

## Appendix H

# Additional Graphics Depicting the Scenarios Modeled with RESRAD to Derive the Soil DCGLs

### *RESRAD 6.0 Output Graphics*

#### ➤ **Occupational Worker Scenario**

- Byproduct Source Term
- Uranium Source Term

#### ➤ **Construction Worker Scenario**

- Byproduct Source Term
- Uranium Source Term

#### ➤ **Recreational User (Visitor) Scenario**

- Byproduct Source Term
- Uranium Source Term

#### ➤ **Truck Farmer Scenario**

- Byproduct Source Term
- Uranium Source Term

#### ➤ **Suburban Resident Scenario**

- Byproduct Source Term
- Uranium Source Term

#### ➤ **Resident Farmer Scenario**

- Byproduct Source Term
- Uranium Source Term

## H.0 PROBABILISTIC EVALUATION GRAPHICAL SUMMARY

### H.1 INTRODUCTION TO THE GRAPHICAL SUMMARY

The graphical summary is provided to offer the reader with additional insight into the results of the dose modeling used to derive the soil DCGLs for the site. While all of the data upon which the graphics are plotted is presented in tabular form in the RESRAD output report files contained in Appendices A through F, it is often more intuitive to view the data in a visual format such as the graphical formats presented in this appendix. The graphics are presented in an appendix to this report rather than in the main text in an effort to preserve the readability of the report.

Three different types of graphical presentations are included in this appendix. Each has its own utility.

#### H.1.1 Cumulative Probability Plots

Cumulative probability plots portray the range of potential outcomes in terms of total annual effective dose equivalent. The annual dose, including its potential range, can be read on the horizontal axis of the graph. The vertical axis provides a quantitative indication of the cumulative probability that the projected annual dose in the scenario under evaluation will be lower than a given annual dose. For example, in the sample cumulative probability plot below, there is a 70% probability that the peak mean annual dose will be less than 22 mrem/y.

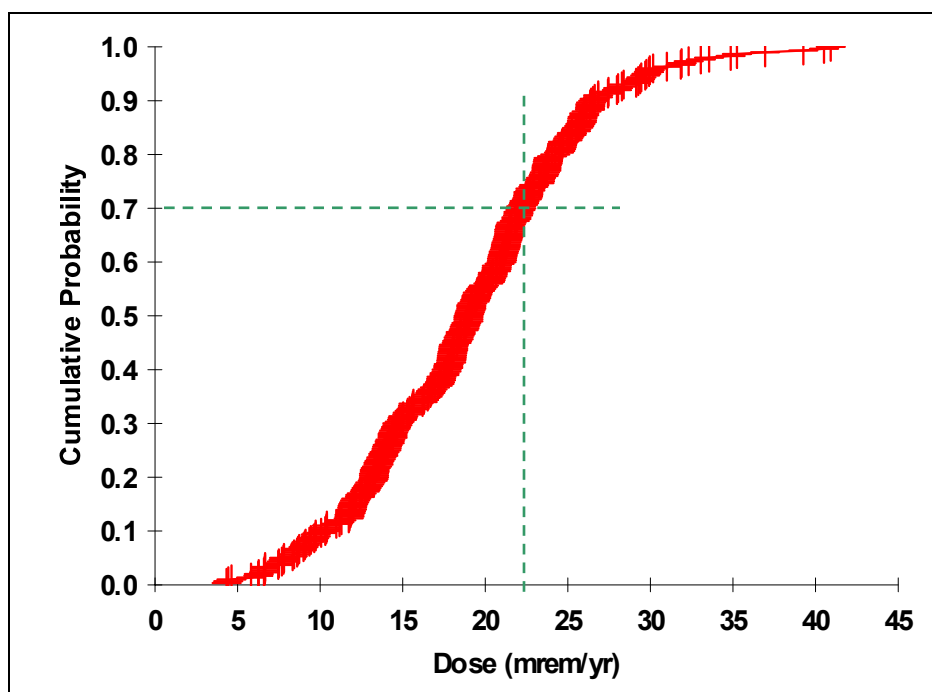


Figure H-1 Sample Cumulative Probability Plot

### H.1.2 Temporal Plots

A chronological presentation of the projected annual dose is offered in the temporal plots. The temporal plots graph the peak mean annual dose in three separate random probabilistic runs of the scenario under consideration versus time over the prescribed 1000-year outlook period. The temporal plots provide the reader with a visual means of assessing the relative change in potential annual dose. Downward trends are indicative of increased margin relative to the decommissioning standard.

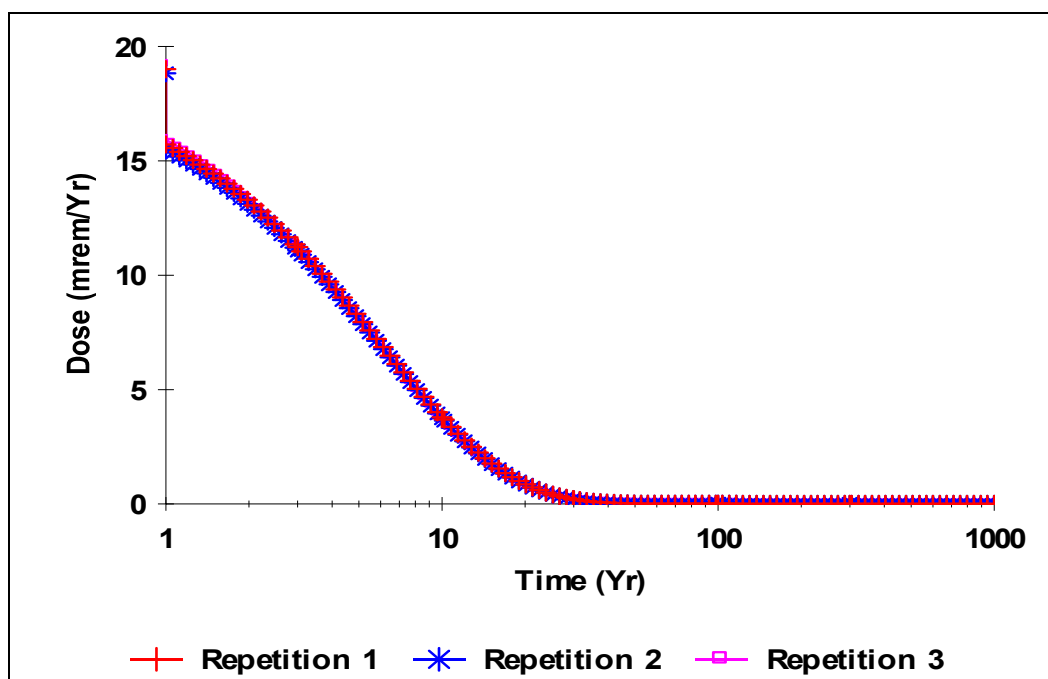


Figure H-2 Sample Temporal Plot

### H.1.3 Scatter Plots

Scatter plots are useful in understanding the relationship between individual parameters and the total annual dose in the scenario under consideration. The scatter plot is an effective way of visualizing the presence (or absence) of a correlation between a single parameter and total annual dose. A clear trend in the plotted data indicates a notable correlation and typically a strong dependence between the value of the selected parameter and the resulting annual dose.

For example, sample scatter plot #1 indicates a very weak relationship between the distribution coefficient for uranium and total annual dose. One could reasonably conclude, then, that there is no significant correlation between the uranium distribution coefficient and total annual dose and that total annual dose is relatively insensitive to variability in the distribution coefficient over the range considered. On the other hand, sample scatter plot #2 indicates a strong relationship between the fraction of time a receptor might spend outdoors on site and total annual dose. Thus, the total annual dose is sensitive to variability in the outdoor time fraction parameter over the range considered.

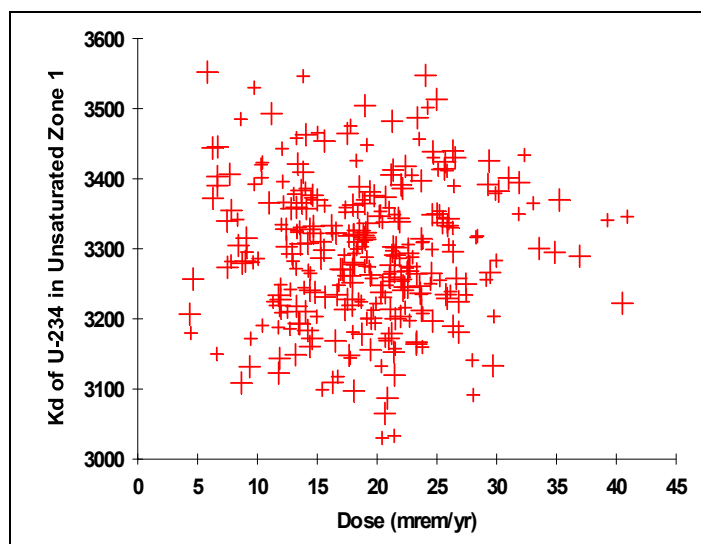


Figure H-3 Sample Scatter Plot #1

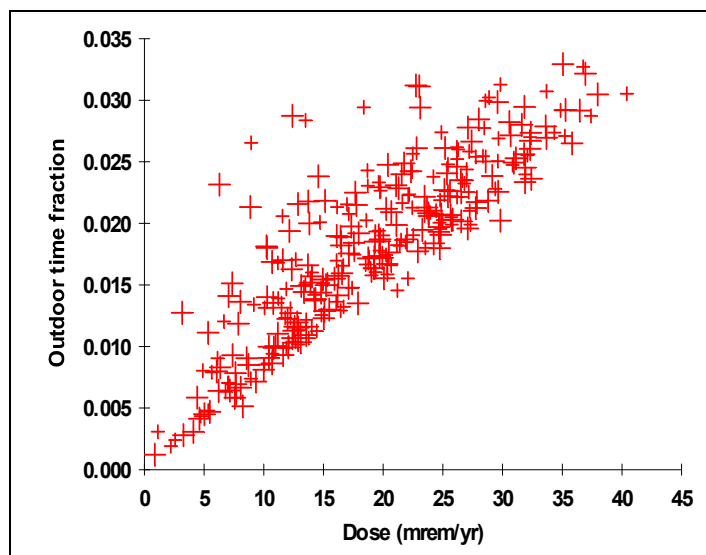


Figure H-4 Sample Scatter Plot #2

## H.2 OCCUPATIONAL WORKER SCENARIO

### H.2.1 Byproduct Source Term, Occupational Worker

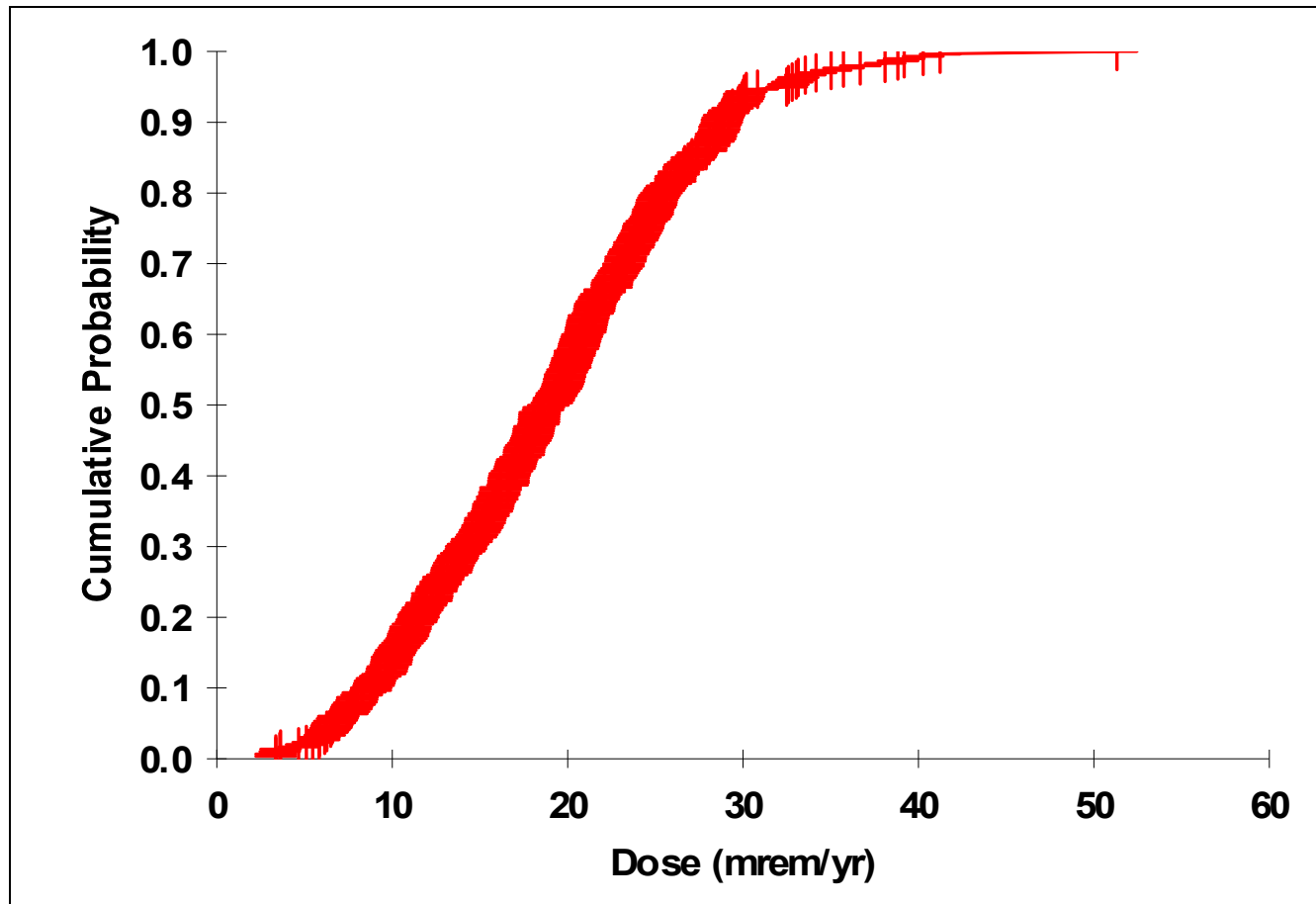


Figure H-5 Cumulative Probability Plot, All Pathways, Occupational Worker, Byproduct Source Term

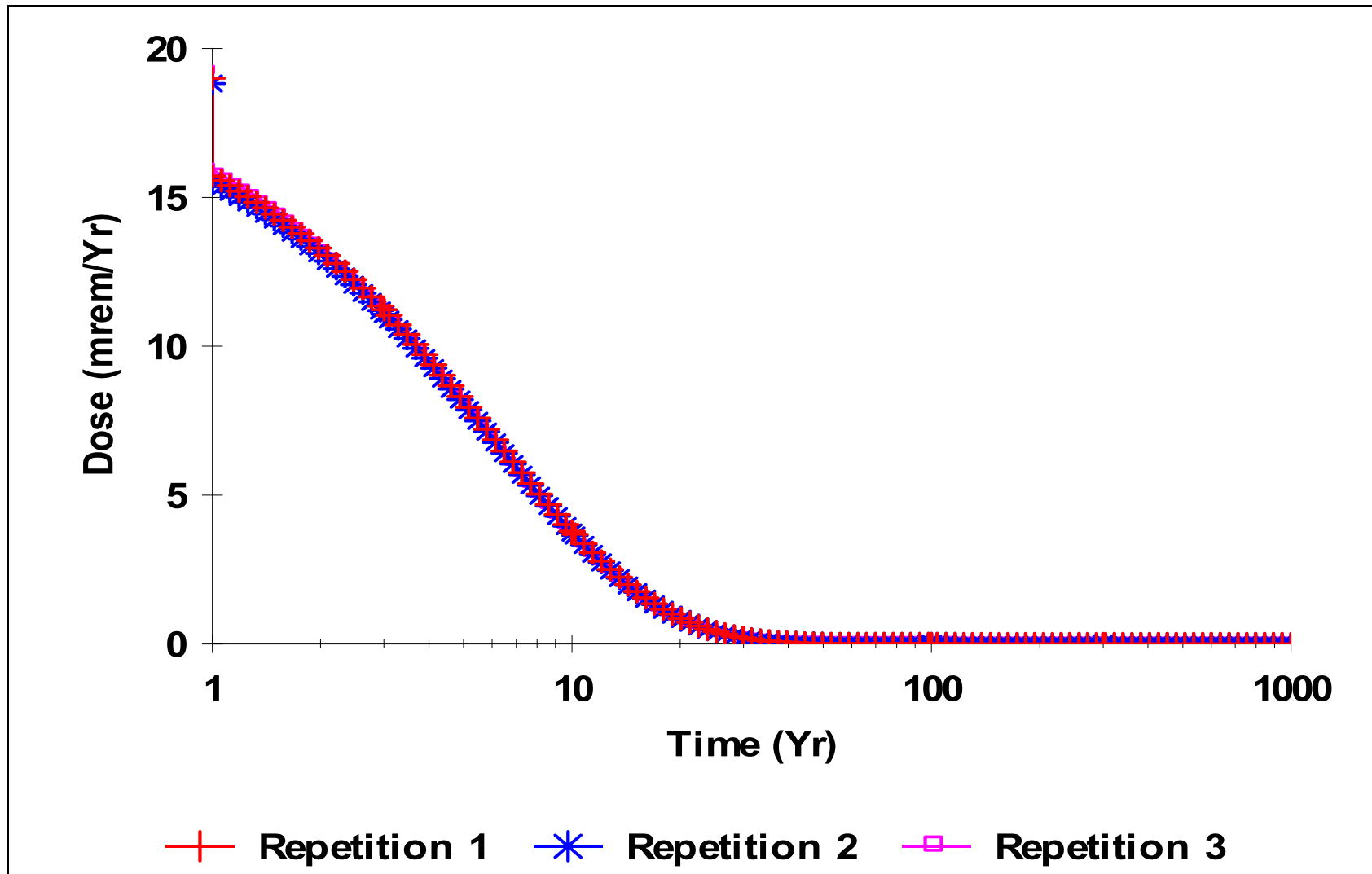


Figure H-6 Temporal Plot, Mean Total Dose, Occupational Worker, Byproduct Source Term

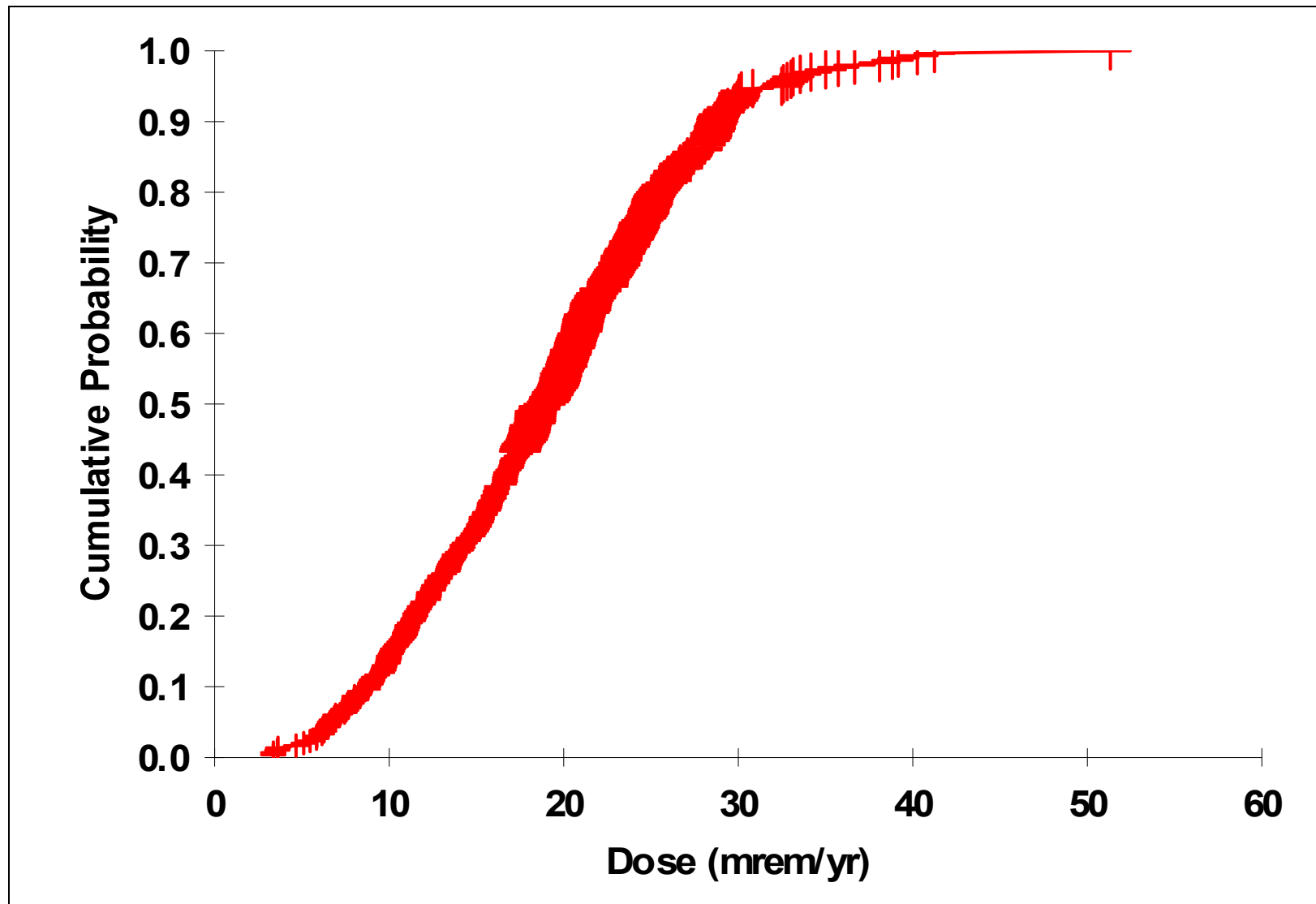


Figure H-7 Cumulative Probability Plot, External Pathway, Occupational Worker, Byproduct Source Term

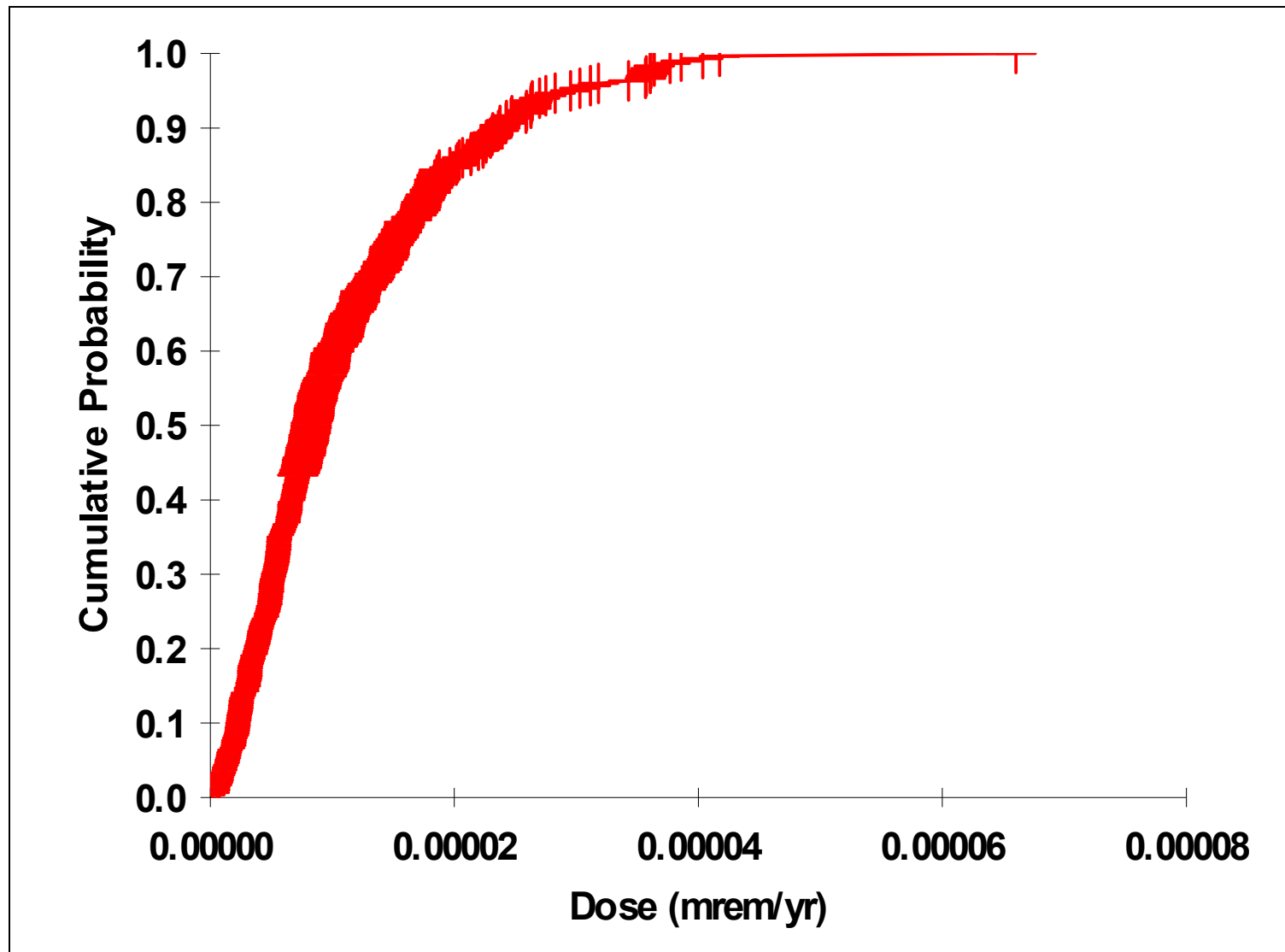


Figure H-8 Cumulative Probability Plot, Inhalation Pathway, Occupational Worker, Byproduct Source Term



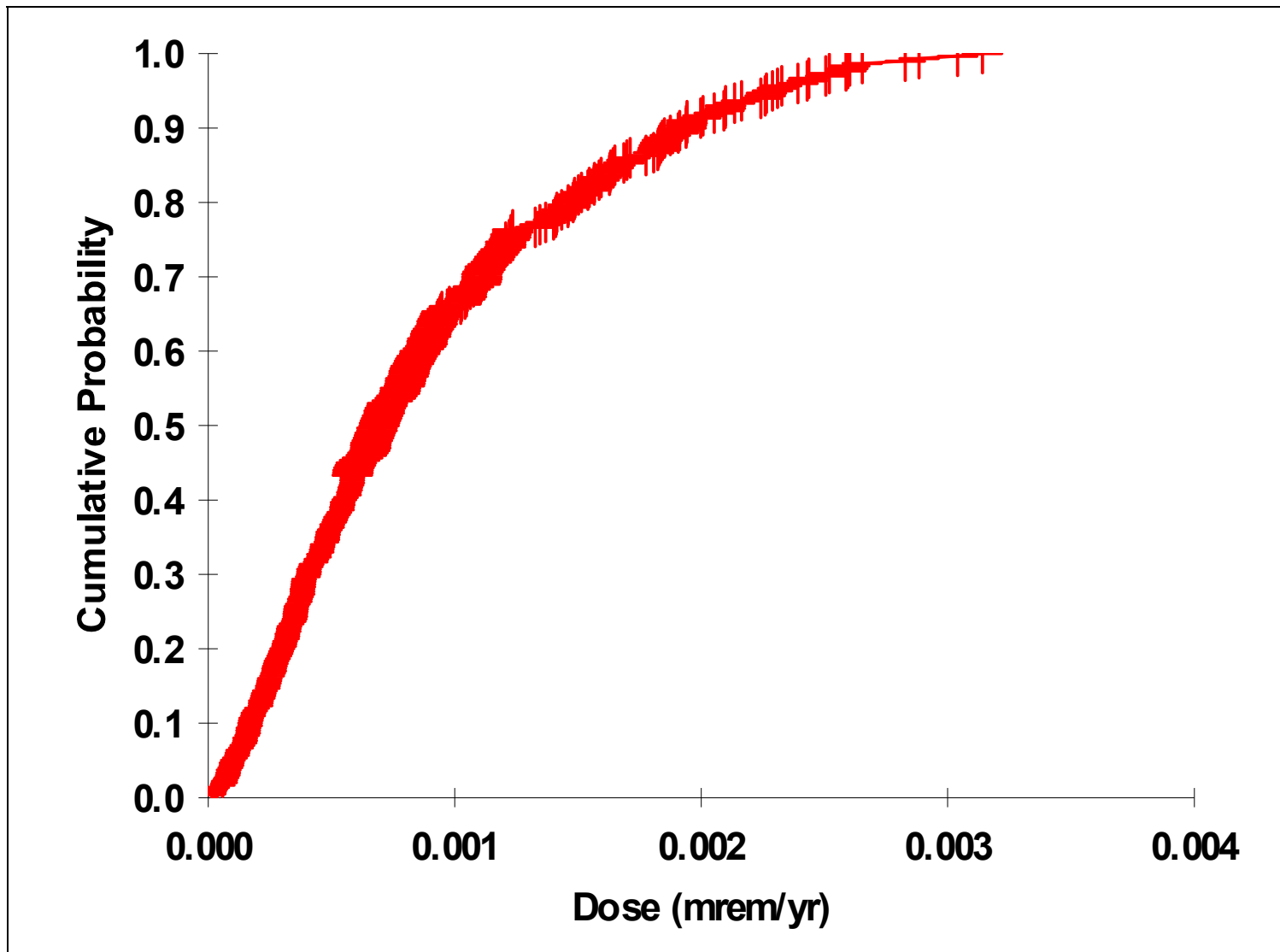


Figure H-9 Cumulative Probability Plot, Soil Ingestion Pathway, Occupational Worker, Byproduct Source Term

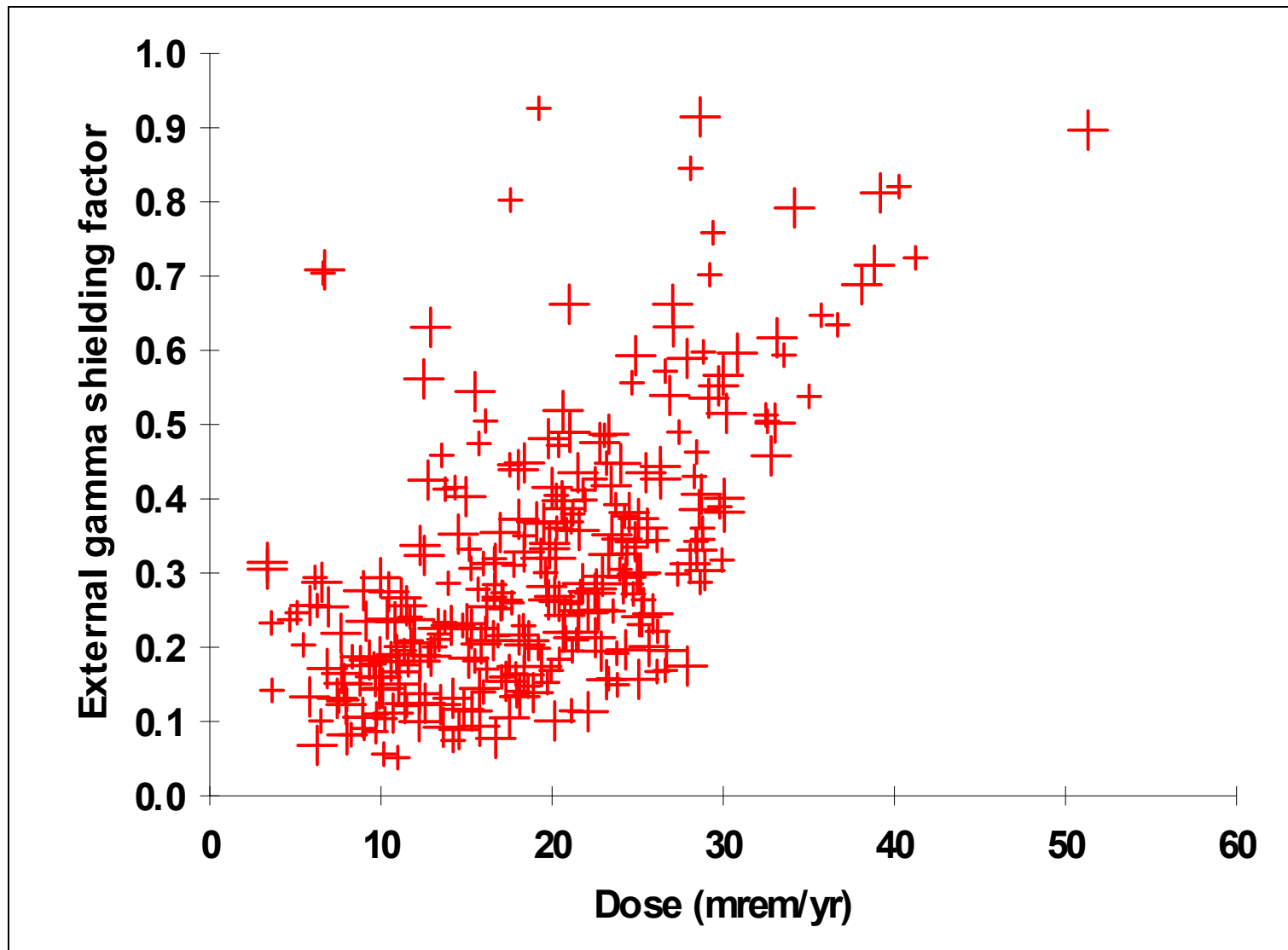


Figure H-10 Scatter Plot, Dose from All Pathways vs. External Gamma Shielding Factor, Occupational Worker, Byproduct Source Term

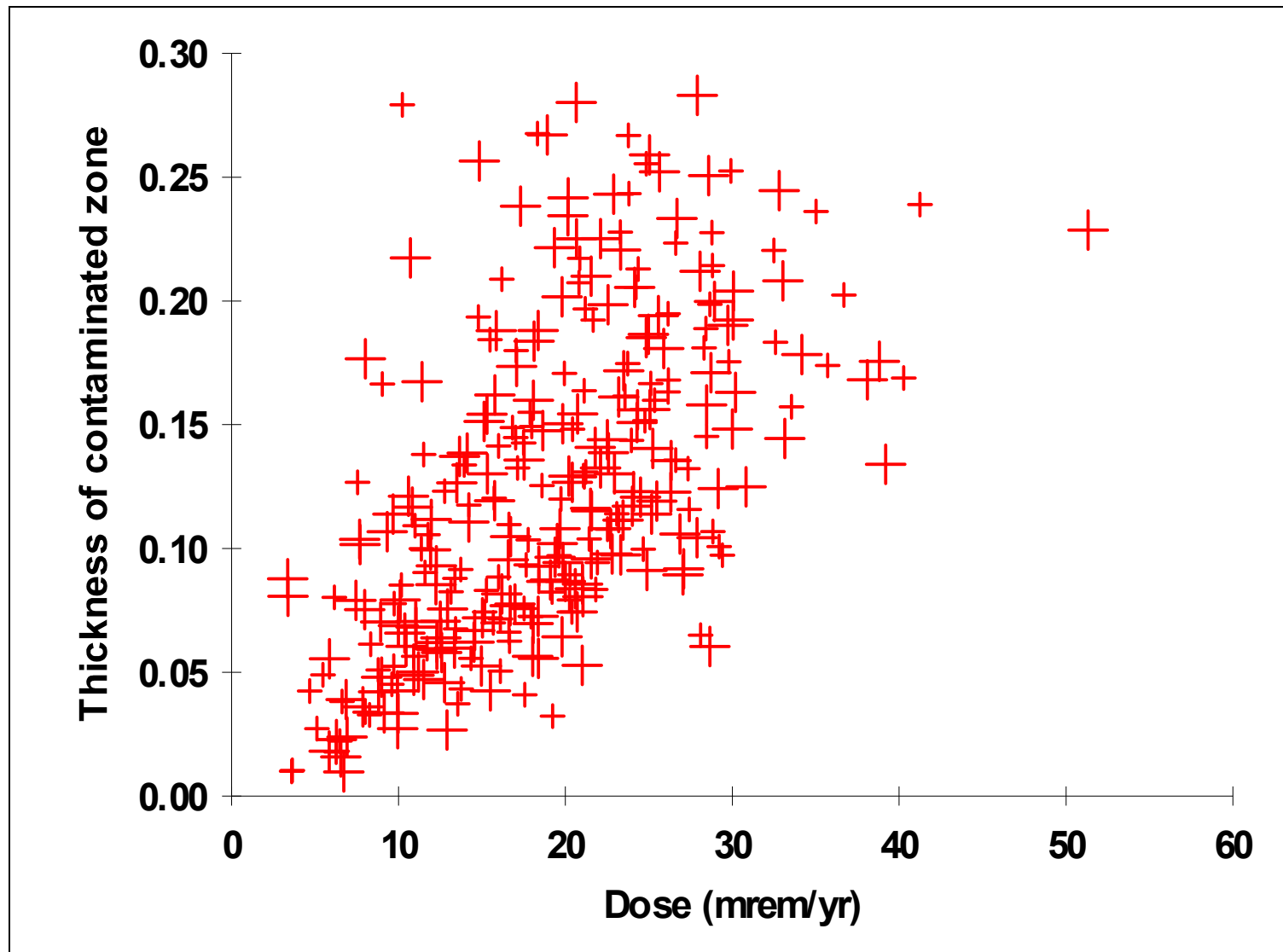


Figure H-11 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Occupational Worker, Byproduct Source Term

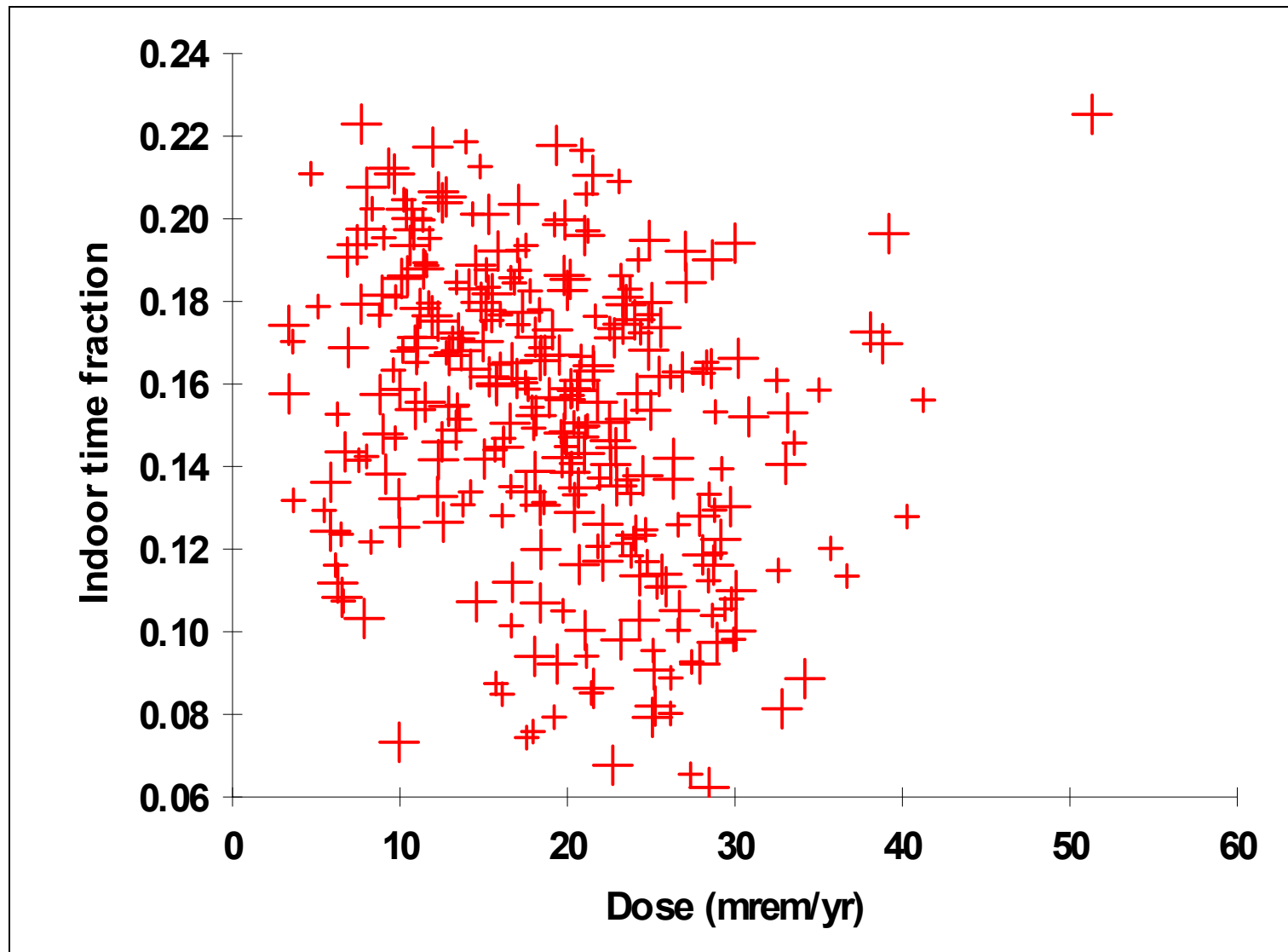


Figure H-12 Scatter Plot, Dose from All Pathways vs. Indoor Time Fraction, Occupational Worker, Byproduct Source Term

## H.2.2 Uranium Source Term, Occupational Worker

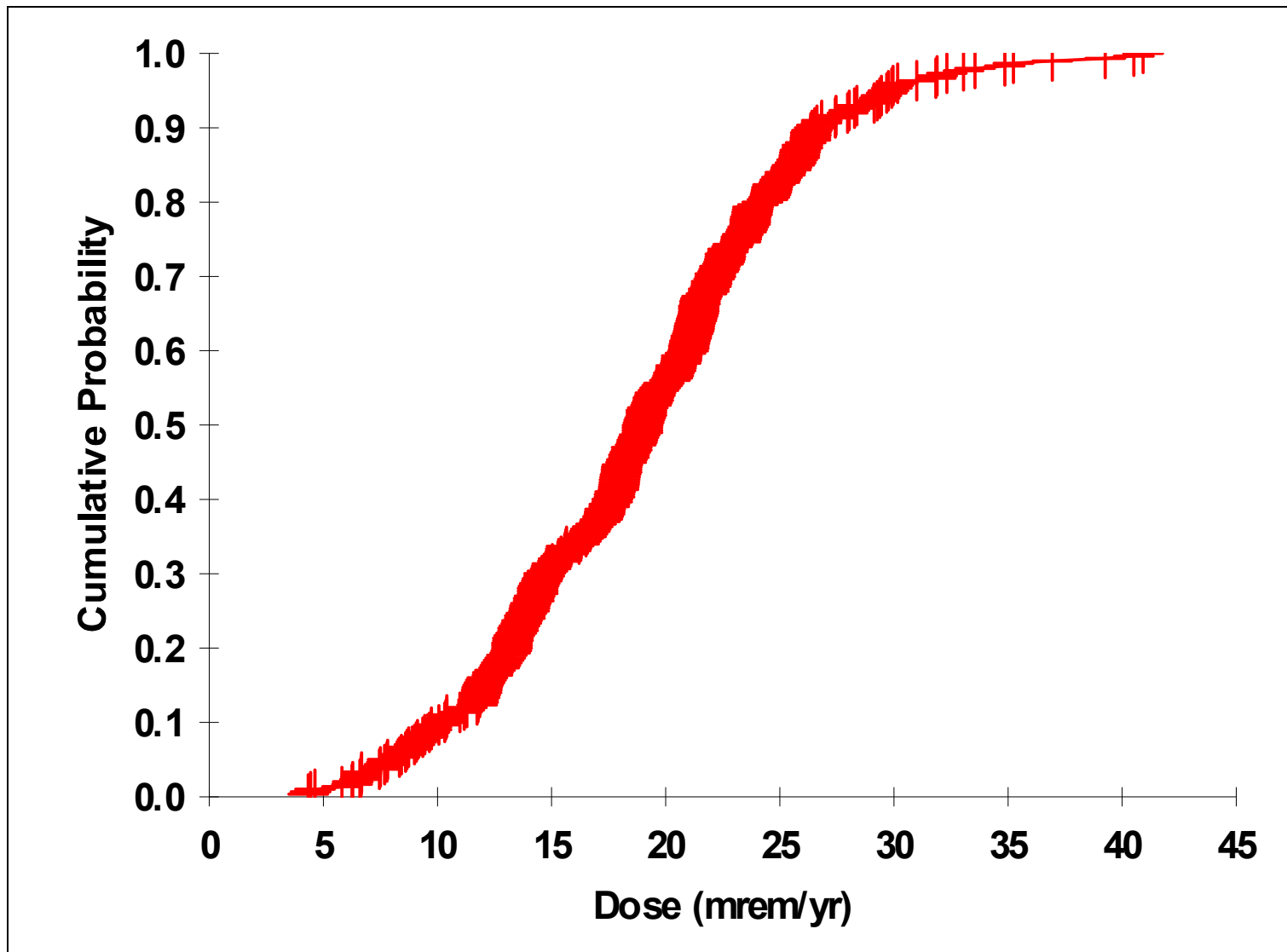


Figure H-13 Cumulative Probability Plot, All Pathways, Occupational Worker, Uranium Source Term

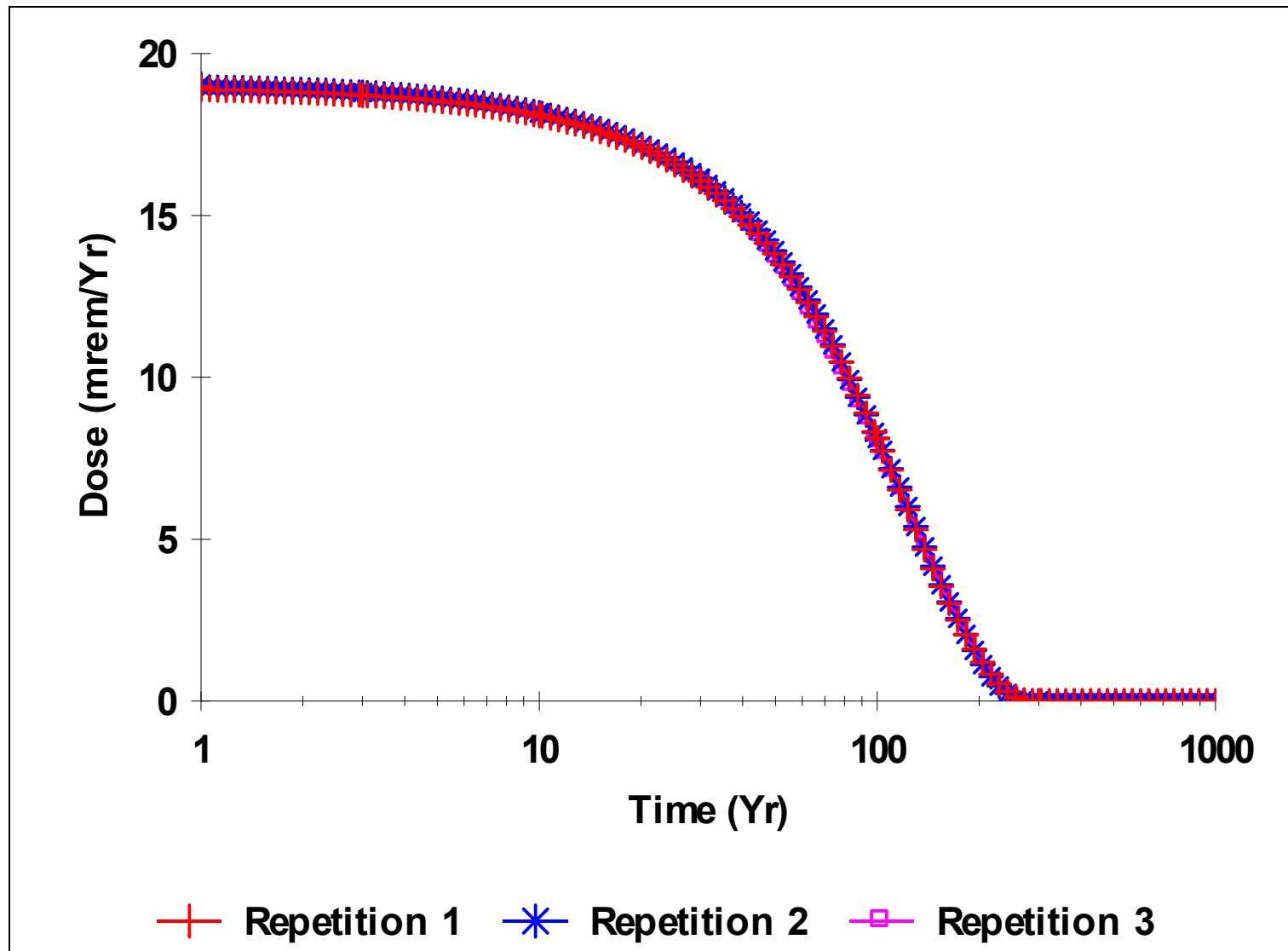


Figure H-14 Temporal Plot, Mean Total Dose, Occupational Worker, Uranium Source Term

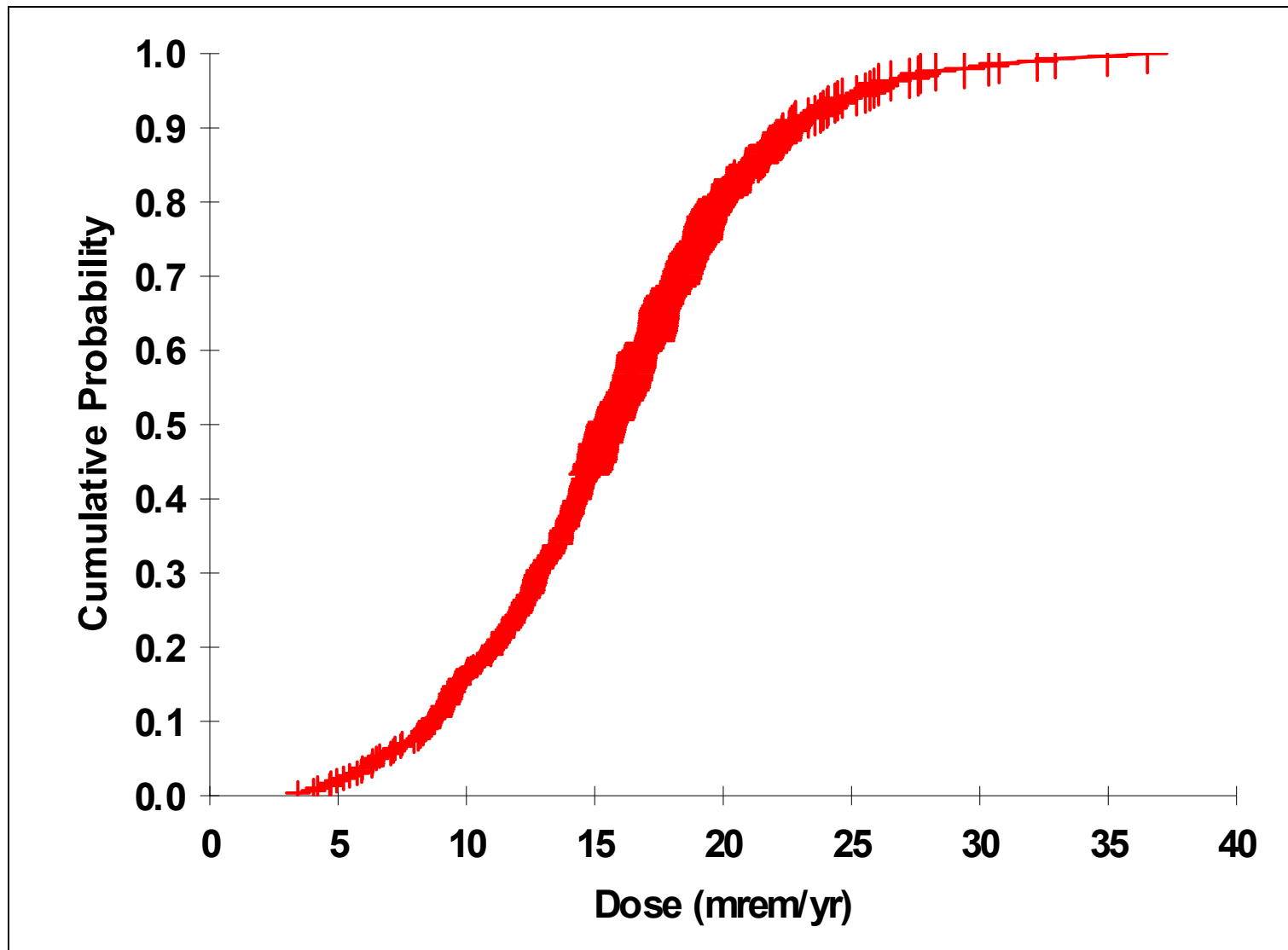


Figure H-15 Cumulative Probability Plot, External Pathway, Occupational Worker, Uranium Source Term

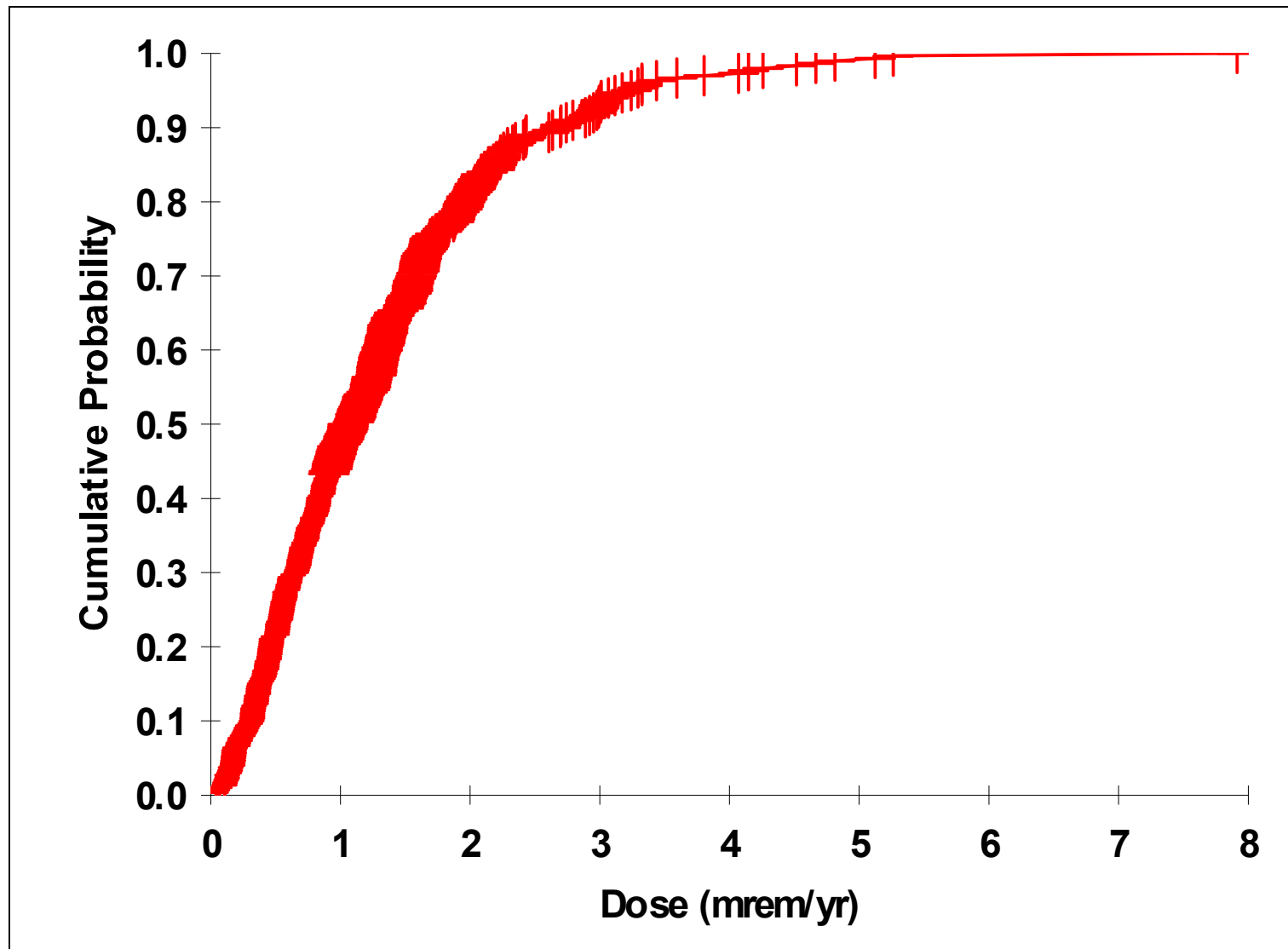


Figure H-16 Cumulative Probability Plot, Inhalation Pathway, Occupational Worker, Uranium Source Term



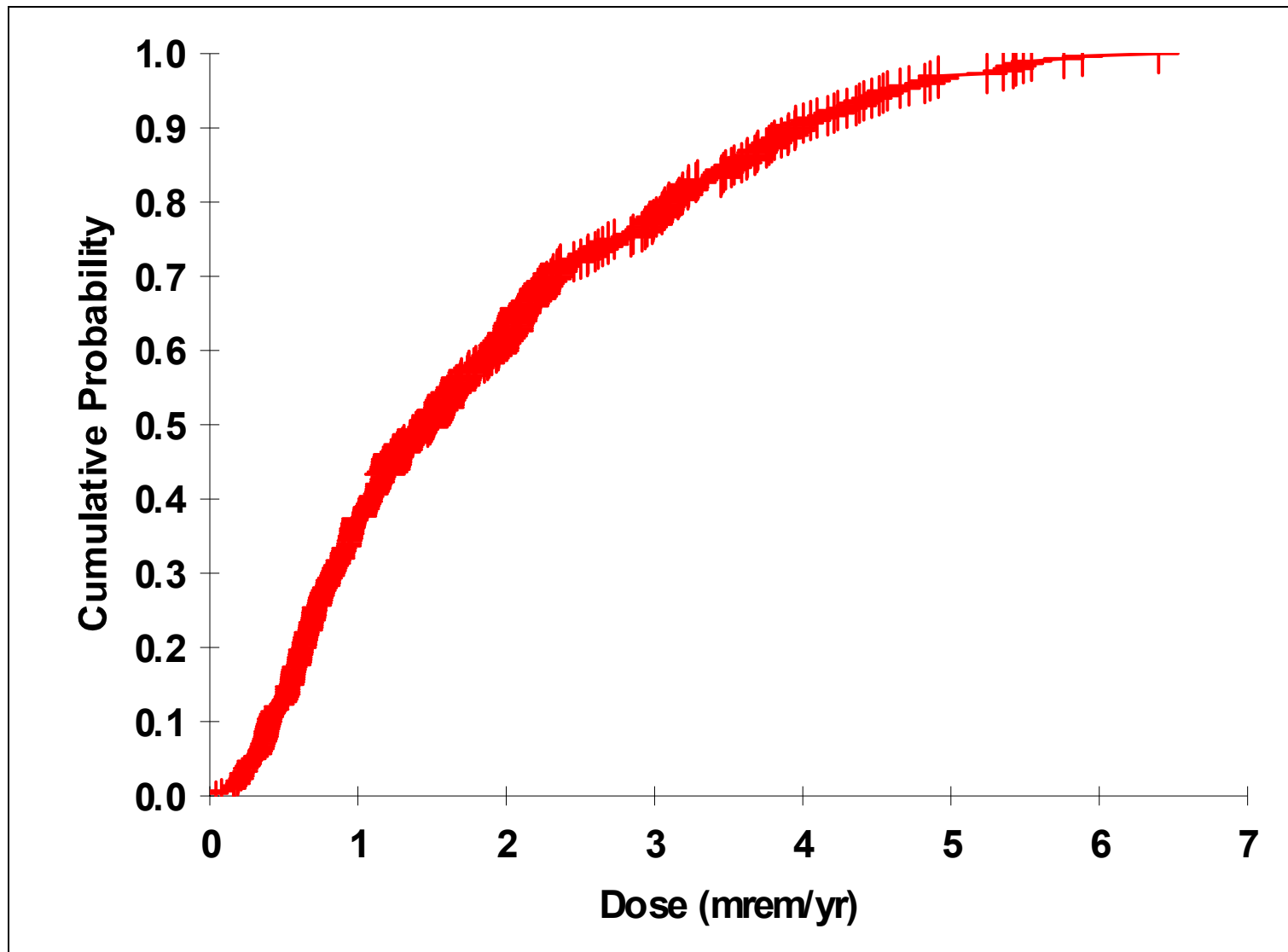


Figure H-17 Cumulative Probability Plot, Soil Ingestion Pathway, Occupational Worker, Uranium Source Term

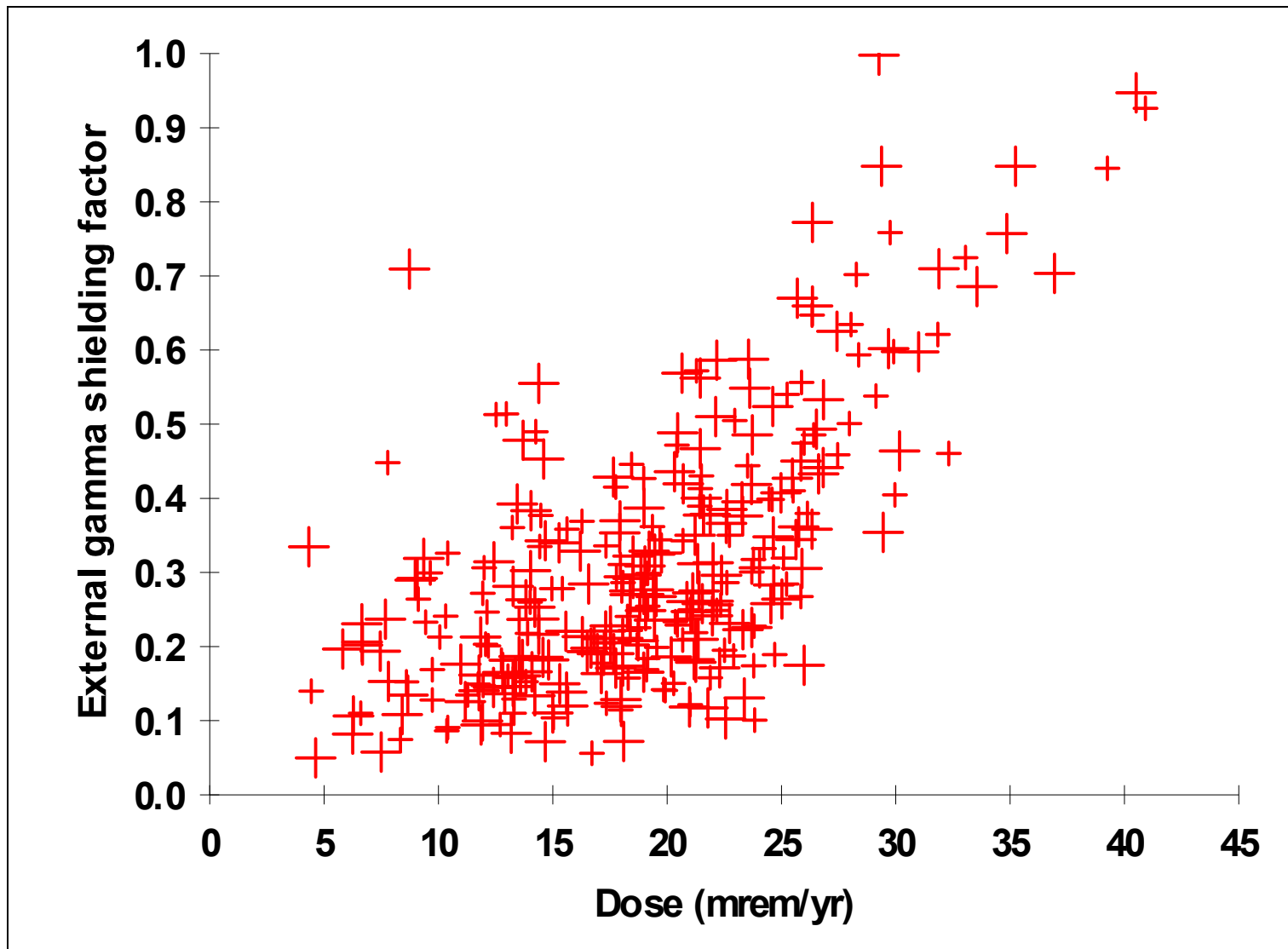


Figure H-18 Scatter Plot, Dose from All Pathways vs. External Gamma Shielding Factor, Occupational Worker, Uranium Source Term

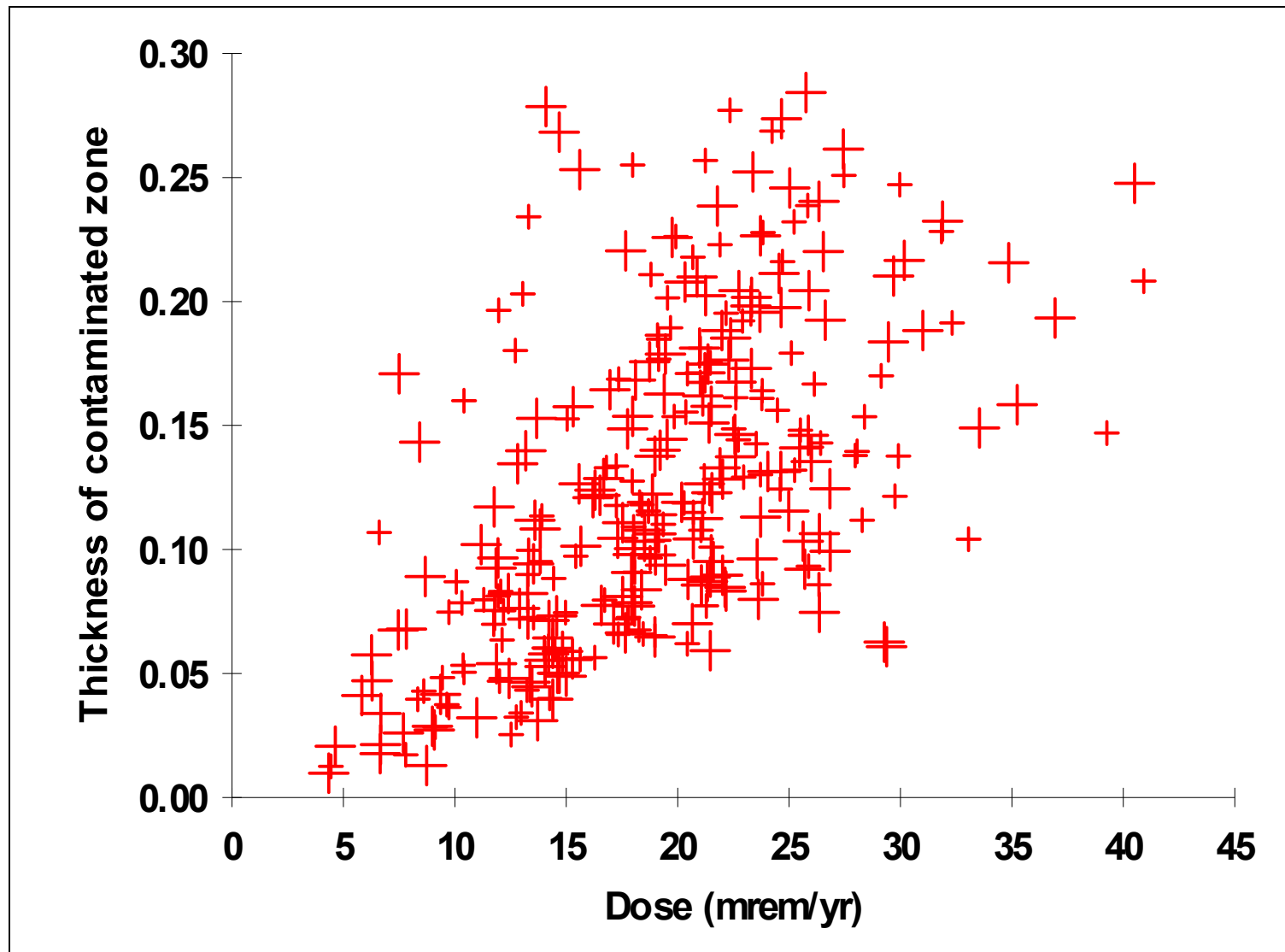


Figure H-19 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Occupational Worker, Uranium Source Term

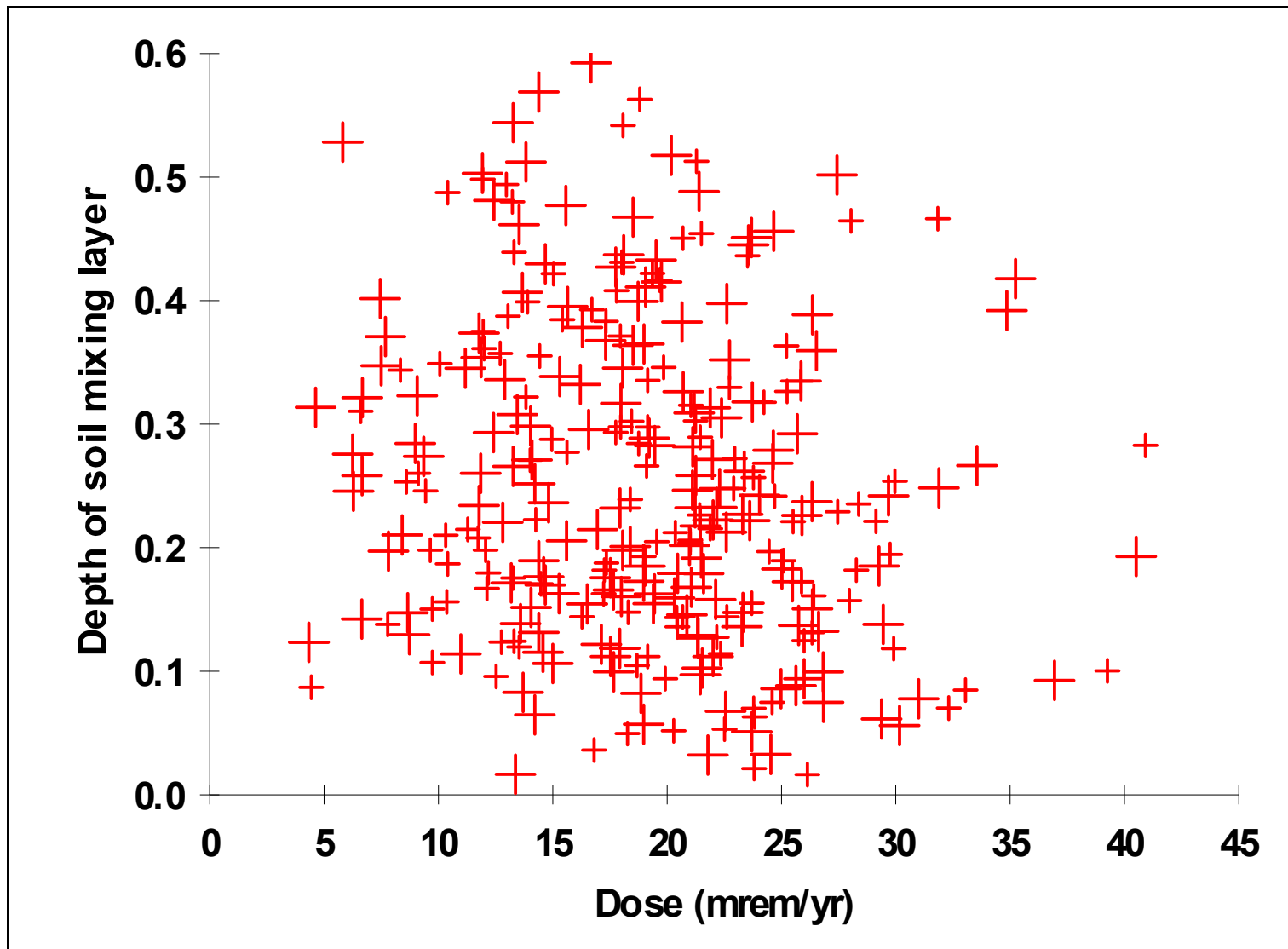


Figure H-20 Scatter Plot, Dose from All Pathways vs. Depth of Soil Mixing Layer, Occupational Worker, Uranium Source Term

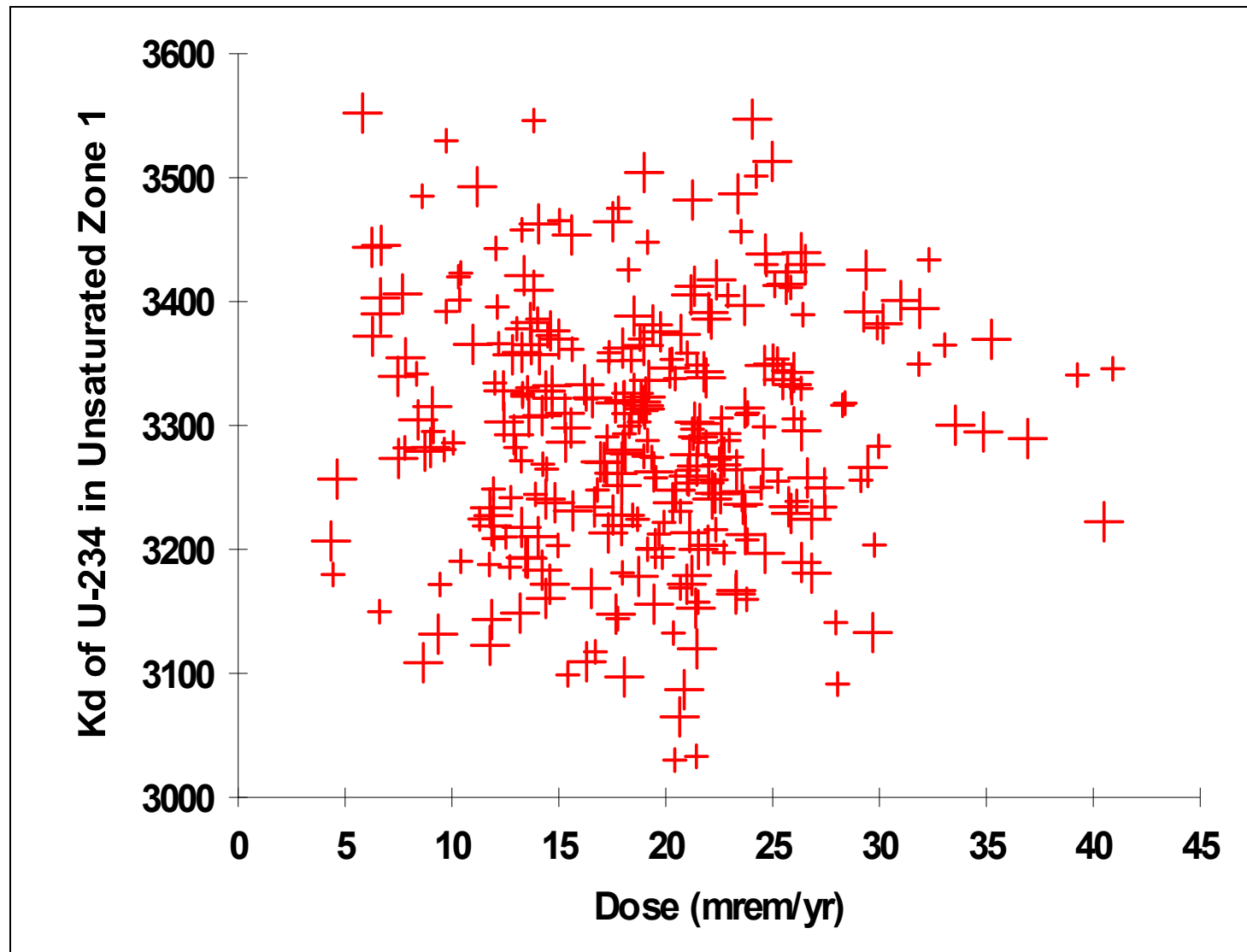


Figure H-21 Scatter Plot, Dose from All Pathways vs. Uranium Kd in Unsaturated Zone 1, Occupational Worker, Uranium Source Term

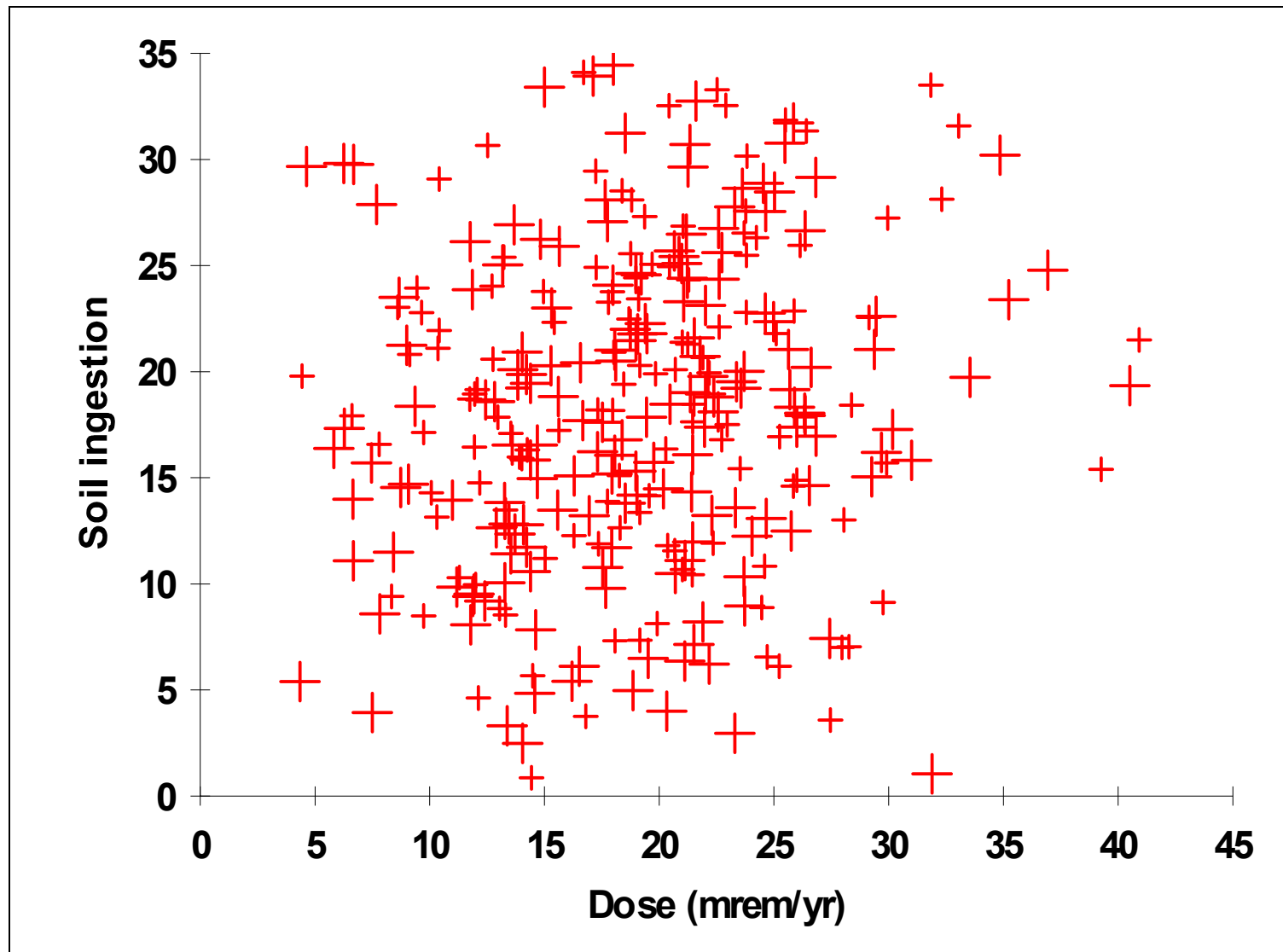


Figure H-22 Scatter Plot, Dose from All Pathways vs. Soil Ingestion Rate, Occupational Worker, Uranium Source Term

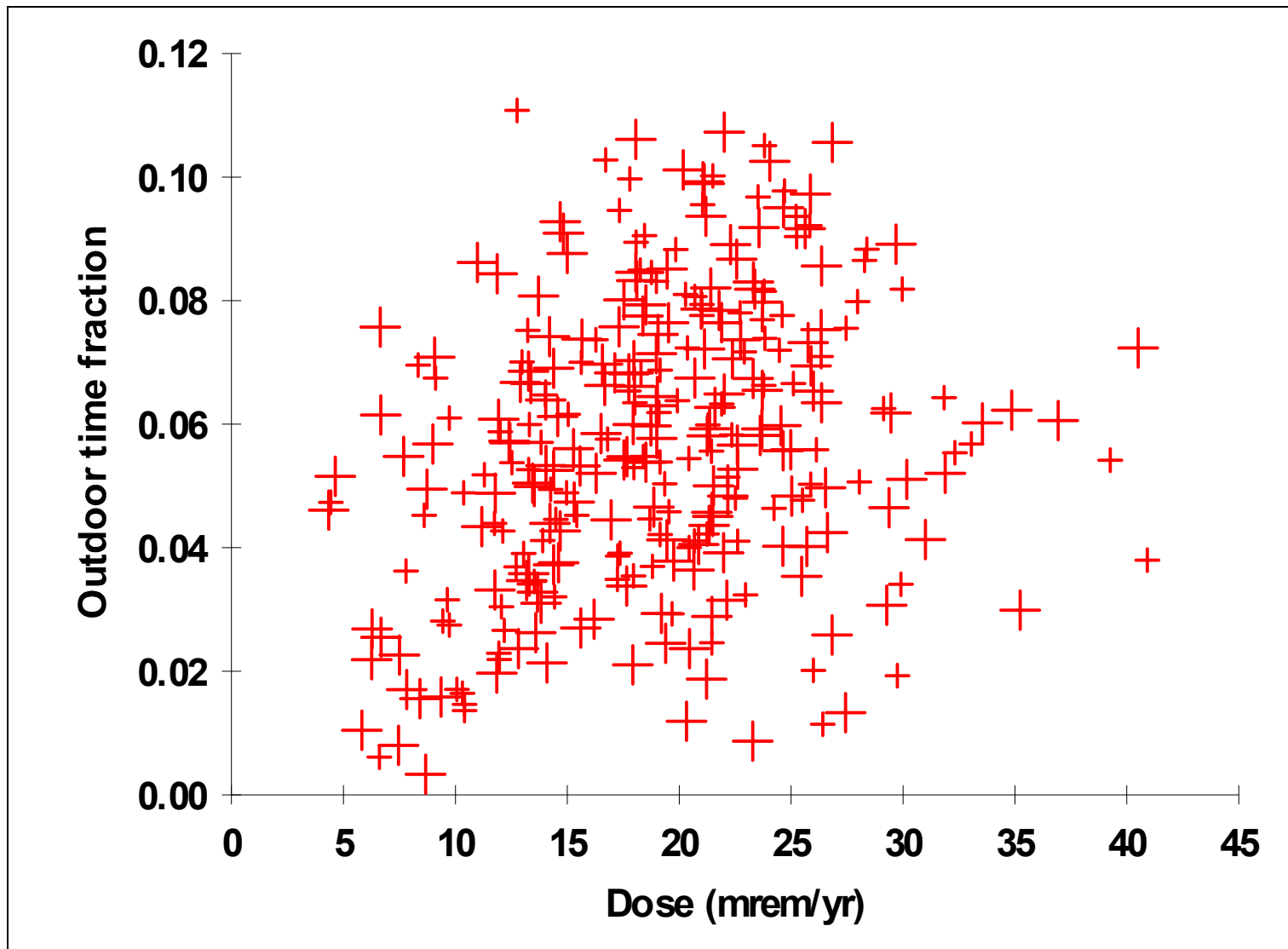


Figure H-23 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Occupational Worker, Uranium Source Term

### H.3 CONSTRUCTION WORKER SCENARIO

#### H.3.1 Byproduct Source Term, Construction Worker

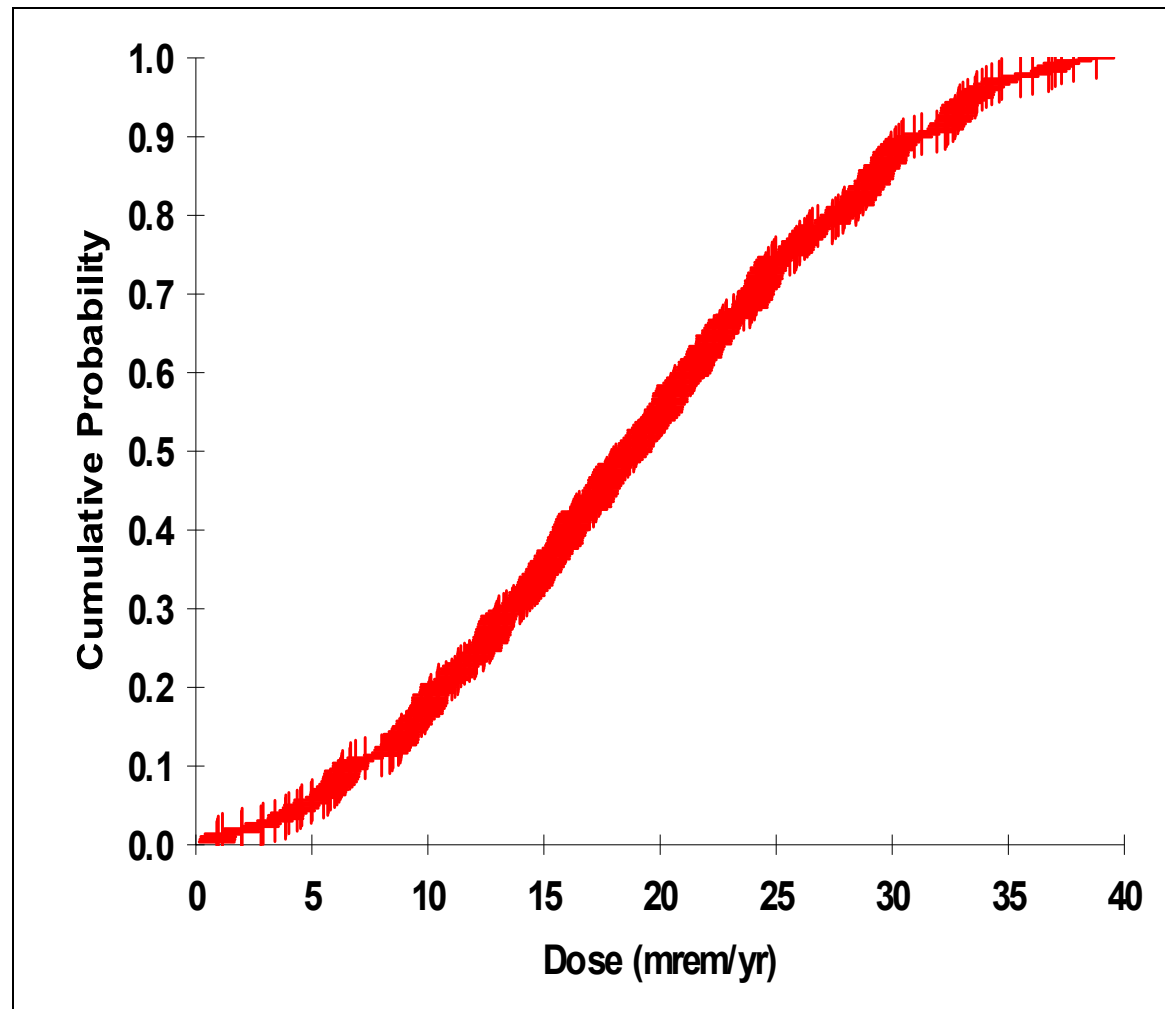


Figure H-24 Cumulative Probability Plot, All Pathways, Construction Worker, Byproduct Source Term



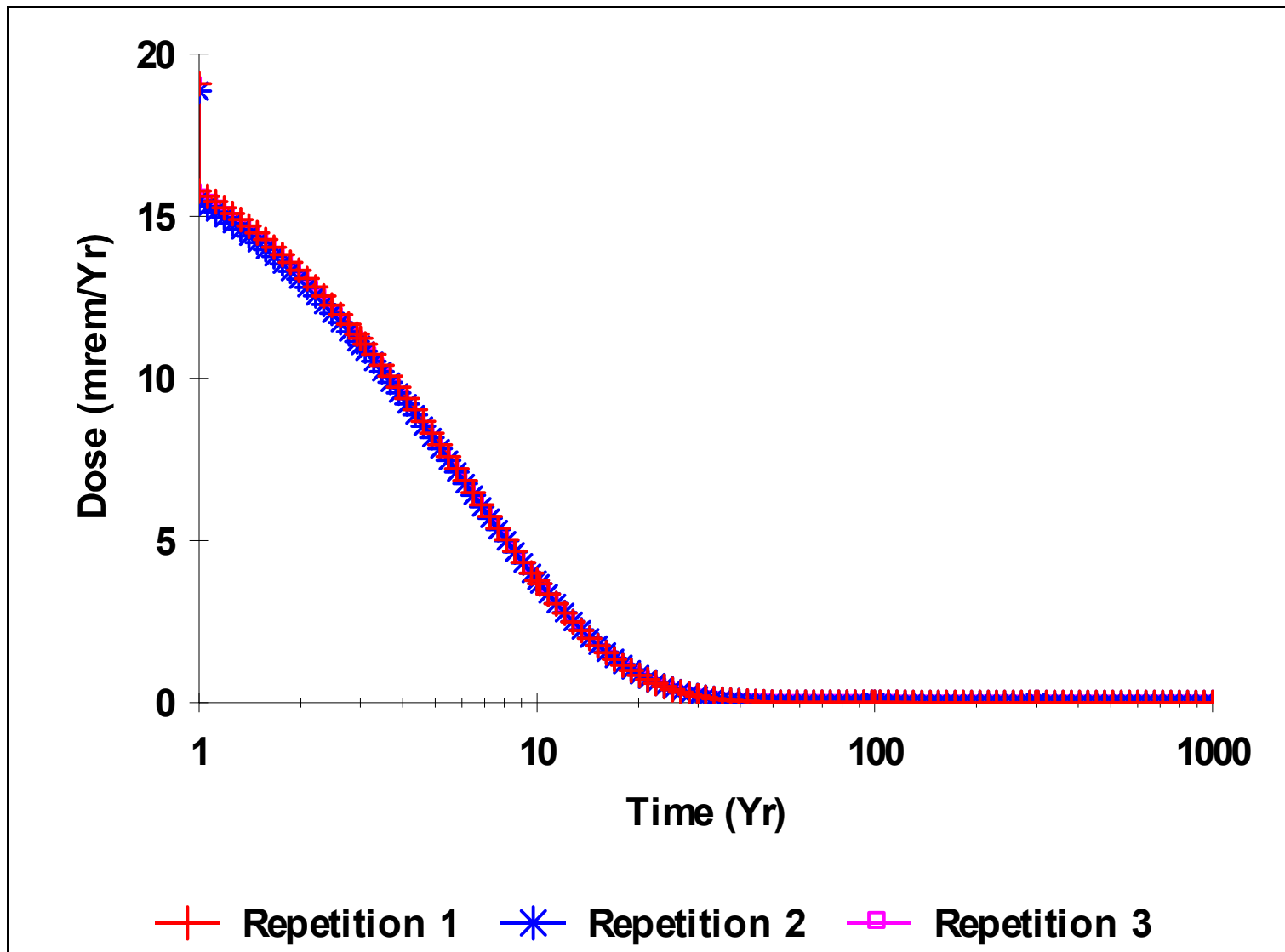


Figure H-25 Temporal Plot, Mean Total Dose, Construction Worker, Byproduct Source Term

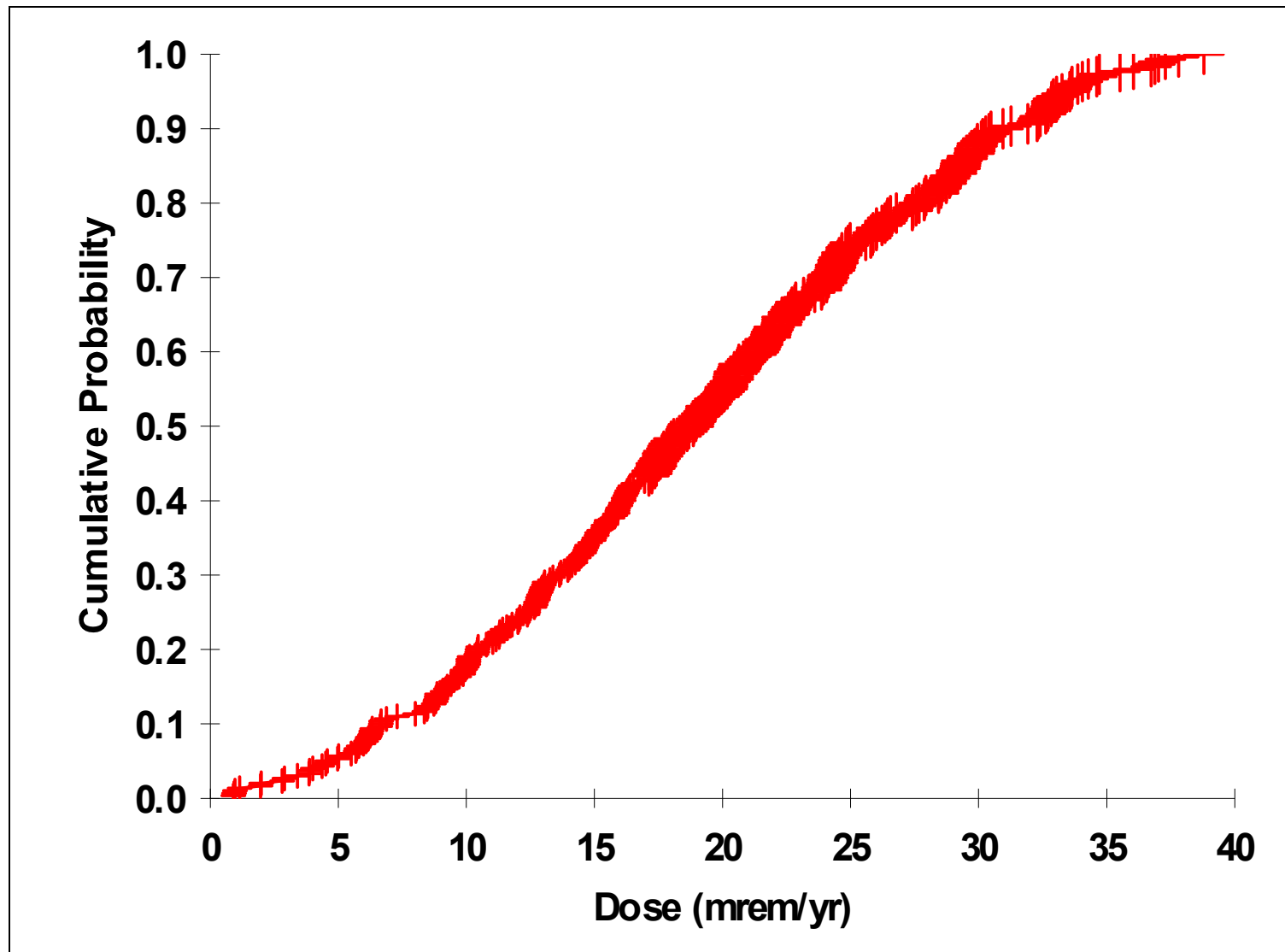


Figure H-26 Cumulative Probability Plot, External Pathway, Construction Worker, Byproduct Source Term

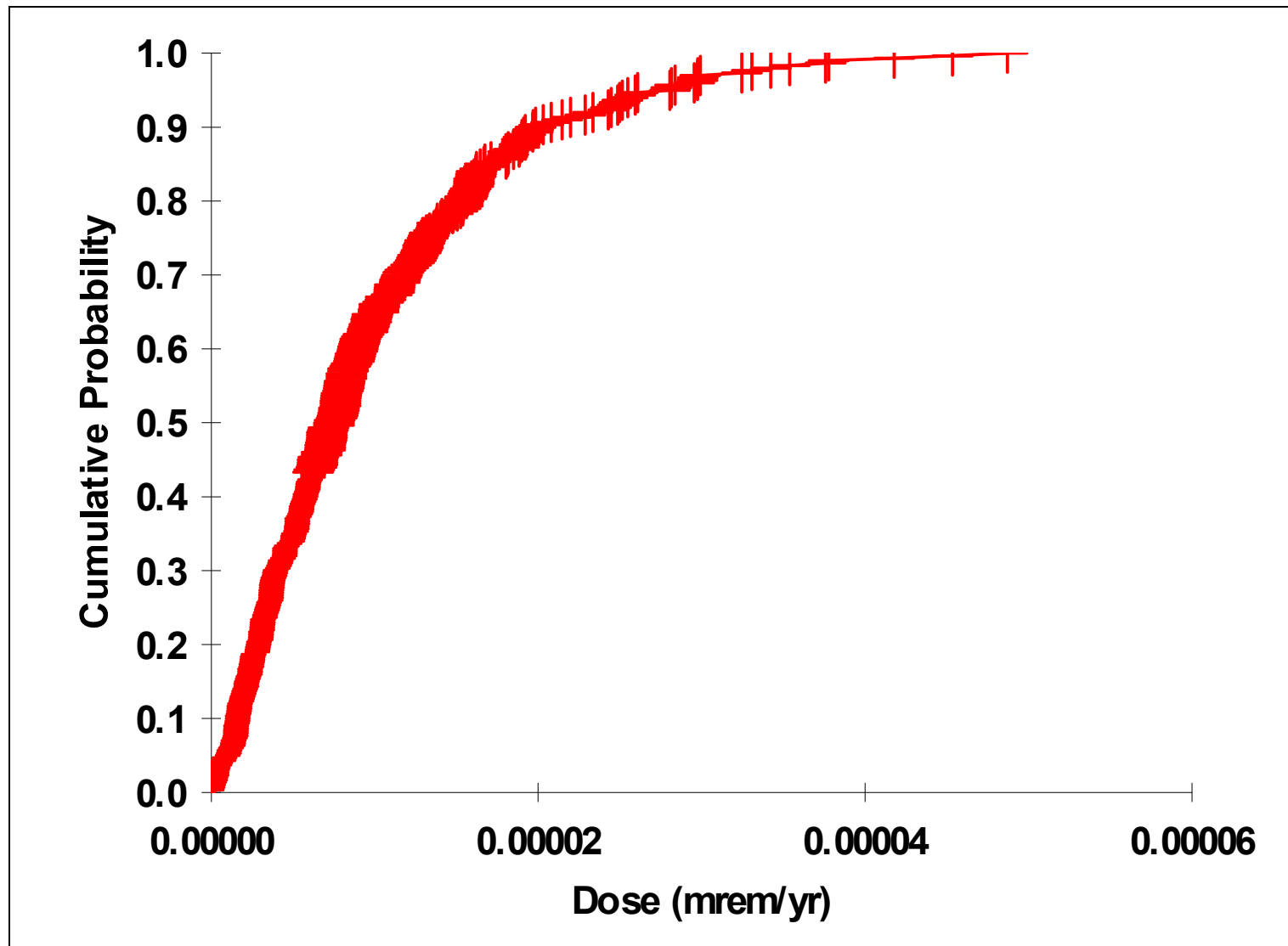


Figure H-27 Cumulative Probability Plot, Inhalation Pathway, Construction Worker, Byproduct Source Term

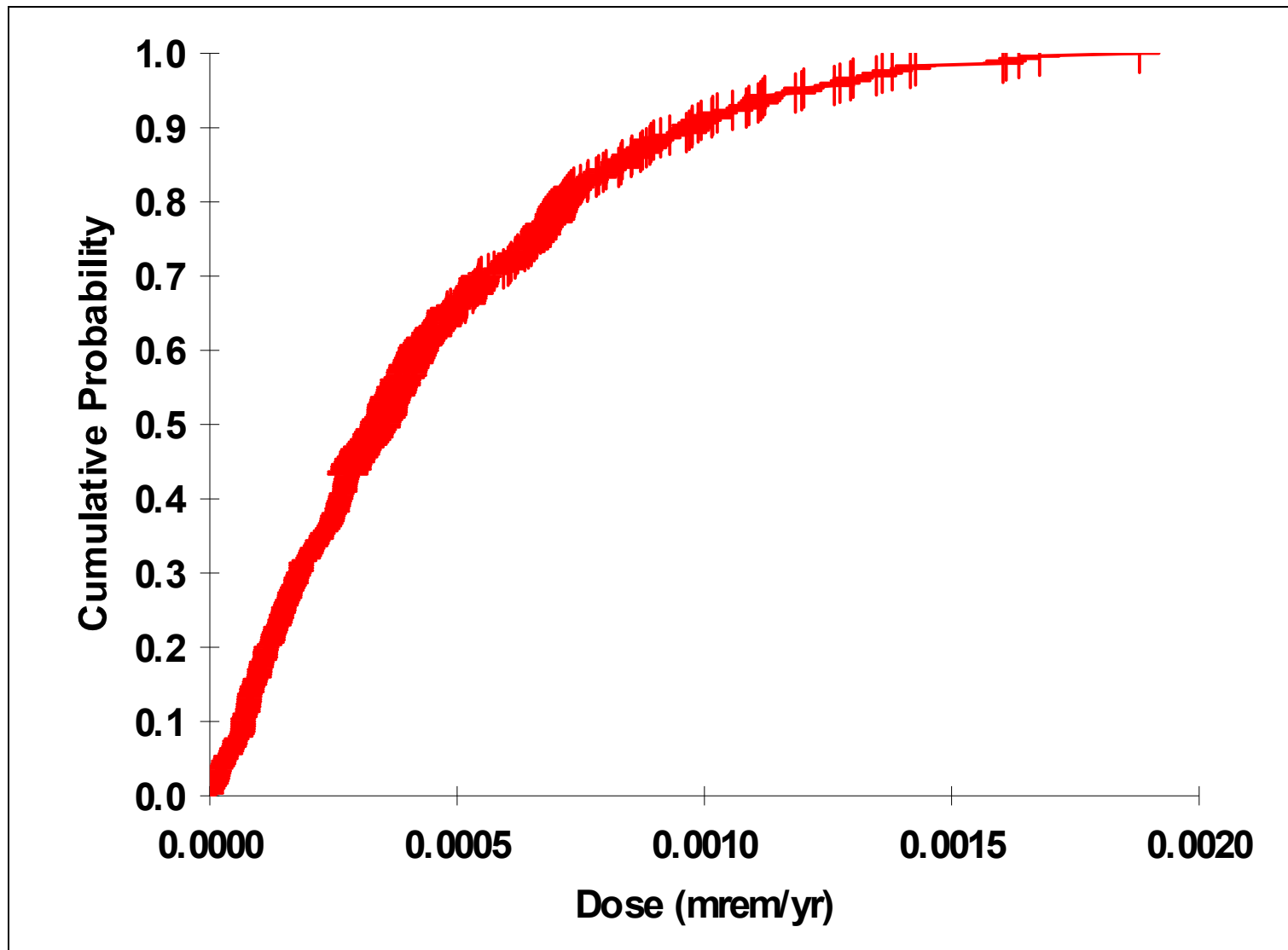


Figure H-28 Cumulative Probability Plot, Soil Ingestion Pathway, Construction Worker, Byproduct Source Term

## H.3.2 Uranium Source Term, Construction Worker

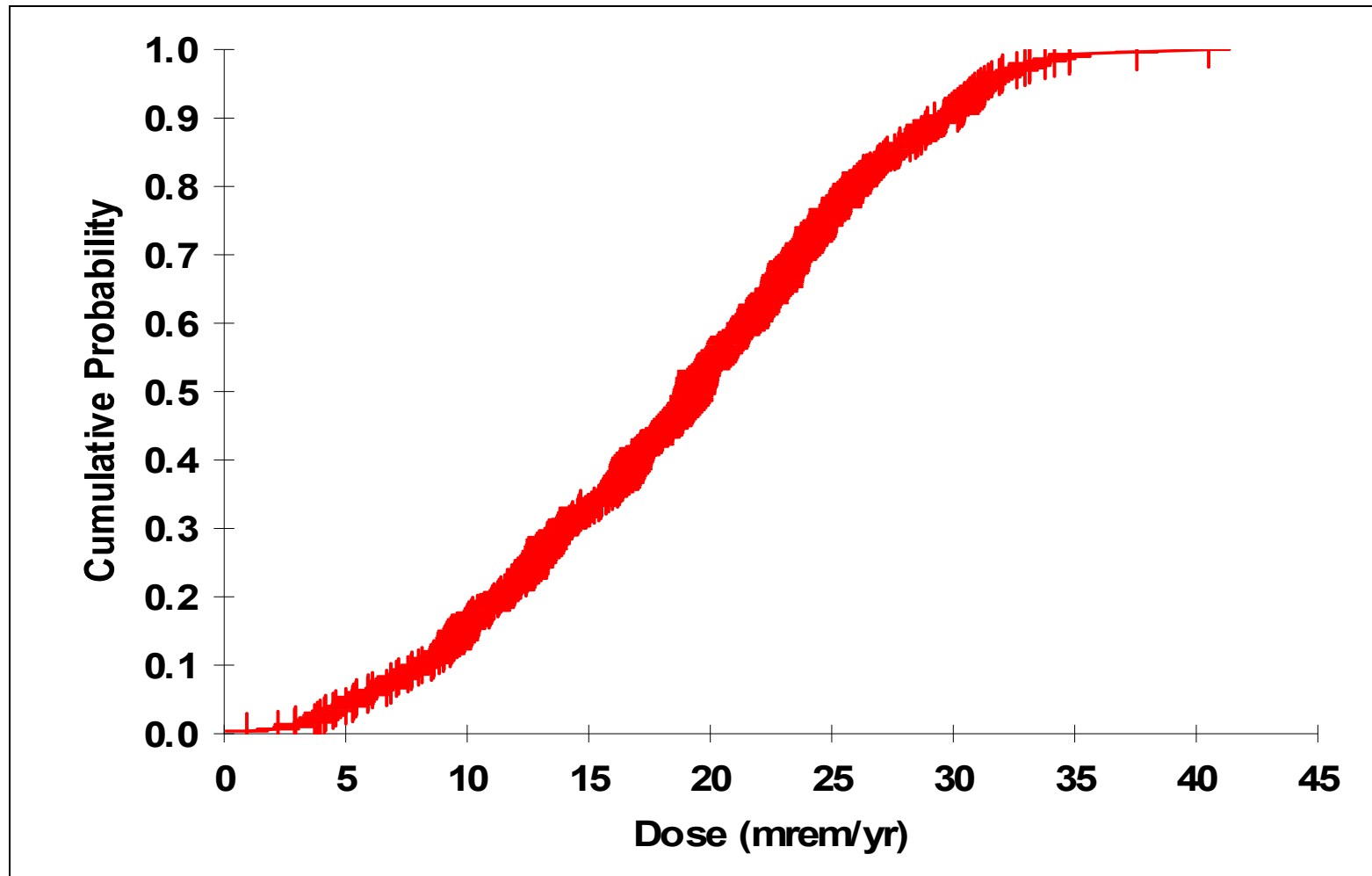


Figure H-29 Cumulative Probability Plot, All Pathways, Construction Worker, Uranium Source Term

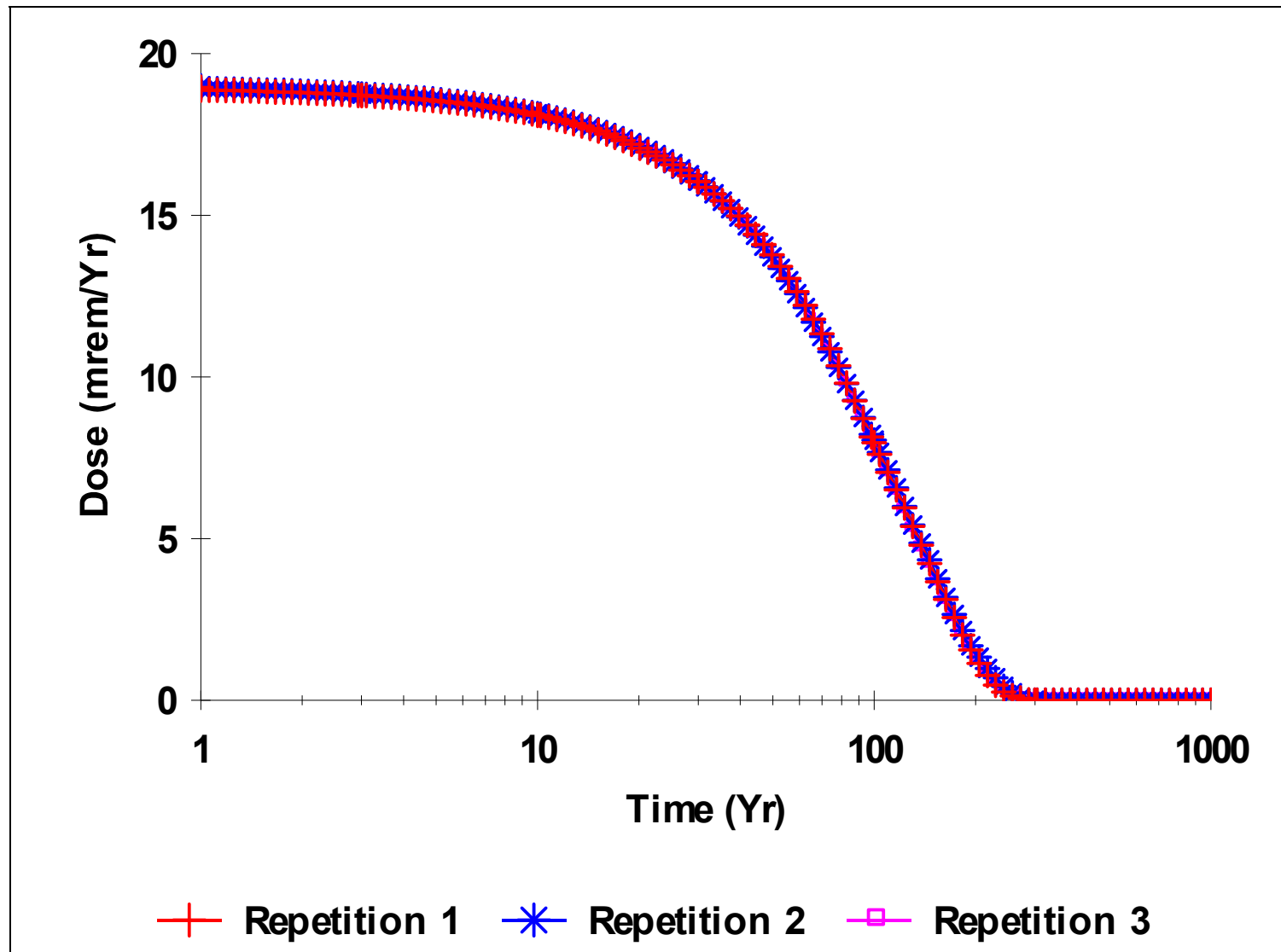


Figure H-30 Temporal Plot, Mean Total Dose, Construction Worker, Uranium Source Term

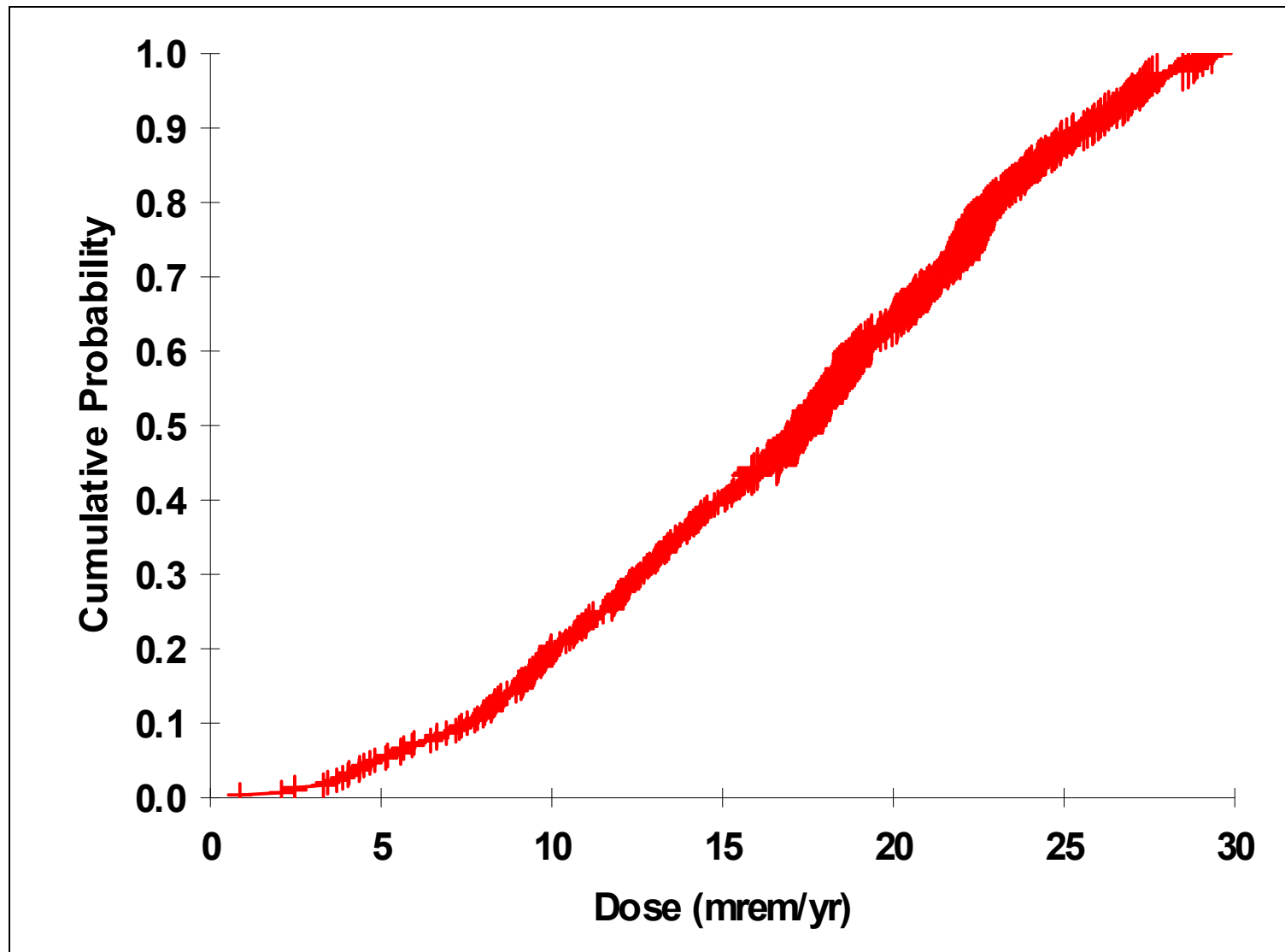


Figure H-31 Cumulative Probability Plot, External Pathway, Construction Worker, Uranium Source Term

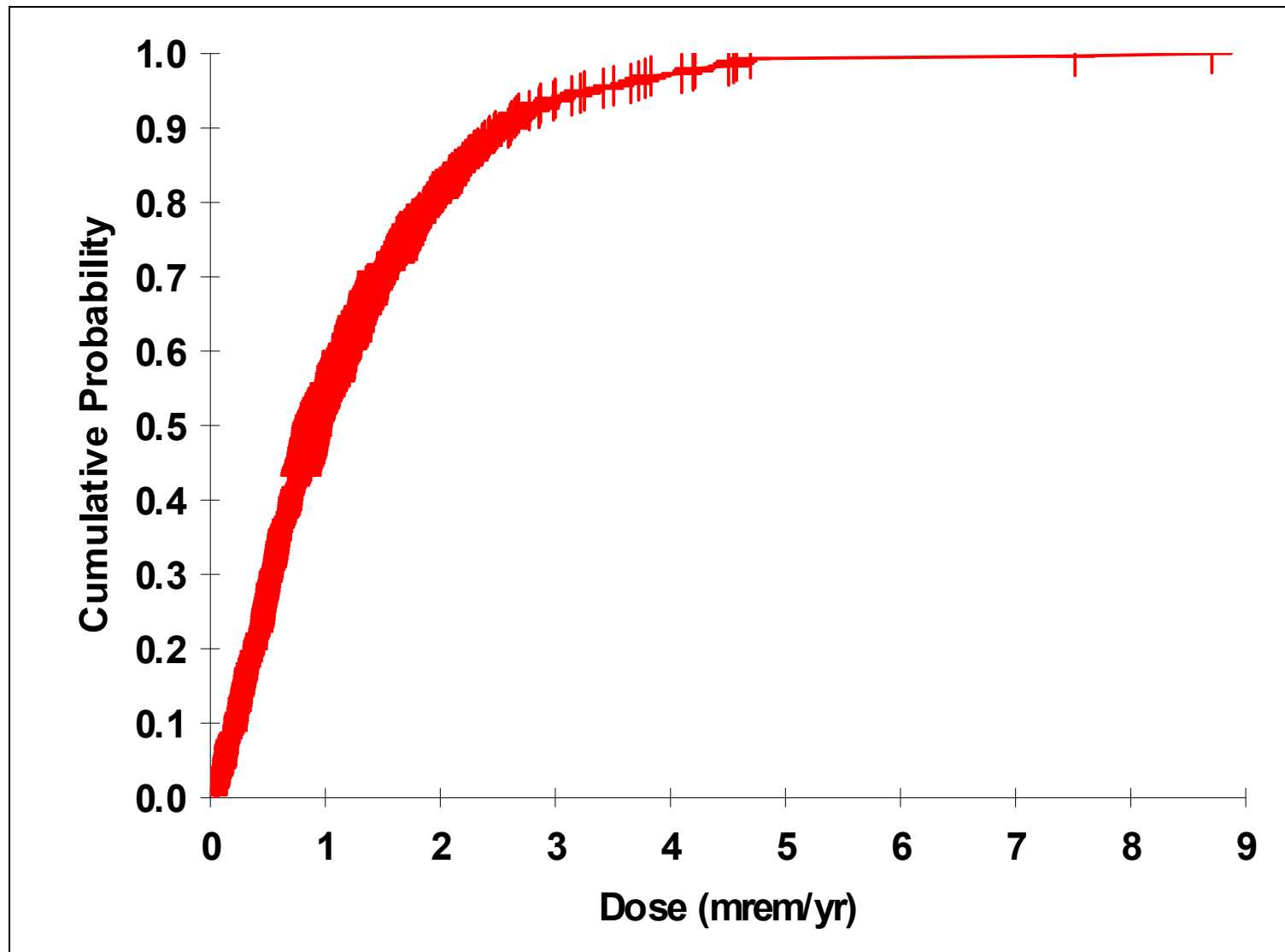


Figure H-32 Cumulative Probability Plot, External Pathway, Construction Worker, Uranium Source Term



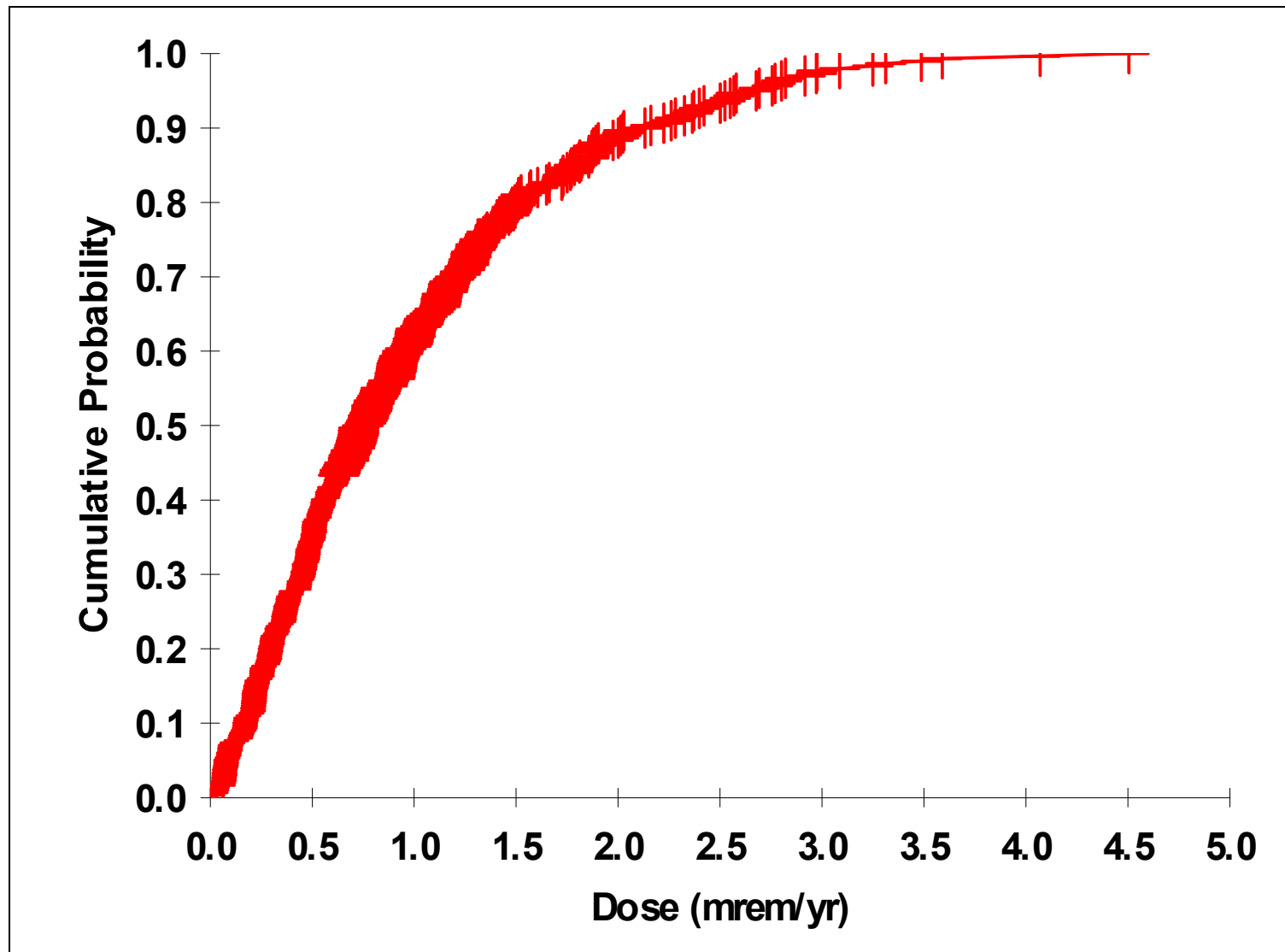


Figure H-33 Cumulative Probability Plot, External Pathway, Construction Worker, Uranium Source Term

## H.4 RECREATIONAL USER (VISITOR) SCENARIO

### H.4.1 Byproduct Source Term, Recreational User

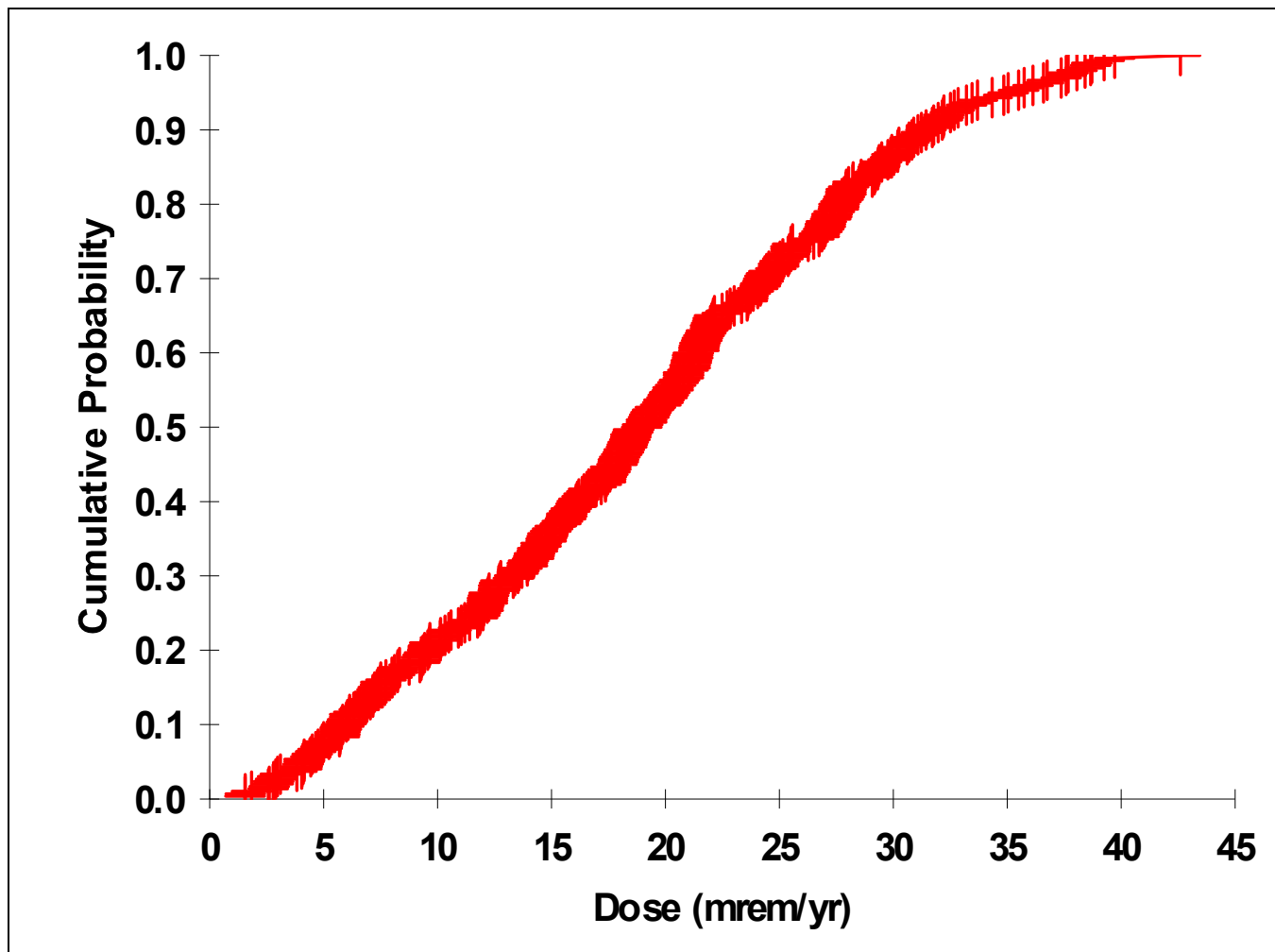


Figure H-34 Cumulative Probability Plot, All Pathways, Recreational User, Byproduct Source Term

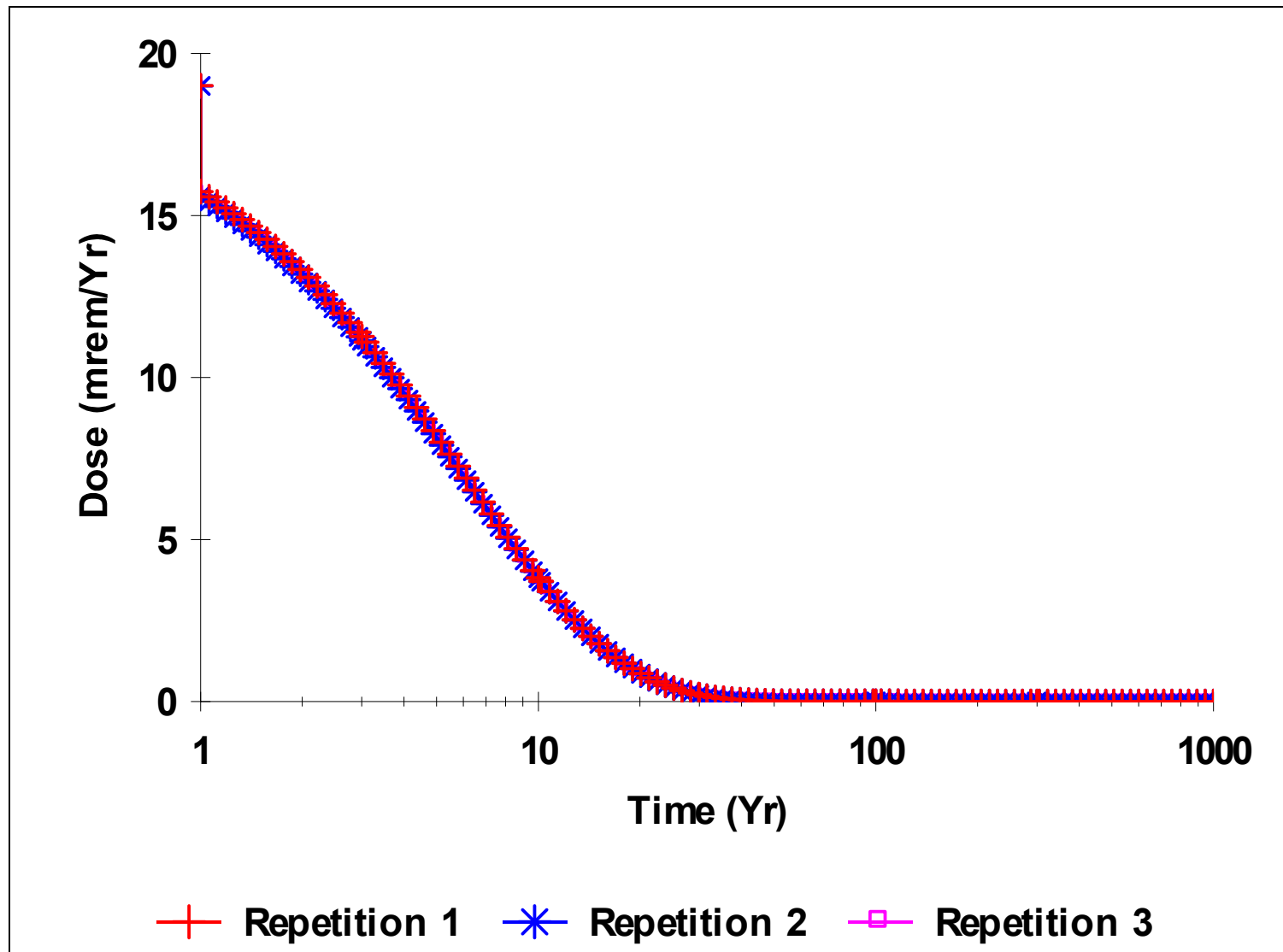


Figure H-35 Temporal Plot, Mean Total Dose, Recreational User, Byproduct Source Term

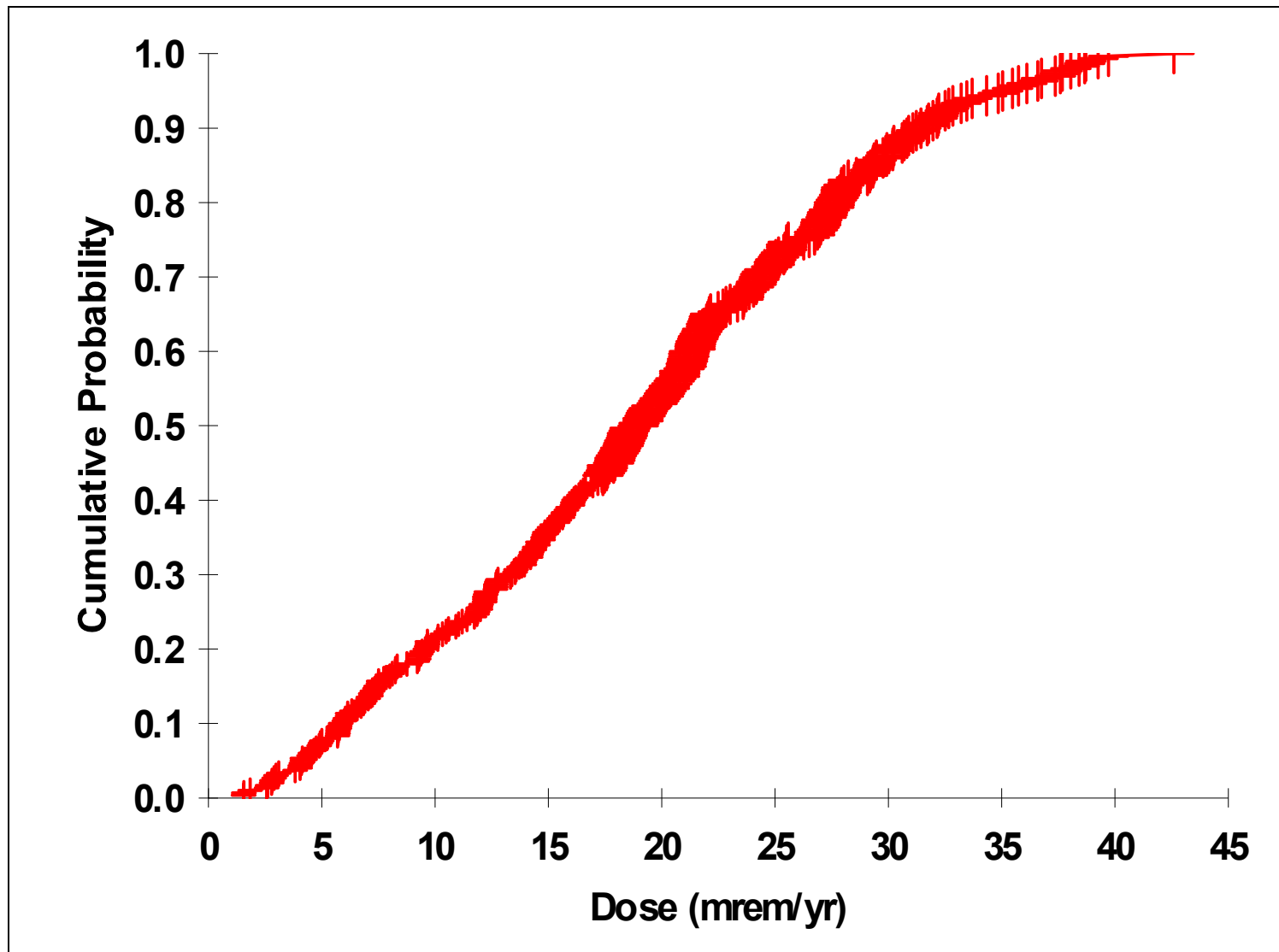


Figure H-36 Cumulative Probability Plot, External Pathway, Recreational User, Byproduct Source Term

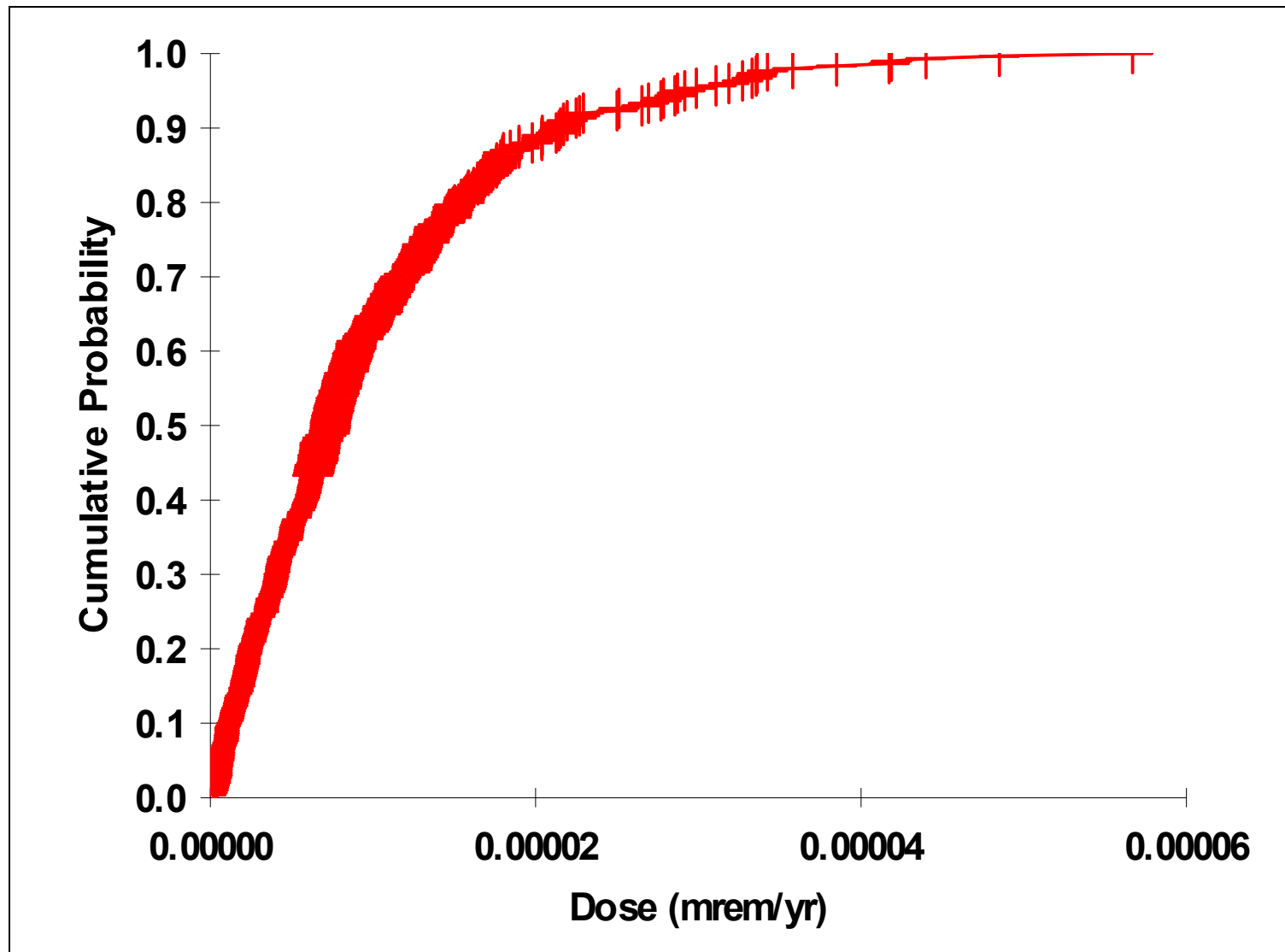


Figure H-37 Cumulative Probability Plot, Inhalation Pathway, Recreational User, Byproduct Source Term

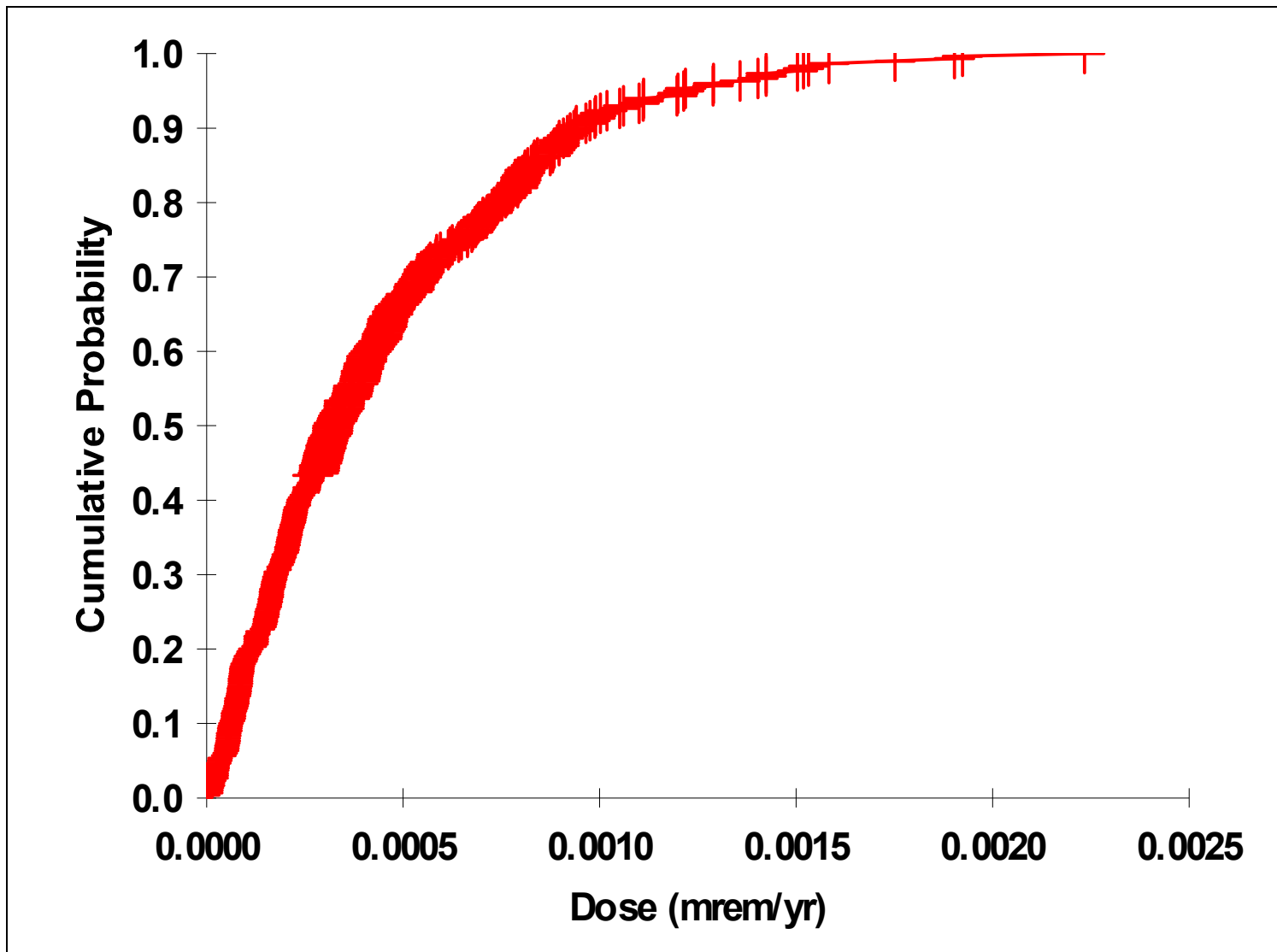


Figure H-38 Cumulative Probability Plot, Soil Ingestion Pathway, Recreational User, Byproduct Source Term

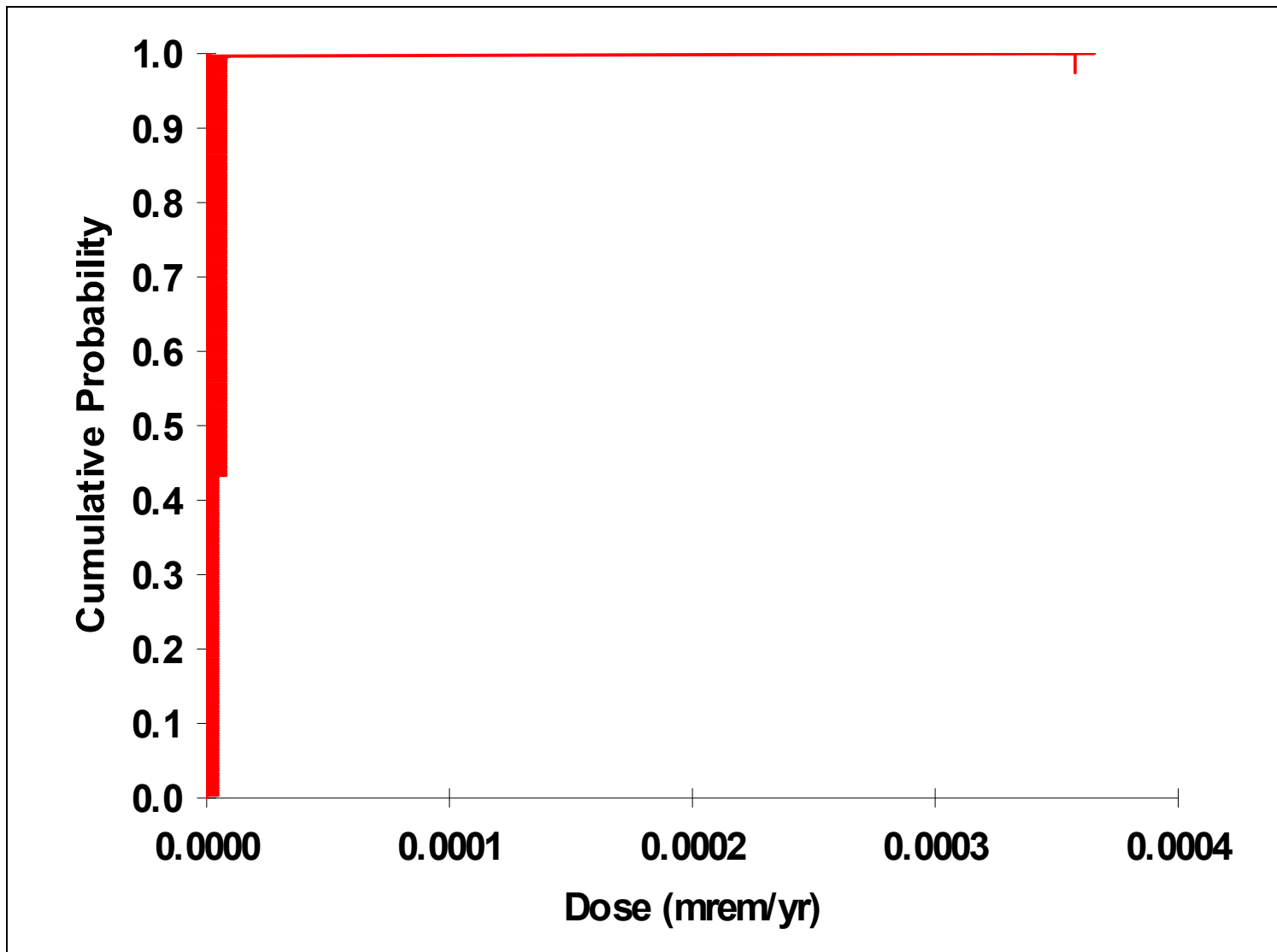


Figure H-39 Cumulative Probability Plot, Aquatic Foods Ingestion Pathway, Recreational User, Byproduct Source Term

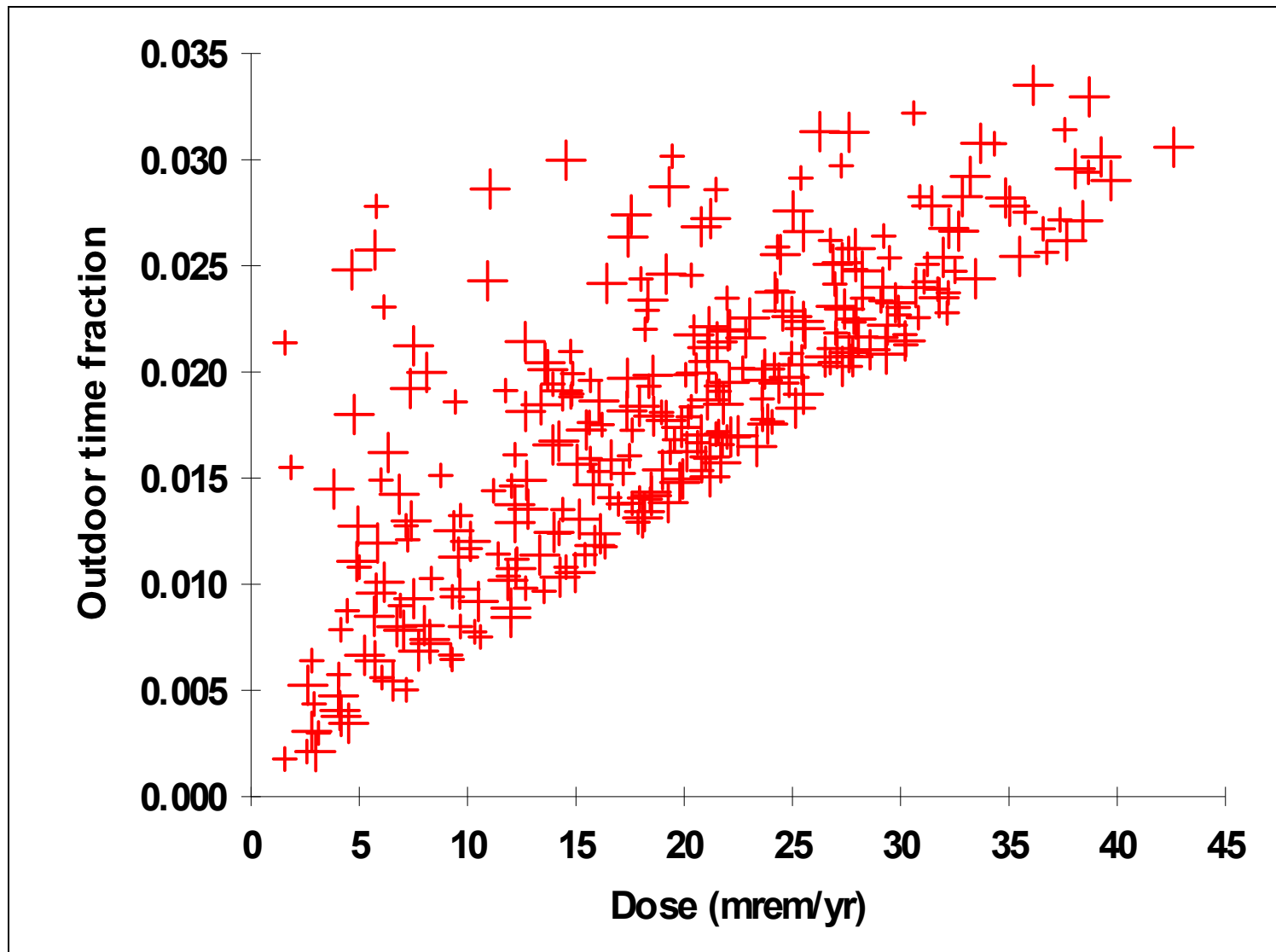


Figure H-40 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Recreational User, Byproduct Source Term



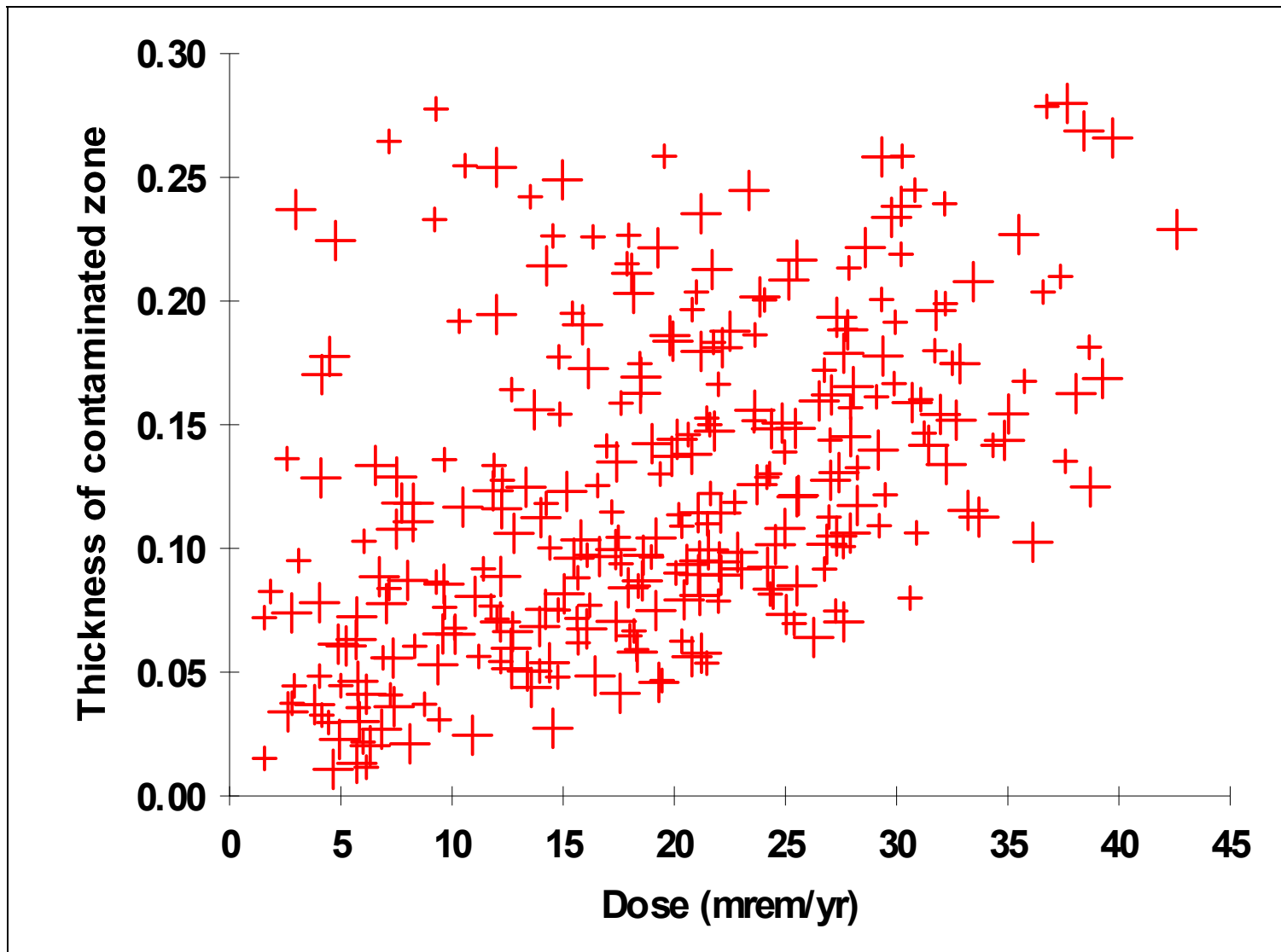


Figure H-41 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Recreational User, Byproduct Source Term

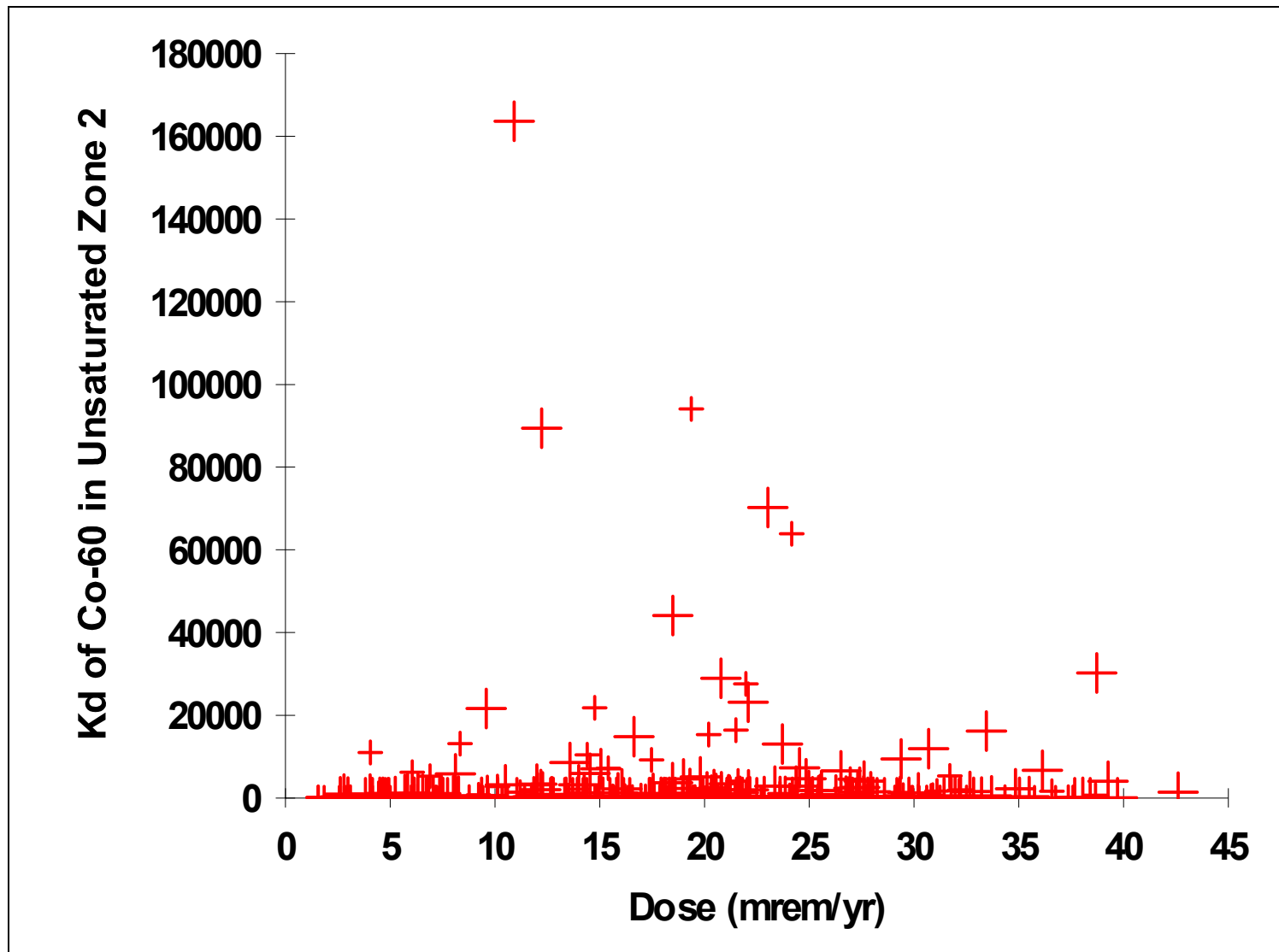


Figure H-42 Scatter Plot, Dose from All Pathways vs. Co-60 Kd in Unsaturated Zone2, Recreational User, Byproduct Source Term

## H.4.2 Uranium Source Term, Recreational User

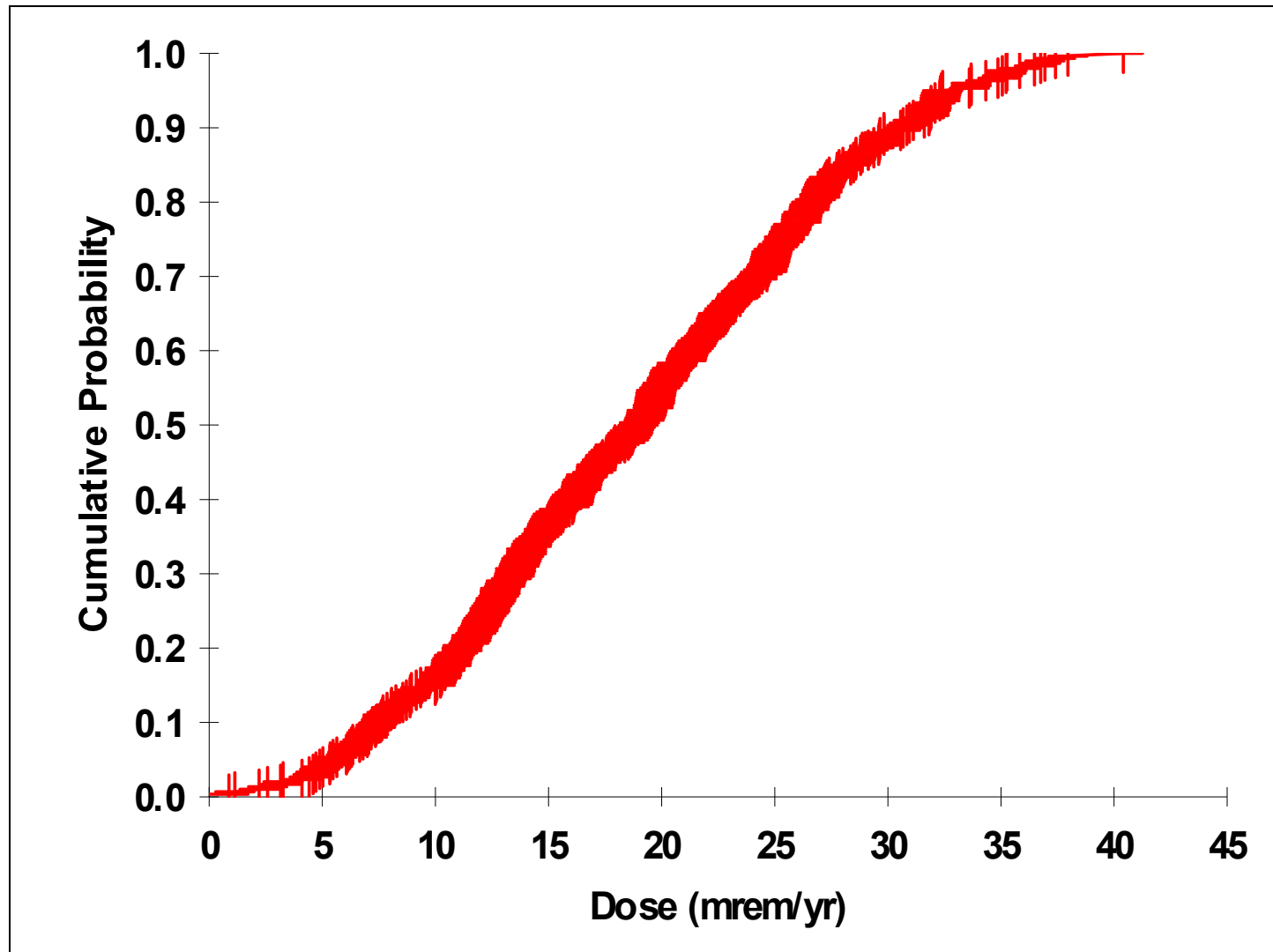


Figure H-43 Cumulative Probability Plot, All Pathways, Recreational User, Uranium Source Term

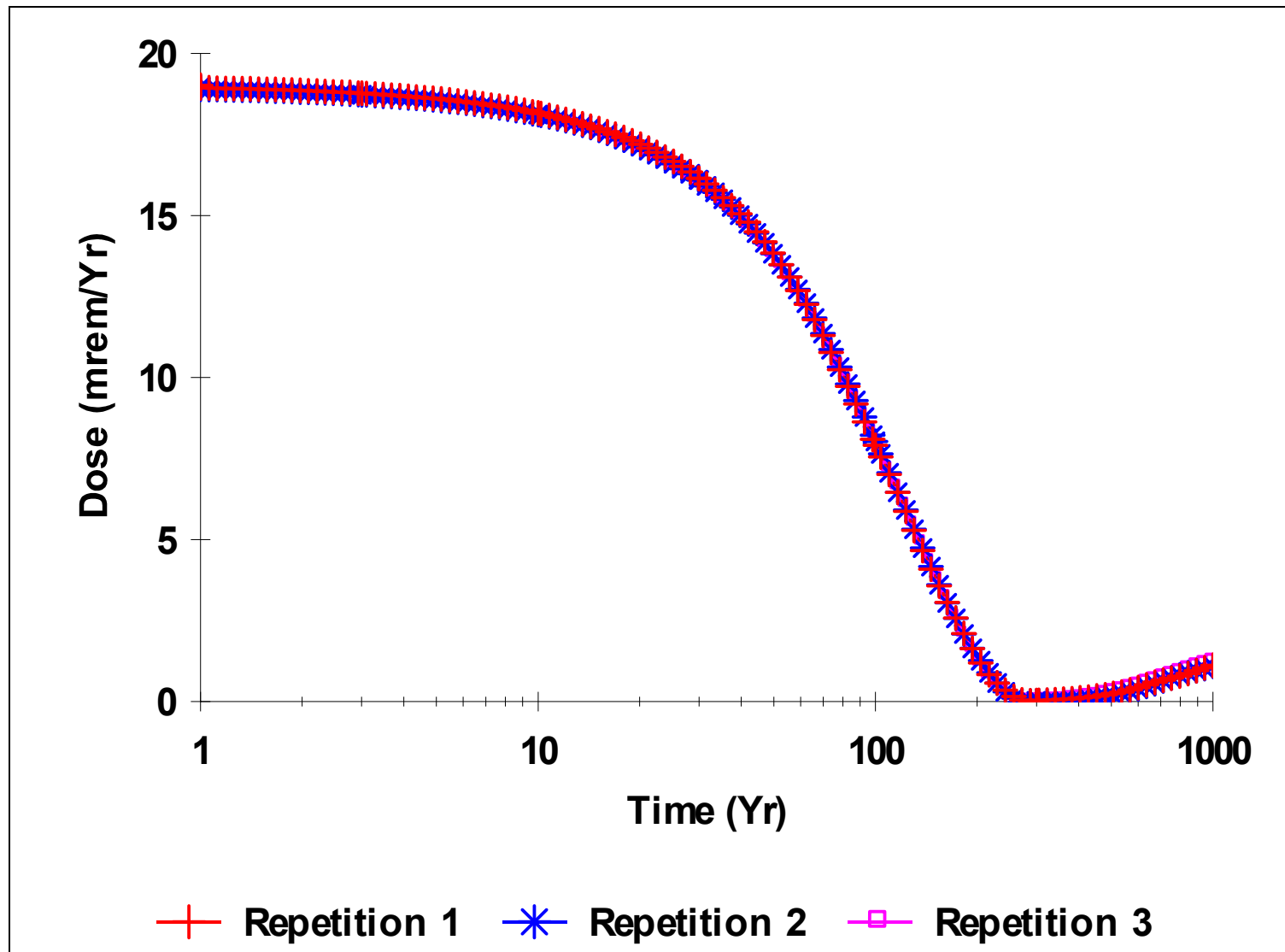


Figure H-44 Temporal Plot, Mean Total Dose, Recreational User, Uranium Source Term

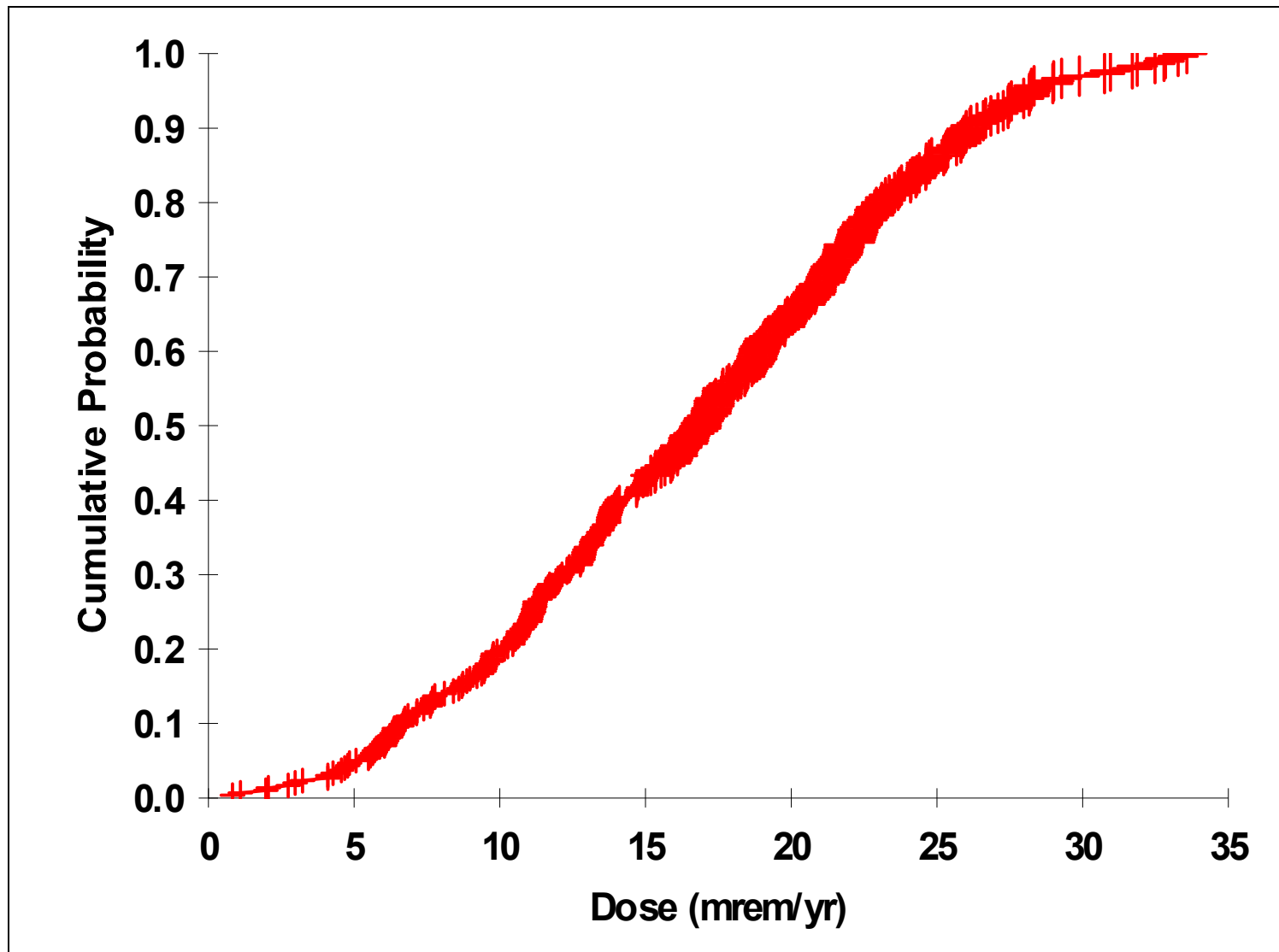


Figure H-45 Cumulative Probability Plot, External Pathway, Recreational User, Uranium Source Term

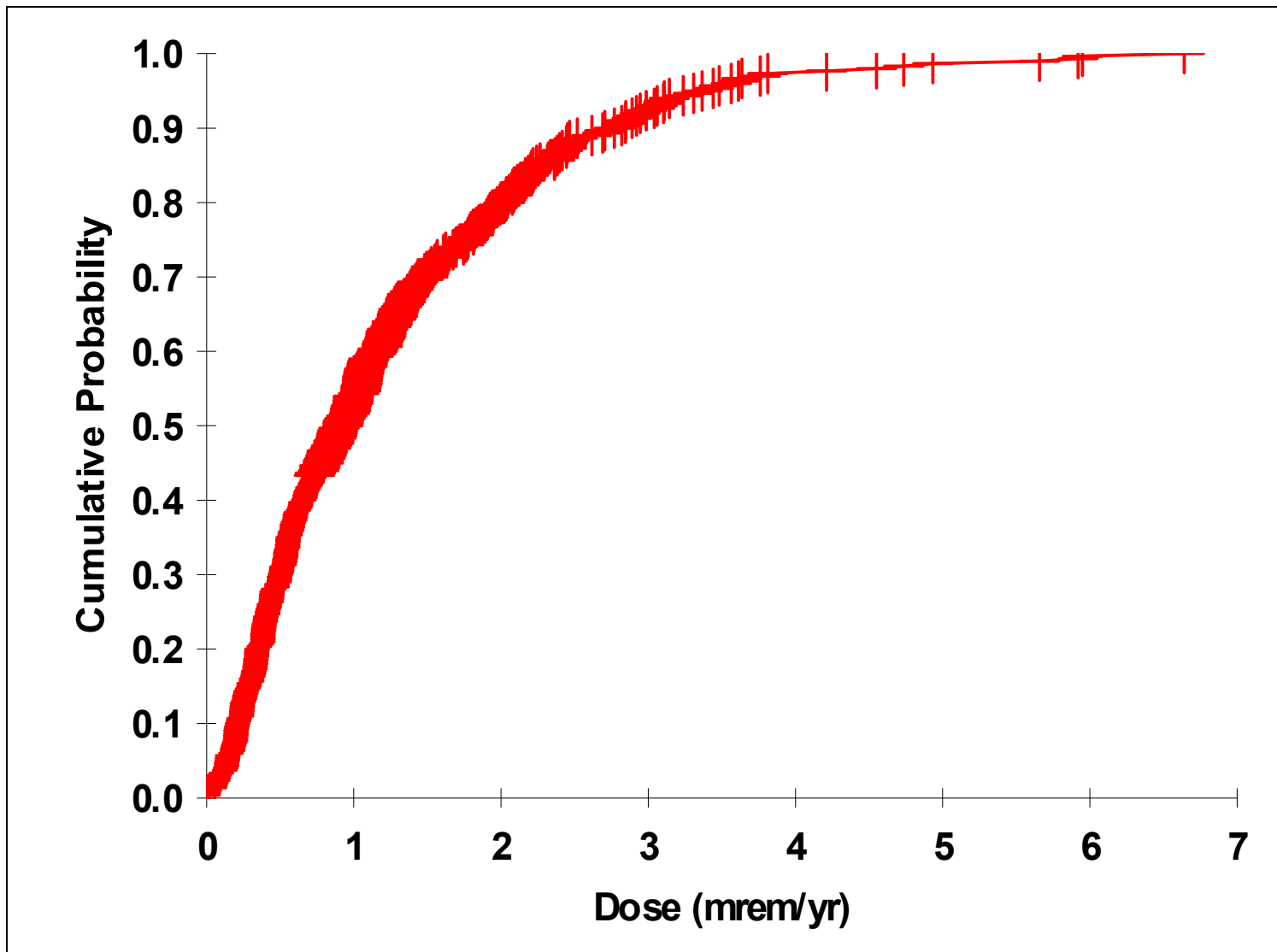


Figure H-46 Cumulative Probability Plot, Inhalation Pathway, Recreational User, Uranium Source Term

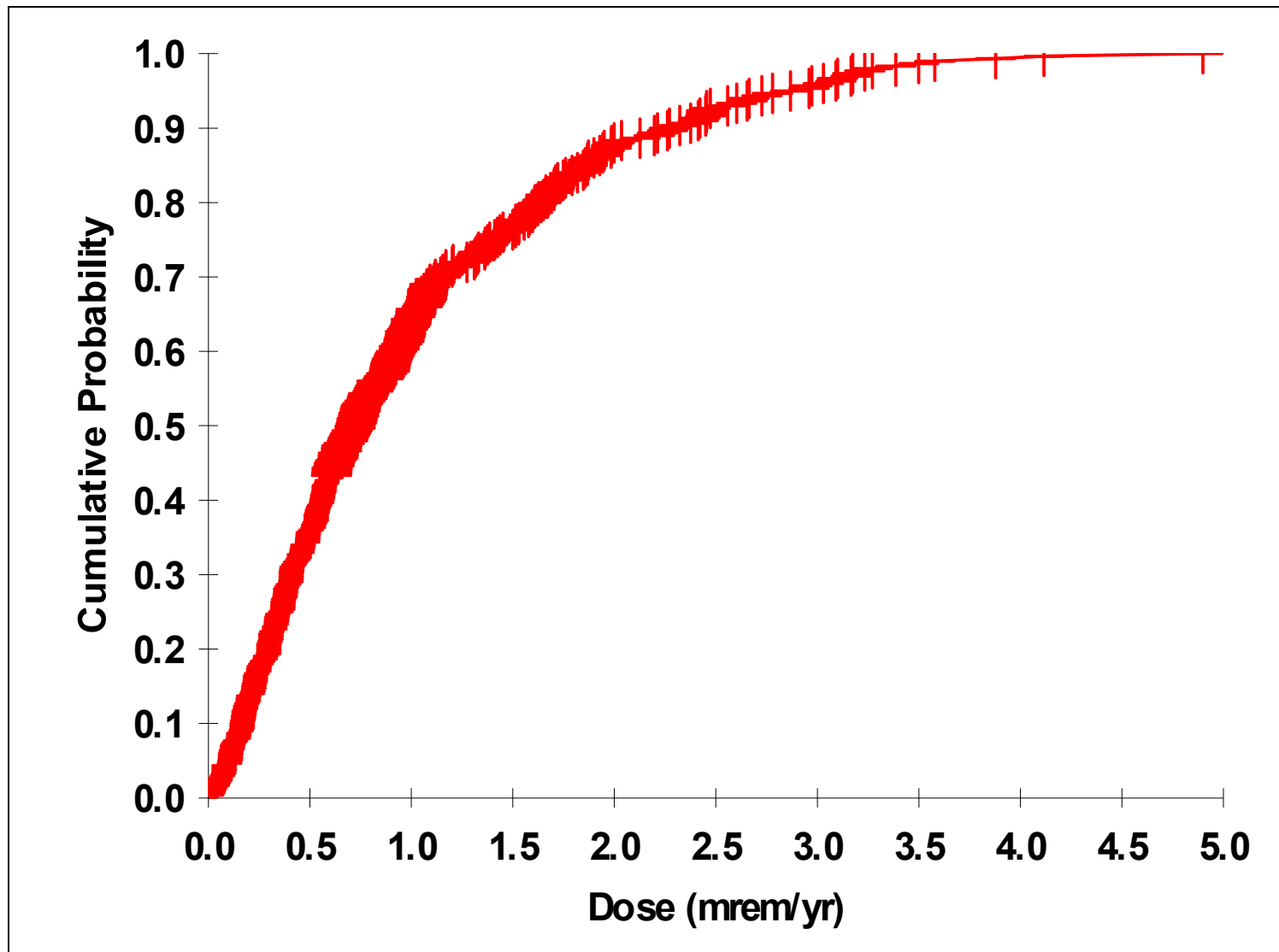


Figure H-47 Cumulative Probability Plot, Soil Ingestion Pathway, Recreational User, Uranium Source Term

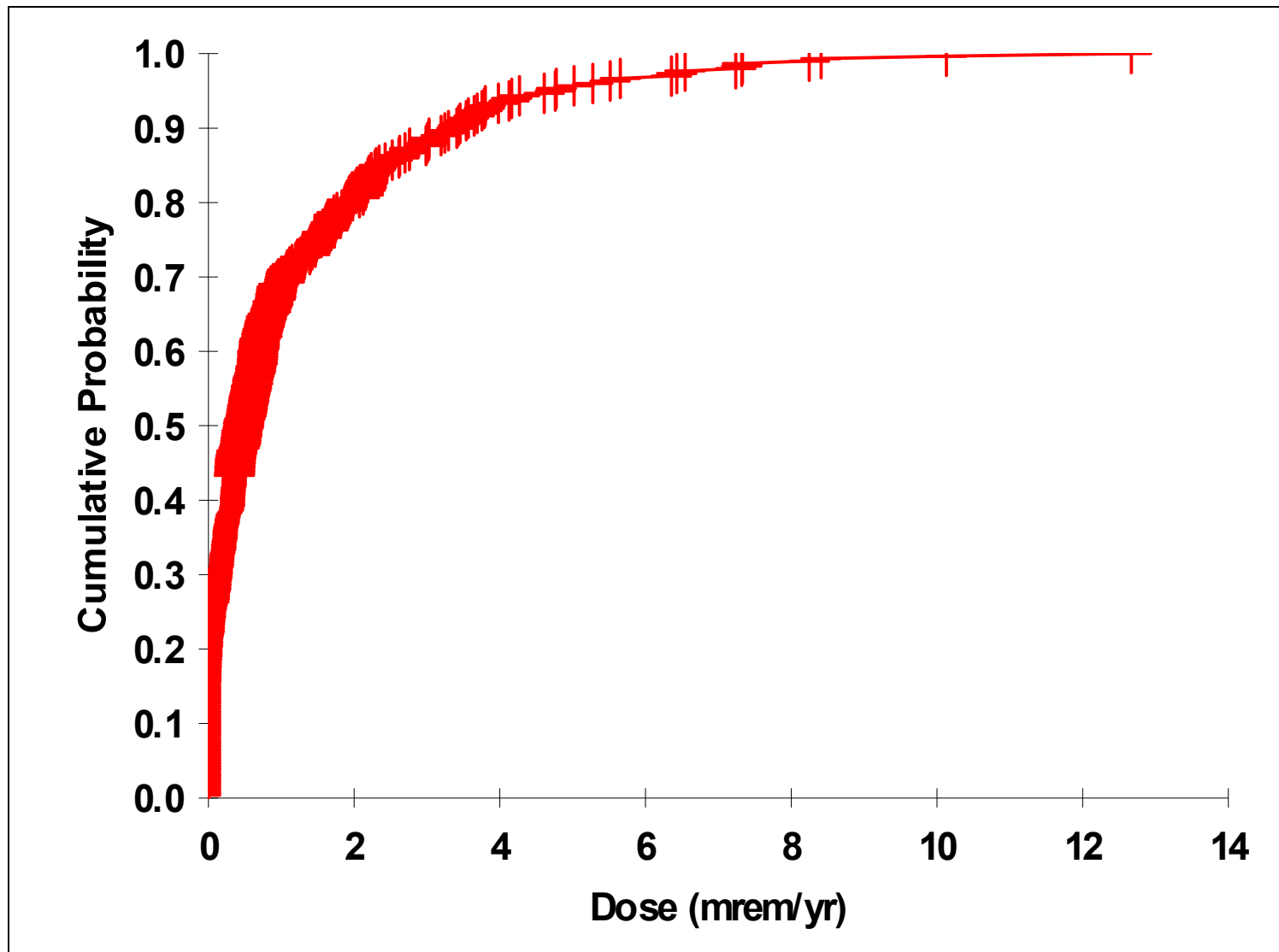


Figure H-48 Cumulative Probability Plot, Aquatic Foods Ingestion Pathway, Recreational User, Uranium Source Term



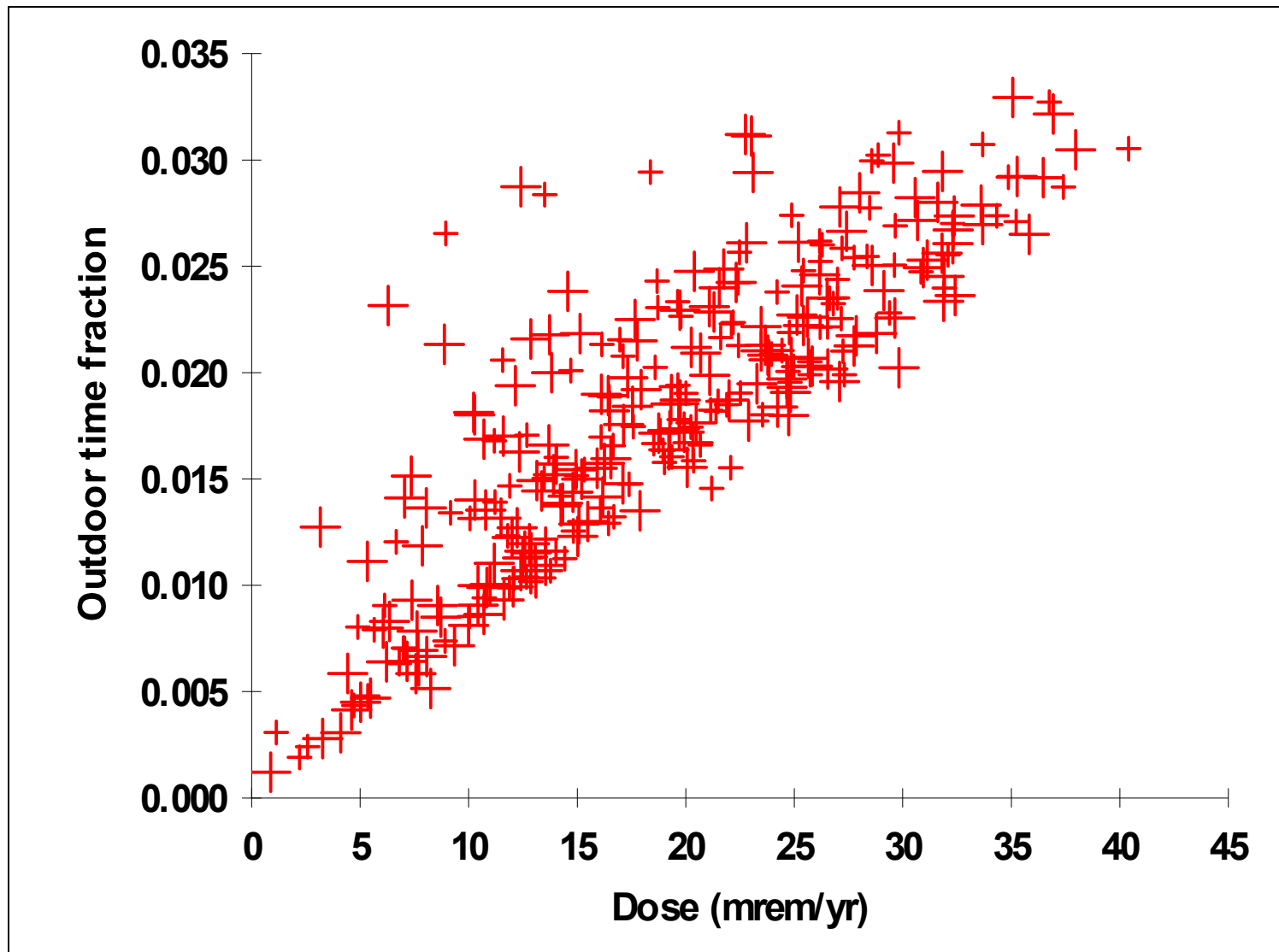


Figure H-49 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Recreational User, Uranium Source Term

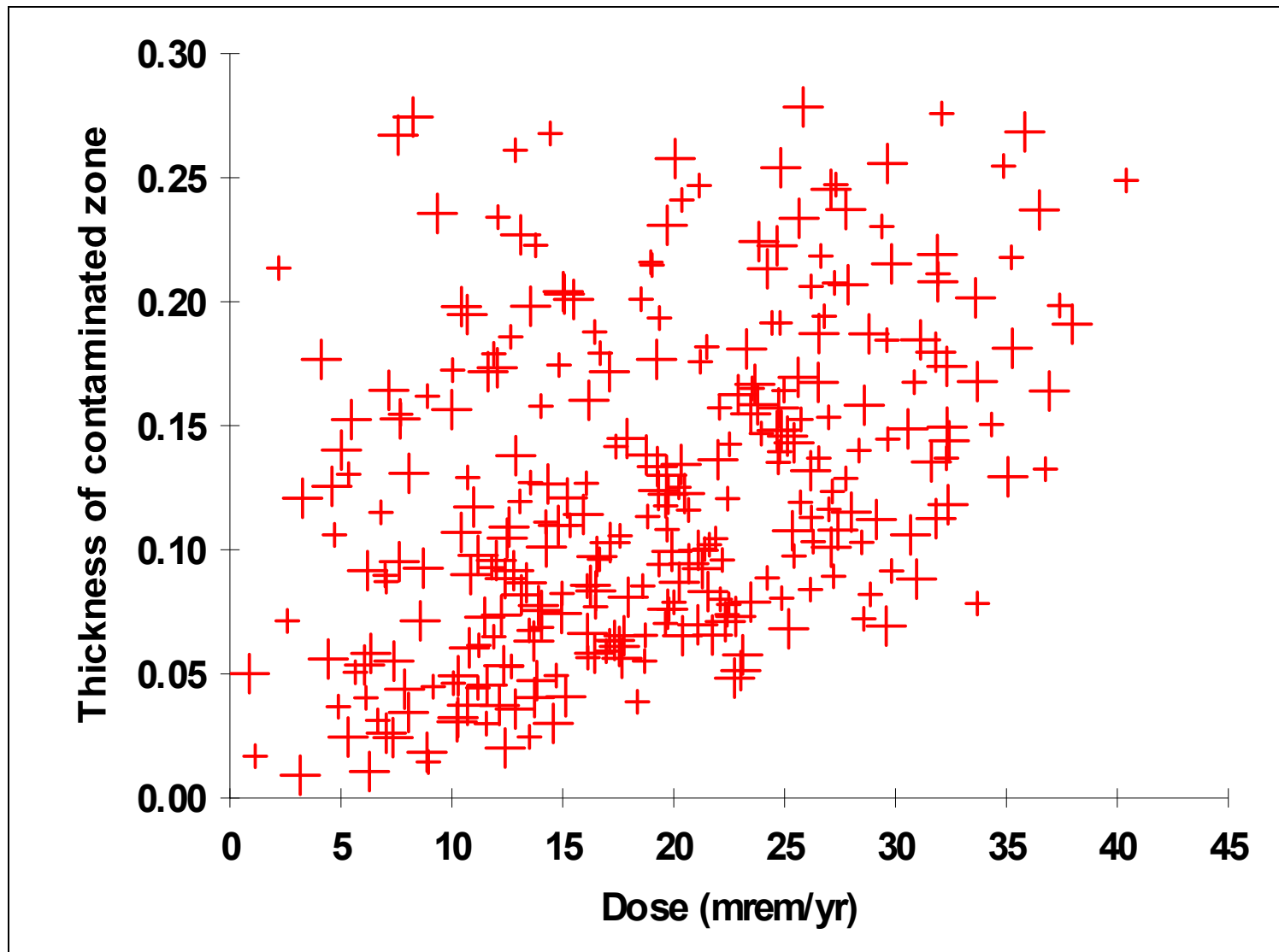


Figure H-50 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Recreational User, Uranium Source Term

## H.5 TRUCK FARMER SCENARIO

### H.5.1 Byproduct Source Term, Truck Farmer

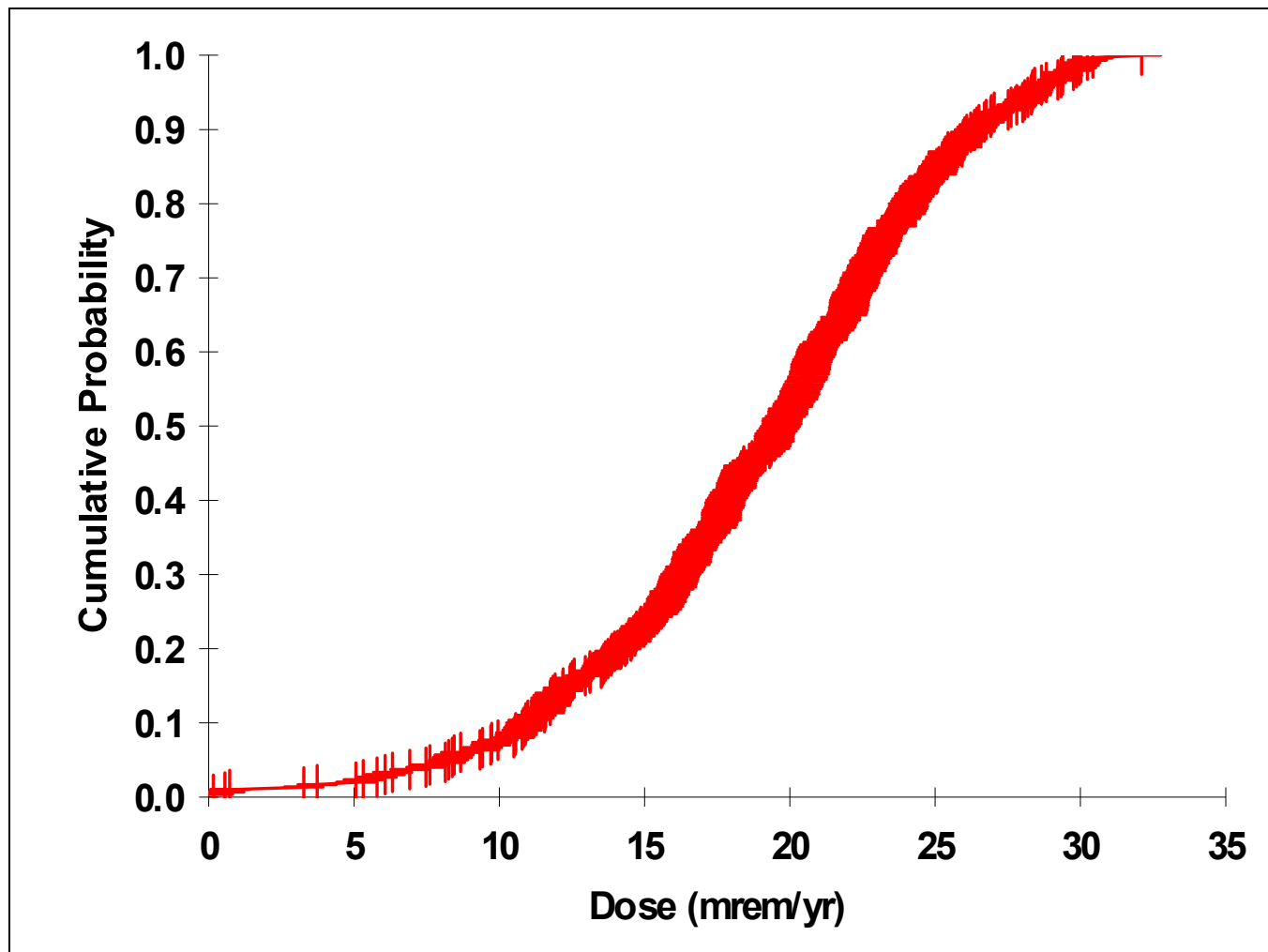


Figure H-51 Cumulative Probability Plot, All Pathways, Truck Farmer, Byproduct Source Term

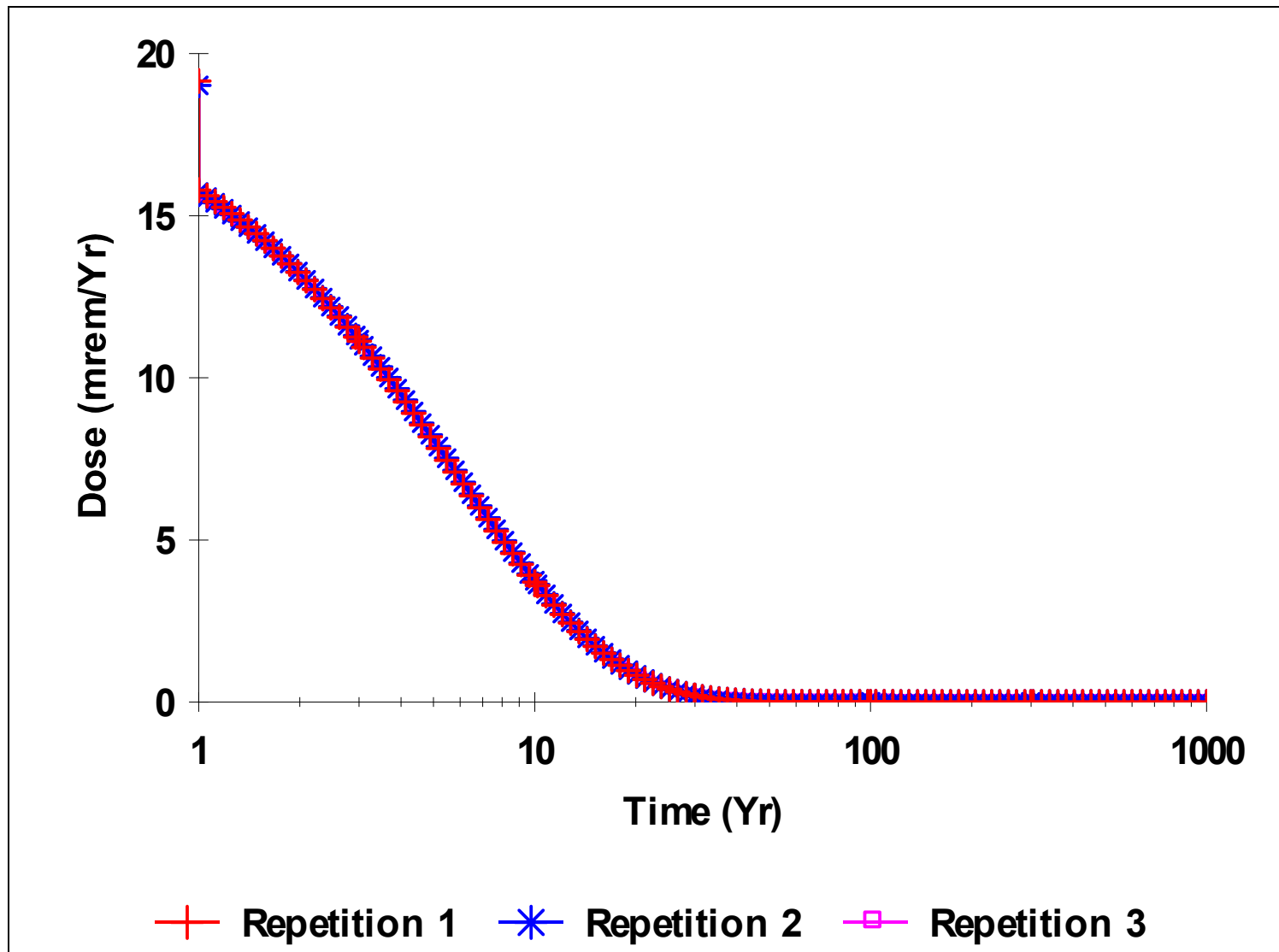


Figure H-52 Temporal Plot, Mean Total Dose, Truck Farmer, Byproduct Source Term

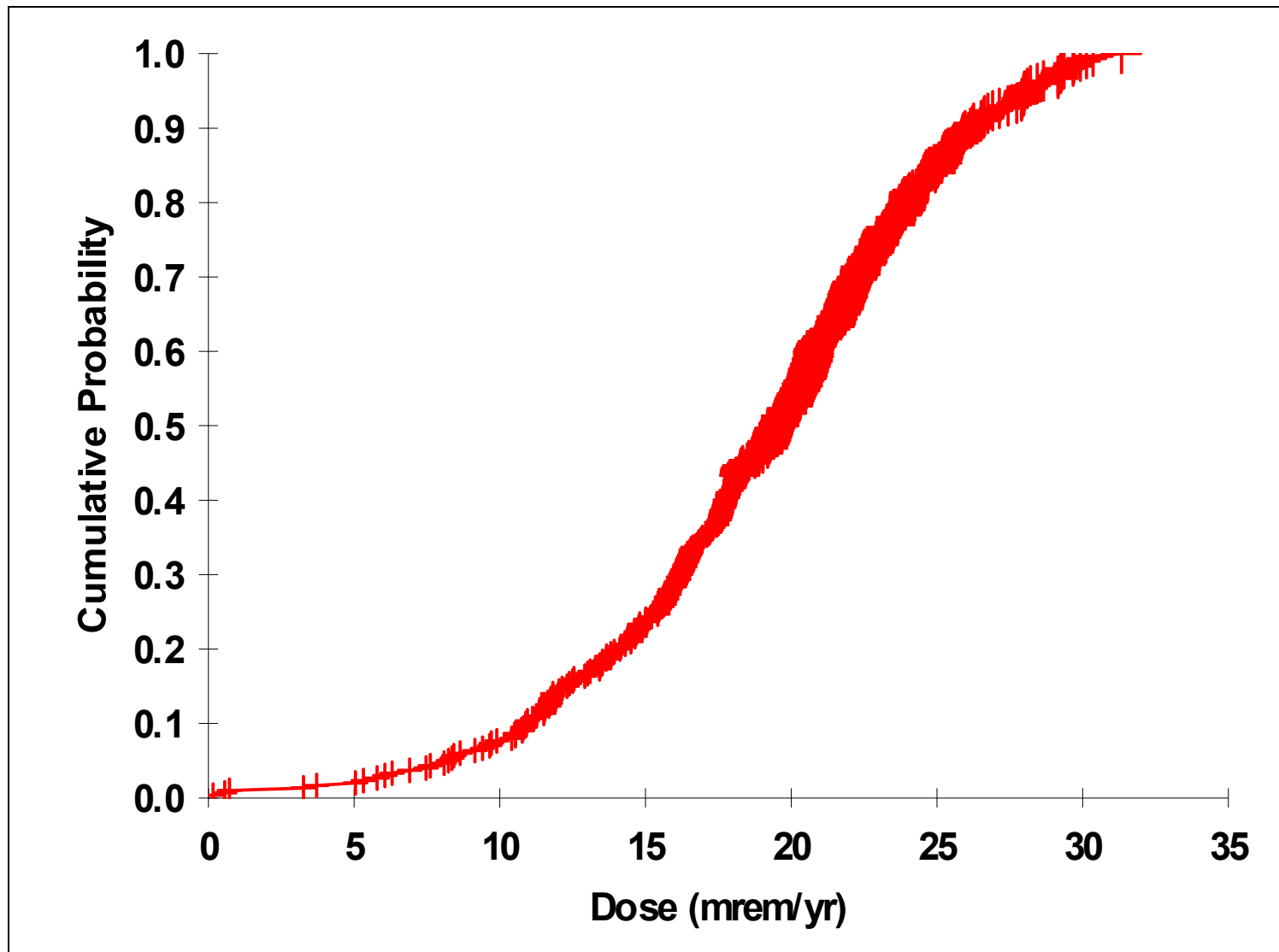


Figure H-53 Cumulative Probability Plot, External Pathway, Truck Farmer, Byproduct Source Term

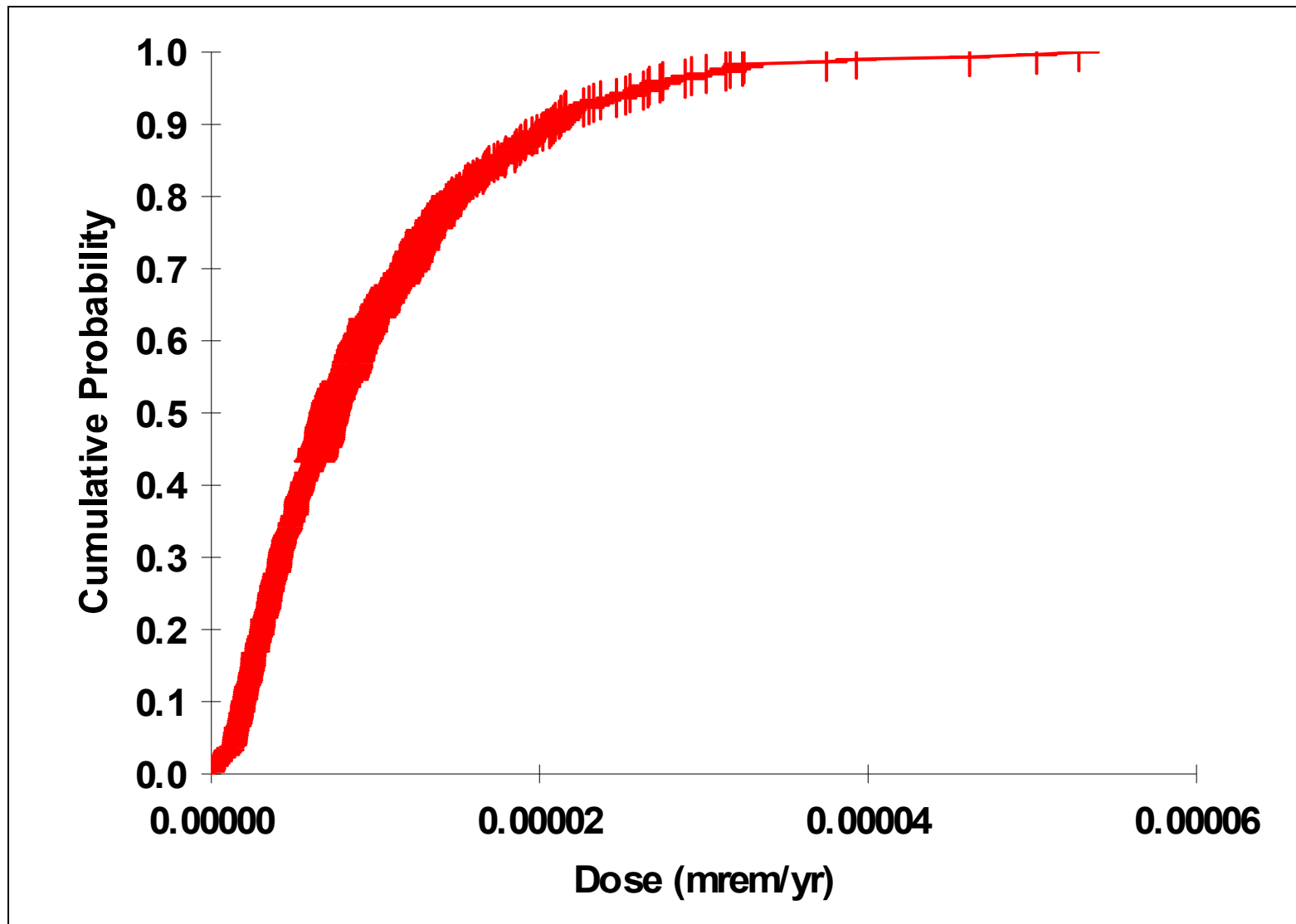


Figure H-54 Cumulative Probability Plot, Inhalation Pathway, Truck Farmer, Byproduct Source Term

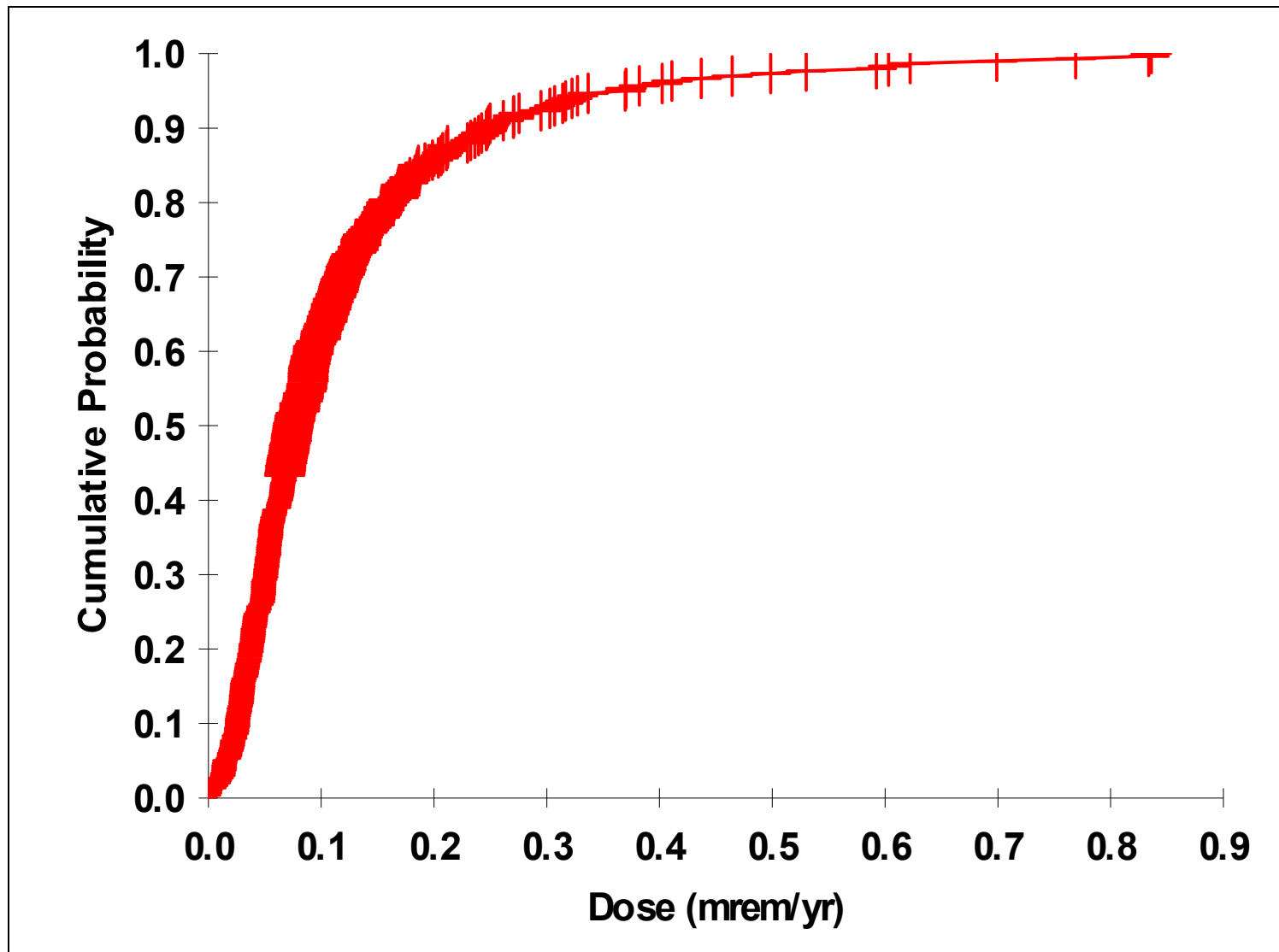


Figure H-55 Cumulative Probability Plot, Plant Ingestion Pathway, Truck Farmer, Byproduct Source Term

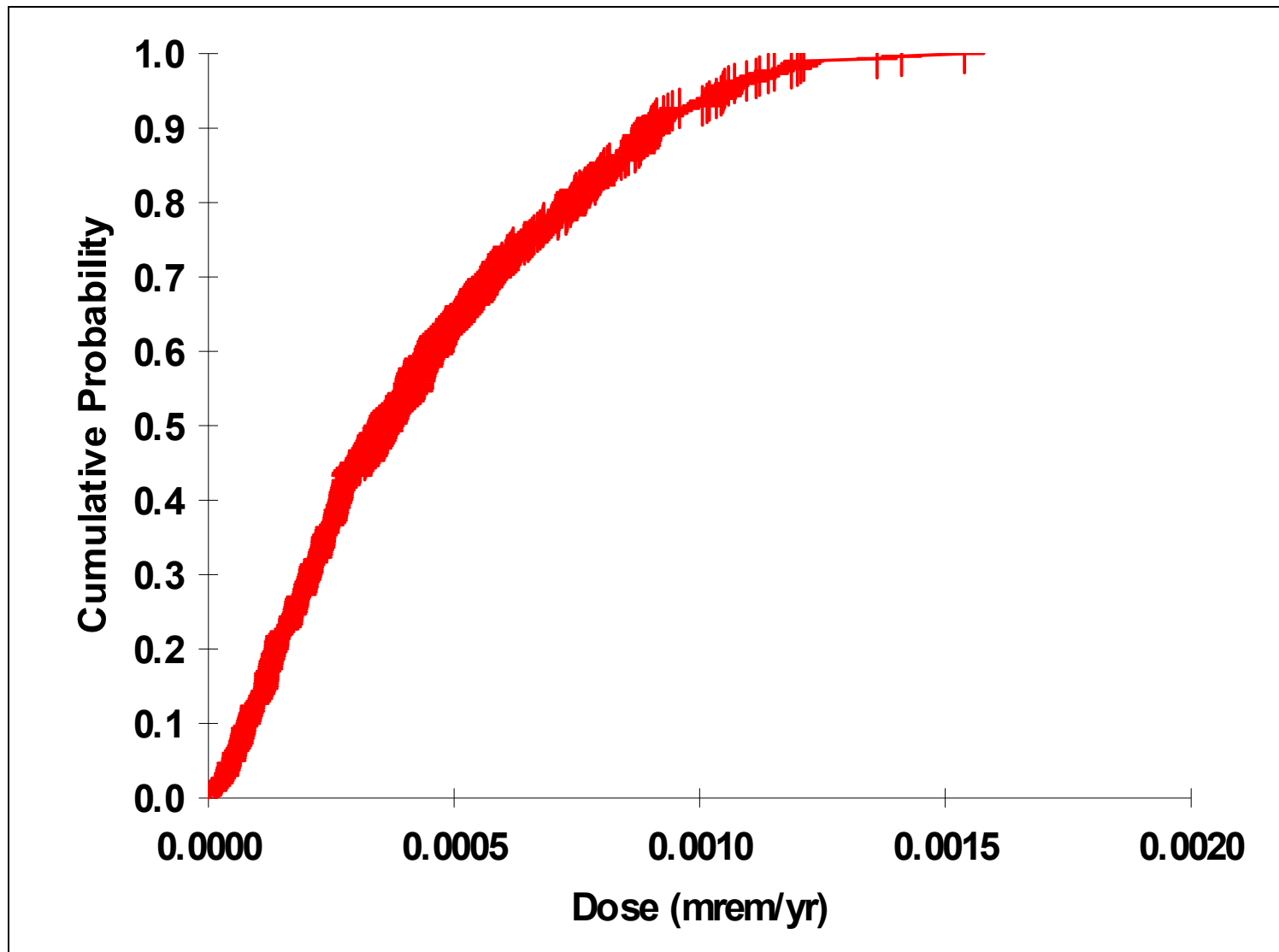


Figure H-56 Cumulative Probability Plot, Soil Ingestion Pathway, Truck Farmer, Byproduct Source Term



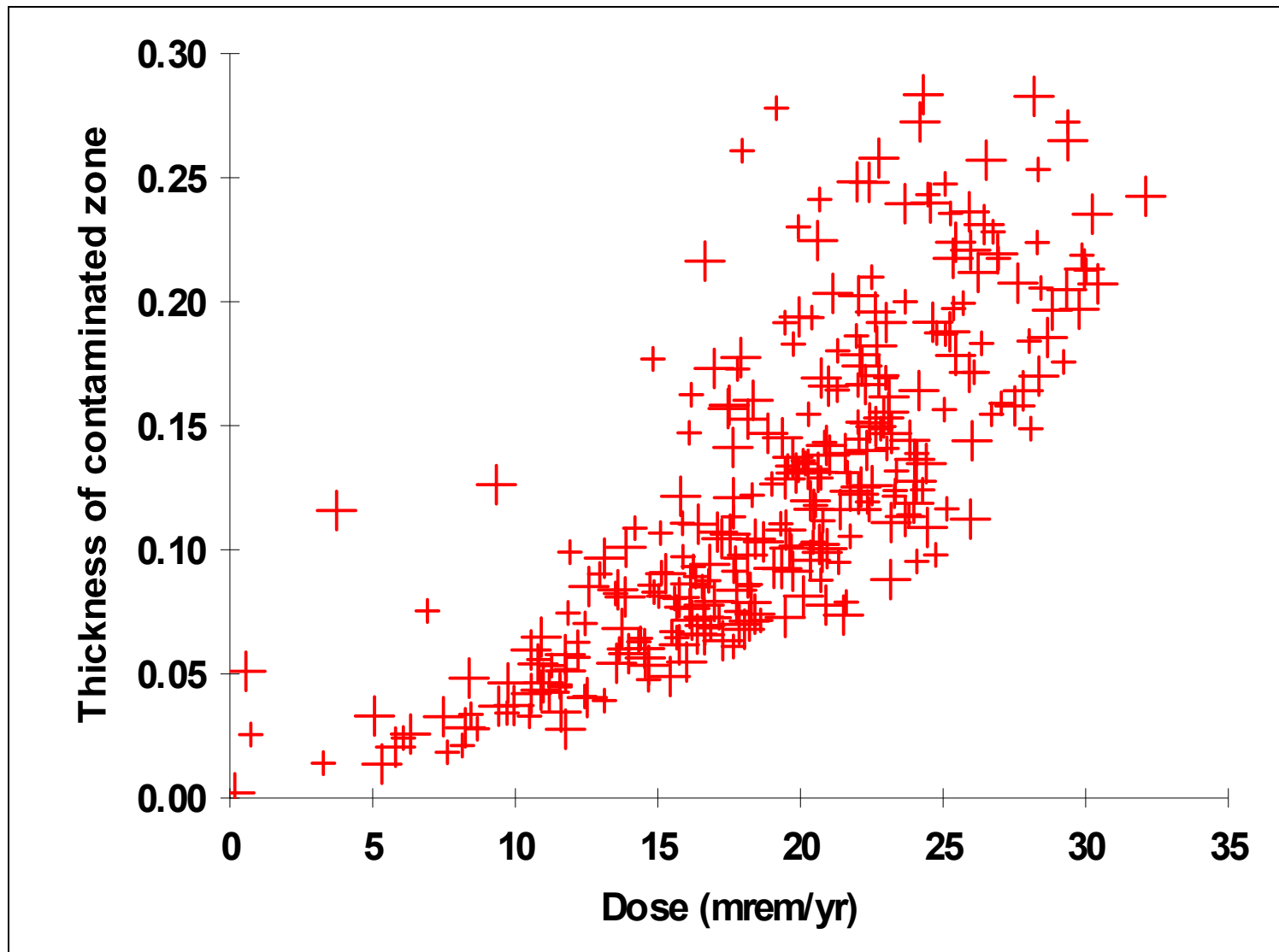


Figure H-57 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Truck Farmer, Byproduct Source Term

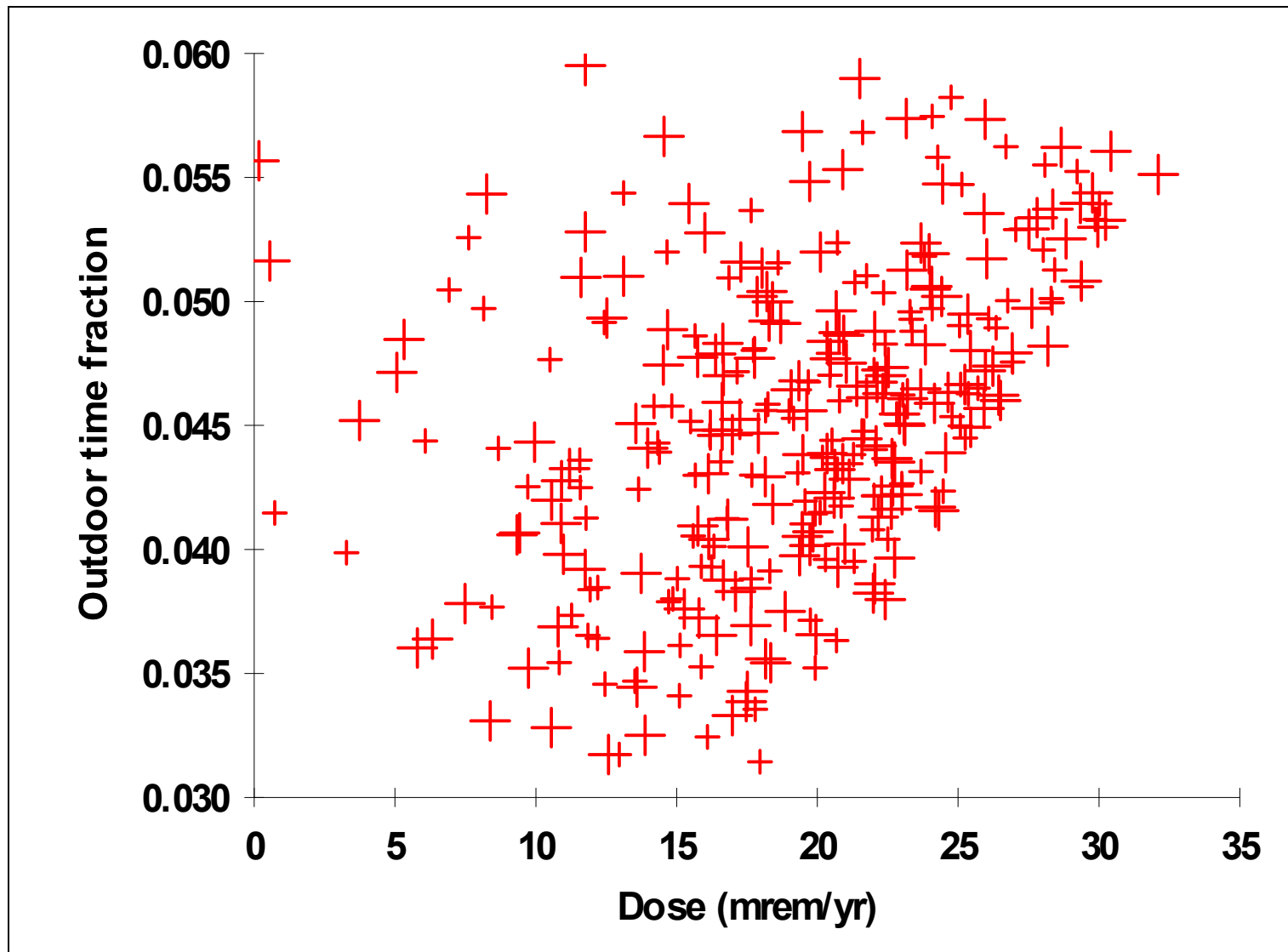


Figure H-58 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Truck Farmer, Byproduct Source Term

## H.5.2 Uranium Source Term, Truck Farmer

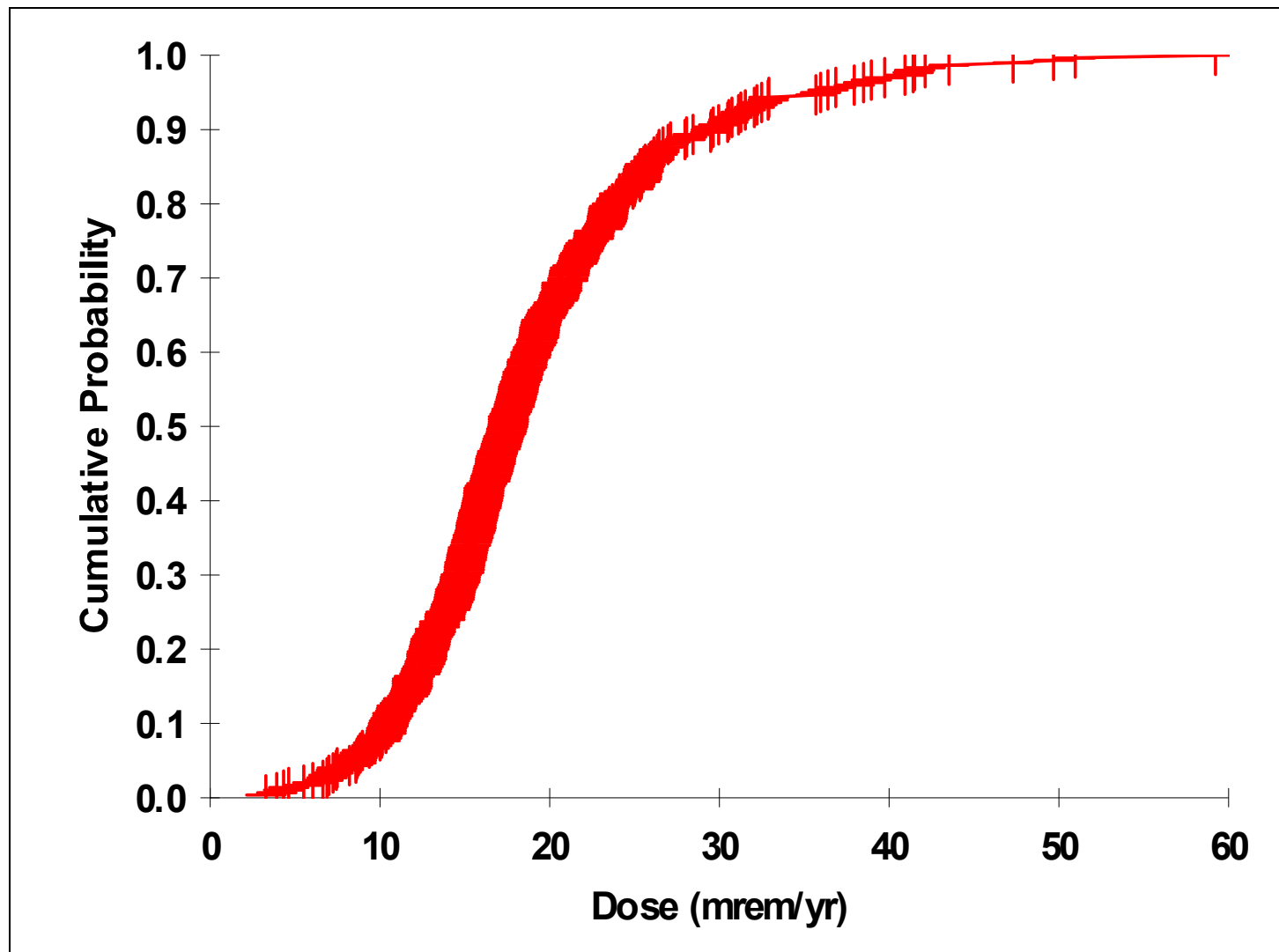


Figure H-59 Cumulative Probability Plot, All Pathways, Truck Farmer, Uranium Source Term

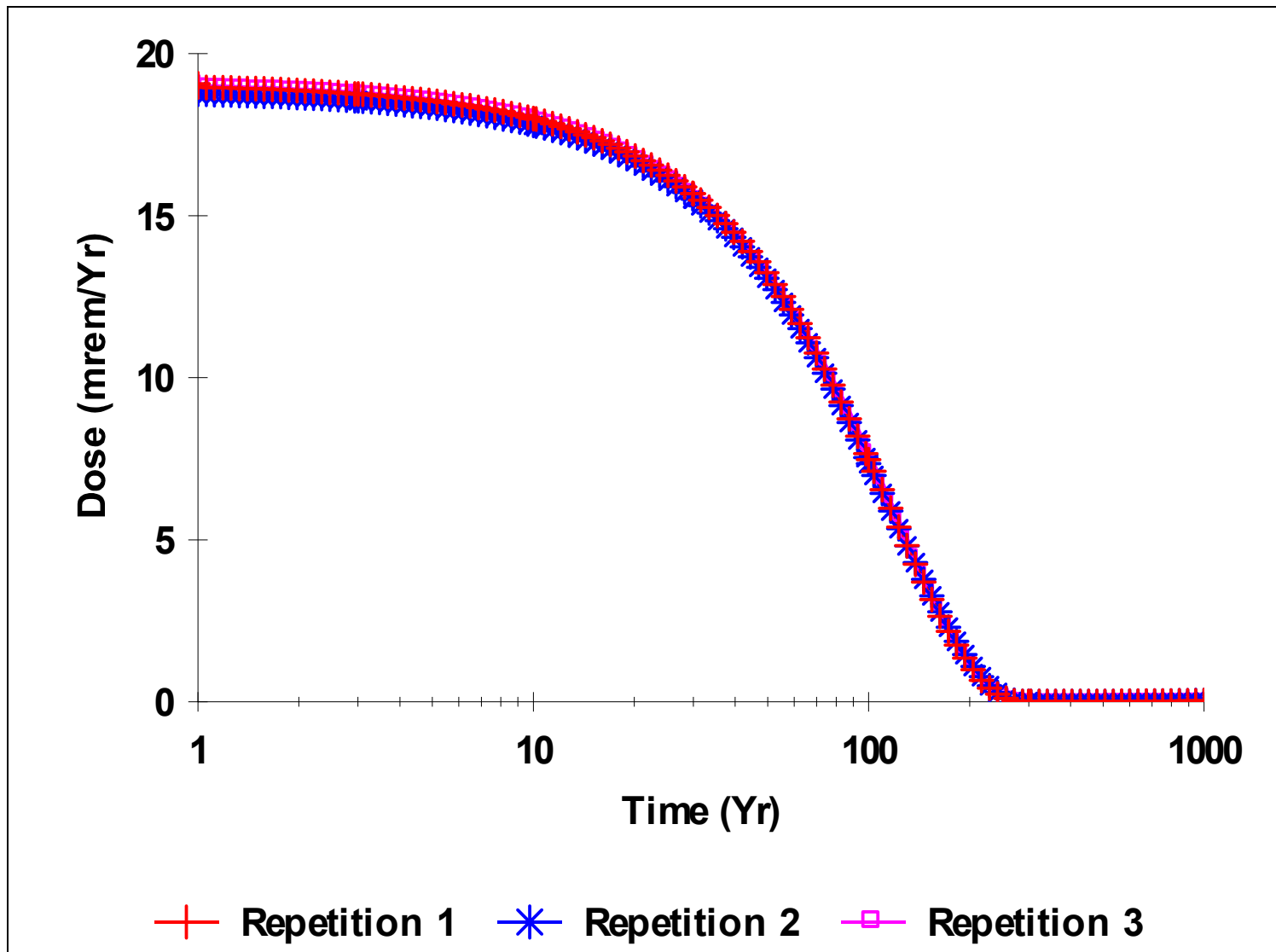


Figure H-60 Temporal Plot, Mean Total Dose, Truck Farmer, Uranium Source Term



Figure H-61 Cumulative Probability Plot, External Pathway, Truck Farmer, Uranium Source Term

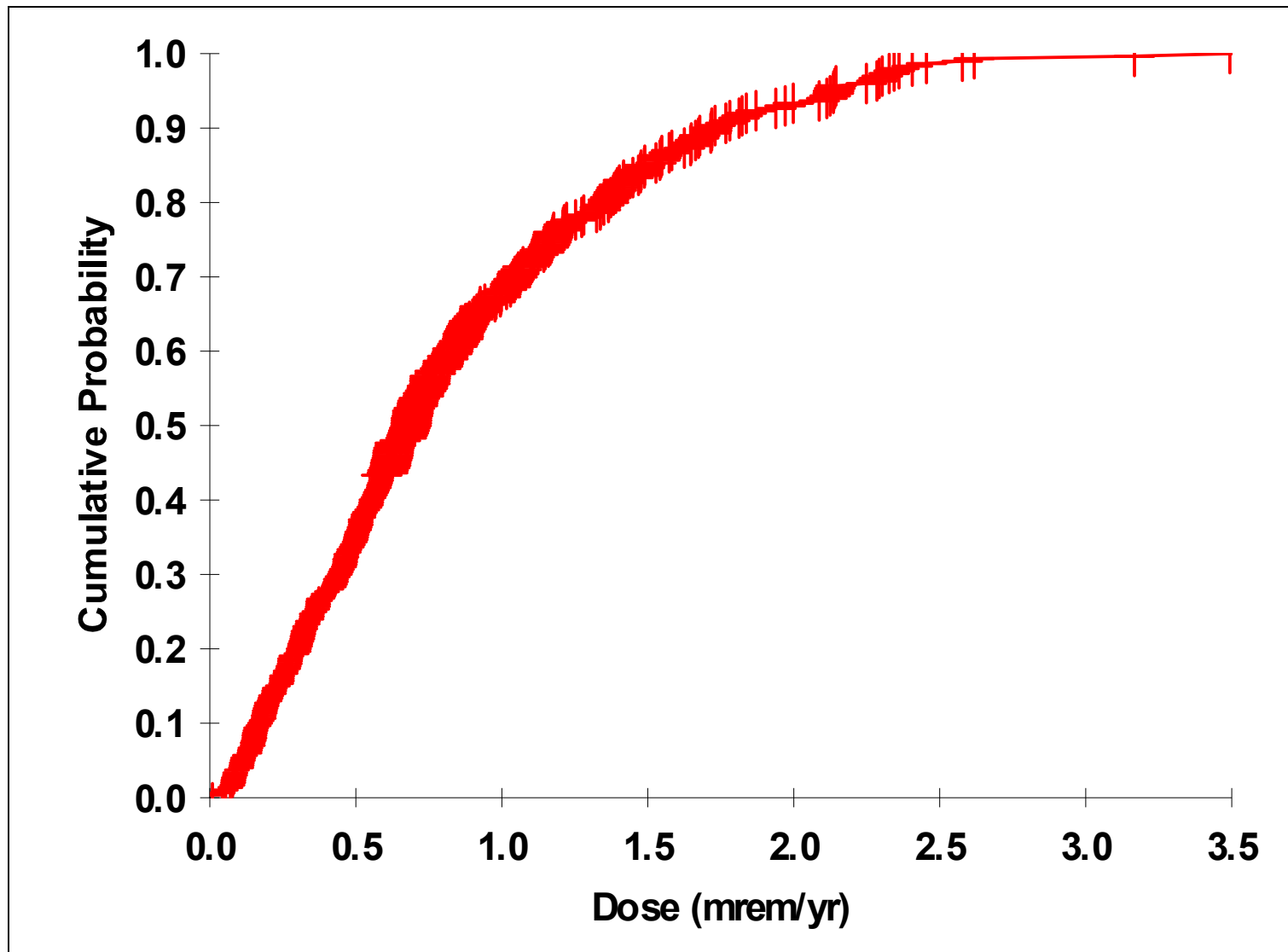


Figure H-62 Cumulative Probability Plot, Inhalation Pathway, Truck Farmer, Uranium Source Term

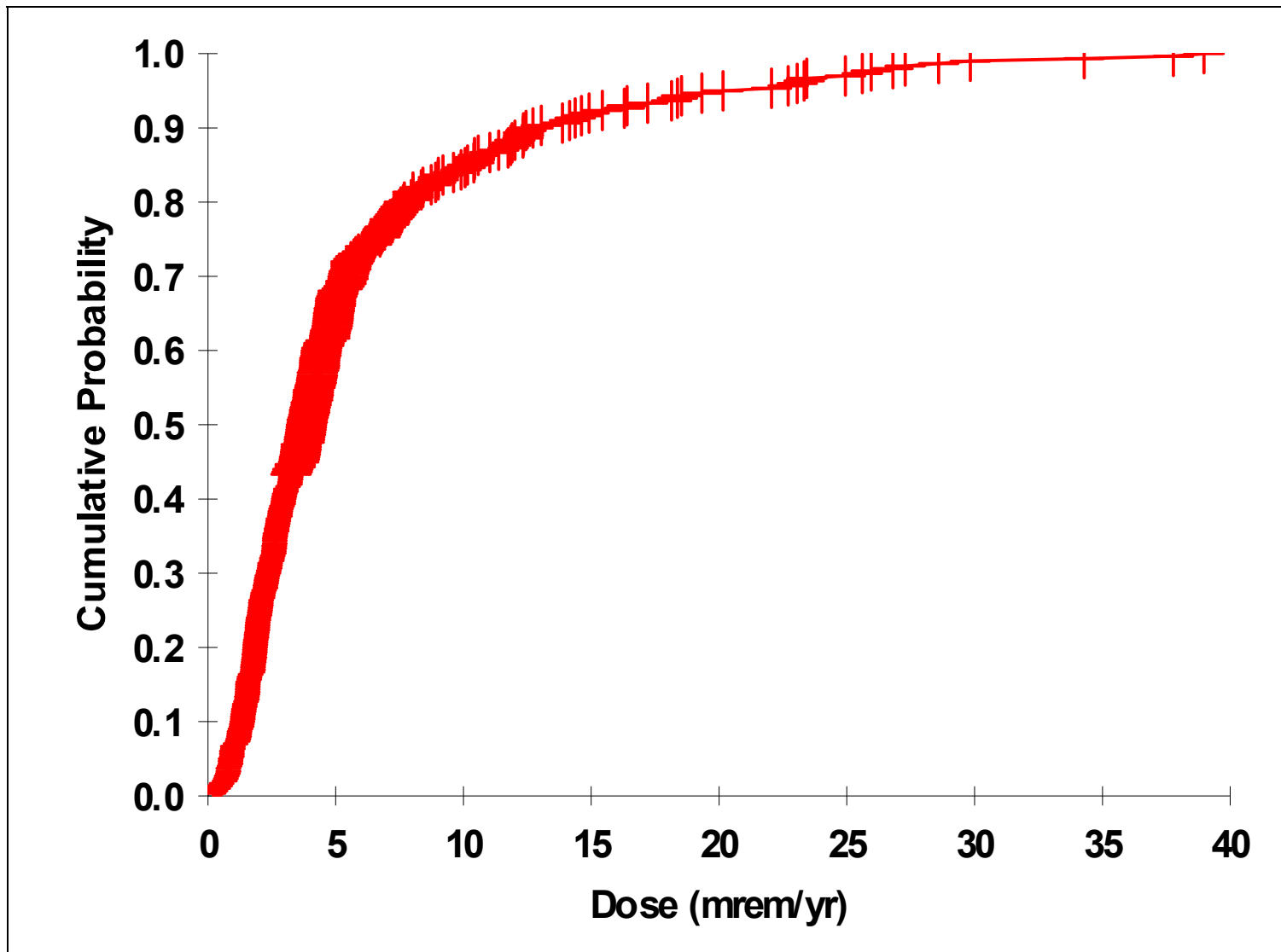


Figure H-63 Cumulative Probability Plot, Plant Ingestion Pathway, Truck Farmer, Uranium Source Term

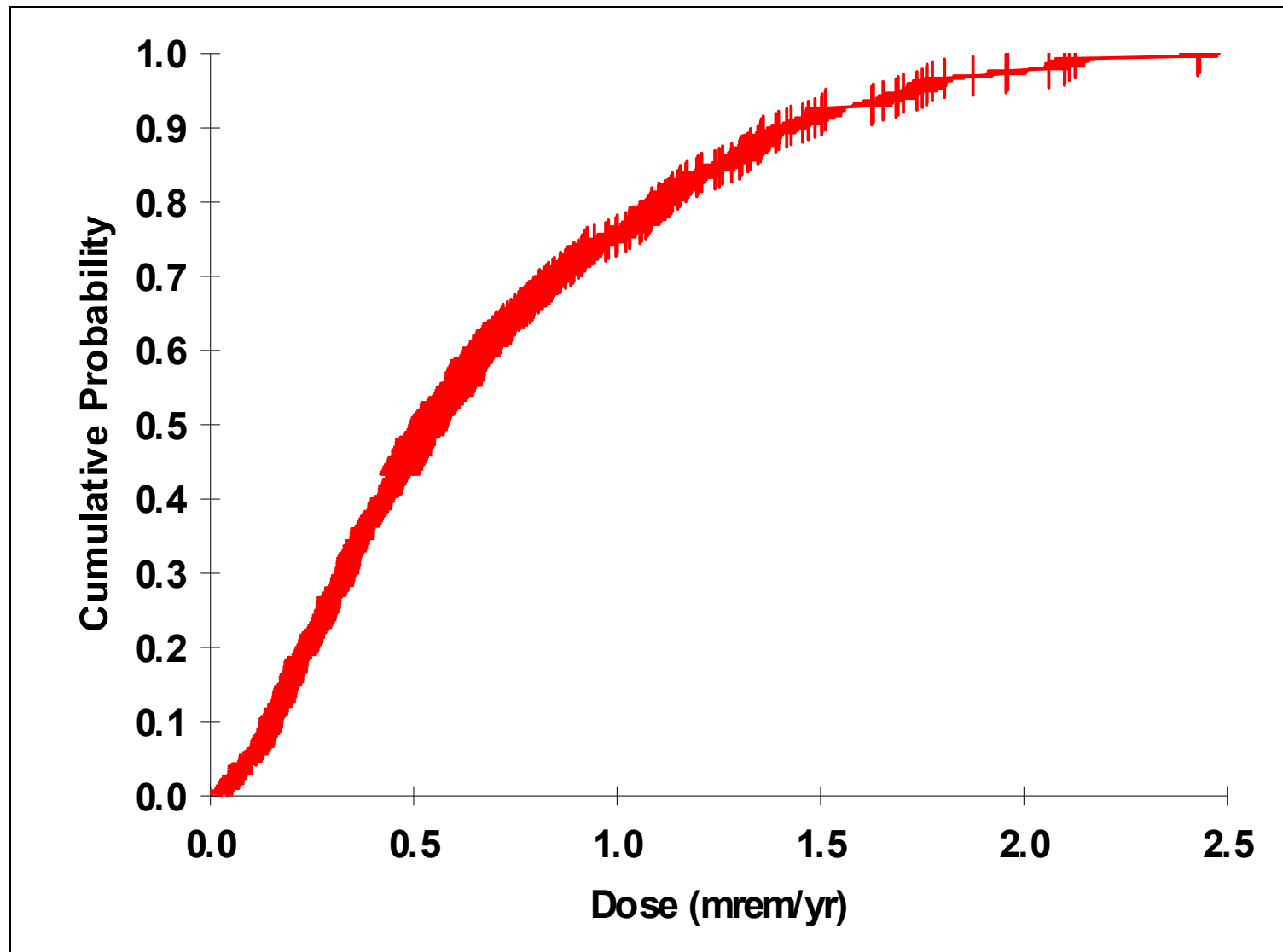


Figure H-64 Cumulative Probability Plot, Soil Ingestion Pathway, Truck Farmer, Uranium Source Term



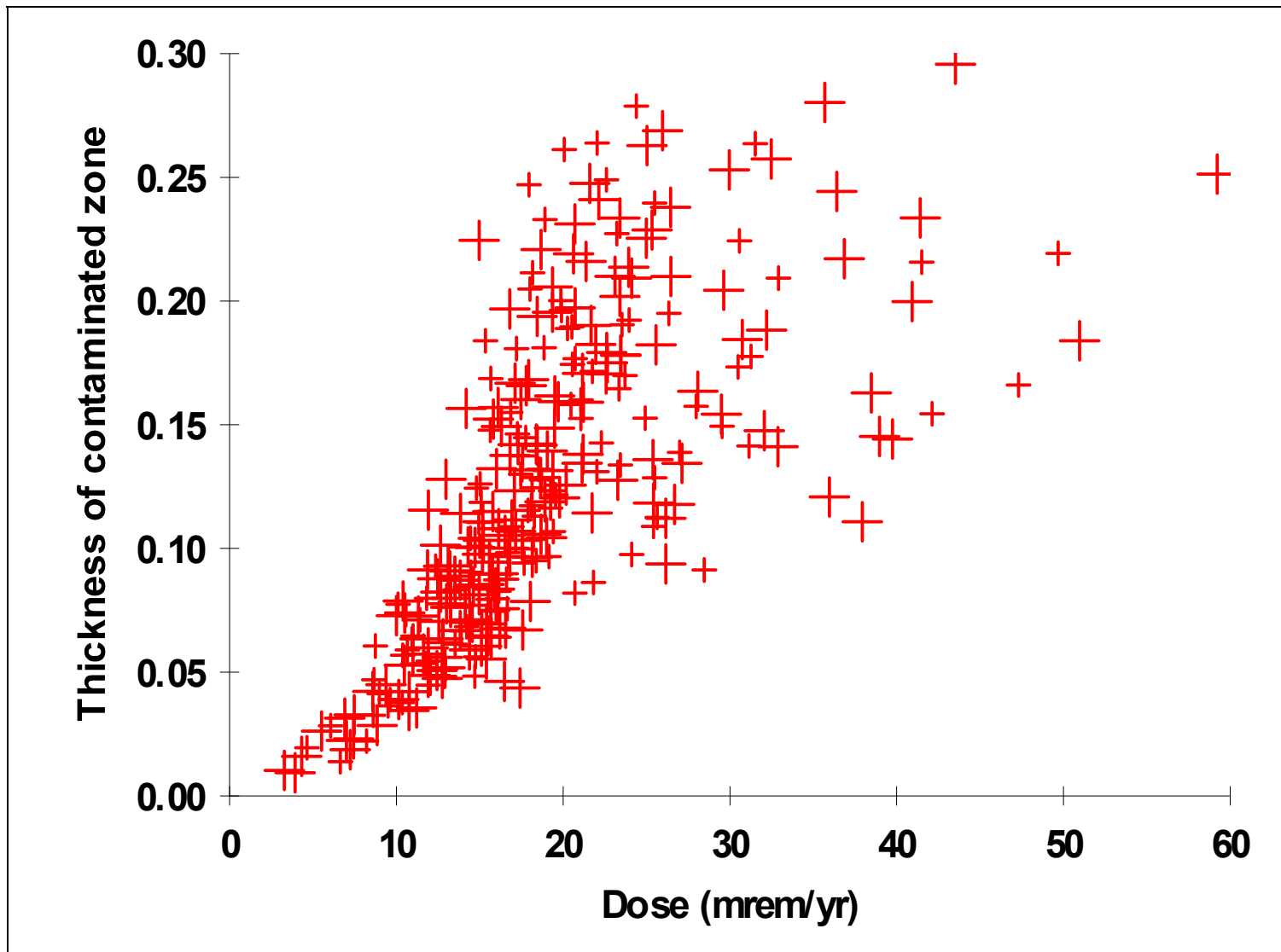


Figure H-65 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Truck Farmer, Uranium Source Term

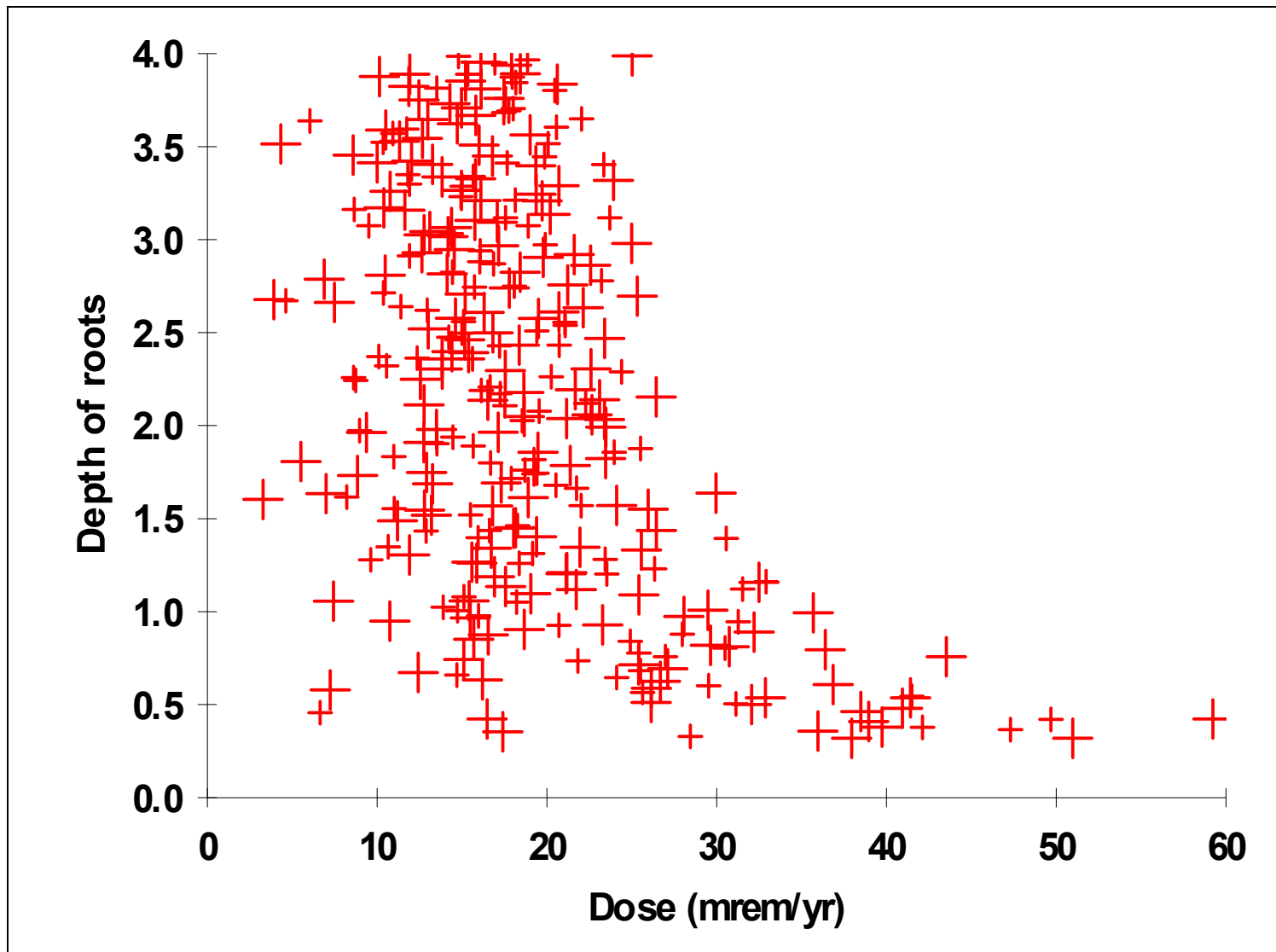


Figure H-66 Scatter Plot, Dose from All Pathways vs. Depth of Roots, Truck Farmer, Uranium Source Term

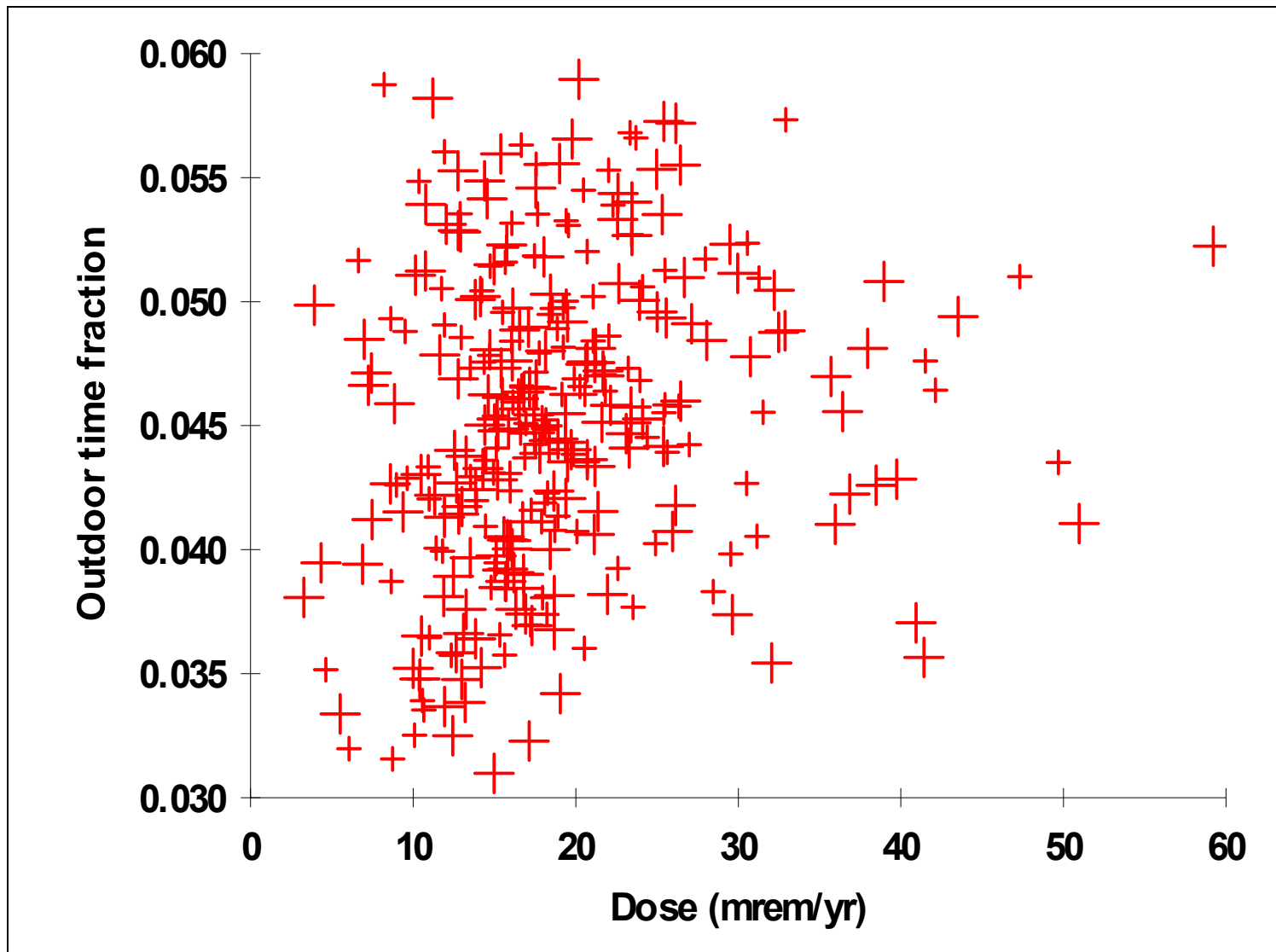


Figure H-67 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Truck Farmer, Uranium Source Term

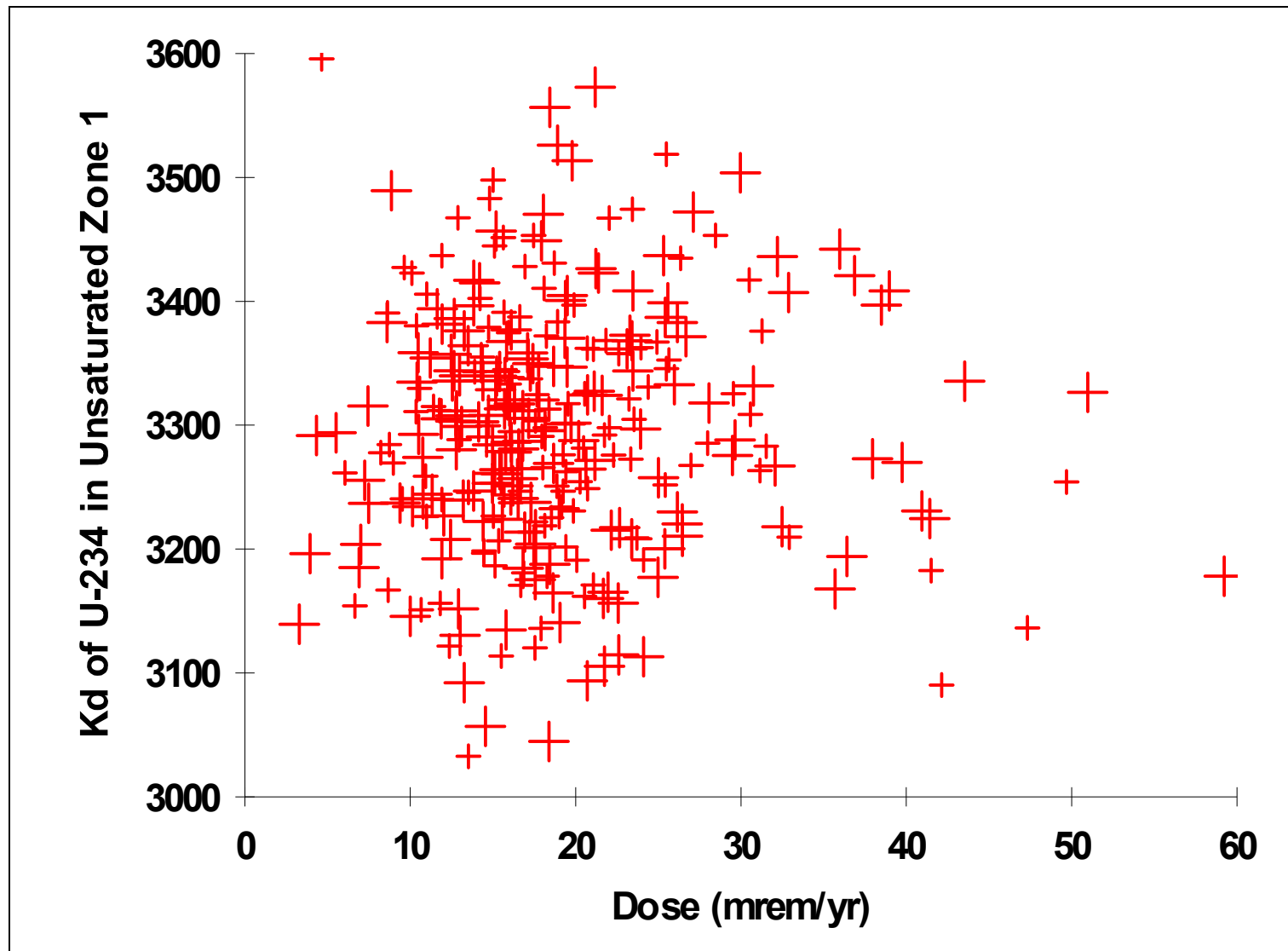


Figure H-68 Scatter Plot, Dose from All Pathways vs. Uranium Kd in Unsaturated Zone 1, Truck Farmer, Uranium Source Term

## H.6 SUBURBAN RESIDENT SCENARIO

### H.6.1 Byproduct Source Term, Suburban Resident

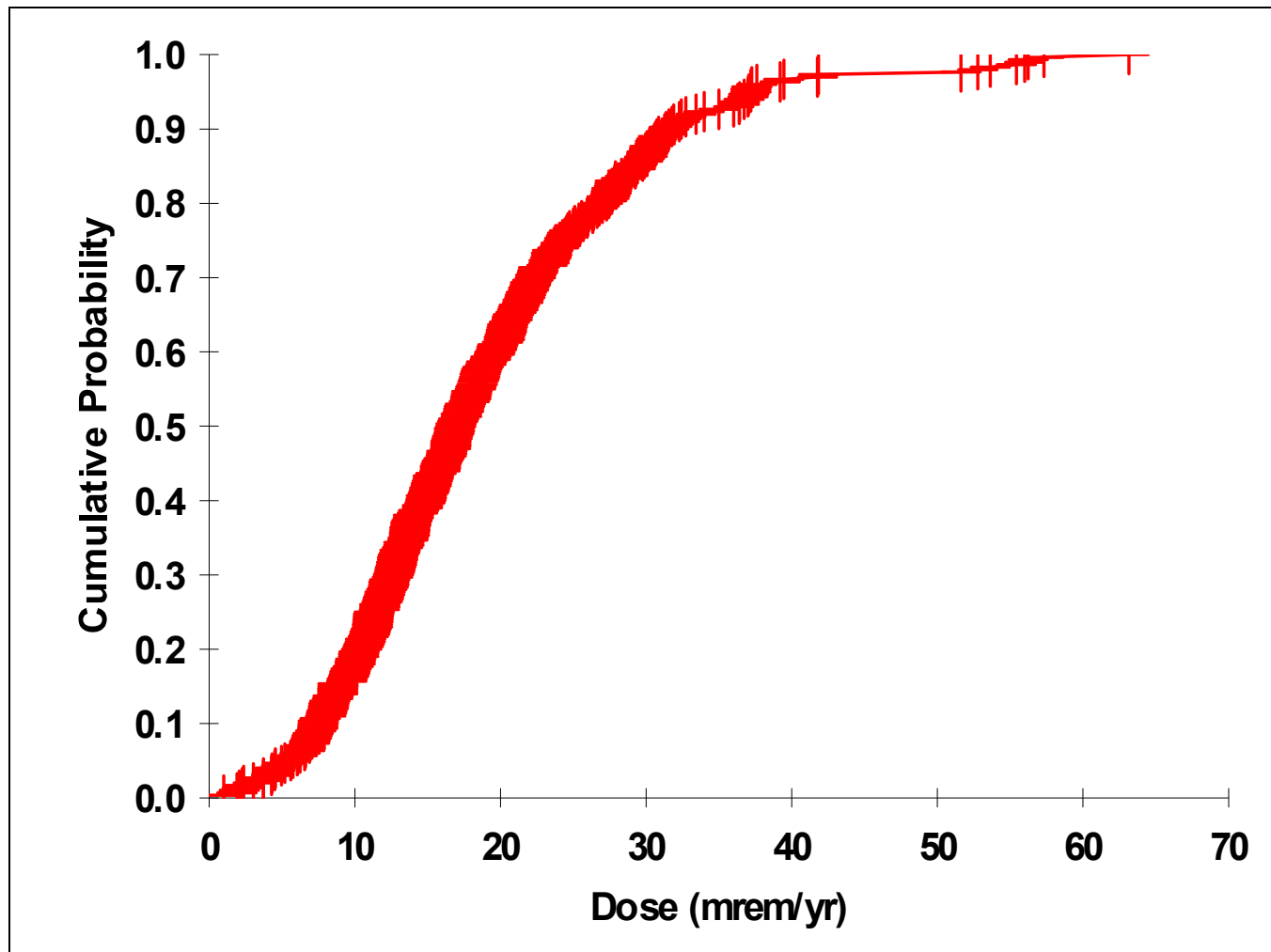


Figure H-69 Cumulative Probability Plot, All Pathways, Suburban Resident, Byproduct Source Term

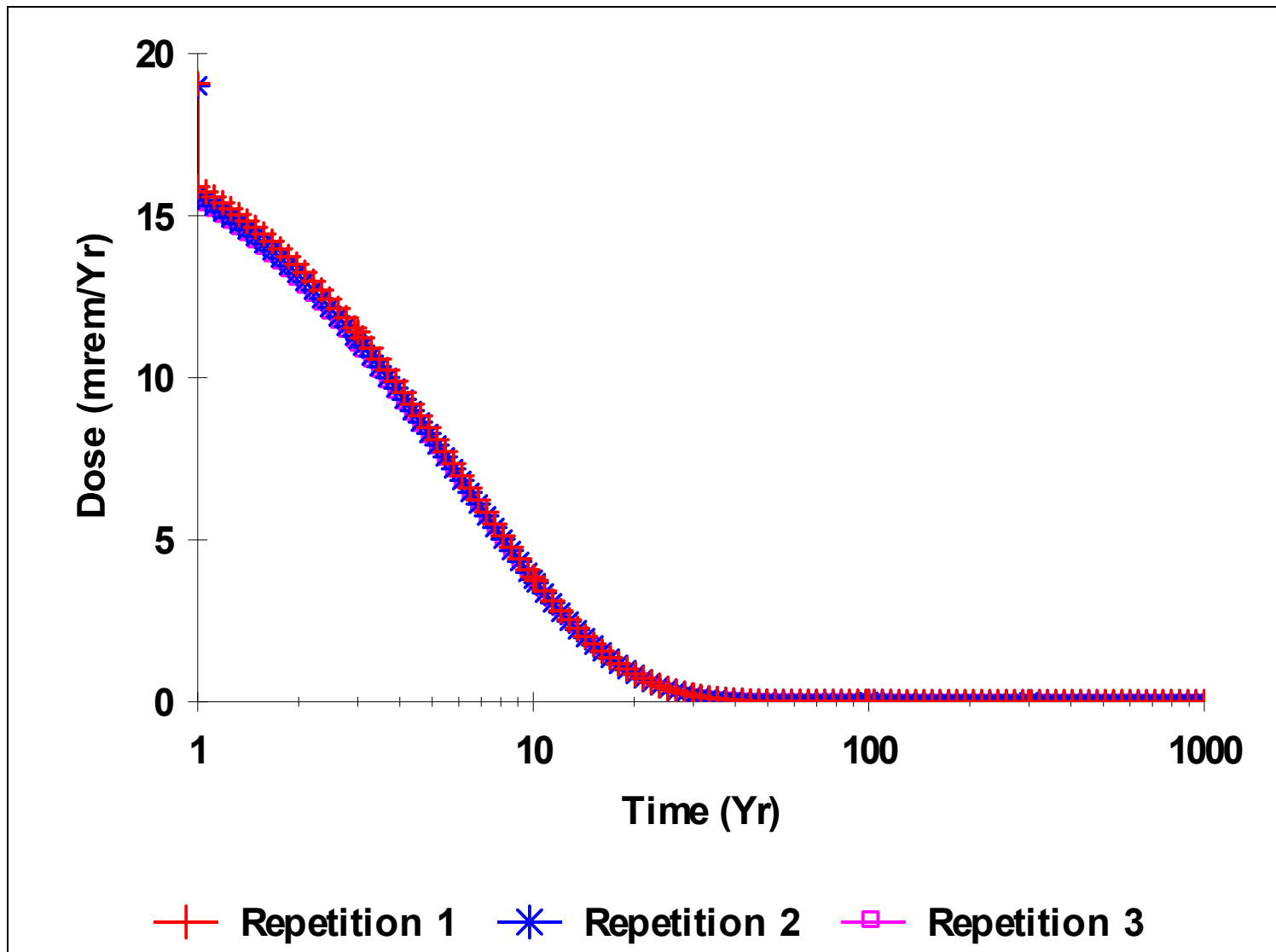


Figure H-70 Temporal Plot, Mean Total Dose, Suburban Resident, Byproduct Source Term

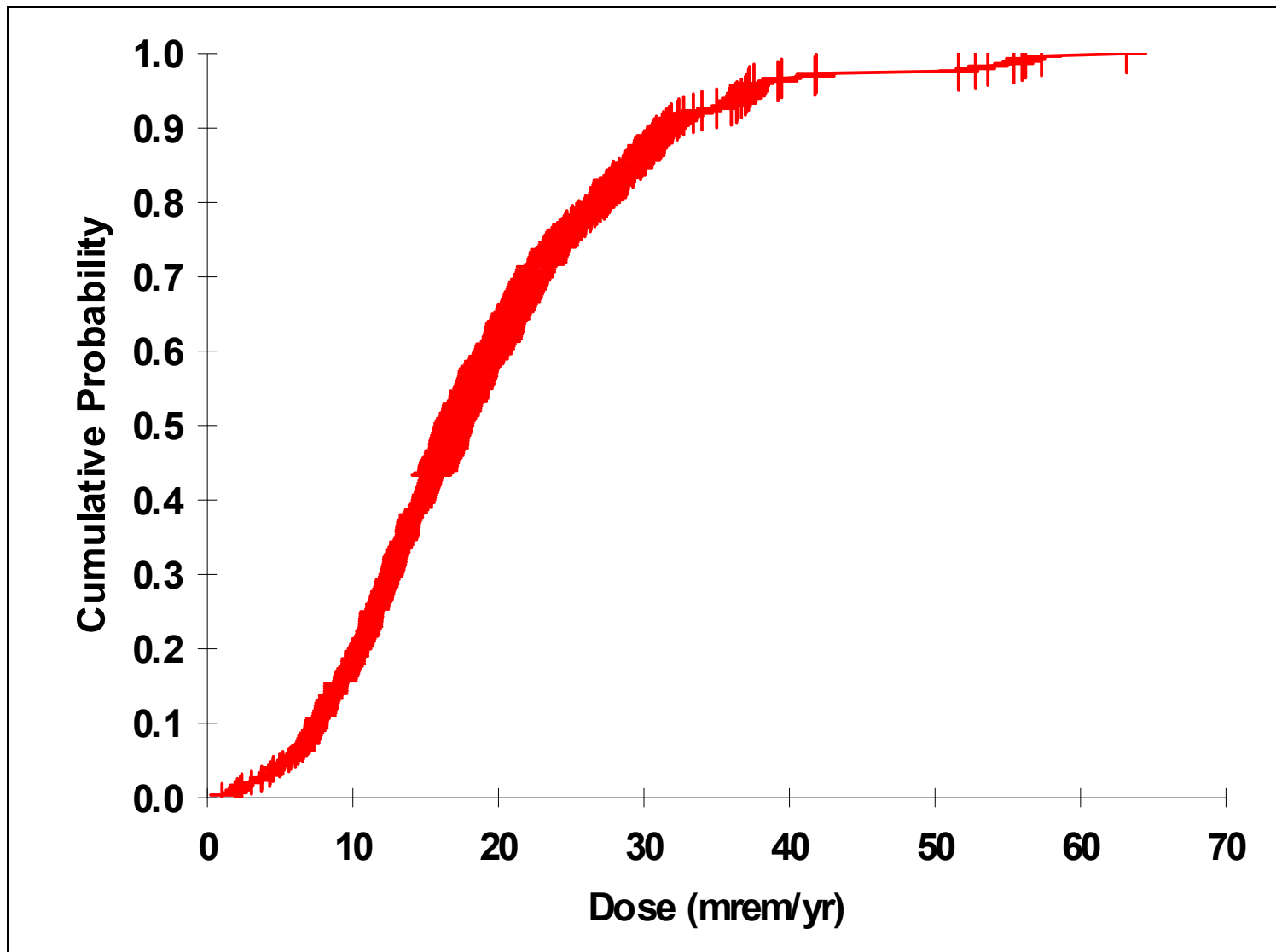


Figure H-71 Cumulative Probability Plot, External Pathway, Suburban Resident, Byproduct Source Term

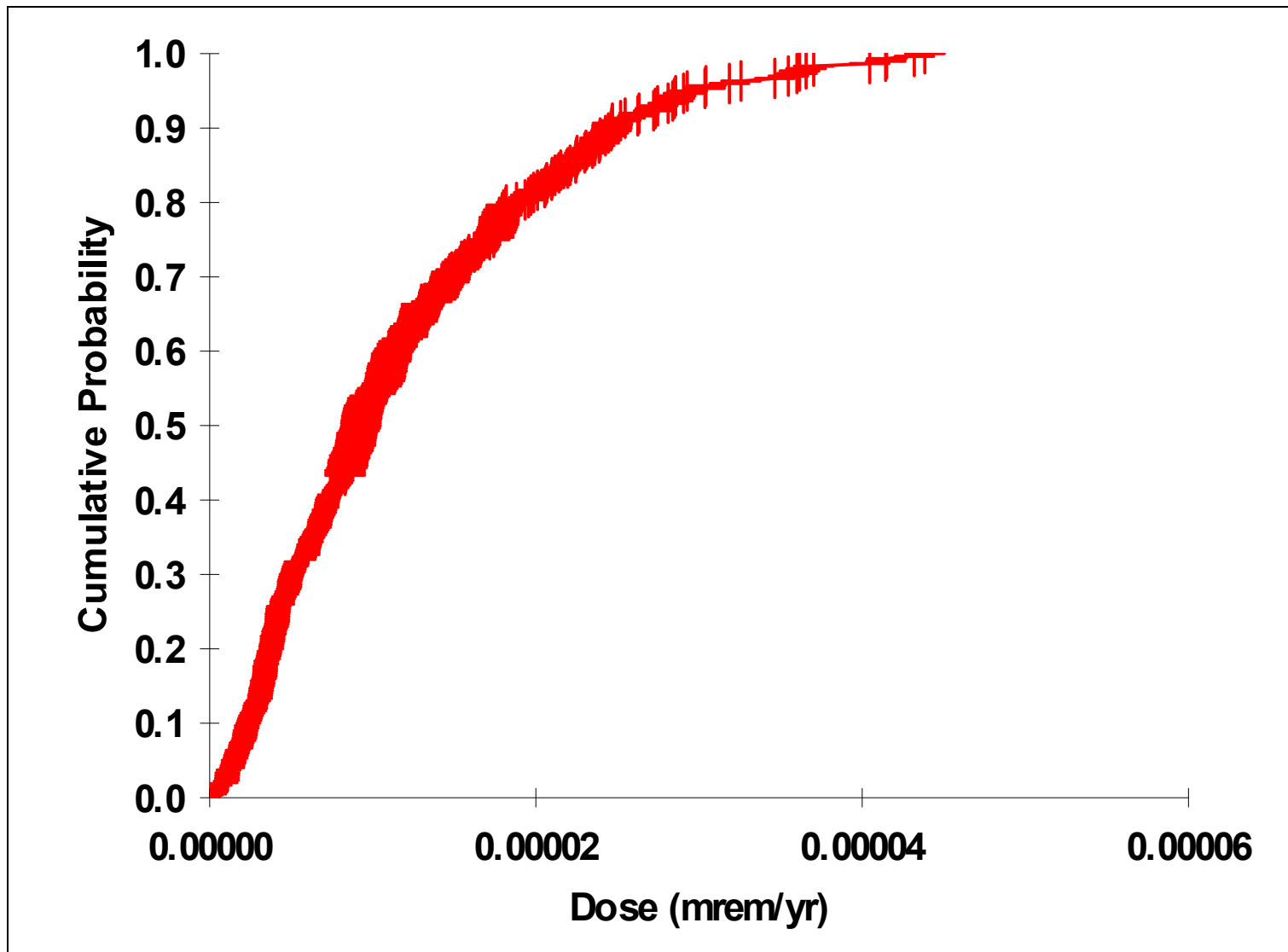


Figure H-72 Cumulative Probability Plot, Inhalation Pathway, Suburban Resident, Byproduct Source Term



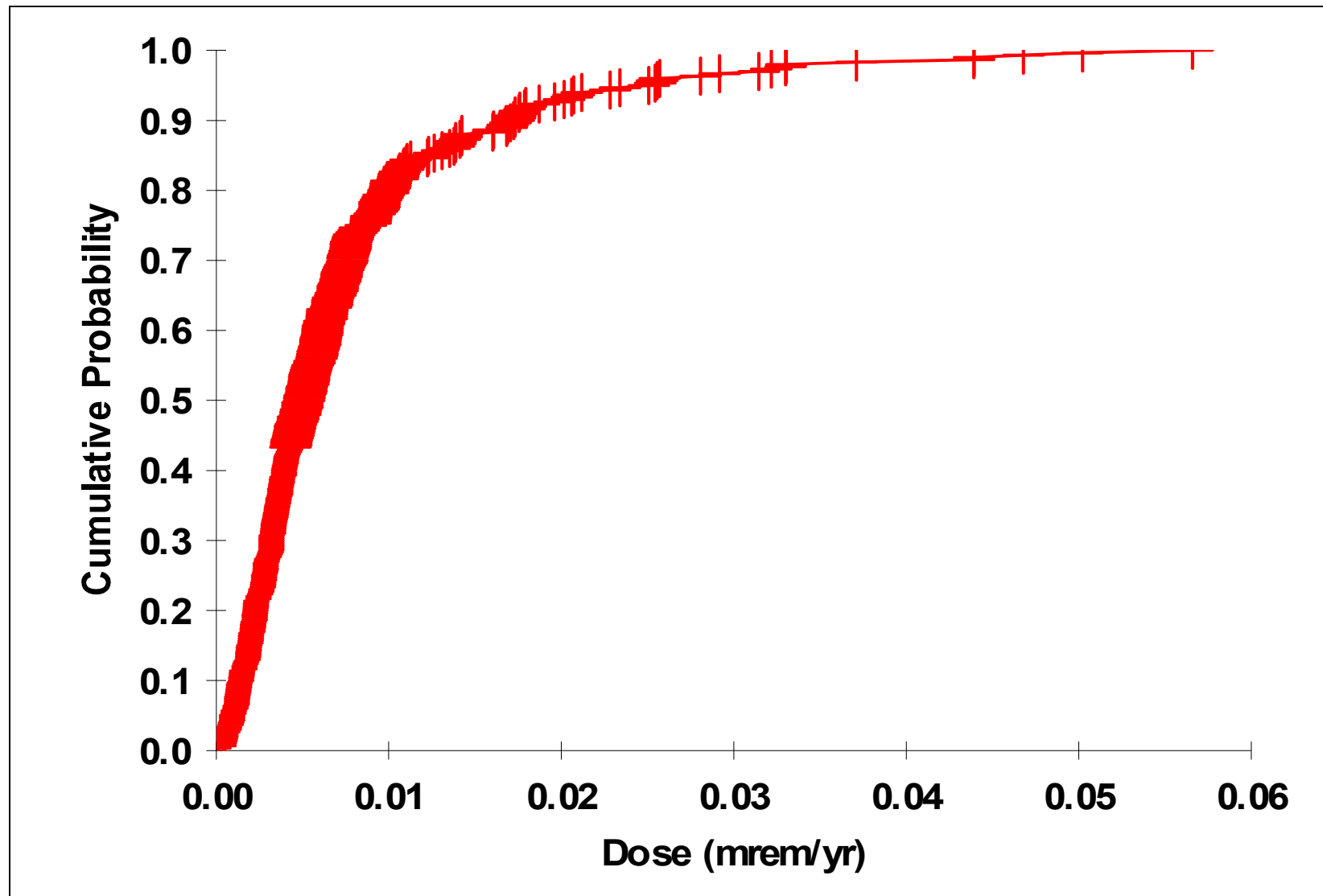


Figure H-73 Cumulative Probability Plot, Plant Ingestion Pathway, Suburban Resident, Byproduct Source Term

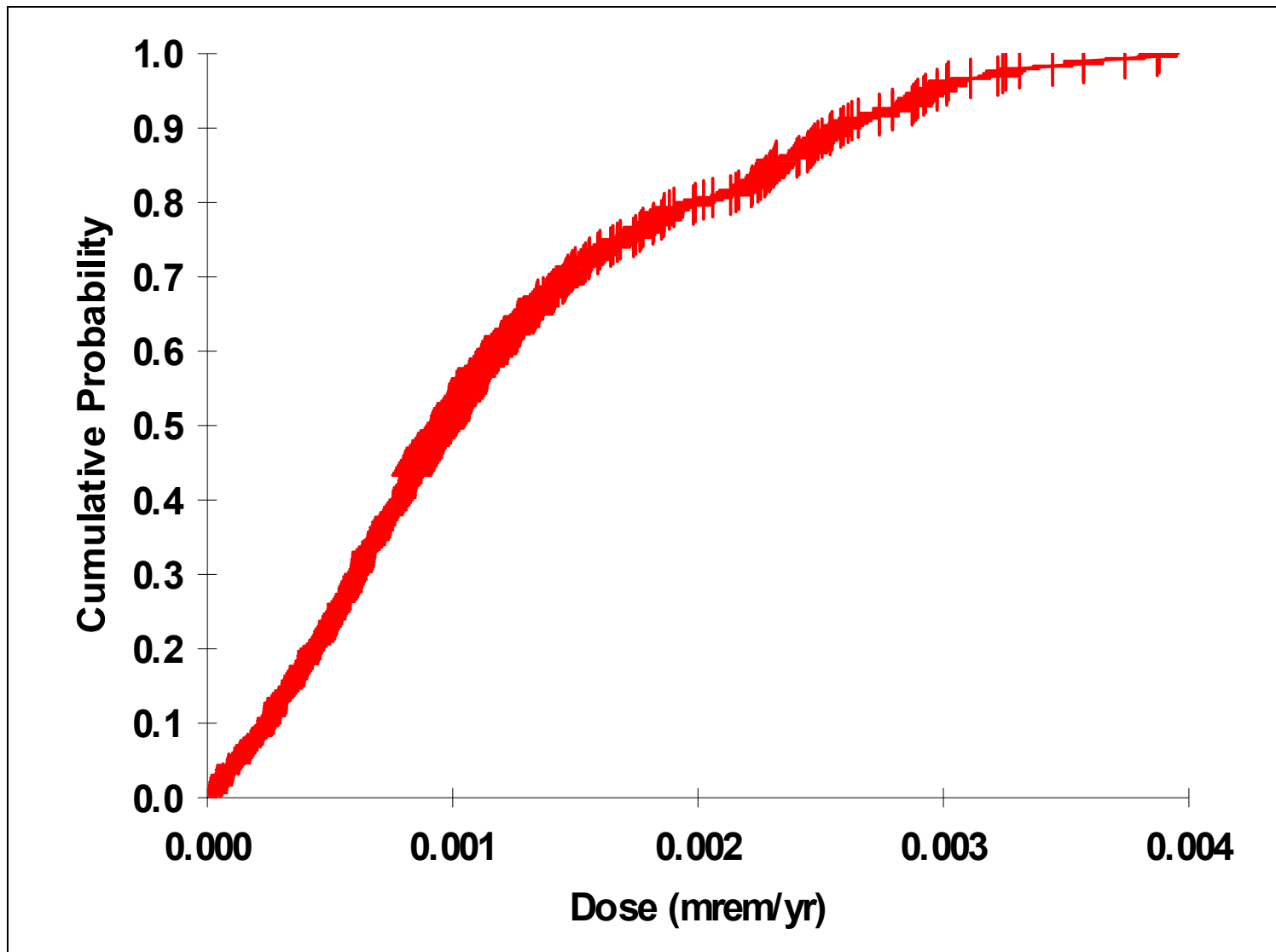


Figure H-74 Cumulative Probability Plot, Soil Ingestion Pathway, Suburban Resident, Byproduct Source Term

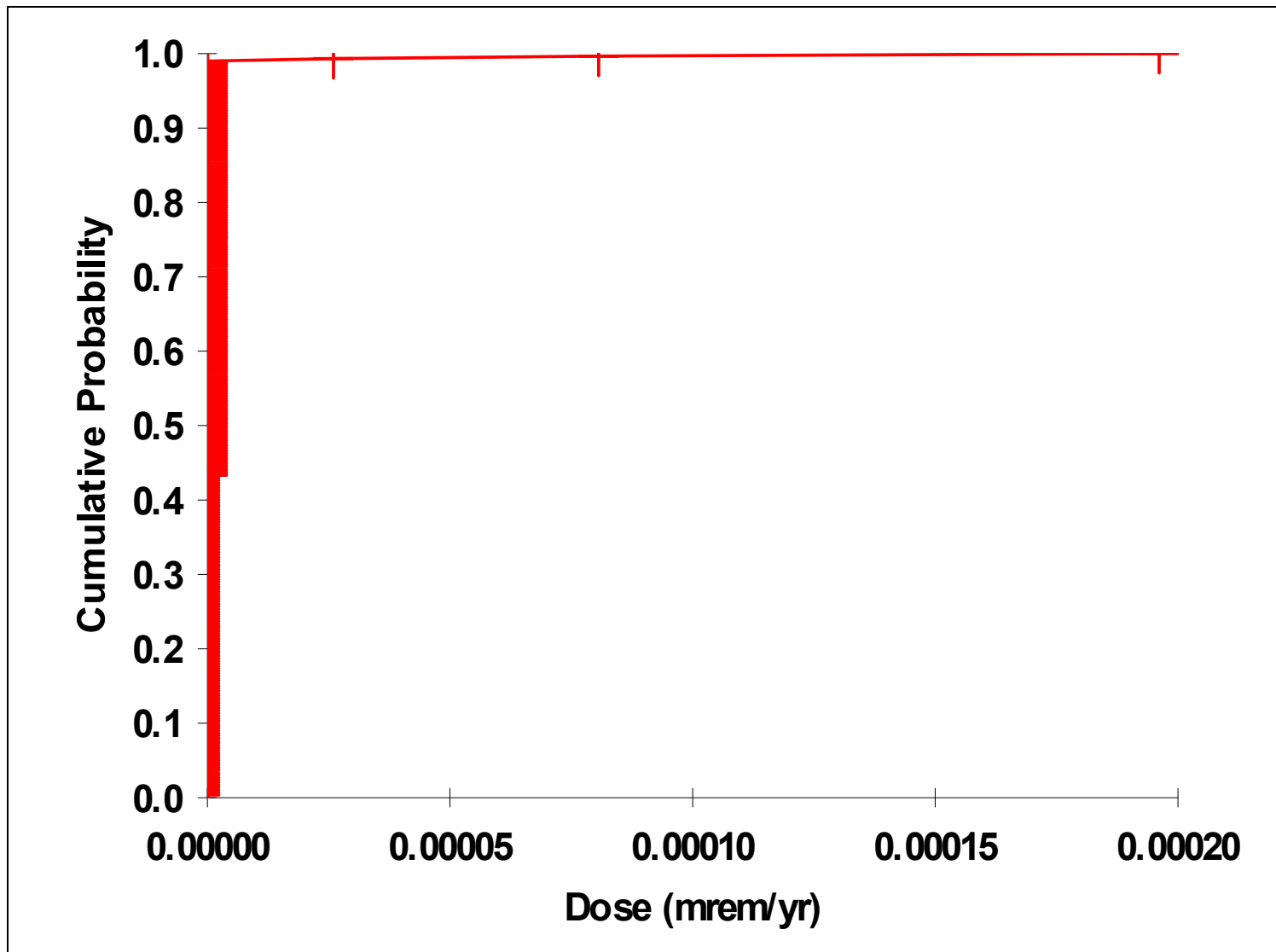


Figure H-75 Cumulative Probability Plot, Drinking Water Pathway, Suburban Resident, Byproduct Source Term

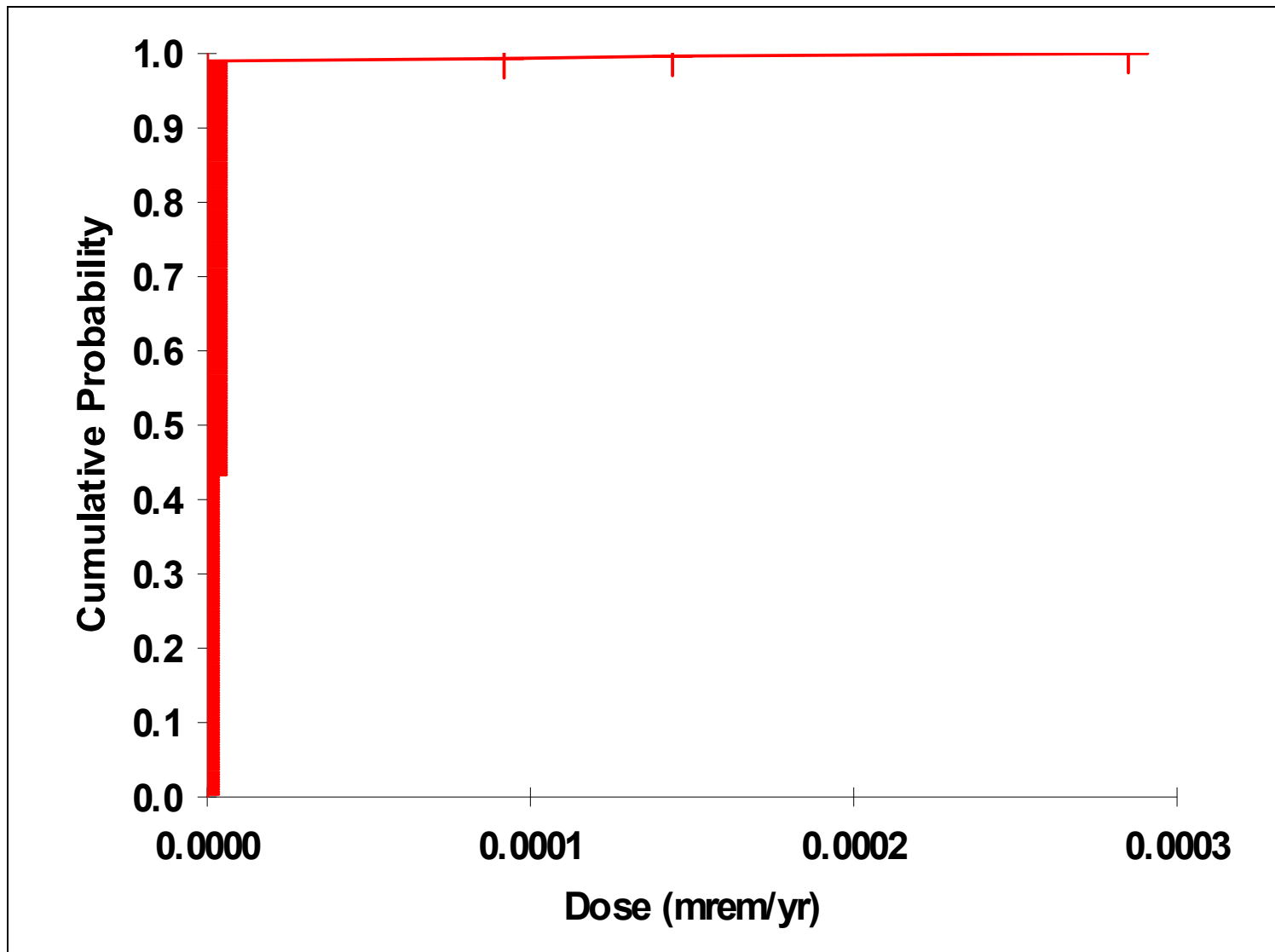


Figure H-76 Cumulative Probability Plot, Aquatic Foods Ingestion Pathway, Suburban Resident, Byproduct Source Term

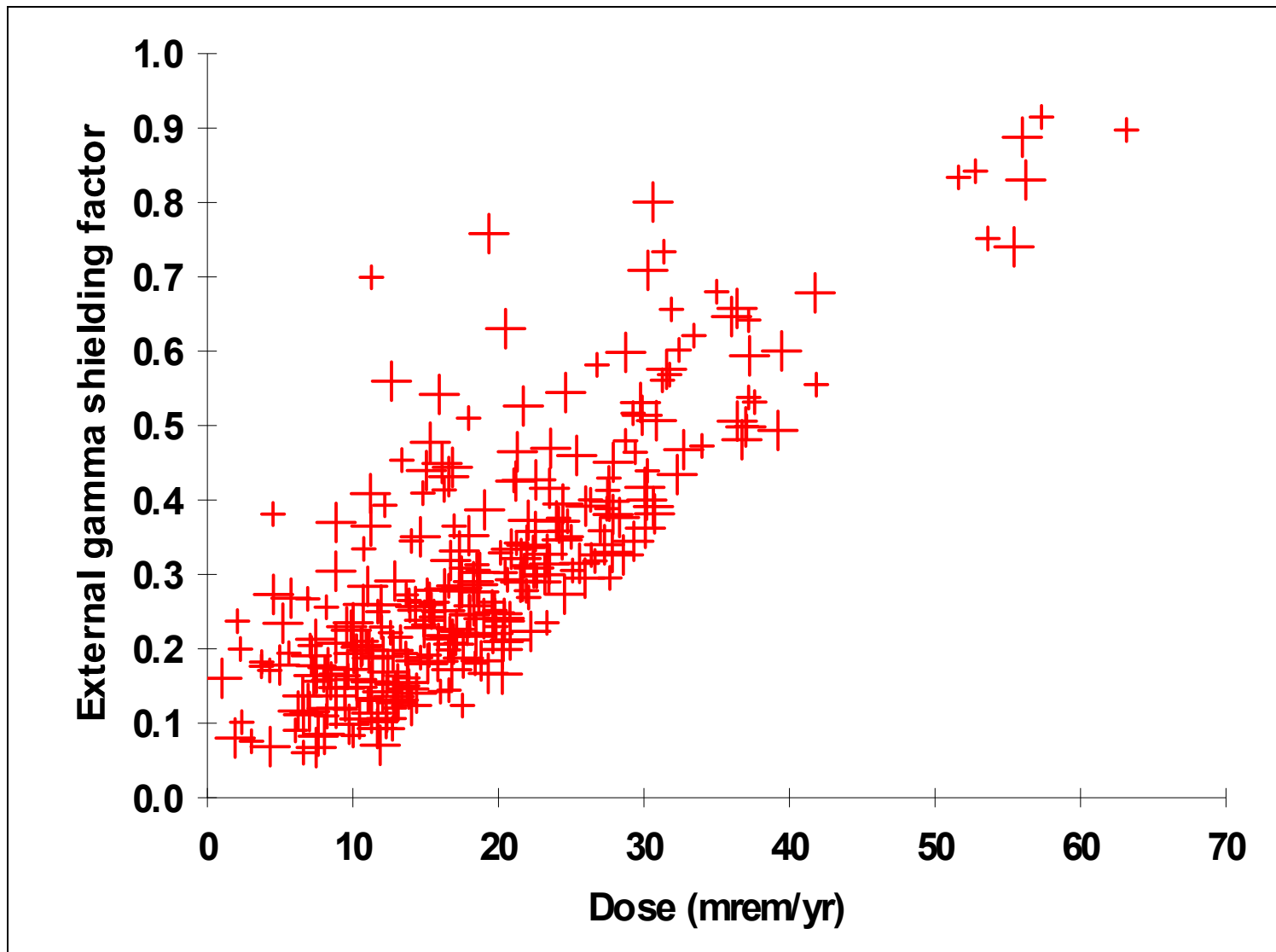


Figure H-77 Scatter Plot, Dose from All Pathways vs. External Gamma Shielding Factor, Suburban Resident, Byproduct Source Term

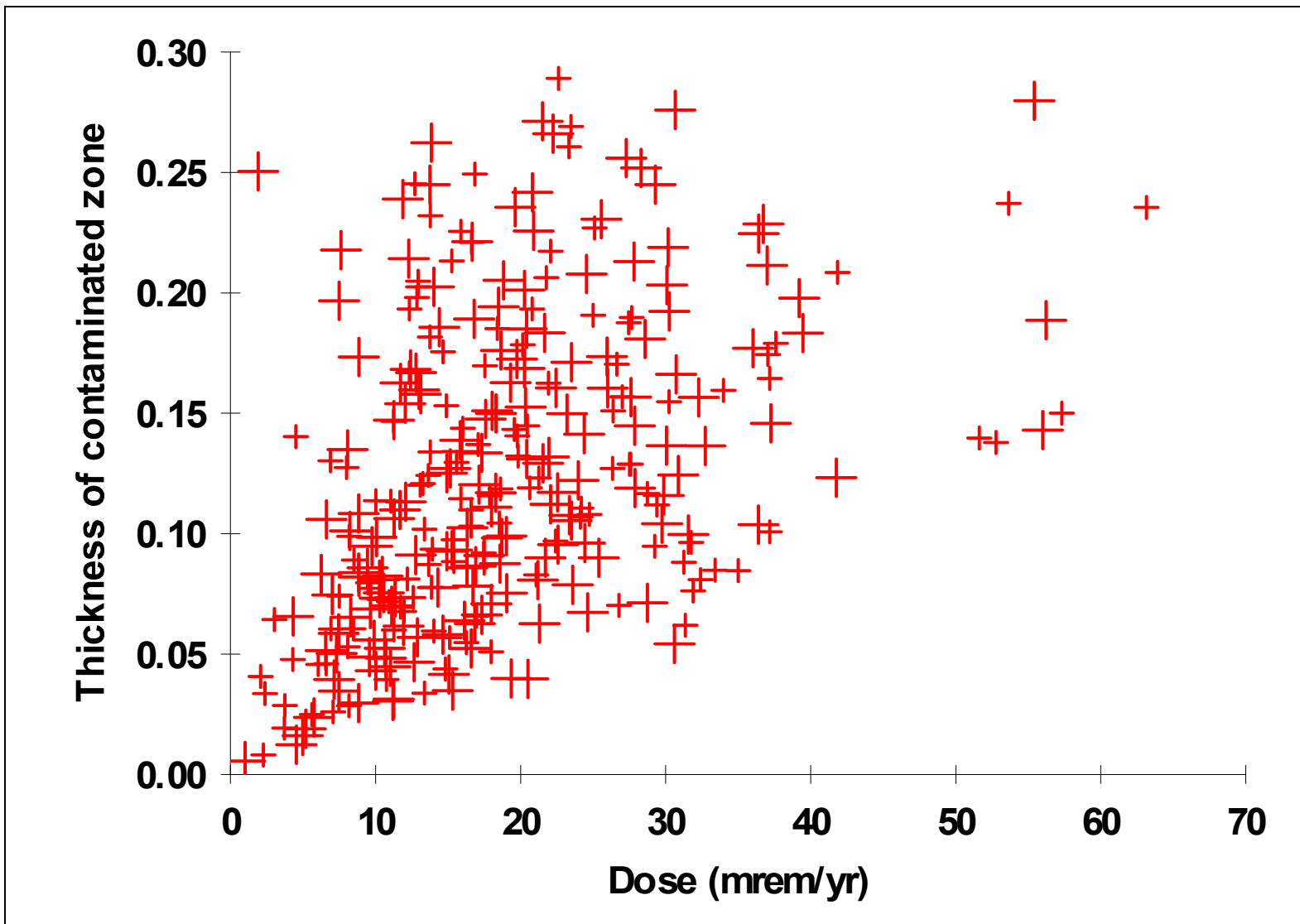


Figure H-78 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Suburban Resident, Byproduct Source Term

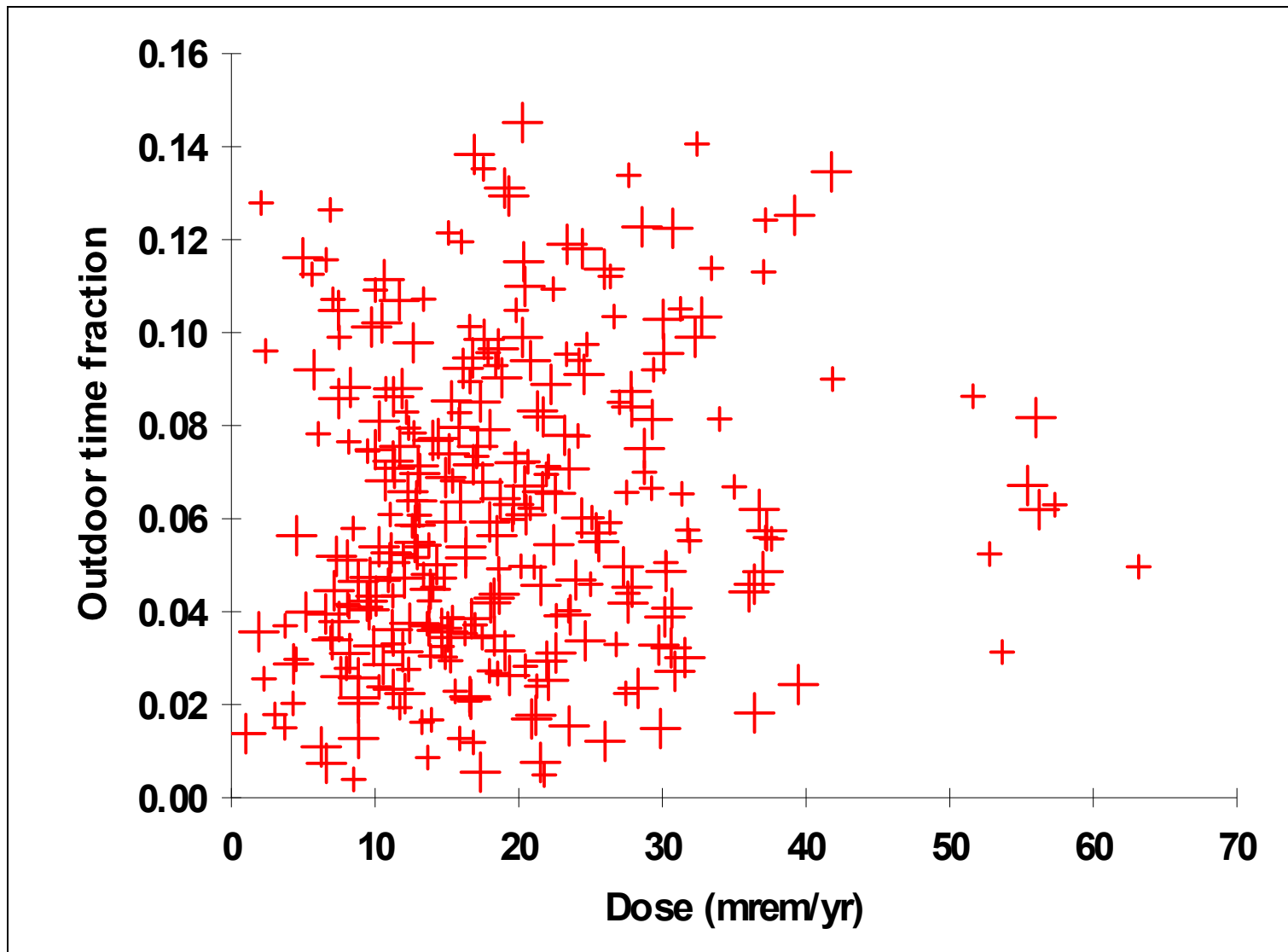


Figure H-79 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Suburban Resident, Byproduct Source Term

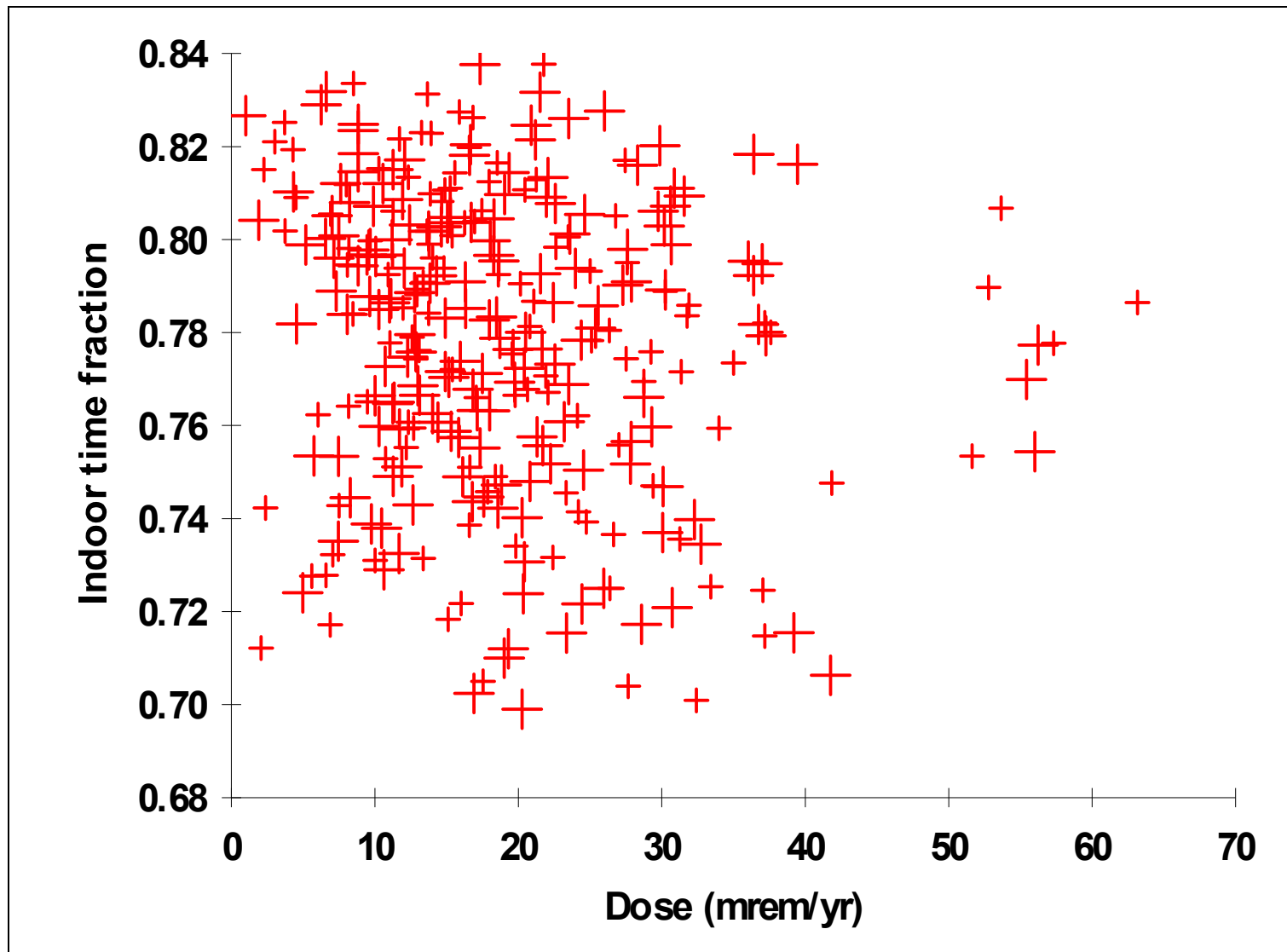


Figure H-80 Scatter Plot, Dose from All Pathways vs. Indoor Time Fraction, Suburban Resident, Byproduct Source Term



### H.6.2 Uranium Source Term, Suburban Resident

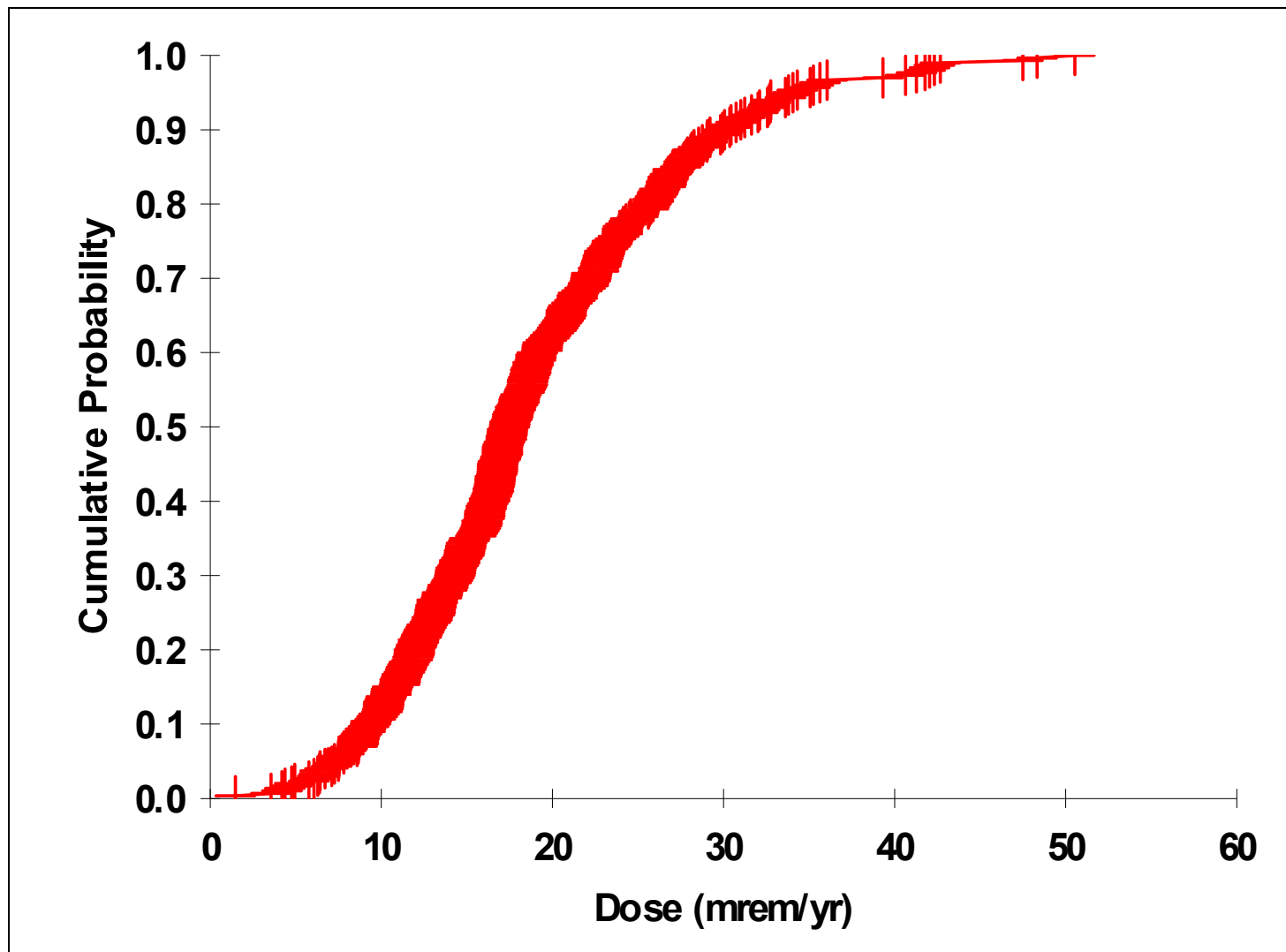


Figure H-81 Cumulative Probability Plot, All Pathways, Suburban Resident, Uranium Source Term

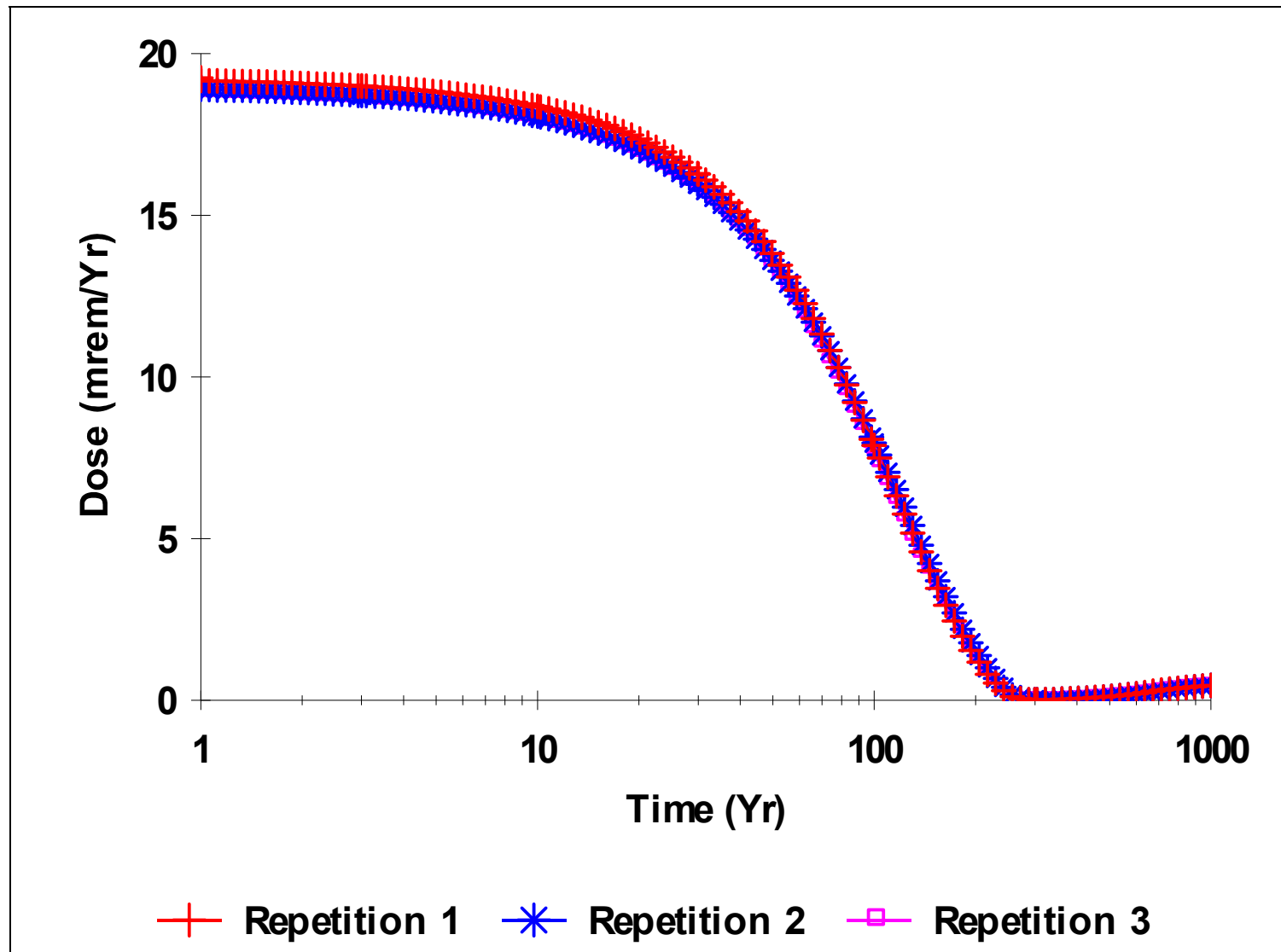


Figure H-82 Temporal Plot, Mean Total Dose, Suburban Resident, Uranium Source Term

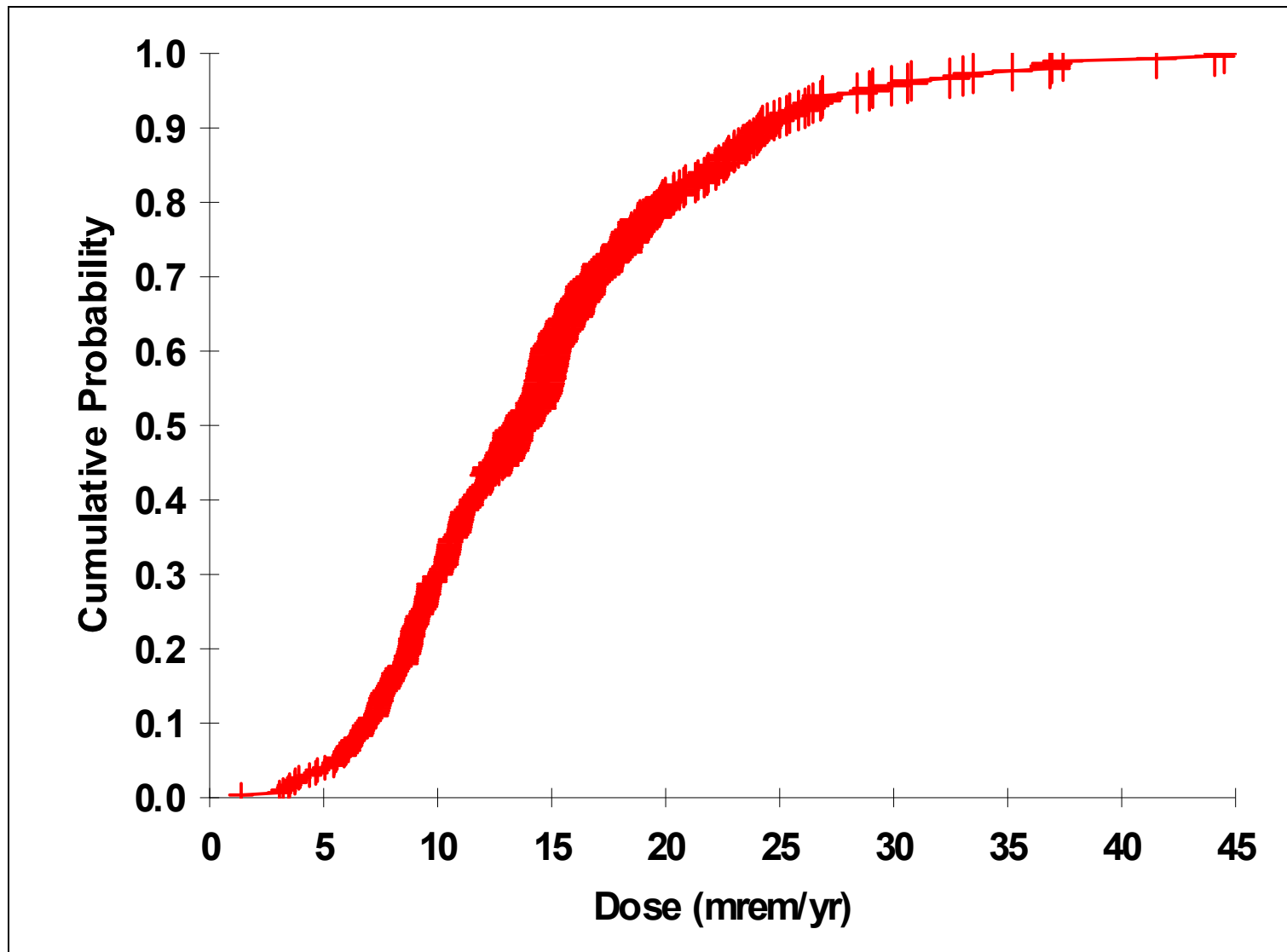


Figure H-83 Cumulative Probability Plot, External Pathway, Suburban Resident, Uranium Source Term

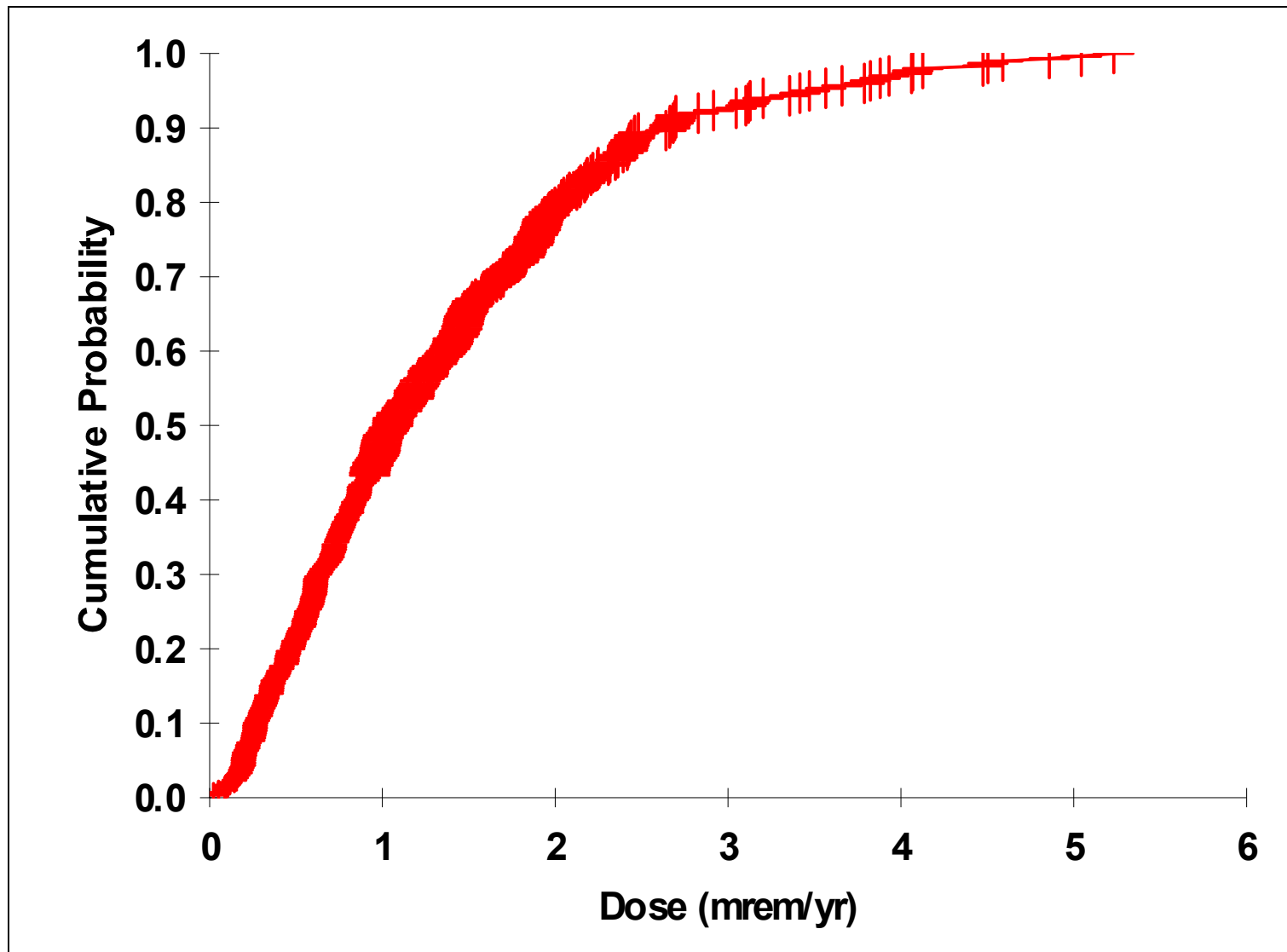


Figure H-84 Cumulative Probability Plot, Inhalation Pathway, Suburban Resident, Uranium Source Term

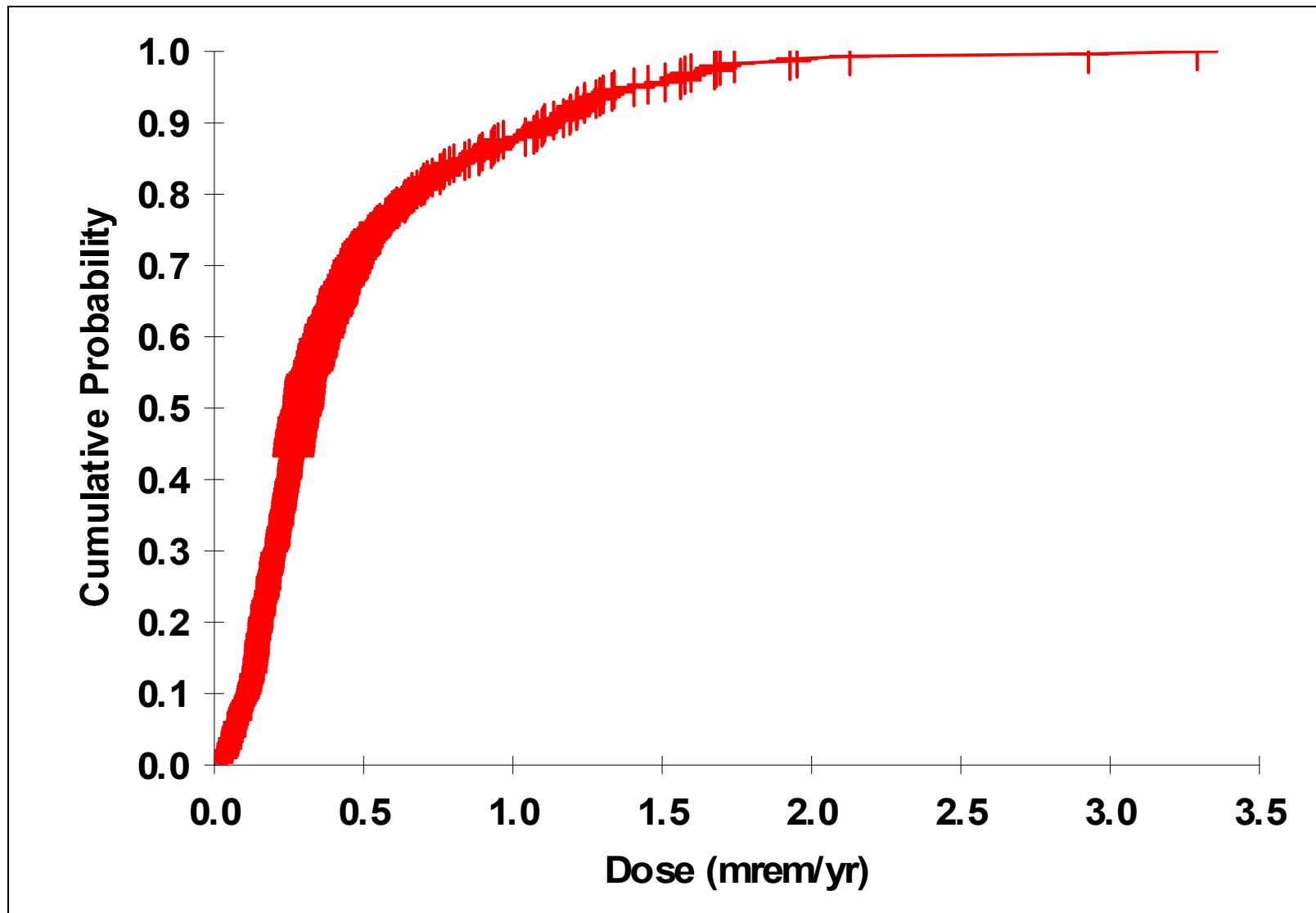


Figure H-85 Cumulative Probability Plot, Plant Ingestion Pathway, Suburban Resident, Uranium Source Term

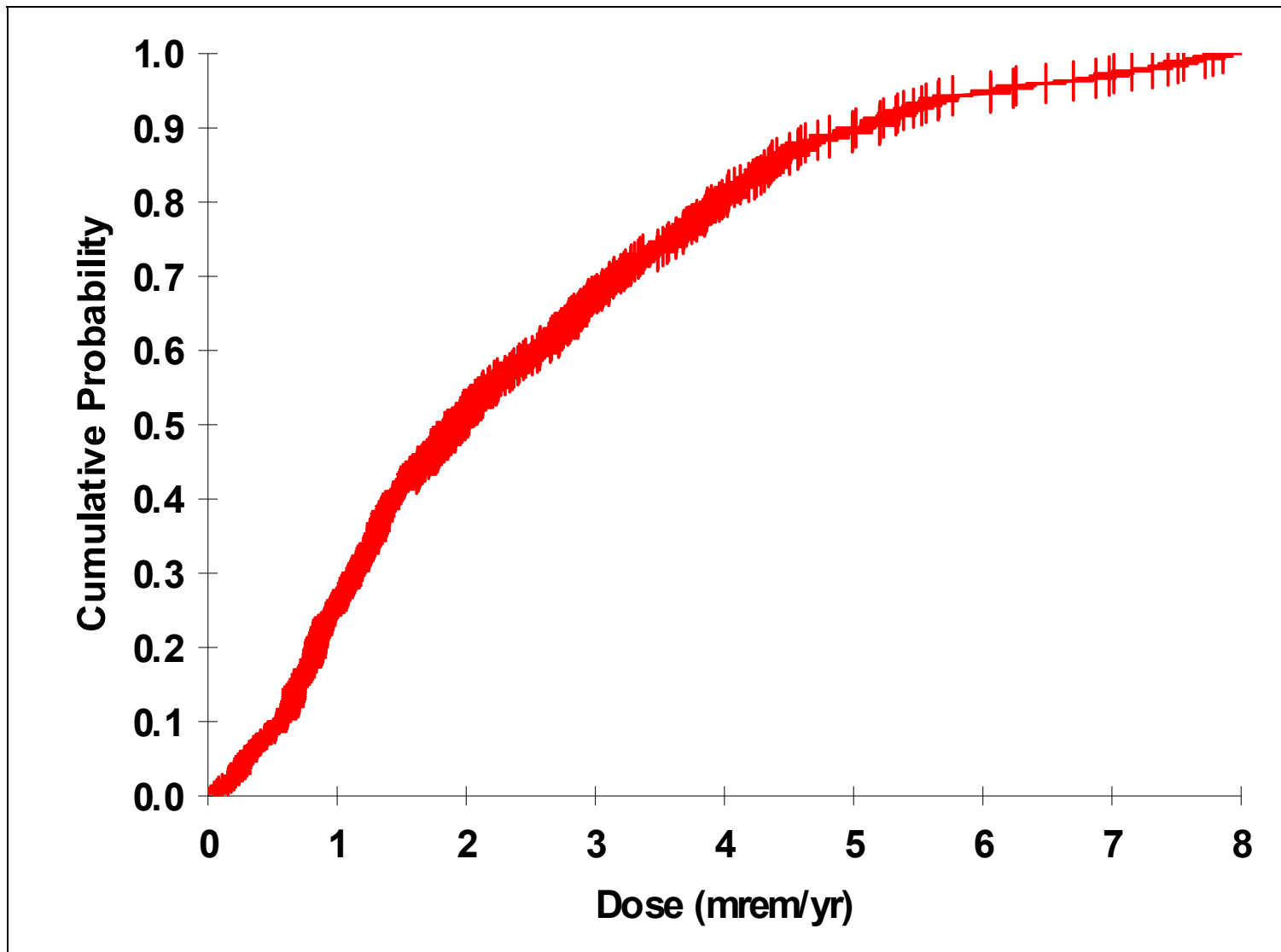


Figure H-86 Cumulative Probability Plot, Soil Ingestion Pathway, Suburban Resident, Uranium Source Term

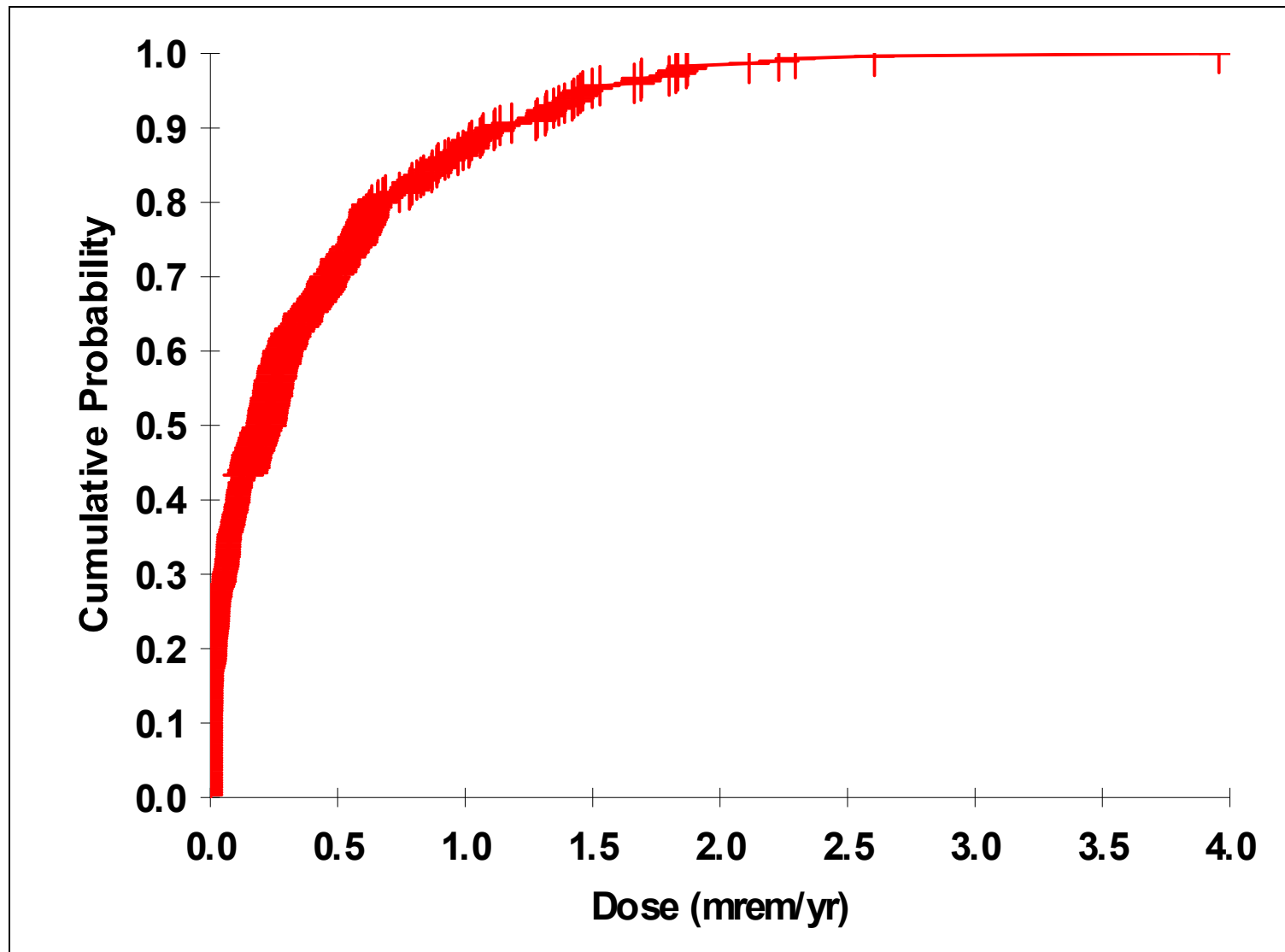


Figure H-87 Cumulative Probability Plot, Drinking Water Pathway, Suburban Resident, Uranium Source Term

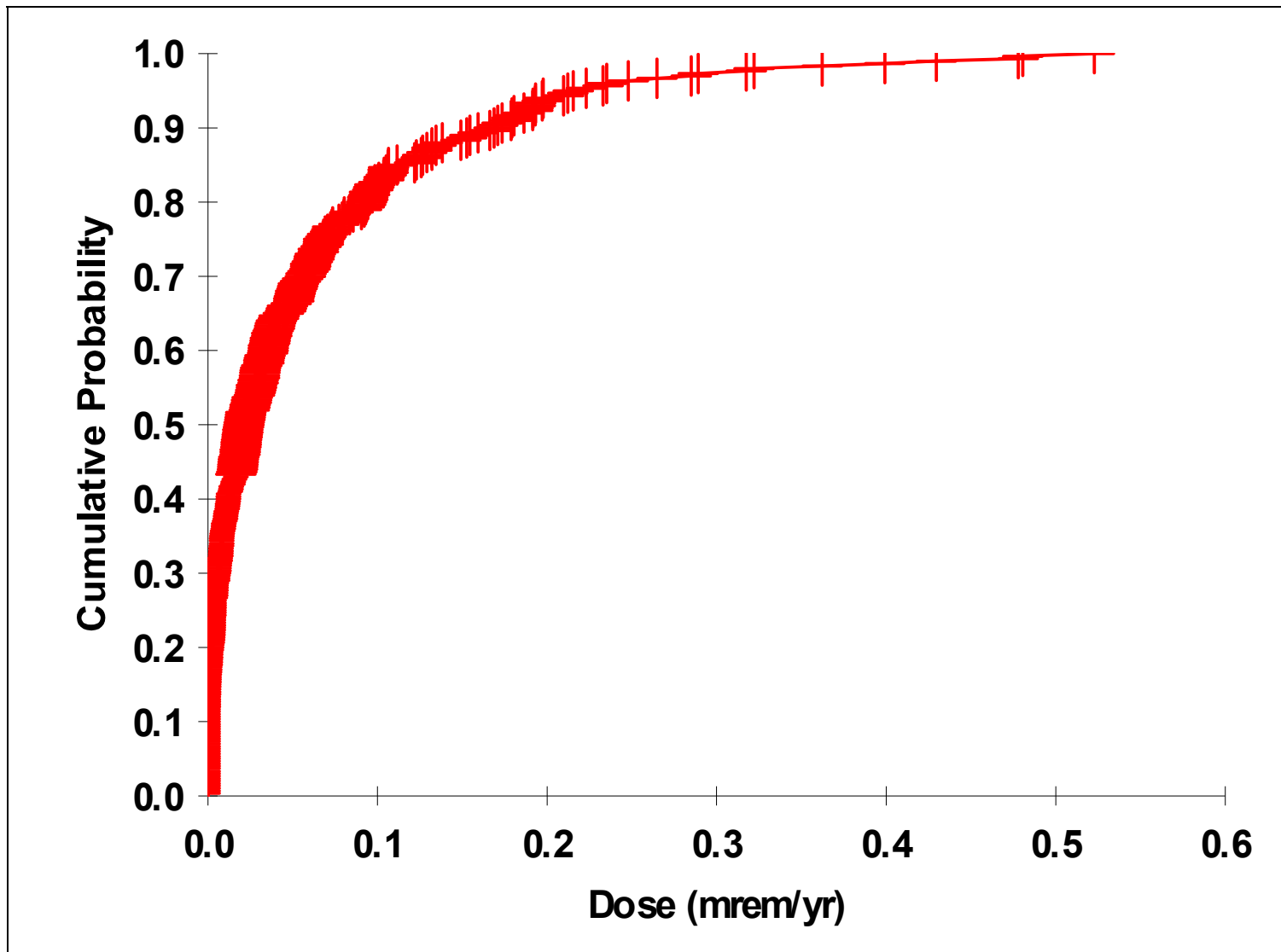


Figure H-88 Cumulative Probability Plot, Aquatic Foods Ingestion Pathway, Suburban Resident, Uranium Source Term



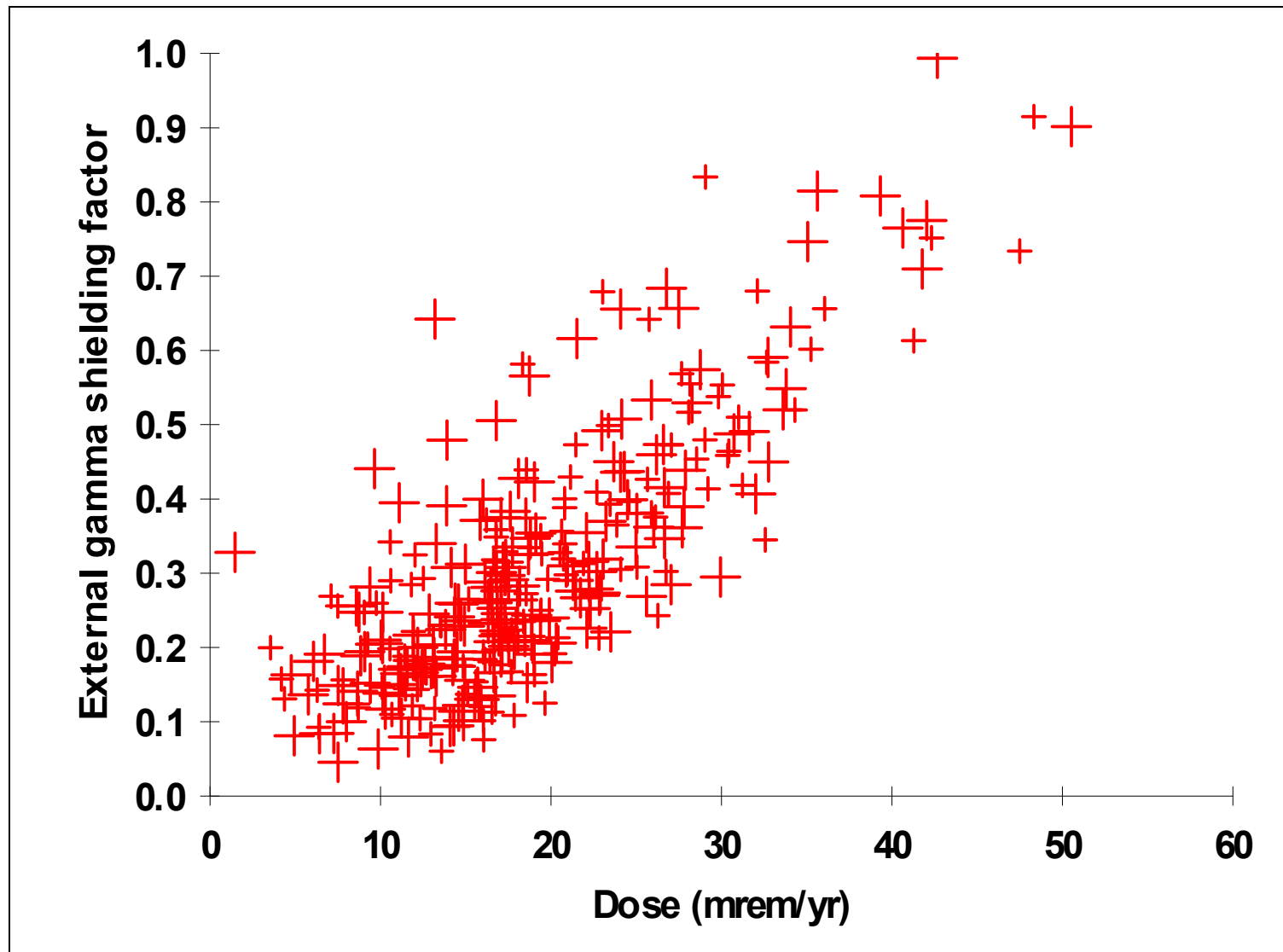


Figure H-89 Scatter Plot, Dose from All Pathways vs. External Gamma Shielding Factor, Suburban Resident, Uranium Source Term

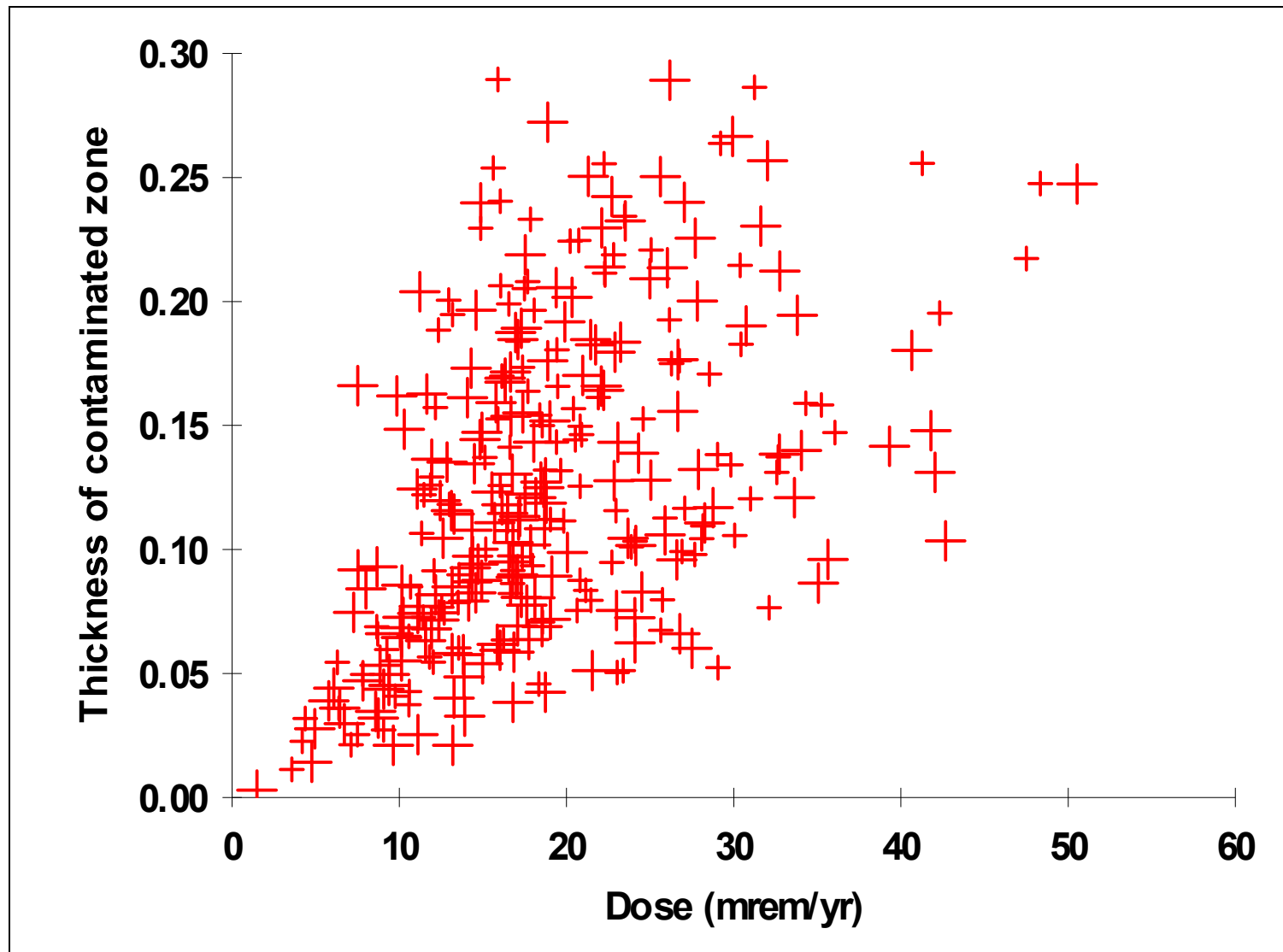


Figure H-90 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Suburban Resident, Uranium Source Term

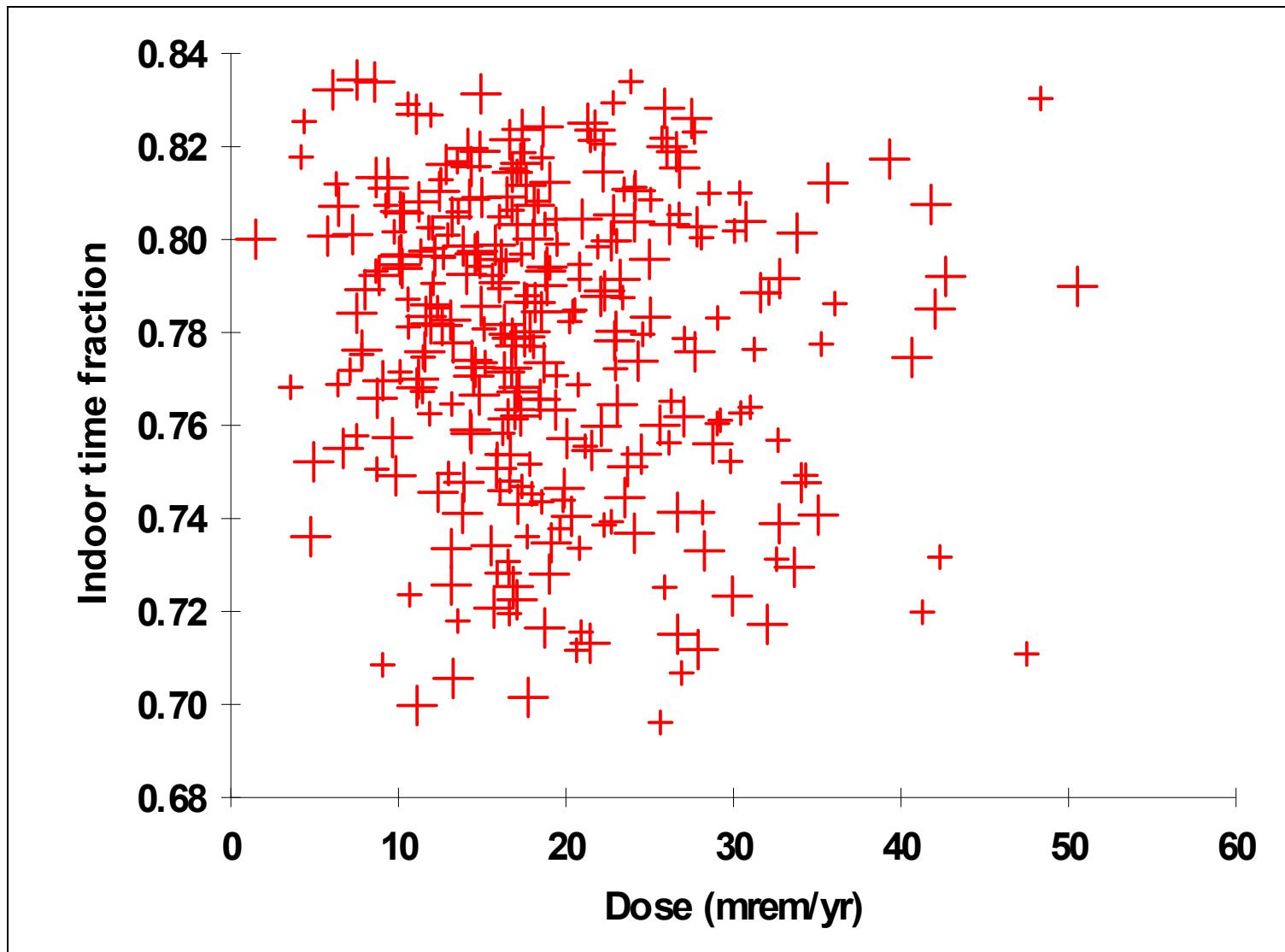


Figure H-91 Scatter Plot, Dose from All Pathways vs. Indoor Time Fraction, Suburban Resident, Uranium Source Term

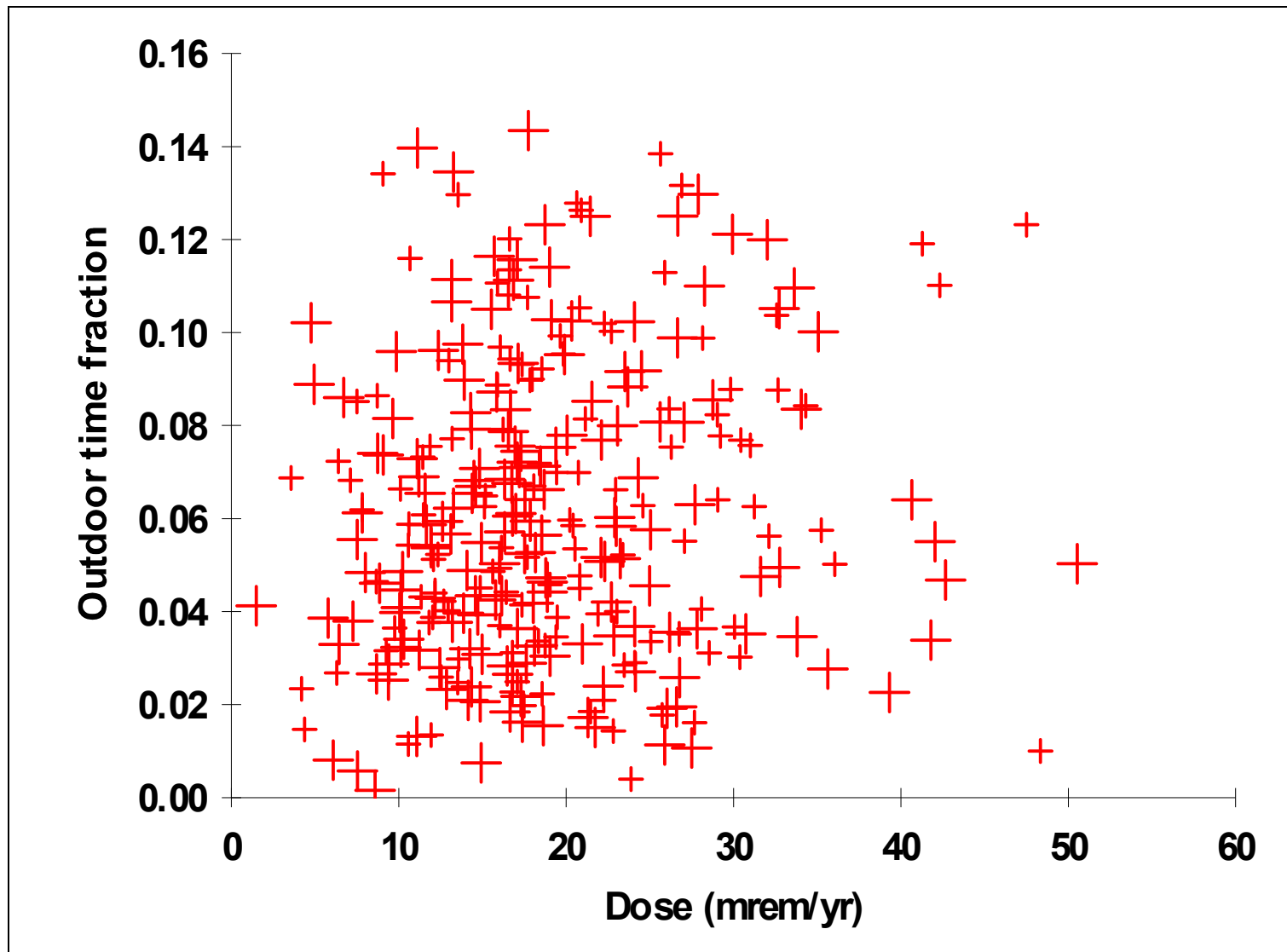


Figure H-92 Scatter Plot, Dose from All Pathways vs. Outdoor Time Fraction, Suburban Resident, Uranium Source Term

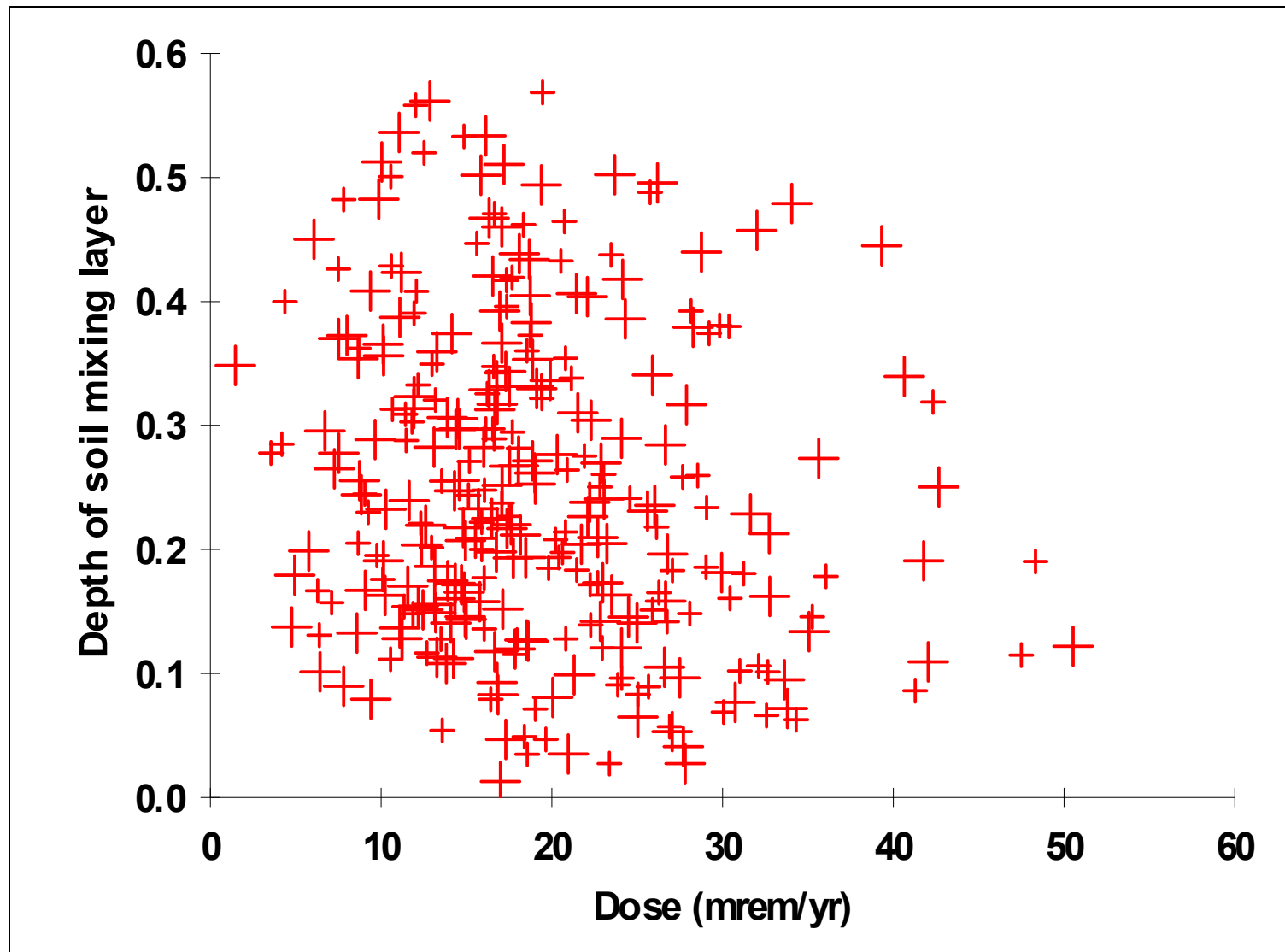


Figure H-93 Scatter Plot, Dose from All Pathways vs. Depth of Soil Mixing Layer, Suburban Resident, Uranium Source Term

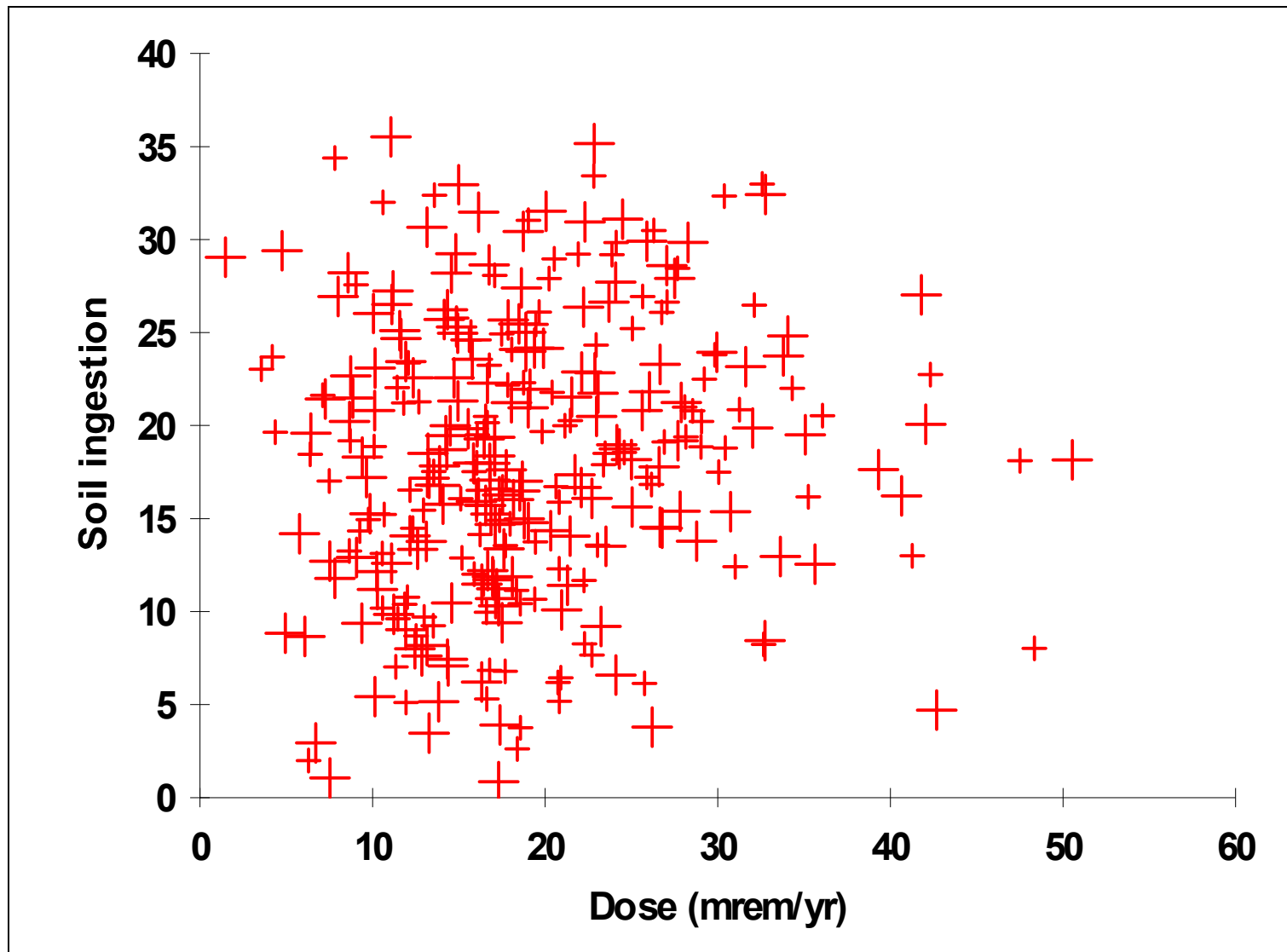


Figure H-94 Scatter Plot, Dose from All Pathways vs. Soil Ingestion Rate, Suburban Resident, Uranium Source Term

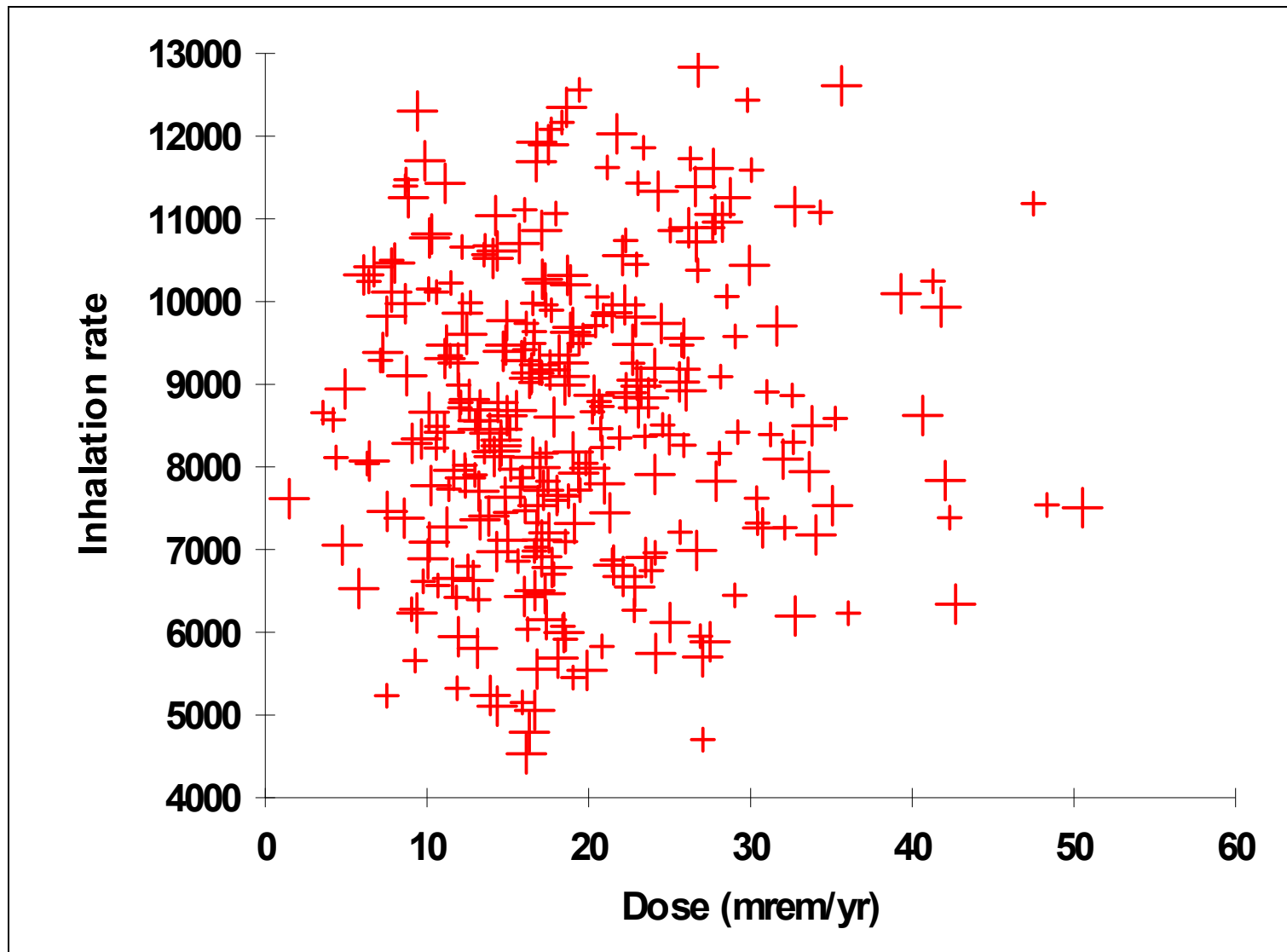


Figure H-95 Scatter Plot, Dose from All Pathways vs. Inhalation Rate, Suburban Resident, Uranium Source Term

## H.7 RESIDENT FARMER SCENARIO

### H.7.1 Byproduct Source Term, Resident Farmer

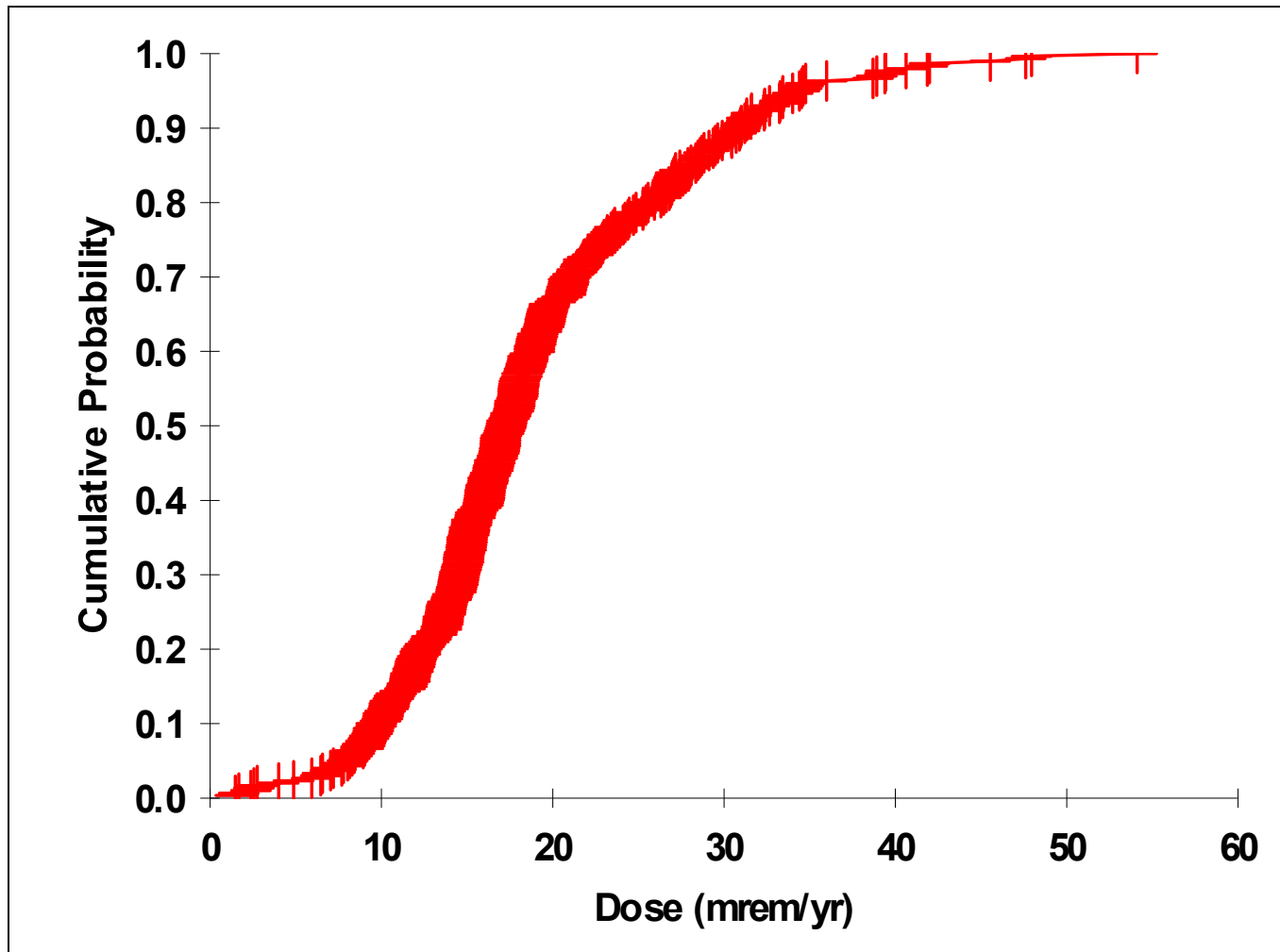


Figure H-96 Cumulative Probability Plot, All Pathways, Resident Farmer, Byproduct Source Term



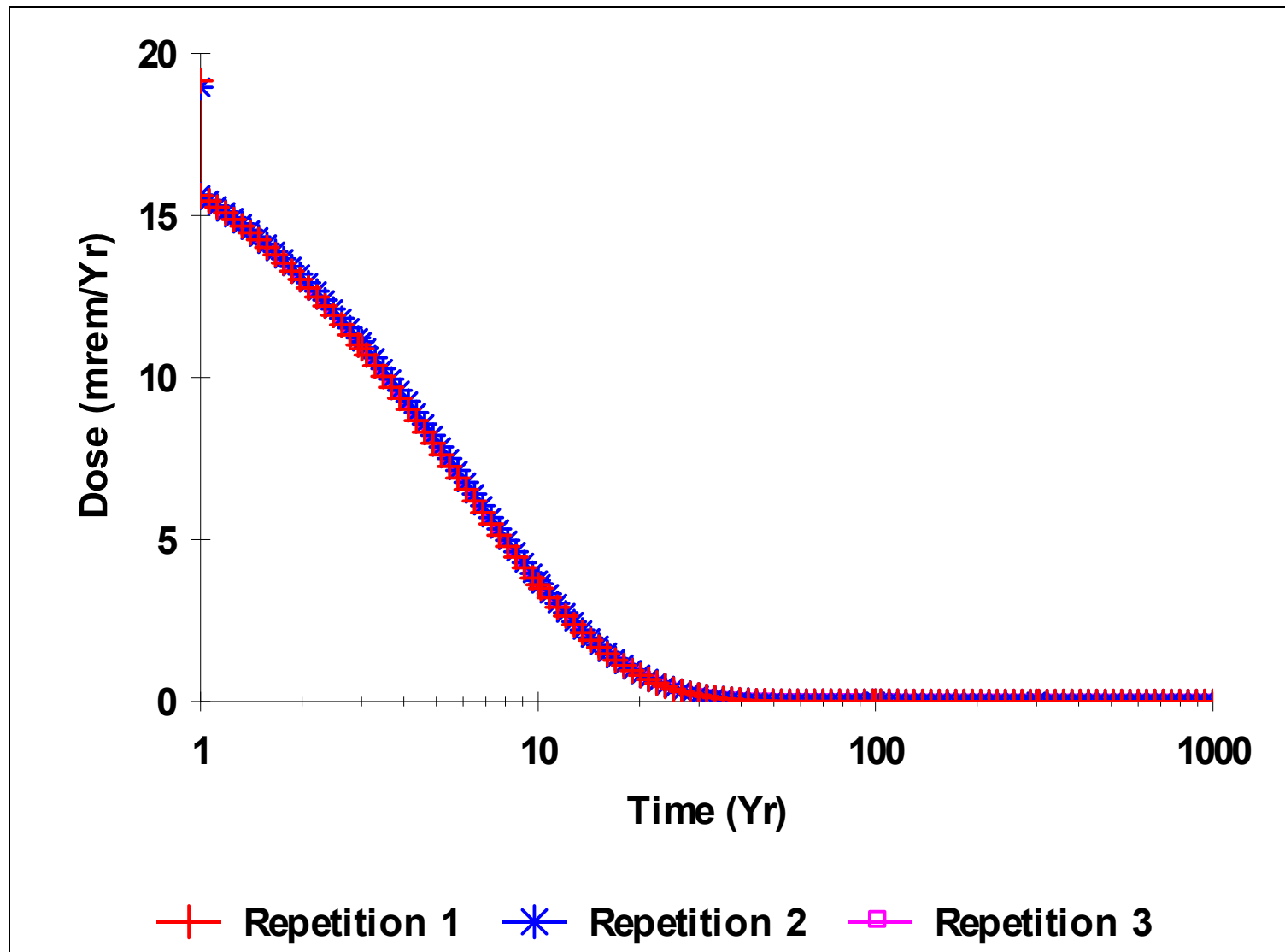


Figure H-97 Temporal Plot, Mean Total Dose, Resident Farmer, Byproduct Source Term

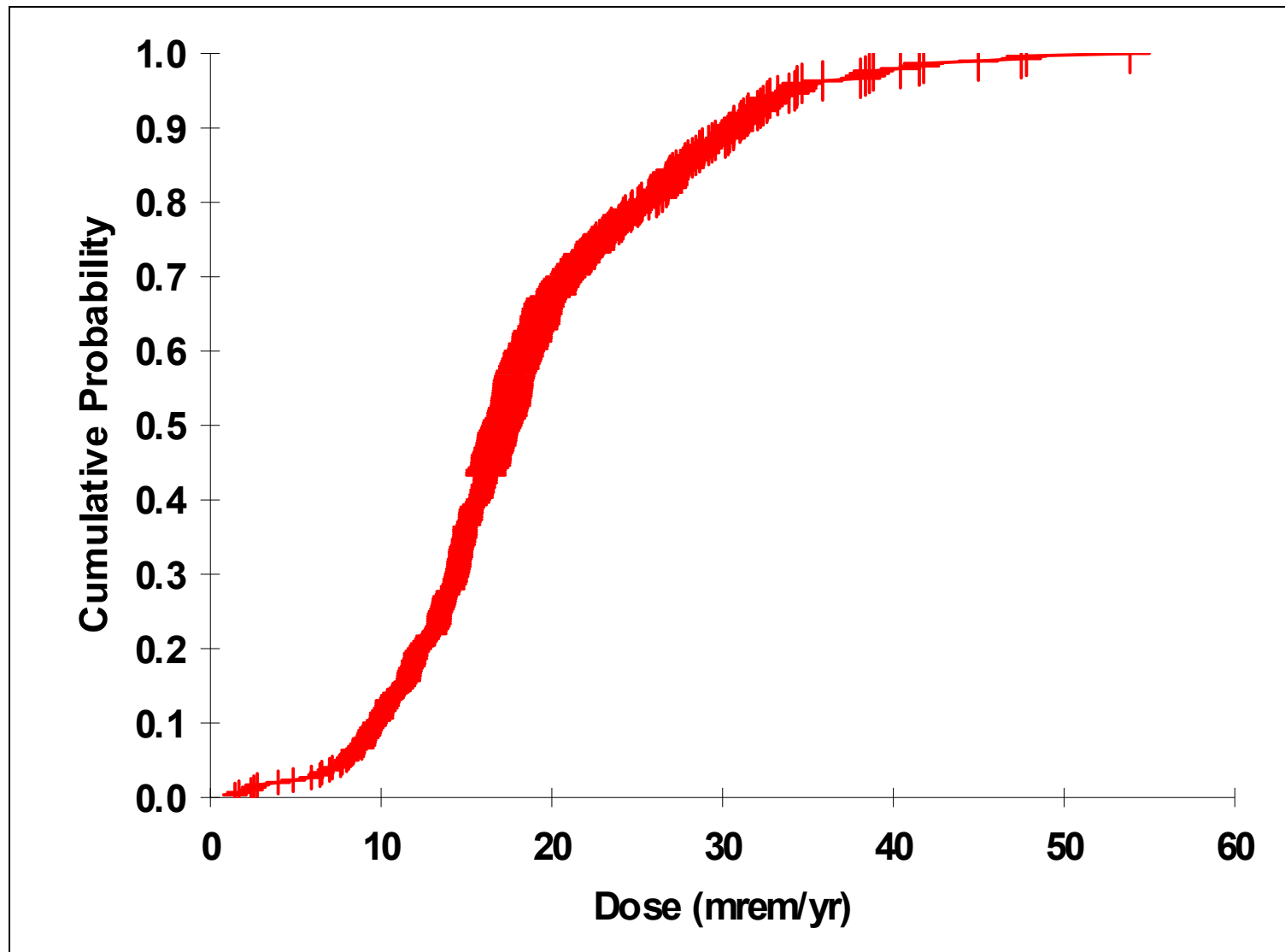


Figure H-98 Cumulative Probability Plot, External Pathway, Resident Farmer, Byproduct Source Term

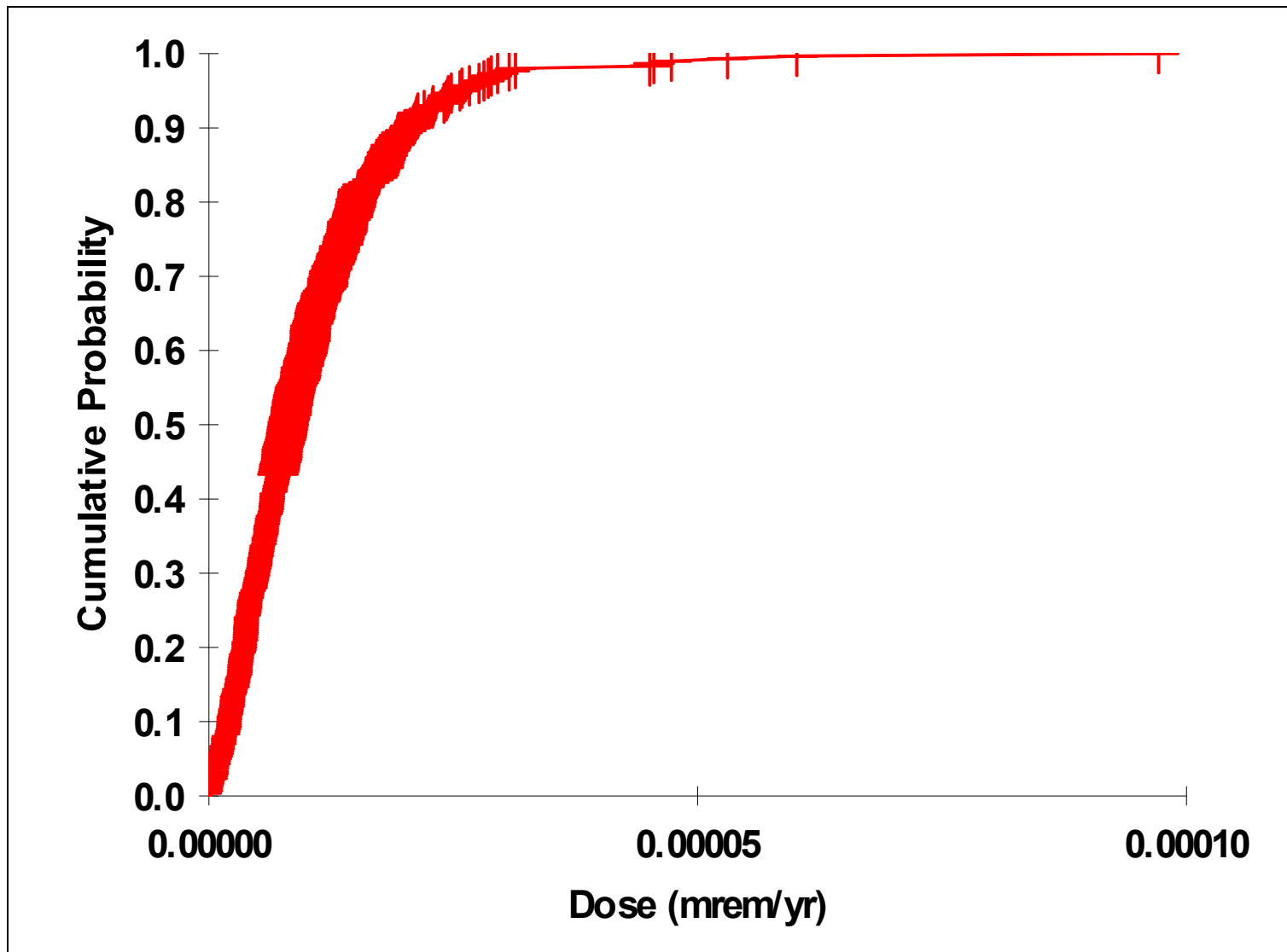


Figure H-99 Cumulative Probability Plot, Inhalation Pathway, Resident Framer, Byproduct Source Term

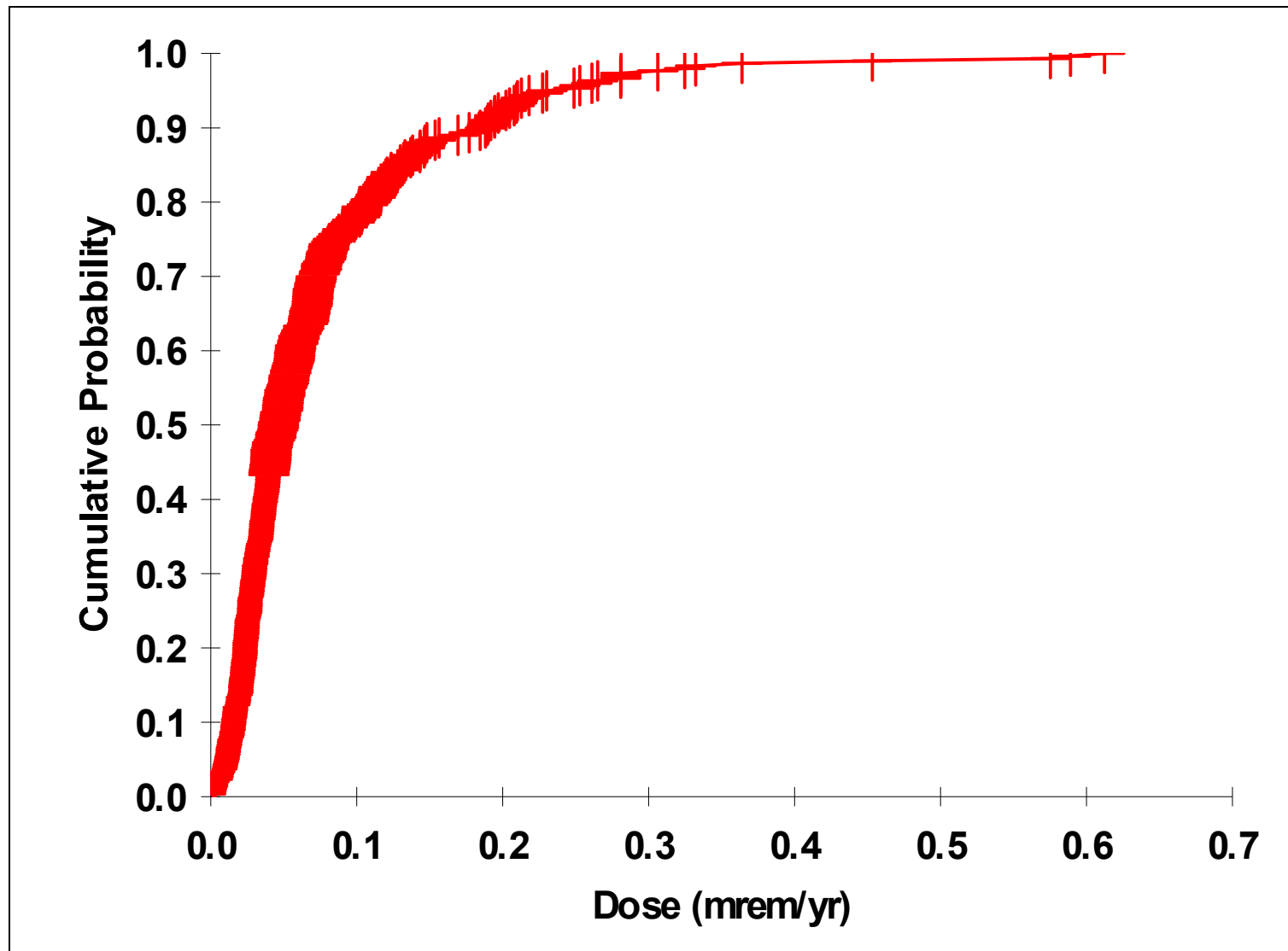


Figure H-100 Cumulative Probability Plot, Plant Ingestion Pathway, Resident Farmer, Byproduct Source Term

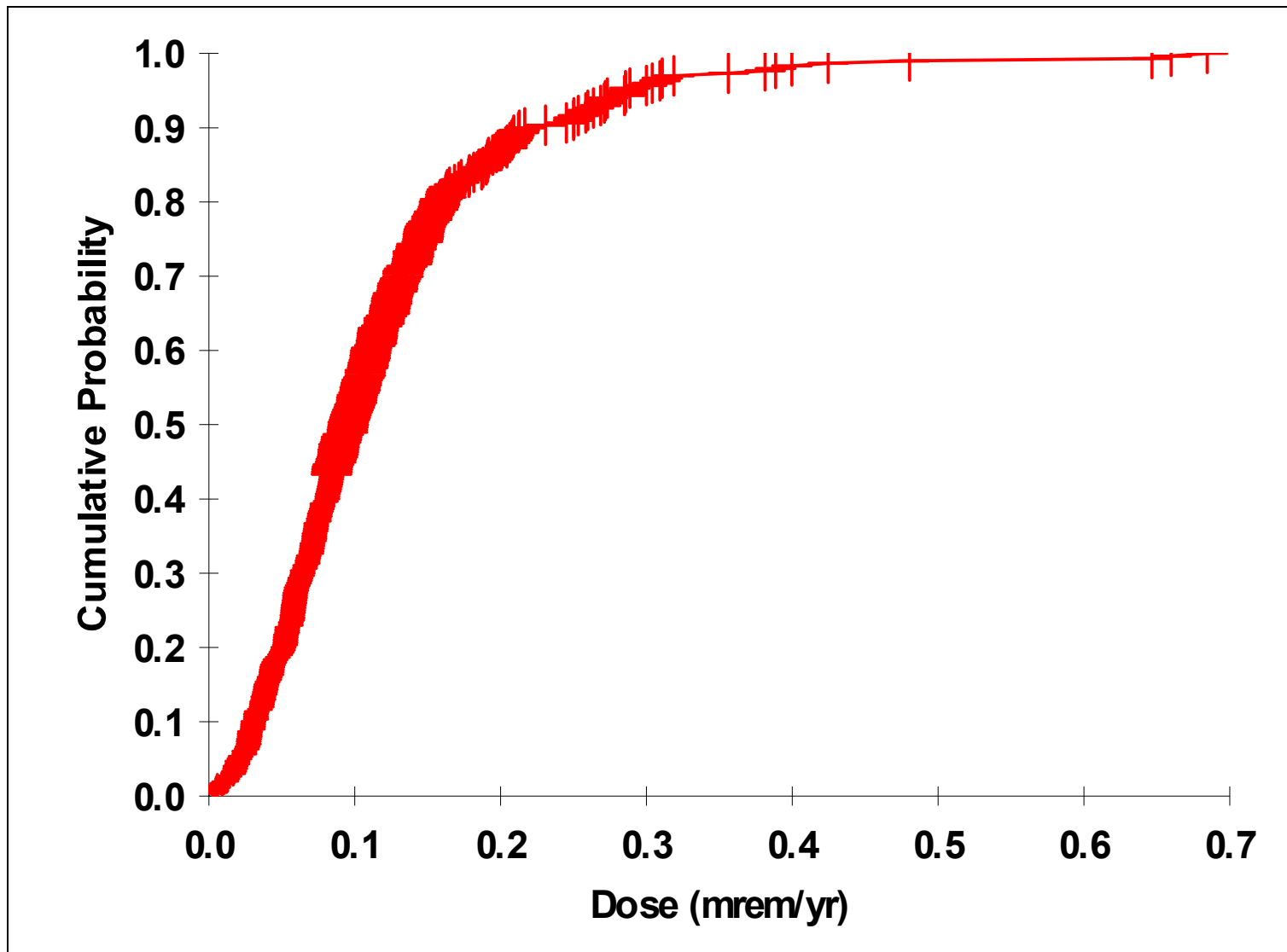


Figure H-101 Cumulative Probability Plot, Meat Ingestion Pathway, Resident Farmer, Byproduct Source Term

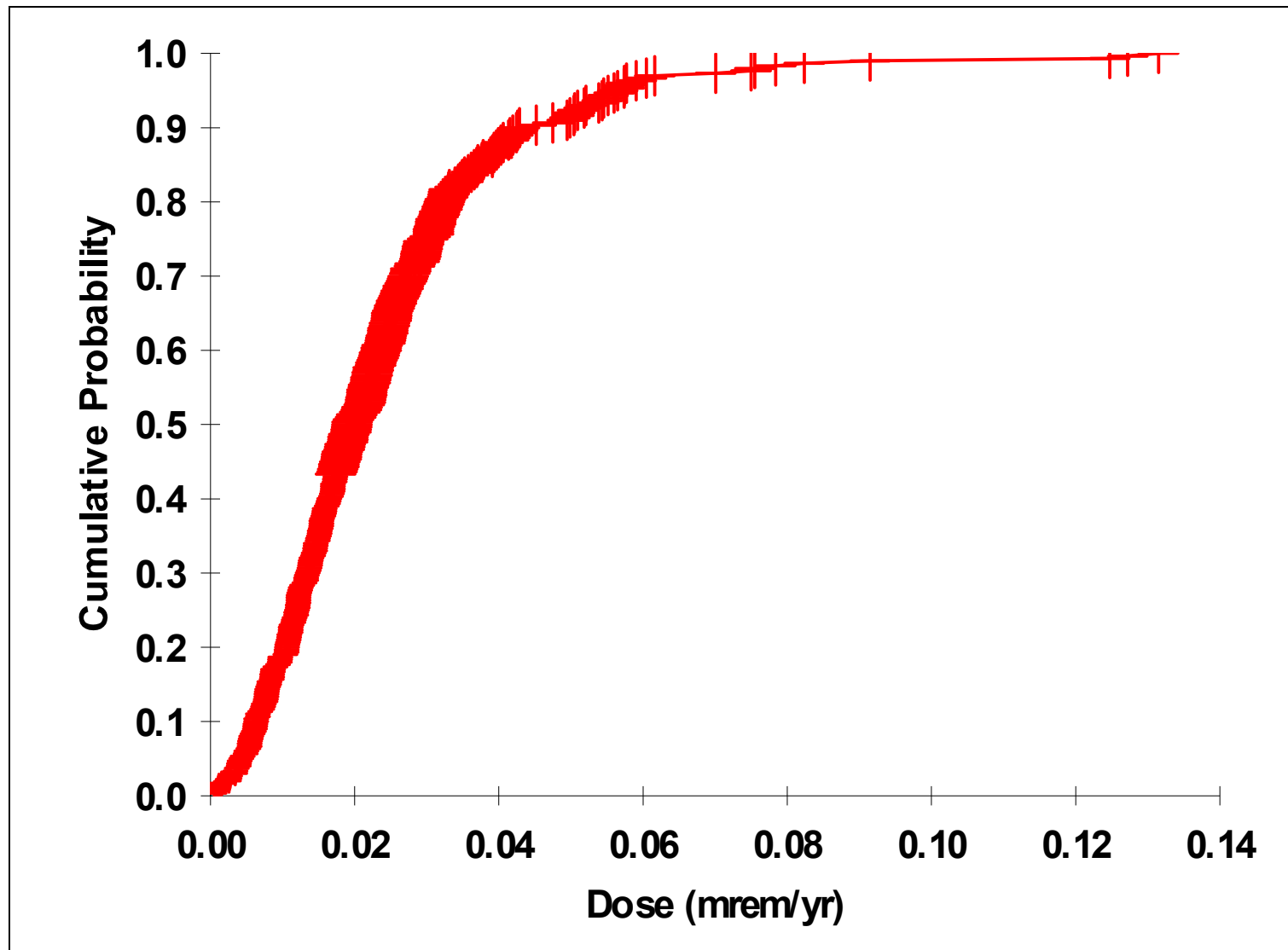


Figure H-102 Cumulative Probability Plot, Milk Ingestion Pathway, Resident Framer, Byproduct Source Term

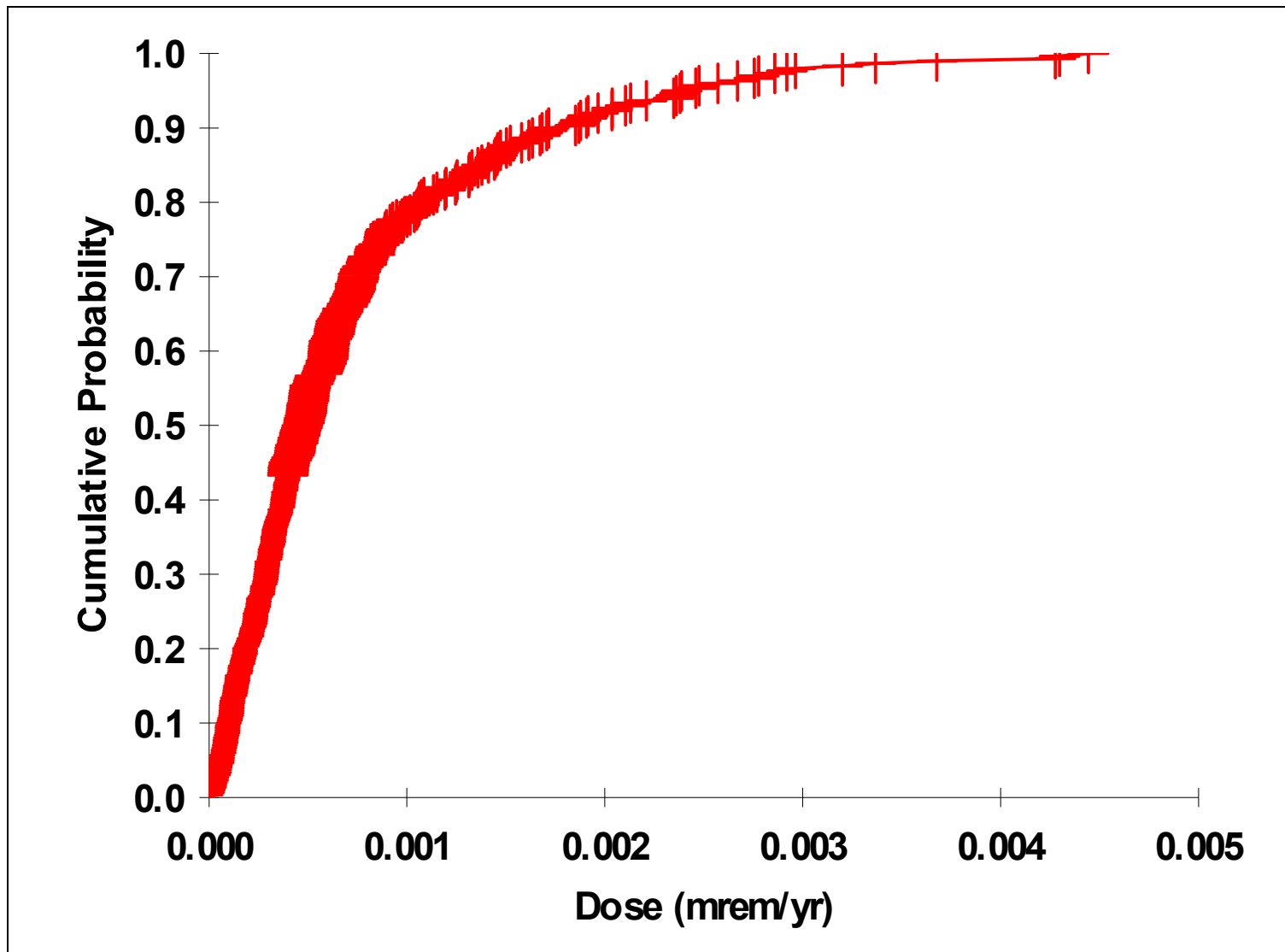


Figure H-103 Cumulative Probability Plot, Soil Ingestion Pathway, Resident Farmer, Byproduct Source Term

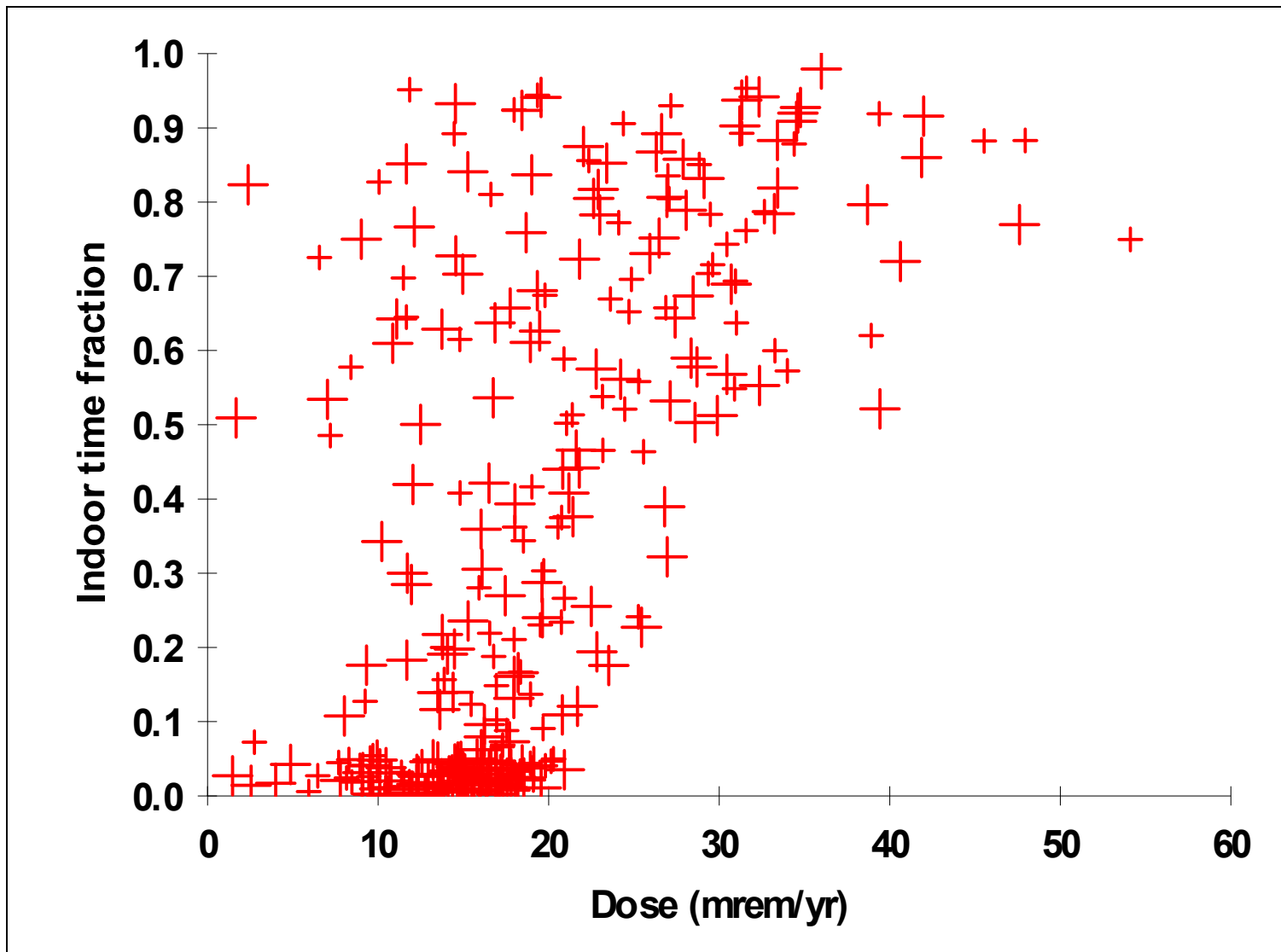


Figure H-104 Scatter Plot, Dose from All Pathways vs. Indoor Time Fraction, Resident Farmer, Byproduct Source Term



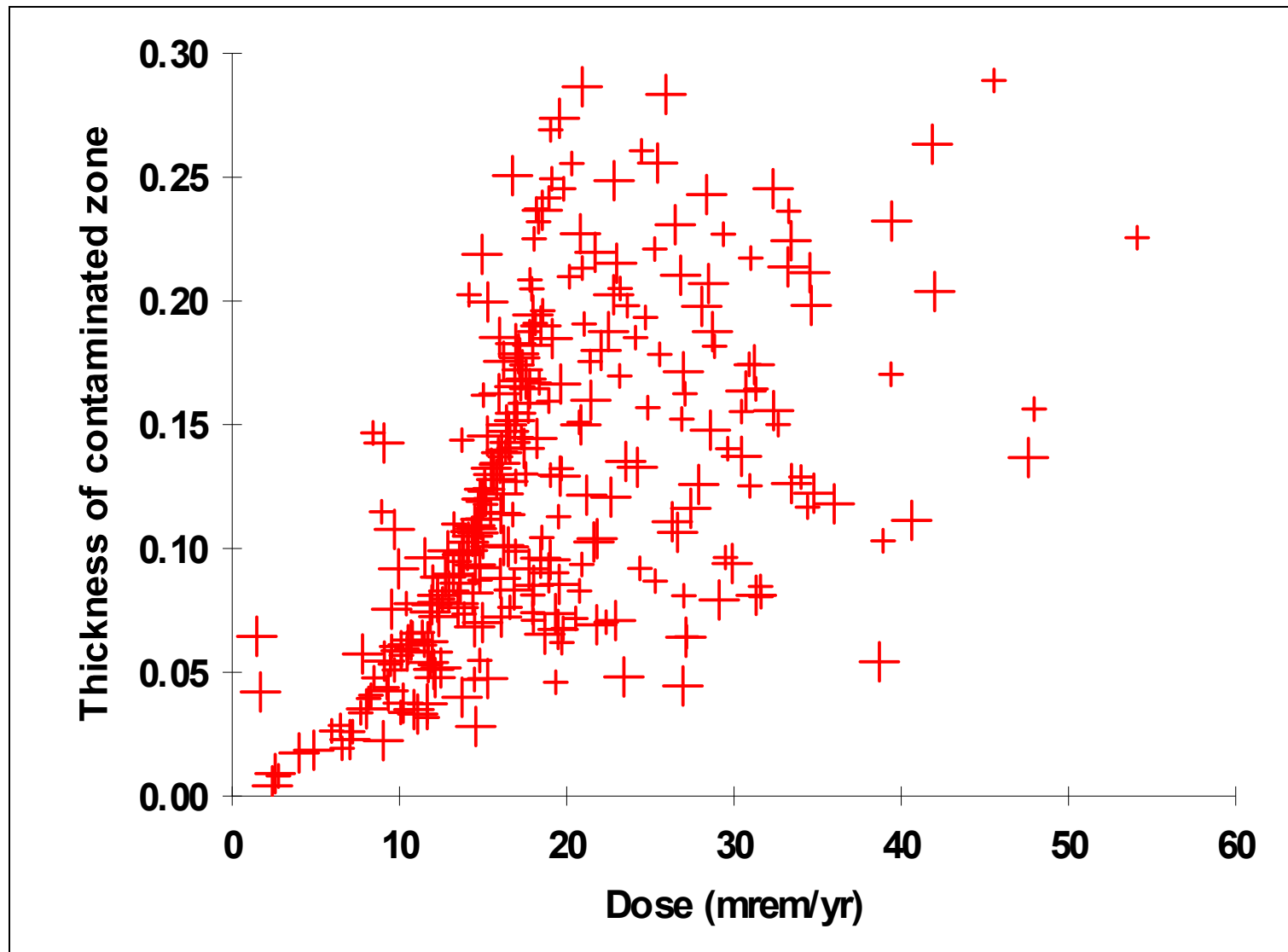


Figure H-105 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Resident Farmer, Byproduct Source Term

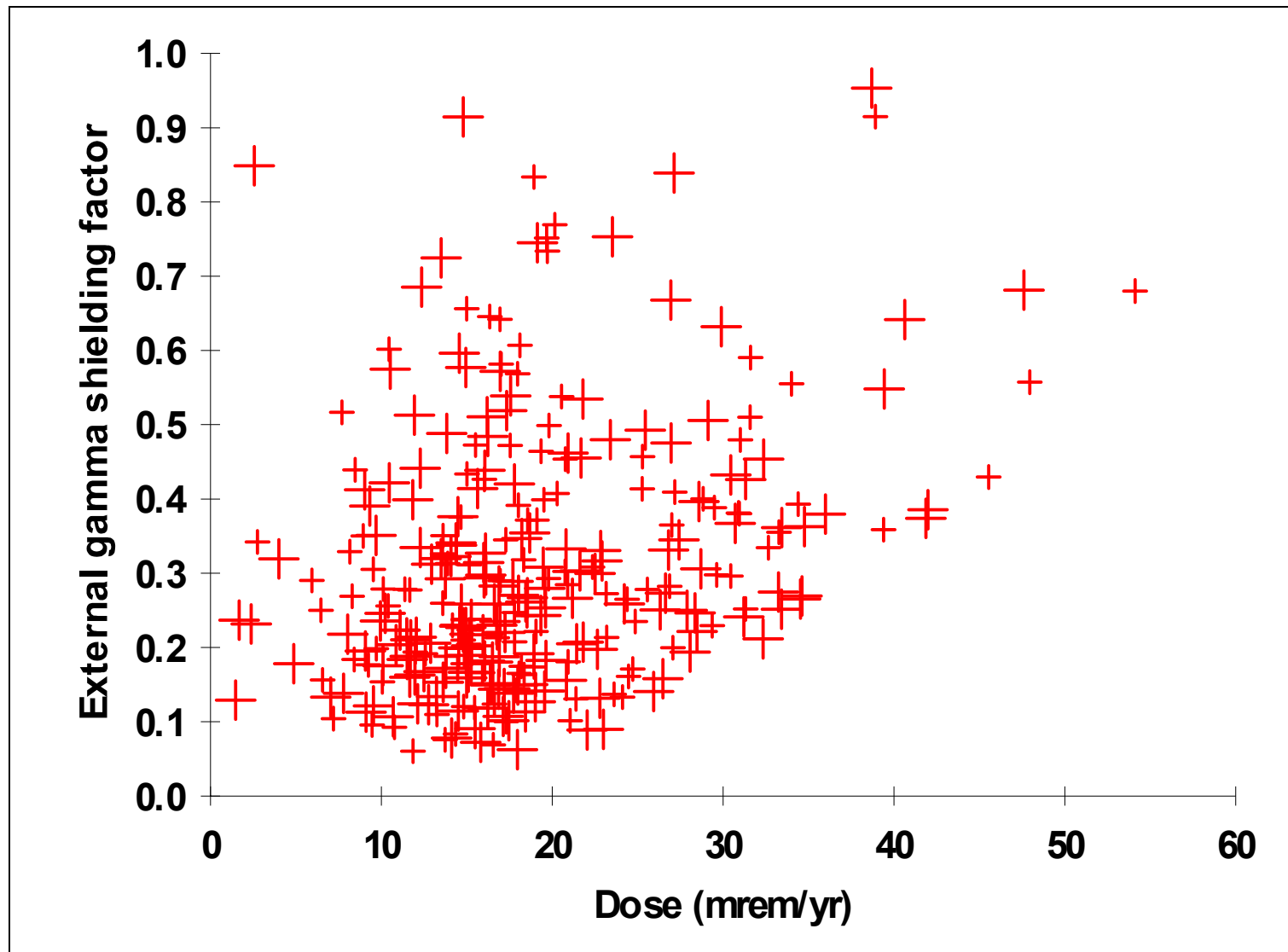


Figure H-106 Scatter Plot, Dose from All Pathways vs. External Gamma Shielding Factor, Resident Farmer, Byproduct Source Term

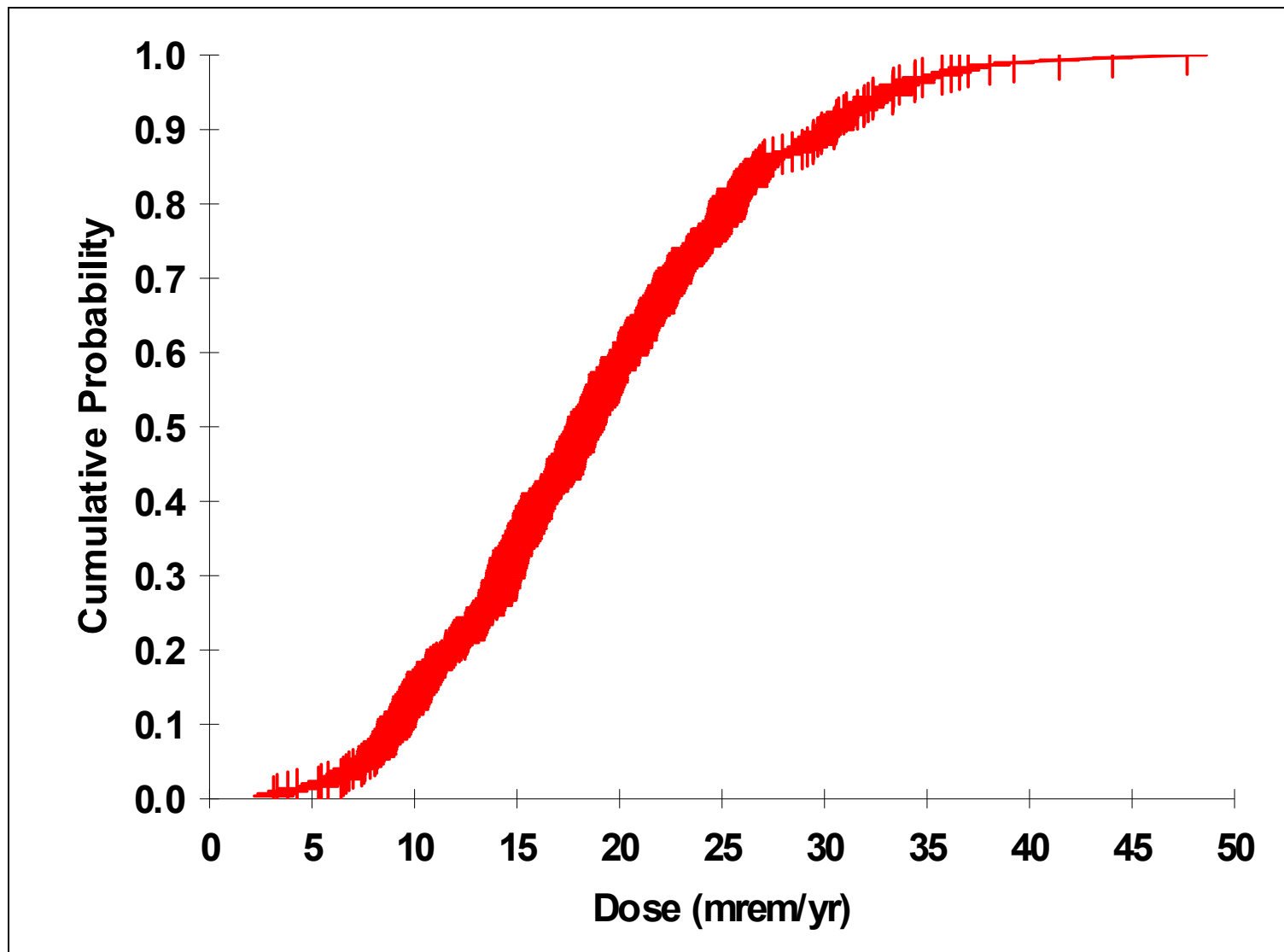
**H.7.2 Uranium Source Term, Resident Farmer**

Figure H-107 Cumulative Probability Plot, All Pathways, Resident Farmer, Uranium Source Term

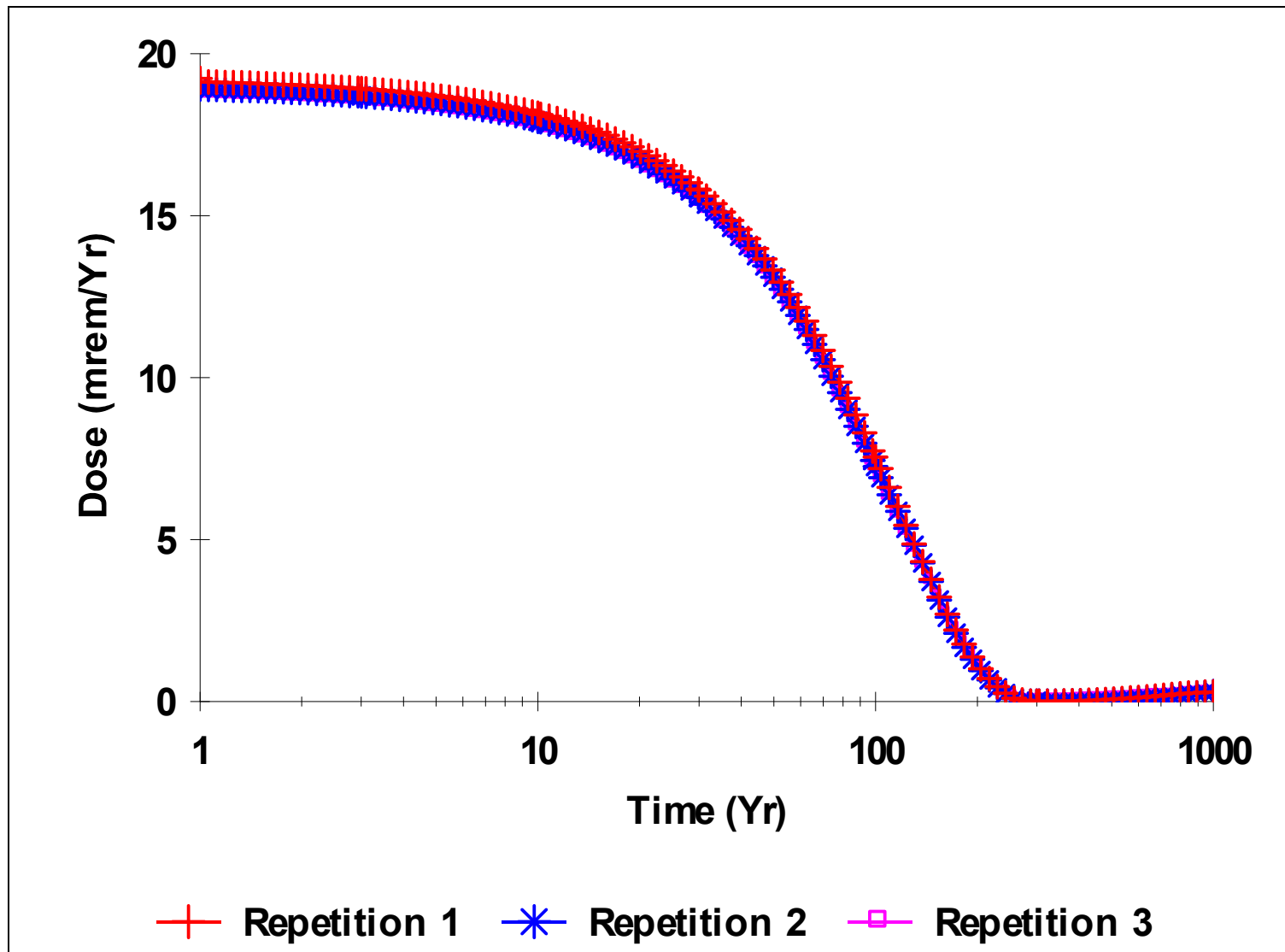


Figure H-108 Temporal Plot, Mean Total Dose, Resident Farmer, Uranium Source Term

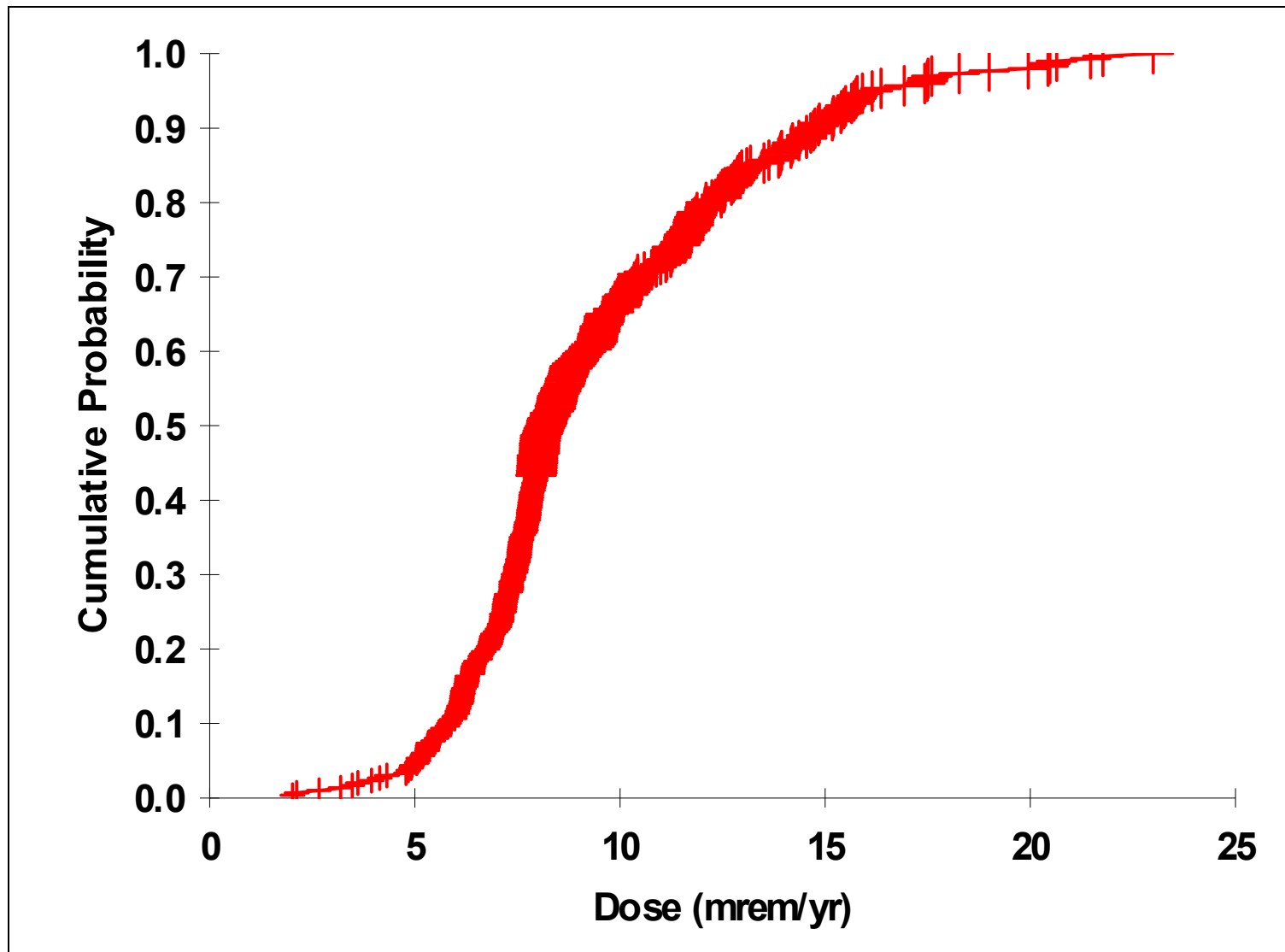


Figure H-109 Cumulative Probability Plot, External Pathway, Resident Framer, Uranium Source Term

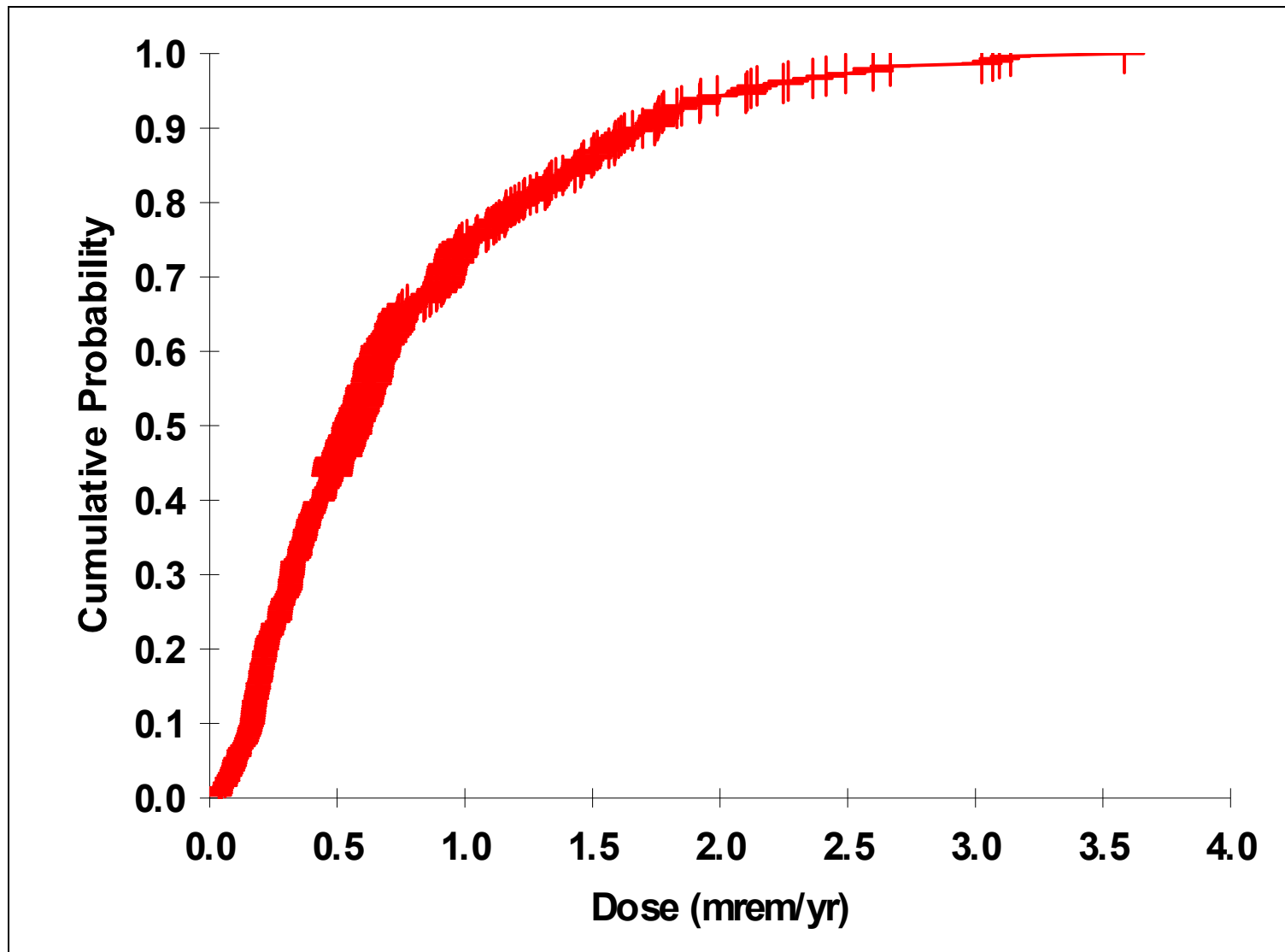


Figure H-110 Cumulative Probability Plot, Inhalation Pathway, Resident Farmer, Uranium Source Term

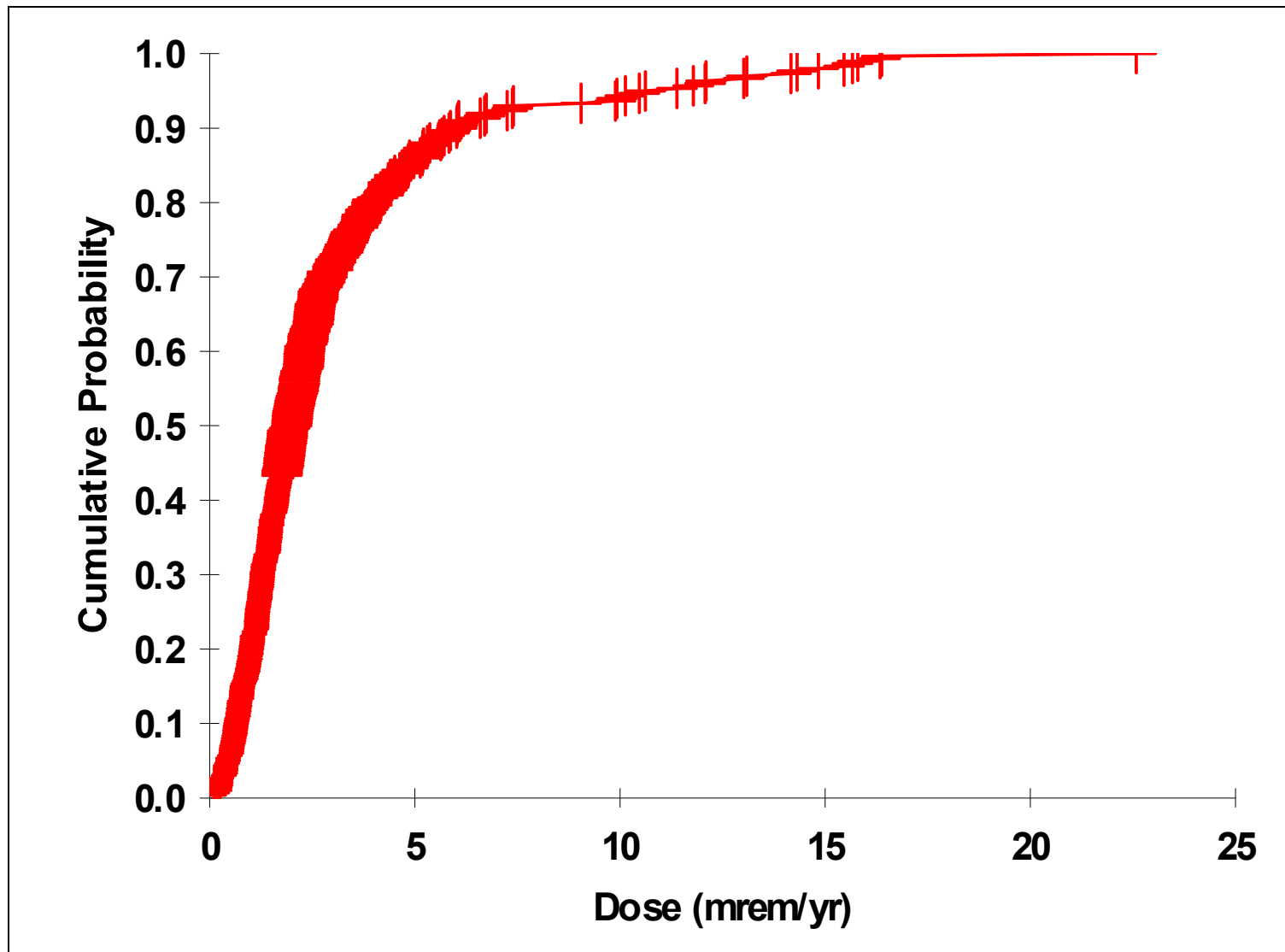


Figure H-111 Cumulative Probability Plot, Plant Ingestion Pathway, Resident Farmer, Uranium Source Term

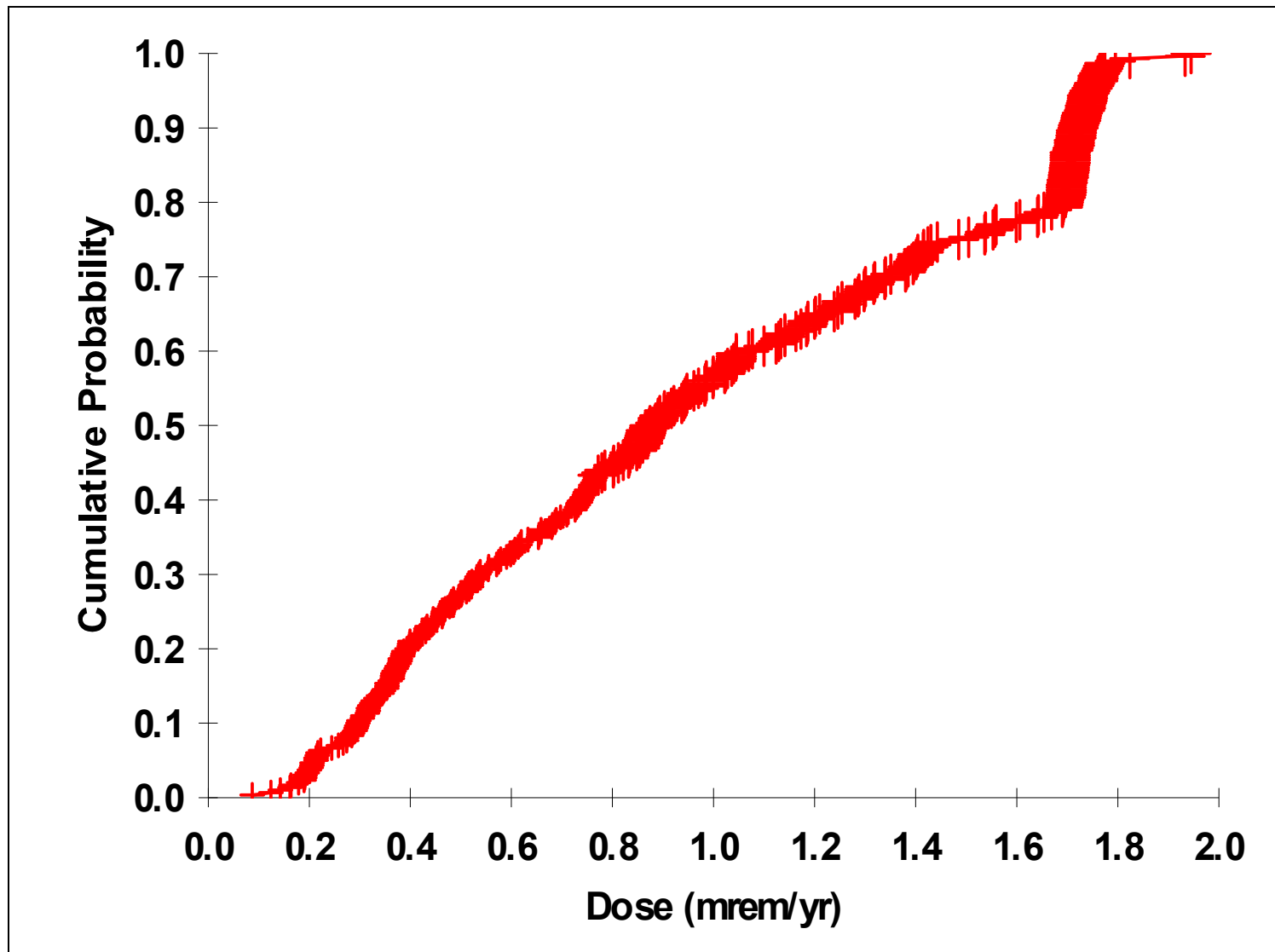


Figure H-112 Cumulative Probability Plot, Meat Ingestion Pathway, Resident Farmer, Uranium Source Term



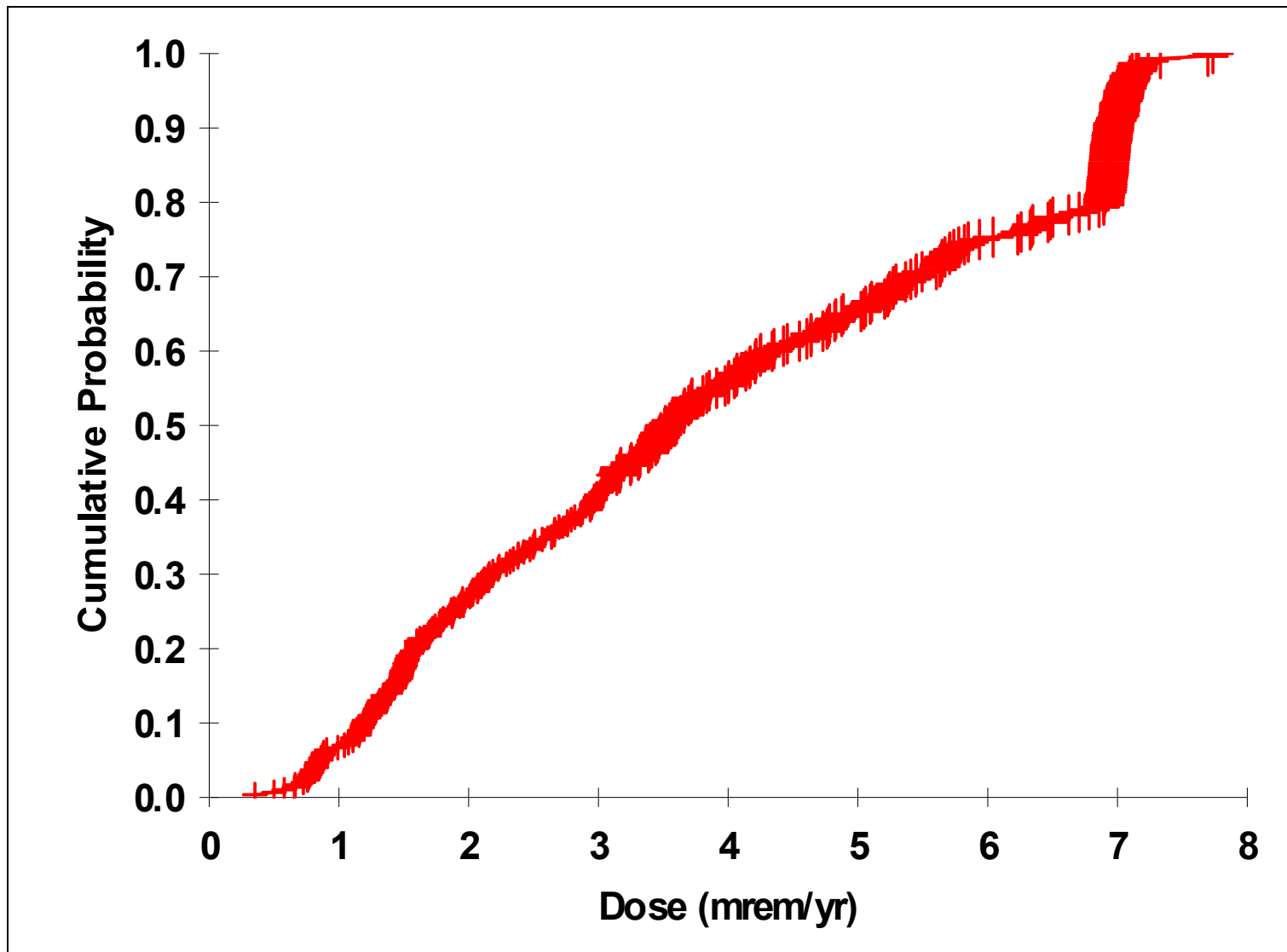


Figure H-113 Cumulative Probability Plot, Milk Ingestion Pathway, Resident Farmer, Uranium Source Term

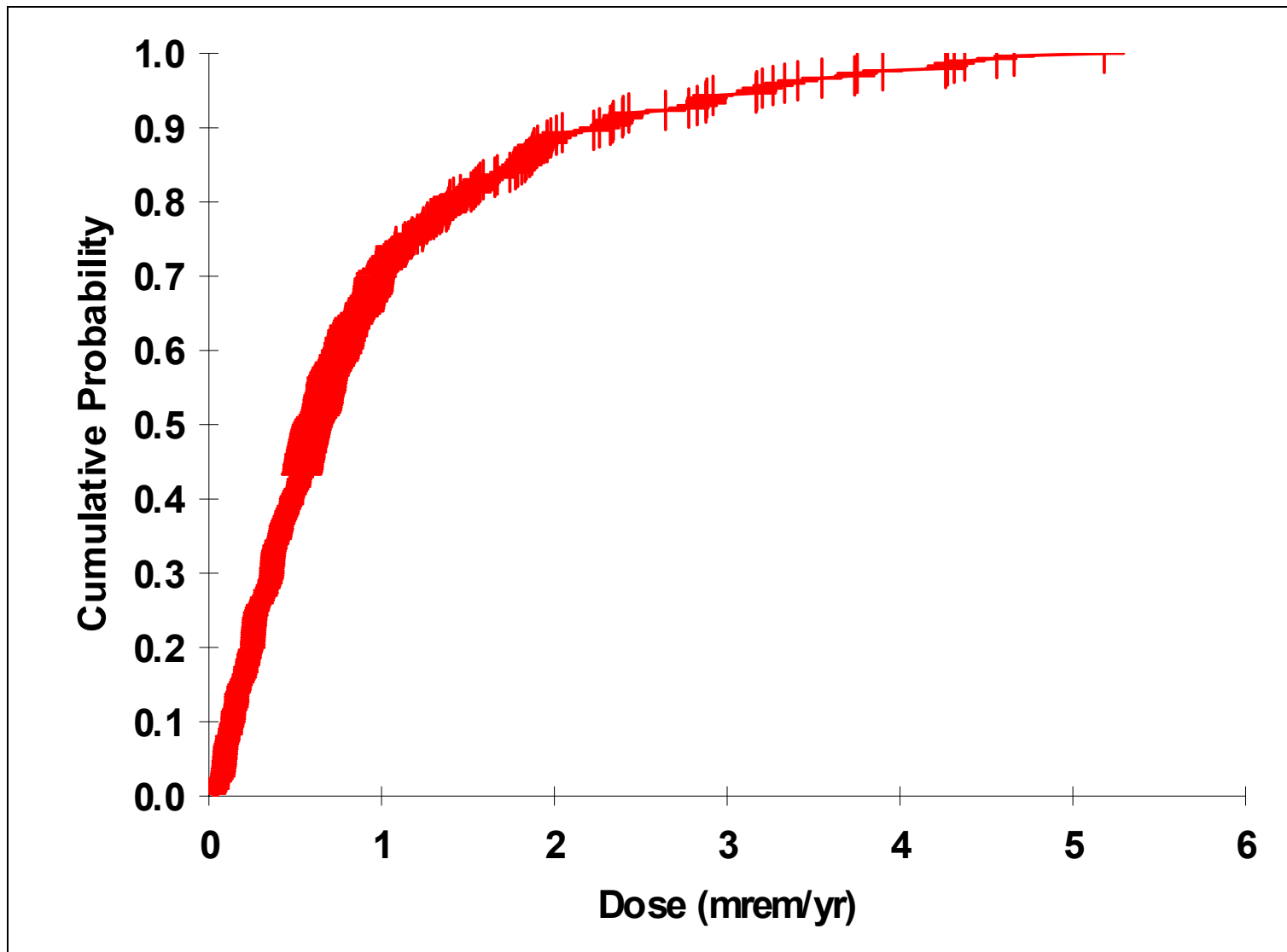


Figure H-114 Cumulative Probability Plot, Soil Ingestion Pathway, Resident Farmer, Uranium Source Term

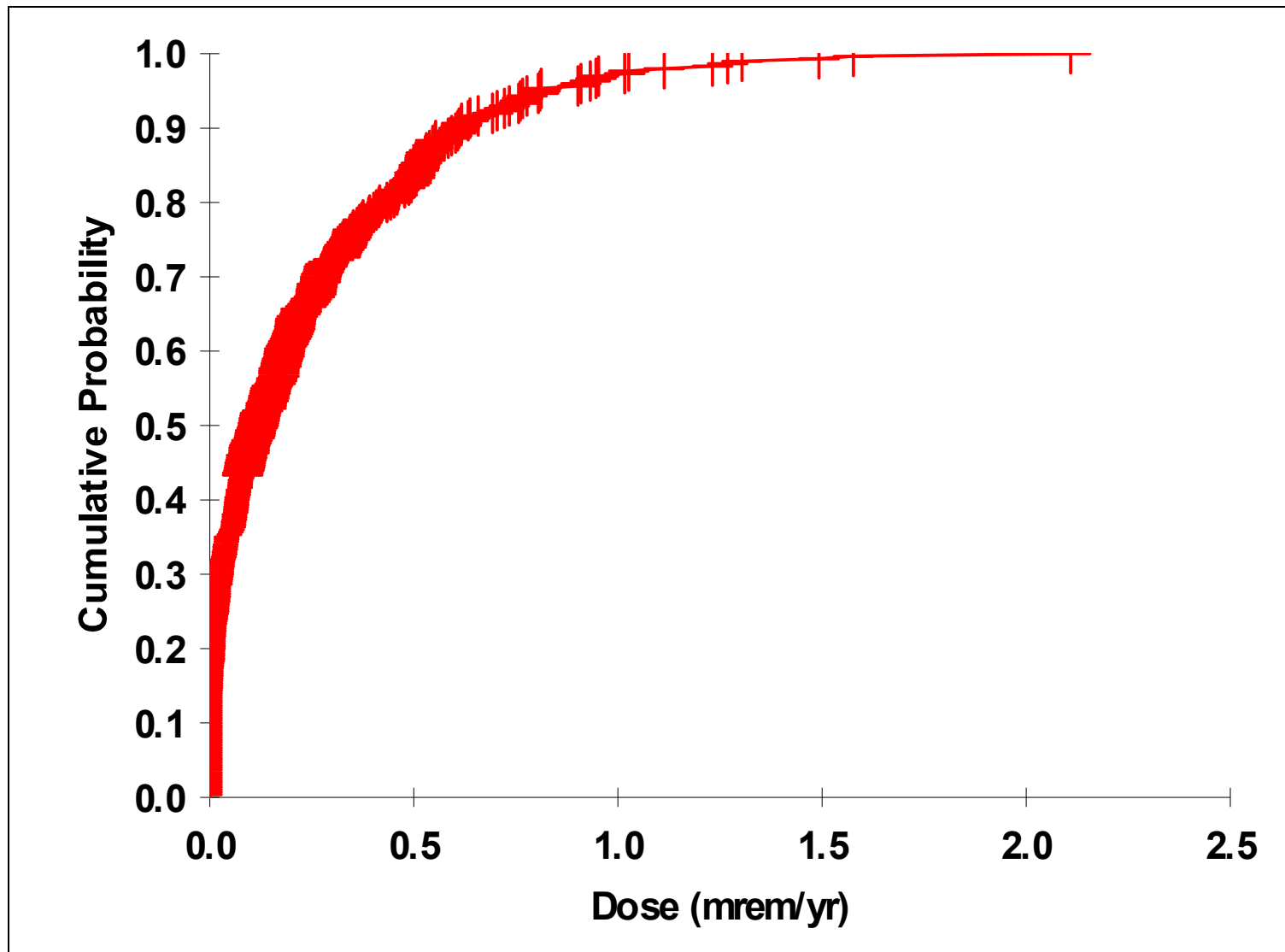


Figure H-115 Cumulative Probability Plot, Drinking Water Pathway, Resident Farmer, Uranium Source Term

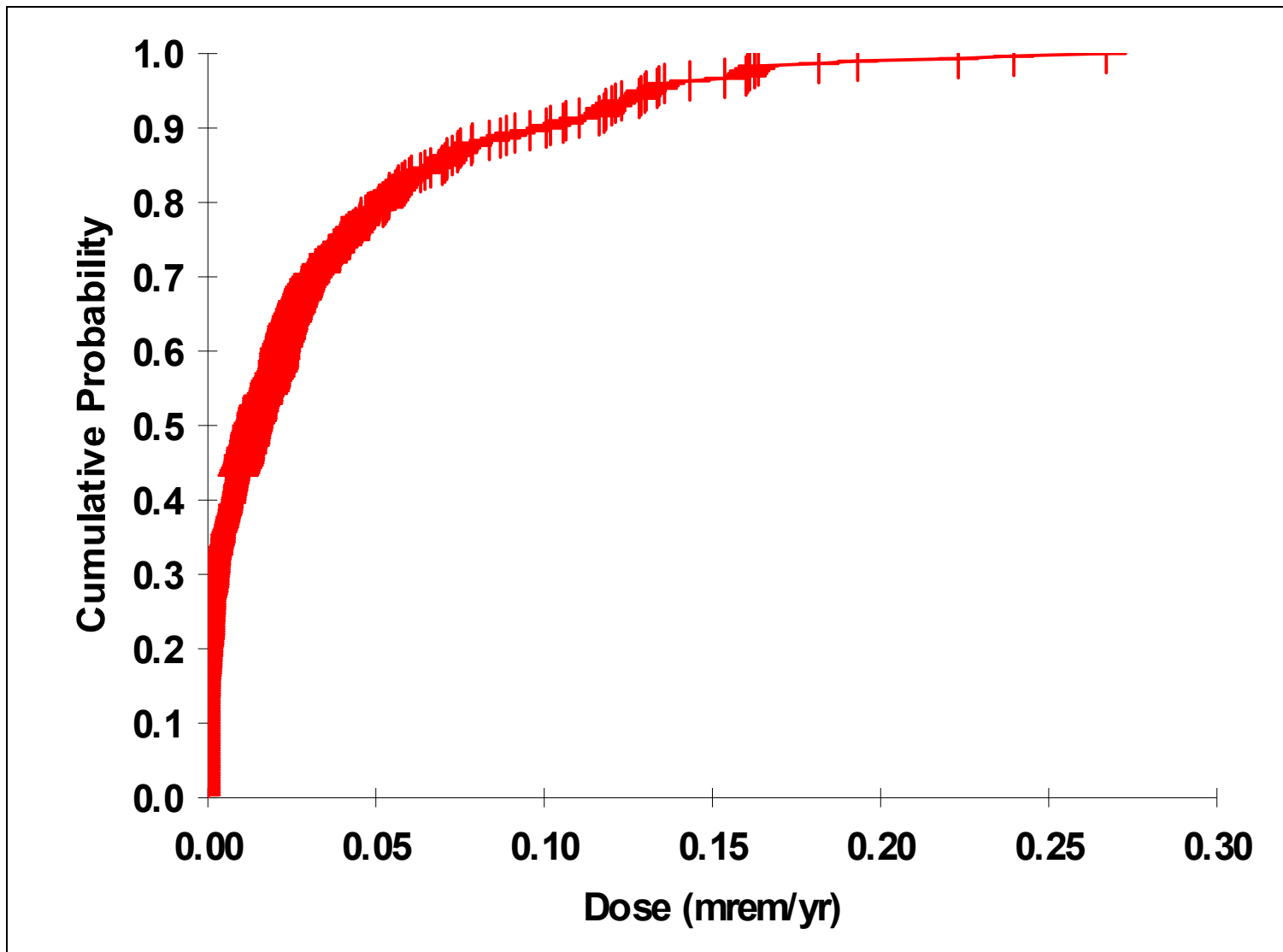


Figure H-116 Cumulative Probability Plot, Aquatic Foods Ingestion Pathway, Resident Farmer, Uranium Source Term

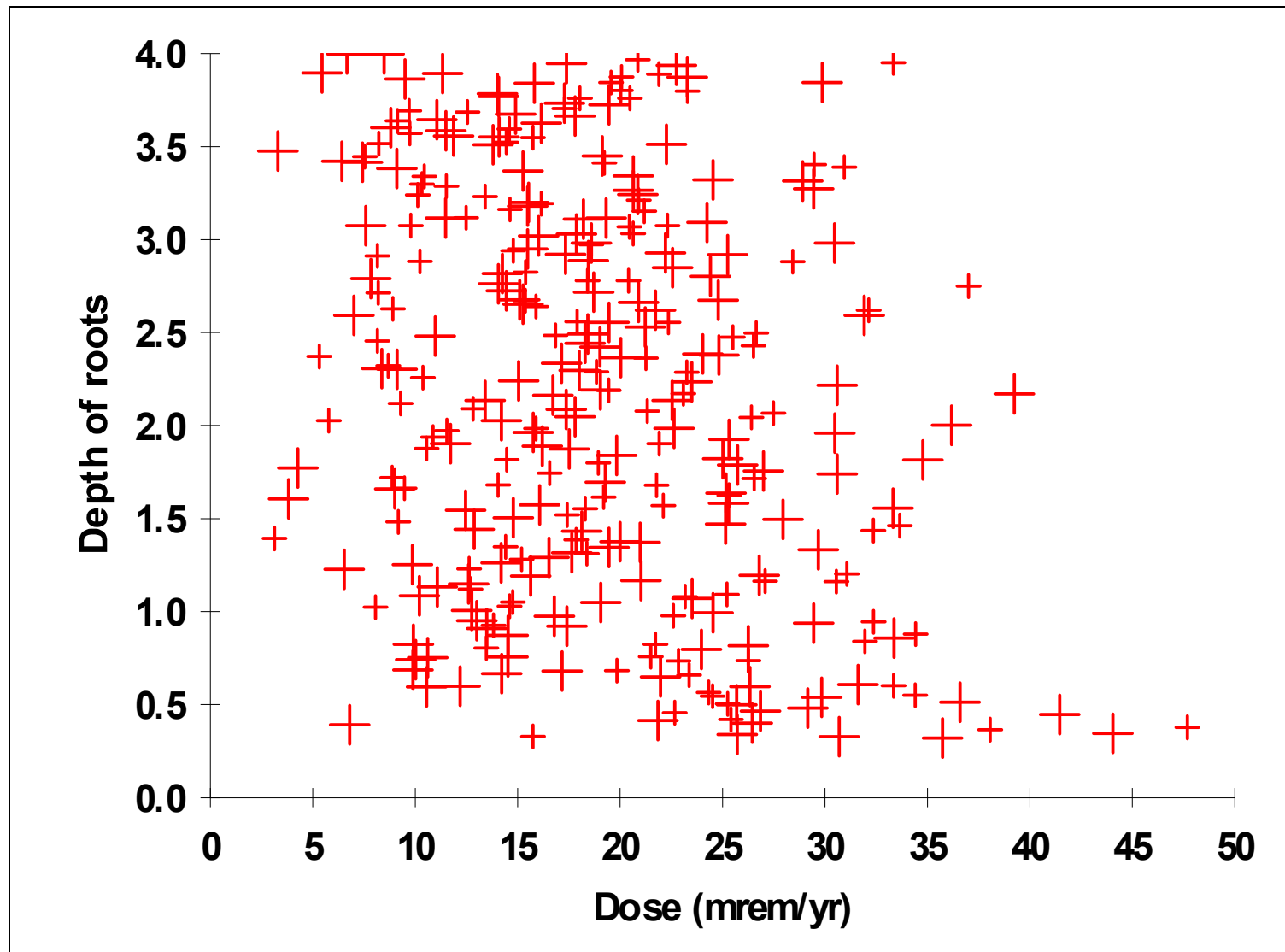


Figure H-117 Scatter Plot, Dose from All Pathways vs. Depth of Roots, Resident Farmer, Uranium Source Term

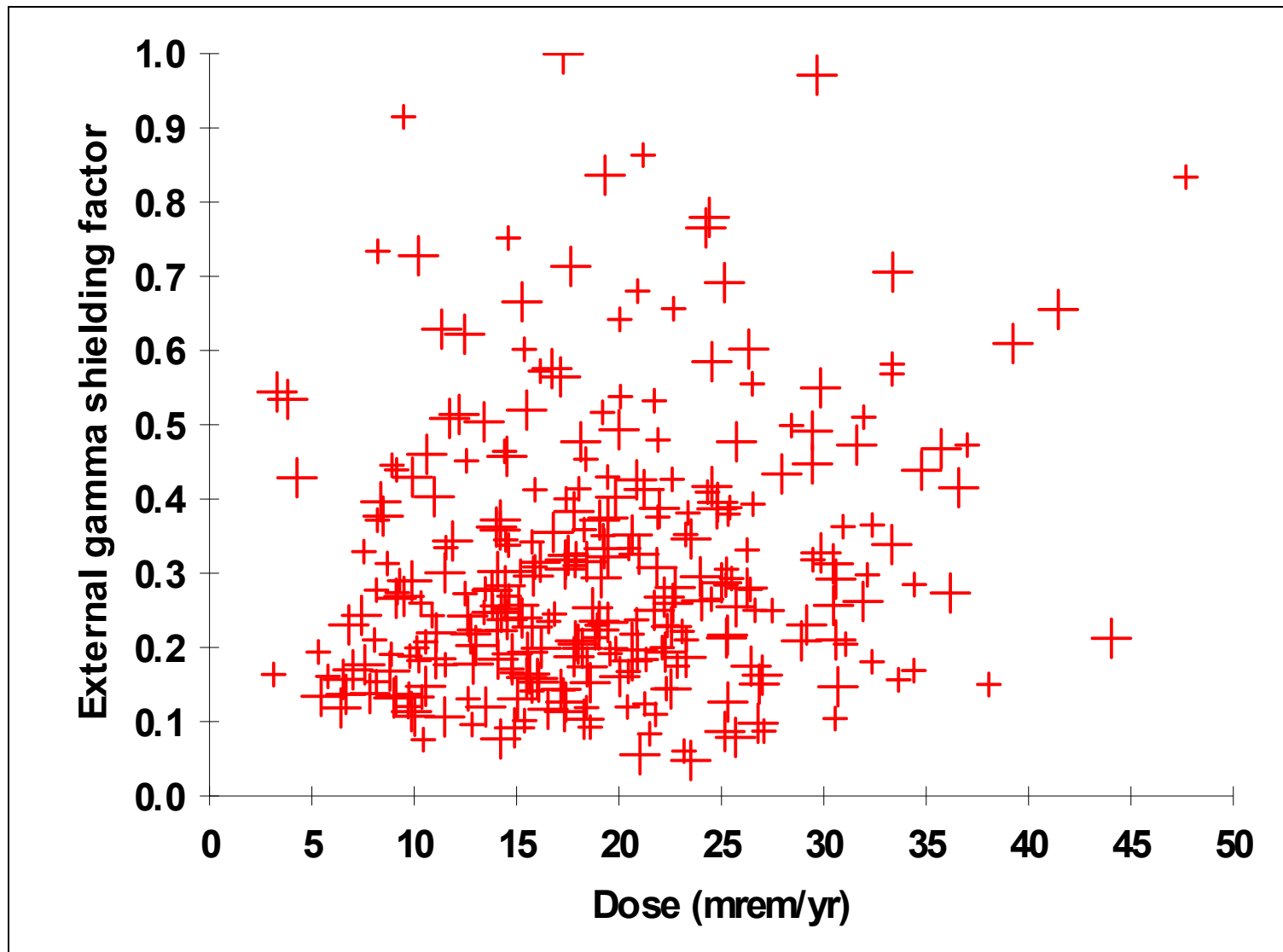


Figure H-118 Scatter Plot, Dose from All Pathways vs. External Gamma Shielding Factor, Resident Farmer, Uranium Source Term

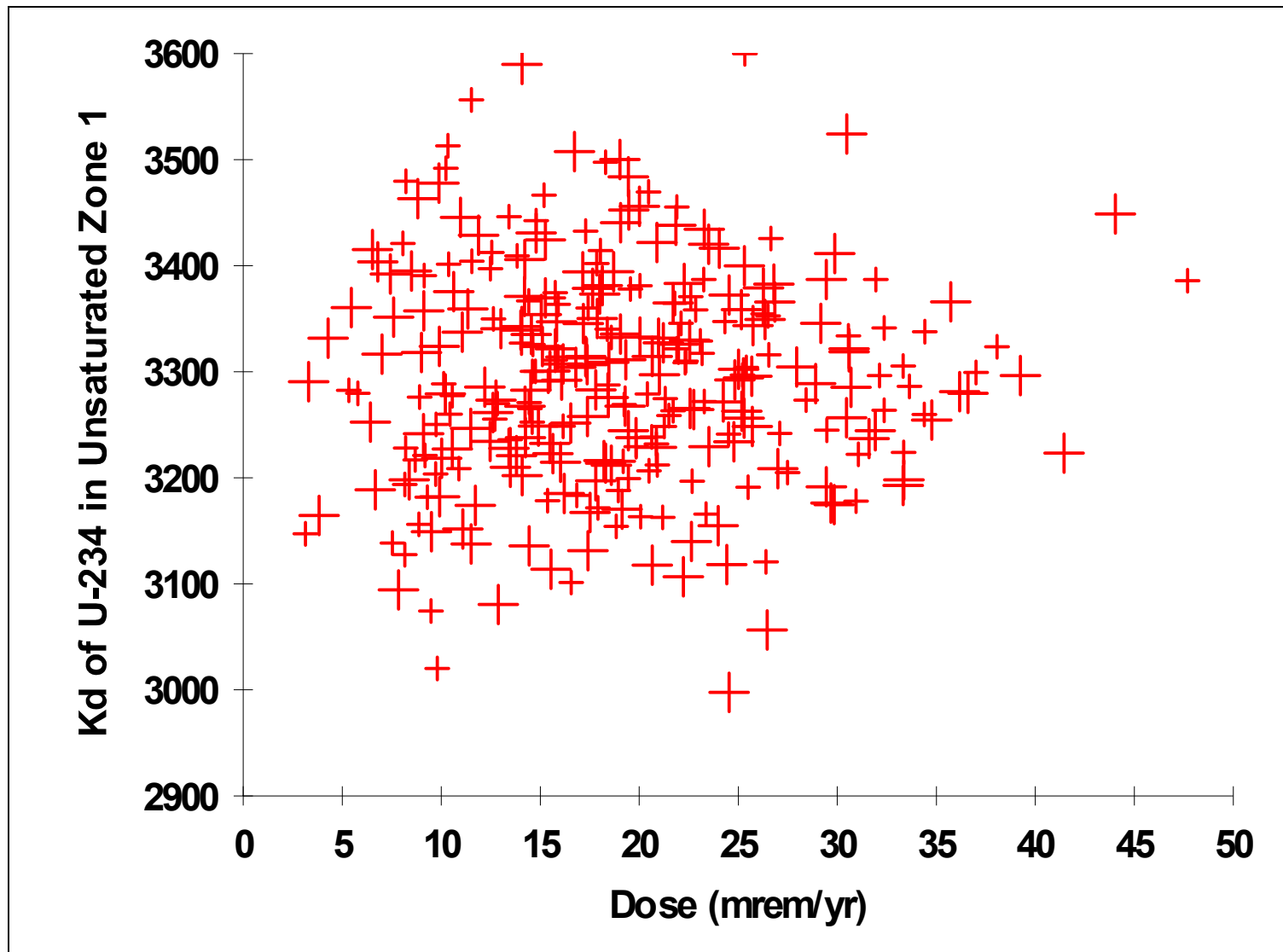


Figure H-119 Scatter Plot, Dose from All Pathways vs. Uranium Kd in Unsaturated Zone 1, Resident Farmer, Uranium Source Term

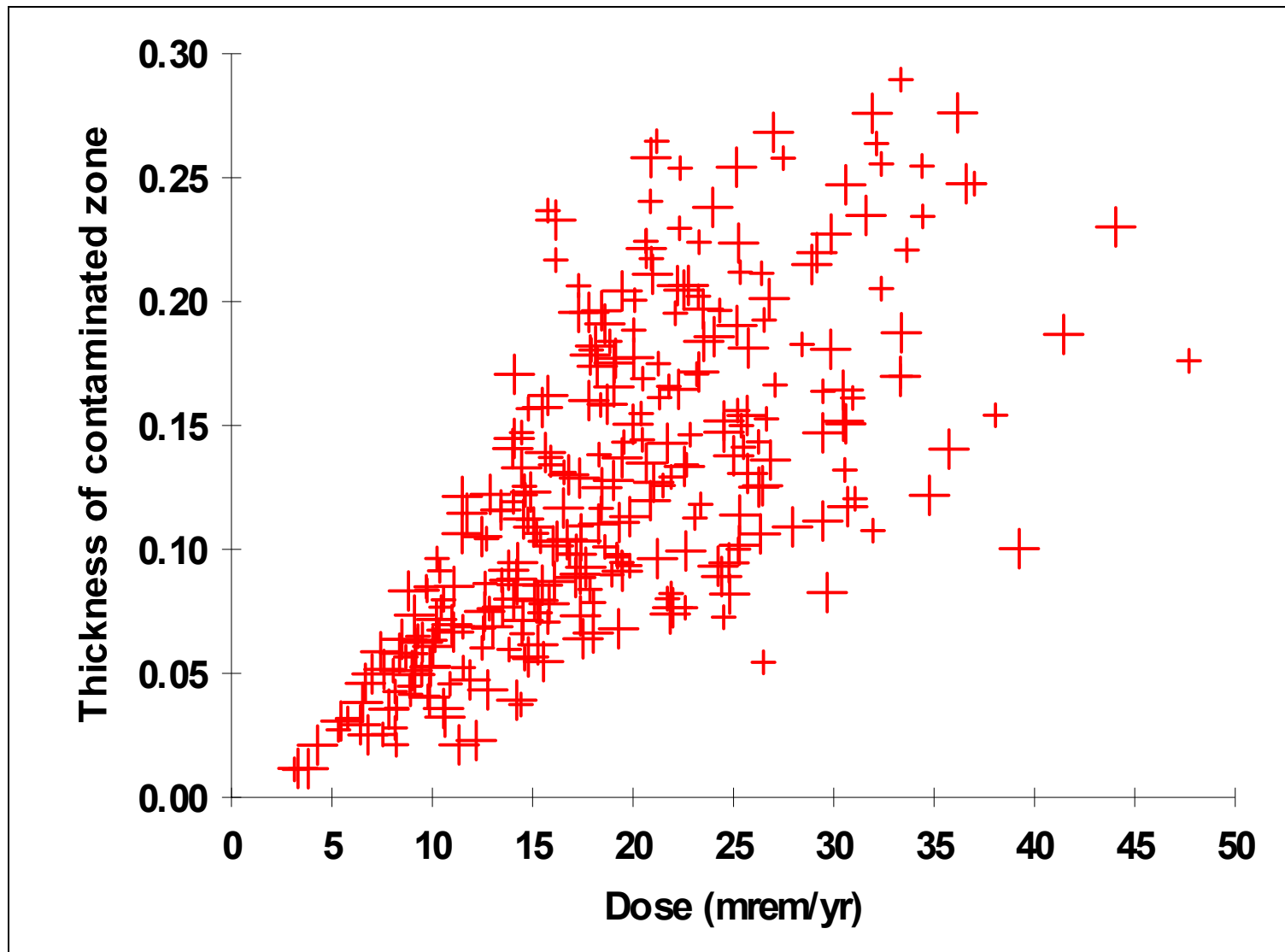


Figure H-120 Scatter Plot, Dose from All Pathways vs. Thickness of Contaminated Zone, Resident Farmer, Uranium Source Term



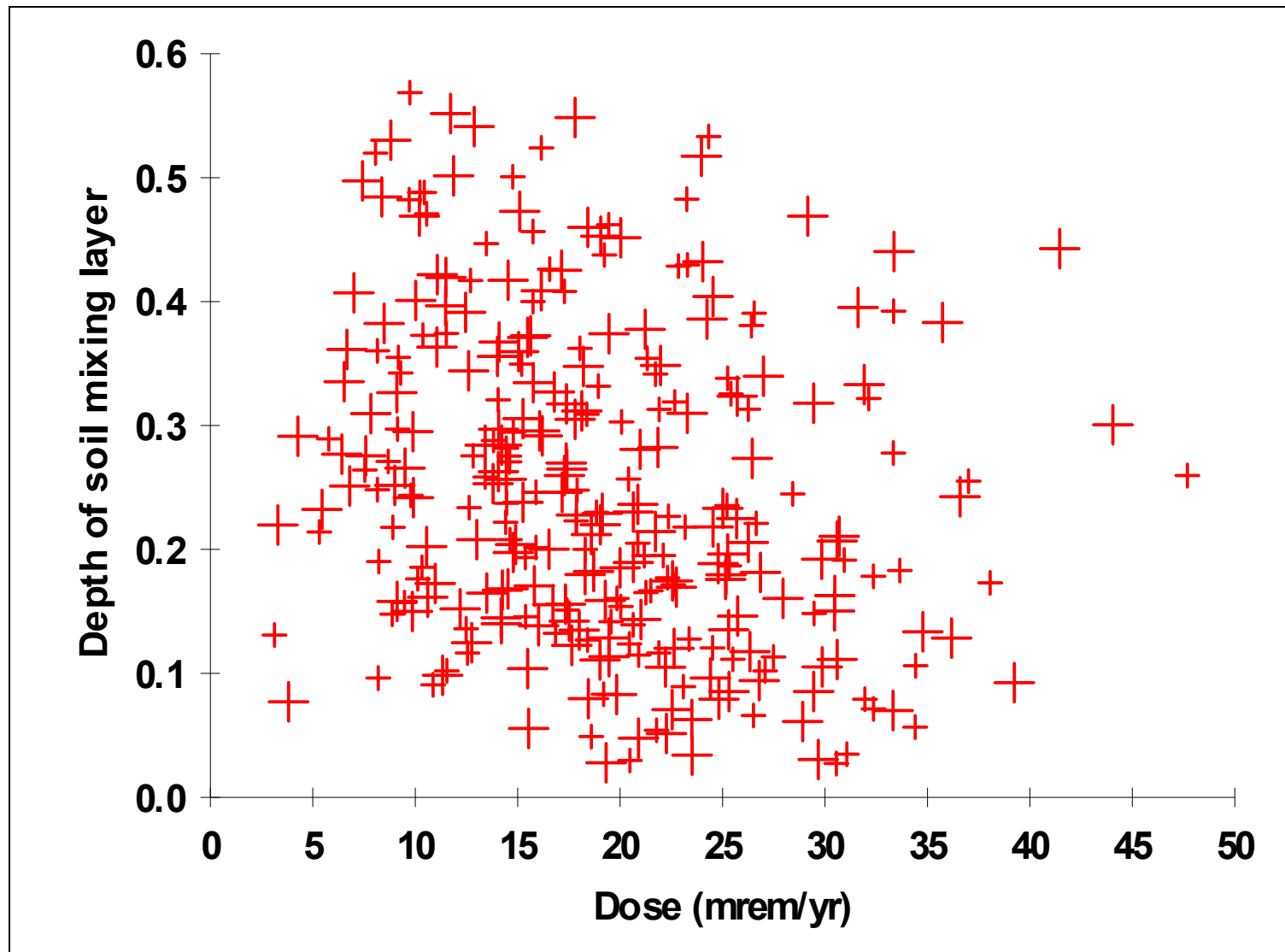


Figure H-121 Scatter Plot, Dose from All Pathways vs. Depth of Soil Mixing Layer, Resident Farmer, Uranium Source Term

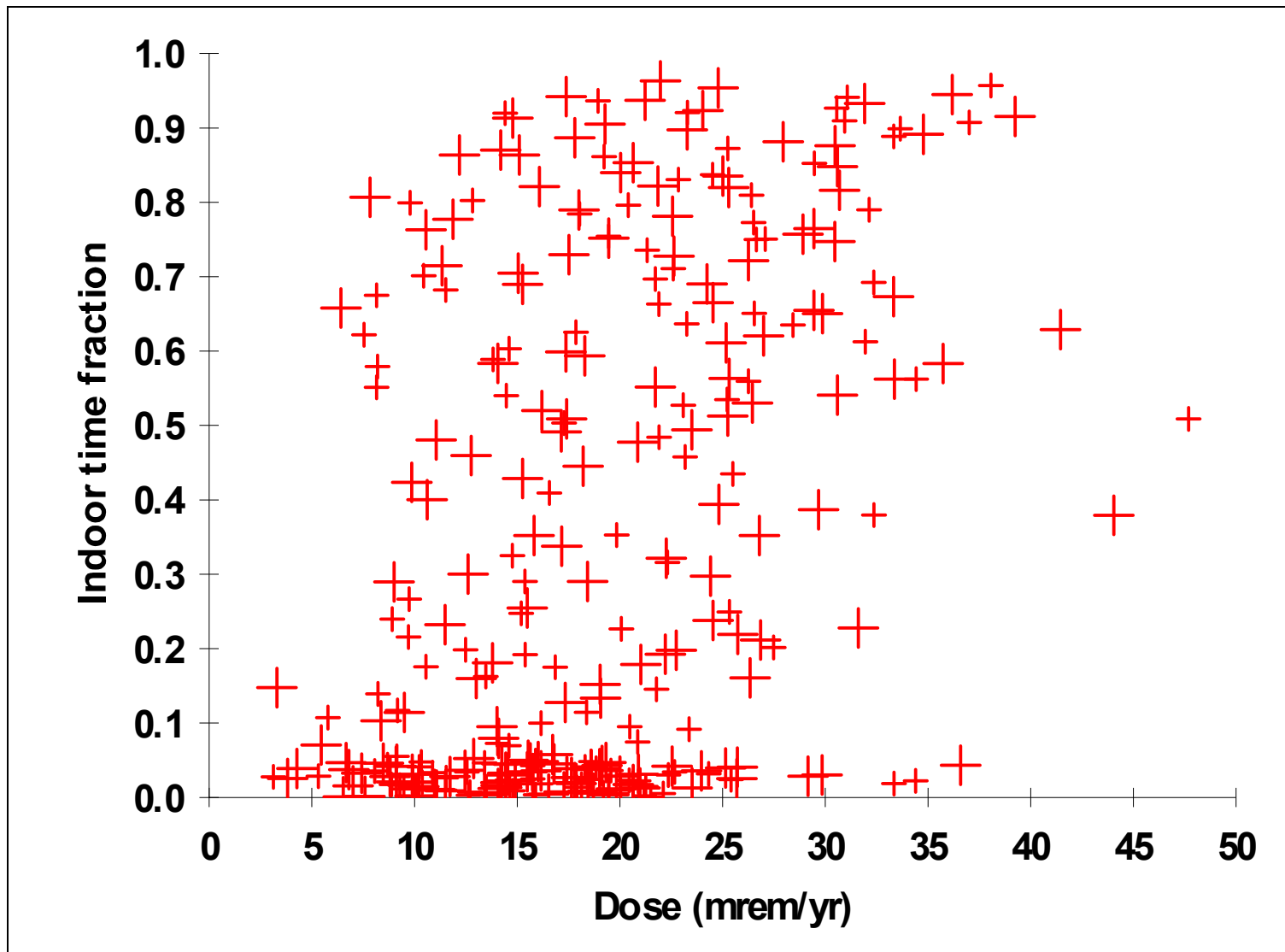


Figure H-122 Scatter Plot, Dose from All Pathways vs. Indoor Time Fraction, Resident Farmer, Uranium Source Term