-Isotopic Tritium</p> <p>Gamma-Isotopic Tritium</p>	<p>Monthly</p> <p>Quarterly Composite</p> <p>According to collection frequency</p>
b. Ground	<p>(1)</p> <p>1 <u>Station</u> located at well down-gradient in the shallow aquifer.</p>	<p>Grab</p>	<p>Quarterly</p>	<p>Gamma-Isotopic Tritium</p>	<p>According to collection frequency</p>

TABLE B5-1

MINIMUM OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM  
(cont'd)

Exposure Pathway and/or Sample Media	Collection			Analysis	
	Nominal Number of Sample Locations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
c. Drinking Water	(2) 1 Station well to the deep aquifer used for onsite drinking water 1 Control Station	Grab	Monthly	Gamma-Isotopic  Gross Beta  Tritium	Monthly   Quarterly Composite
d. Sediment	(3) 1 Control Station located above the site on the Colorado River not in- fluenced by plant discharge. 1 Station located downstream from blowdown entrance into the Colorado river. 1 Station located in reservoir.	Grab	Semiannually	Gamma-Isotopic	According to collection frequency
4. Ingestion	<u>Total Stations: 8</u>				
a. Milk	-----Limited source of sample in vicinity of STPEGS----- (Attempts will be made to obtain samples when available)				
		Grab	Semimonthly when on pasture, monthly at other times	Gamma-Isotopic  Low Level I-131	According to collection frequency
b. Broadleaf Vegetation	(4) 3 Stations located at the exclusion zone, approximately 1 mile from containment, in the N, NW, and NNW sectors.	Grab	Monthly during growing season (when	Gamma-Isotopic	According to collection frequency

TABLE B5-1

MINIMUM OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM  
(cont'd)

Exposure Pathway and/or Sample Media	Collection			Analysis	
	Nominal Number of Sample Locations	Routine Sampling Mode	Nominal Collection Frequency	Analysis Type	Minimum Analysis Frequency
c. Agricultural Products	1 Control Station located in a minimal wind direction (W), 11 miles from containment.		available)		
	-----No sample stations have been identified in the vicinity of the Site.----- Presently no agricultural land is irrigated by water into which liquid plant wastes will be discharged. Agricultural products will be considered if these conditions change.				
d. Terrestrial & Aquatic Animals (edible portion)	(3) 1 Sample representing commercially and/or recreationally important species in vicinity of STEGS that may be influenced by plant operation  *1 Sample of same or analogous species in area not influenced by STEGS. 1 Sample of same or analogous species in the reservoir.	Grab	Sample in season or semiannually if they are not seasonal	Gamma-Isotopic	According to collection frequency
e. Domestic Meat	(1) 1 Sample represents domestic stock fed on crops exclusively grown within 10 miles of containment.		Annually	Gamma-Isotopic	According to collection

\*Applied to aquatic samples only.

NOTE: Collection frequency may vary to accommodate sample media availability, equipment availability, and/or weather conditions.

Table B5-2: Sample Station Locations

Media Code	Station Code	Vector	Location Description
DR, AI, AP, VB, SO, VP	001	1 mile N	Exclusion Zone - TX 521
DR	002	1 mile NNE	Exclusion Zone - TX 521
DR	003	1 mile NE	Exclusion Zone - TX 521
DR	004	1 mile ENE	Exclusion Zone - TX 521
DR	005	1 mile E	STPEGS Visitor Center - TX 521
DR	006	3.5 miles ESE	Site near reservoir makeup pumping facility
DR	007	3.5 mile SE	Site on Dike
DR	008	.5 mile SSE	Site on Dike
DR	009	.25 mile S	Site on Dike
DR	010	.25 mile SSW	Site on Dike
DR	011	.5 mile SW	Site on Dike
DR	012	1 mile WSW	Site on Dike
DR	013	1 mile W	Exclusion Zone - TX 521
DR	014	1 mile WNW	Exclusion Zone - TX 521
DR, AI, AP, VB, SO, VP	015	1 mile NW	Exclusion Zone - TX 521
DR, AI, AP, VB, SO, VP	016	1 mile NNW	Exclusion Zone - TX 521
DR	017	6 miles N	Buckeye - FM 1468
DR, AI, AP	018	5.5 miles NNE	Hoescht Celanese Plant - FM 3057
DR	019	5 miles NE	FM 2668
DR	020	5 miles ENE	FM 2668
DR	021	5 miles E	FM 521

Table B5-2: Sample Station Locations  
(Cont'd)

Media Code	Station Code	Vector	Location Description
DR	022	7 miles ESE	Cain Chemical Plant, TX 60
DR	023*	16 miles ENE	Intersection of TX 521 and FM 2540
DR	024	4 miles SSE	Site on Dike
DR	025	4 miles S	Site on Dike
DR	026	4 miles SSW	Site on Dike
DR	027	2.5 miles SW	Site on Dike
DR	028	5 miles WSW	FM 1095
DR	029	4.5 miles W	FM 1095
DR	030	6 miles WNW	Tres Palacios Oaks, FM 2853
DR	031	5.6 miles NW	Wilson Creek Road
DR	032	3.5 miles NNW	FM 1468
DR, AI, AP, SO	033	14 miles NNE	Bay City
DR	034	8 miles ENE	Wadsworth
DR	035	8.5 miles SSE	Matagorda
DR	036	10 miles WSW	Collegeport
DR, AI, AP, VB, SO, VP	037*	11 miles WSW	Palacios Substation
DR	038	11 miles NW	Blessing
DR	039	9 miles NW	El Maton
DR	040	4.5 miles SW	Citrus Grove
DR	041	2.6 miles ESE	Site on Dike
DR	042	8.2 miles NW	FM 459 at Tidehaven Inter- mediate School
WG	205	4 miles SE	Well #446A, .5 mile north of reservoir blowdown canal (30' deep)

Table B5-2: Sample Station Locations  
(Cont'd)

Media Code	Station Code	Vector	Location Description
WG	206	4 miles SE	Well #446, .5 mile north of reservoir blowdown canal (75' deep)
WG	207*	1.5 miles W	Well #603A, .25 mile W of TX 521 (75' deep)
WG	208*	1.5 miles W	Well #603B, .25 mile W of TX 521 (150' deep)
WS	209	2 miles E	Kelly Lake
WD	210	On Site	Approved drinking water supply
WS,SS	211	3.5 miles S	Site, E. Branch Little Robbins Slough
WS,SS	212	3.5 miles S	Little Robbins Slough
WS,SS	213	3 miles SE	Site, W. Branch Colorado River
**	214	2 miles E	Makeup Water Discharge (Reservoir)
** ,SS	215	1 mile SW	Site, Reservoir - Circulating water discharge
** ,WS,SS,F	216	3 miles SSE	Site, Reservoir - blowdown
**	217		Region 1 (mouth of Colorado River to marker 1)
** ,WS	218		Region 2 (marker #1 to marker #27)
**	219		Region 3 (marker #27 to Highway 521 overpass)
**	220*		Region 4 (Highway 521 overpass to Bay City Dam)
WS,SS,F	221*		Region 5 (above Bay City Dam)

Table B5-2: Sample Station Locations  
(Cont'd)

Media Code	Station Code	Vector	Location Description
**	222	> 10 miles	West Matagorda Bay
**	223	> 10 miles	East Matagorda Bay
**	224	> 10 miles	West Intercoastal Canal
**	225	> 10 miles	East Intercoastal Canal
WS	226*	5.5 miles NNE	Colorado River at Hoescht Celanese Plant
WS,SS	227	6 miles SE	West bank of Colorado River 1.5 miles downstream of STPEGS across from channel marker #22
WD	228*	14 miles NNE	Bay City Public water supply
WS,SS	229	1 mile SE	Drainage ditch north of reservoir that empties into the Colorado River upstream of the reservoir makeup pumping facility
SS	230	3.5 miles ESE	Colorado River at point where drainage ditch (station #229) empties into it
SO	231	11 miles WSW	Soil in vegetation plot at station #37
SO	232	9 miles NW	Farmland behind station #39
SS	233	4.3 miles SE	Colorado River where blowdown discharge channel empties into it
SO	234	1 mile NW	Farm across from station #15



Table B5-2: Sample Station Locations  
(Cont'd)

Media Code	Station Code	Vector	Location Description
WG	235	3.8 miles S	Well B-3 directly south from reservoir
	236		STPEGS Protected Area
WS	237	3.7 miles SE	Blowdown discharge channel from reservoir
WG	238	3.7 miles S	Reservoir relief well
WG	*239	1 mile NW	Well B-1B, near REMP sampling station #15
SO, SS, WS	240	1 mile E	Drainage ditch originating NE of protected area that crosses Hwy 521 south of the main entrance road and empties into Kelly Lake
	241	<1 mile S	Reservoir - Circulating water intake
SS,WS	*242	>10 miles NNE	Colorado River where it intersects Highway 35
WS	243	>10 miles N	Colorado River upstream of Bay City Dam at the LCRA pumping station.
WG	244	3.7 miles SSW	MCR relief wells (West side of South Wall)
F(1,2,3), CC	300**	<1 miles S	STPEGS Main Cooling Reservoir
SS,F(1,2,3), CC	301-631 **		Grids located in main cooling reservoir. One SS shall be taken at any of the grids 304, 305, 312-314, 323-326 and another one at any of the grids 564-566 or 584-586.

NOTES: \*Control Station

\*\*This station may be used to obtain the required aquatic samples in the vicinity of STPEGS that may be influenced by plant operations.

SAMPLE MEDIA CODES

WS	Surface Water	VB	Broadleaf Vegetation
WG	Ground Water	VP	Pasture Grass Vegetation
WD	Drinking Water	C	Crustacean
SS	Shoreline Sediment	AP	Airborne Particulate
SO	Soil	AI	Airborne Radioiodine
F	Fish	DR	Direct Radiation