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User's Guide for the SYSPOP Program

A PC Version of the PRESTO-EPA-POP Operation System

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USER'S GUIDE FOR THE SYSPOP PROGRAM

A PC Version of the PRESTO-EPA-POP Operation System

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PREFACE

Since the mainframe version of the PRESTO-EPA family of models were published in December 1987, the Office of Radiation Programs has received numerous requests from potential users of the model urging the Office to convert the model to a form usable on a personal computer. This effort has subsequently proceeded in two phases, the simplification of the PRESTO-EPA models and the development of the PRESTO-EPA operation system. The simplification of the PRESTO-EPA models involved primarily the modifi-cation of the DARTAB subroutine so that the size required by the random access memory could be reduced considerably without altering the accuracy of the simulation results. The PRESTO-EPA operation system is designed to assist users to create and edit the main input file for the PRESTO-EPA models. It is a user - friendly, menu-directed operation system. The operation system for the PRESTO-EPA-CPG model was developed first because it received the most request from the public. This system development was completed and published in April 1989. Users found that the operation system has been greatly simplified and much of the potential errors were prevented by employing the operation system program. In response to many users' requests, we began to develop the PRESTO-EPA-POP operation system subsequently. The structure of the operation system is in general kept the same as that used in the PRESTO-EPA-CPG

operation system to improve the system efficiency. The use of a color monitor is one of the improvements. The operation system does not include the preparation of the input file required by the INFIL subroutine because the input file can be easily handled without an operation system.

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1. INTRODUCTION

The U.S. Environmental Protection Agency (EPA) developed the PRESTO-EPA-POP, a member of PRESTO-EPA family models, to calculate the potential fatal health effects and serious genetic effects for the general population downstream of a low-level radioactive waste (LLW) disposal site. These results serve as data bases for the comparison of the potential health impacts for a broad number of LLW disposal alternatives and are used to support generally applicable environmental standards for the management and disposal of LLW. The model is also considered to be suitable for the initial screening of candidate LLW disposal sites.

The original PRESTO-EPA-POP model employed the DARTAB subroutine, EPA's standardized generic submodel for doses and health effects calculations, which requires a large volume of access files. The model could therefore only be executed by a mainframe computer. In responding to many potential users' request, a PC version of the PRESTO-EPA-CPG Operation System was published in 1989 [EPA 89]. Soon after the PC version of the PRESTO-EPA-CPG Operation System was released, we received numerous comments from potential users that it would be beneficial to new users if the PRESTO-EPA-POP model could also be operated on a personal computer (PC). In responding to the

request, the mainframe version of the PRESTO-EPA-POP model was modified and converted into a PC version [Ro87].

The structure of the PRESTO-EPA-POP Operation System is maintained the same as that used in the PRESTO-EPA-CPG Operation System. That is, a user-friendly input file preparation program was developed to automate the input file preparation to reduce the potential of making unnecessary errors.

This user-friendly PRESTO-EPA-POP Operation System Program, SYSPOP, is the combination of the input file preparation program and the PC version of PRESTO-EPA-POP model which simplifies the operation of PRESTO-EPA-POP.

2. DESCRIPTION OF SYSPOP PROGRAM

2.1 PC VERSION OF THE PRESTO-EPA-POP MODEL

The PRESTO-EPA-POP model was designed to analyze the potential fatal health effects and serious genetic effects to the general public from the disposal of LLW. The original model was implemented in an IBM mainframe computer and is well documented in EPA's report on the documentation of the PRESTO-EPA-POP model [EPA87].

The mainframe version of the model employed the DARTAB subroutine, EPA's standardized model for dose and health effects calculations, which requires a large volume of access files. The model could therefore be executed by a mainframe computer. To execute the model in a personal computer, it is necessary to modify the model to reduce the core memory requirement and to improve the process efficiency as well.

The major modifications of the model include the replacement of the DARTAB subroutine with the HESTAB subroutine, elimination of QUANC8 function, and adjustment of I/O statements [Ro87].

The replacement of the DARTAB subroutine with HESTAB has reduced considerably the core memory requirement. To calculate the health effects and genetic effects resulting from human exposures, the HESTAB subroutine reads a set of health effects and genetic effects conversions factors from the POPFAC input file, which were precalculated from the RADRISK file using the

same methodology as used in the original DARTAB subroutine. The results of the calculation are printed out in much the same format used in the mainframe version of the model.

The elimination of the QUANC8 function, a function for integrating an algebraic function having an infinite limit, prevents the tedious numerical integration of Hung's correction factor [Hu80]. The modified model employs an analytical solution as derived by Hung [Hu86]. This modification resulted in some savings in the process time. A complete listing of the PC version of the PRESTO-EPA-POP model is presented in Appendix A. The PC version of PRESTO-EPA-POP will be called PRESTO-EPA-POP throughout the rest of this documentation.

2.2 PRESTO-EPA-POP INPUT REQUIREMENTS

There are three input files required for the execution of PRESTO-EPA-POP. They are: (1) the environmental and nuclide specific input file; (2) the INFIL subroutine input file, and (3) the health effects input file. Details of the input files are presented in the following sections.

2.2.1 Environmental and Nuclide-Specific Input File

This input file is used to supply the physical and hydrogeological characteristics of the disposal site, the meteorological data for atmospheric dispersion and deposition, the data for the biological pathways, and the radionuclide characteristics and inventories.

The data set also contains parameters describing the site characteristics, the disposal technology, the human exposure characteristics, and some specific parameters characterizing the site and exposure scenarios. For simplification, this input file is referred to as the main input file throughout this documentation.

2.2.2 INFIL Subroutine Input File

The INFIL subroutine input file is used to calculate rainwater infiltrating through the trench cap into the waste trench. It is divided into two categories, trench cap characteristics and local hydrological and meteorological data.

2.2.3 Health Effects Input File

This file contains health effect and genetic effect conversion factors for each radionuclide. It is used to calculate the fatal health effects and serious genetic effects through each exposure pathway.

These conversion factors are independent of disposal site and disposal method; therefore, this file is incorporated into the program and requires no changes from the user under normal application.

The format for the environmental and nuclide-specific, INFIL subroutine, and health effects input files are listed in Appendix B, Tables B-1, B-2, and B-3, respectively.

The definition and format of the input files for the environmental and nuclide-specific input file and INFIL subroutine input file are basically identical to that for the mainframe version of the model, except for two cards used in the environmental and nuclide specific input file. Modifications on these cards are described as follows:

1. Card 18: The variable name RR is renamed RMECH, but the definition of the variable remains the same (see Appendix B for definitions of RR and RMECH).
2. Card 19: Two variables, RR and FTRR, are added in front of the two original variables, IT and IS (see Appendix B for definitions of RR, FTRR, IT, and IS).

2.3. DESCRIPTION OF THE SYSPOP OPERATION SYSTEM

2.3.1 General

The PRESTO-EPA-POP operation system, SYSPOP, is designed to help the user of the PRESTO-EPA-POP model to prepare the input data files, to perform necessary file management for the execution of the pre-compiled PRESTO-EPA-POP objective module, and to automate the execution of the PRESTO-EPA-POP model.

The program provides the capability of editing the input data file which includes line editing of the input file, display of the input file, line-by-line comparison with a predesignated

input file, and insertion and deletion of radionuclides to be considered in the analysis.

In managing the data files for the execution of the pre-compiled objective module, the operation system helps users to clear the files which need to be deleted, check the availability of the storage volume, and save the pre-existing output file.

Although there are three input files required to execute the PRESTO-EPA-POP model, the SYSPOP operation system includes the preparation of the environmental and nuclide input file only because this file is the most complicated input file of all and needs the most attention.

The preparation of the INFIL subroutine input file is excluded from the program because there would be only one line of input data to change if there is a change in the trench cap design.

The preparation of the health effects input file is also excluded from the SYSPOP program because the file is independent of site location and facility design, and no change is necessary under normal application.

2.3.2 System Structure

The structure of the PRESTO-EPA-POP operation system consists of many subprograms each of which performs a designated function. These subprograms include 10 operation programs, 7 batch programs, 3 input data files and 1 pre-compiled objective program.

The operation programs include, DATACHK.FOR, INPOPC.BAS, INPOPD.BAS, INPOPE.BAS, INPOPI.BAS, INPOPR.BAS, LOGO.BAS, MENU.BAS, MENUED.BAS, AND RUNPOP.BAS. The batch programs include COPFIL.BAT, COPY1.BAT, COPY2.BAT, COPY3.BAT, PRINTPOP.BAT, RUNPOPB.BAT, and SYSPOP.BAT. The three input files are INPOP.DAT, STPOP.DAT, and POPFAC.DAT and the precompiled objective file is POPPC.EXE.

The functions of each subprogram are described as follows:

DATACHK.FOR: an operation program which allows the user to check the matching of the type of each input data with that specified in the PRESTO-EPA-POP coding.

INPOPC.BAS: an operation program which allows the user to make a line-to-line comparison of the input file with a predesignated standard input file to locate errors in the input file;

INPOPD.BAS: an operation program which allows the user to delete radionuclides of no concern, thus saving calculation time;

INPOPE.BAS: an operation program which allows the user to make line editing of the input file;

INPOPI.BAS: an operation program which allows the user to insert radionuclides of his interest;

INPOPR.BAS: an operation program which allows the user to review the entire input file;

LOGO.BAS	A program which displays the logo of the SYSPOP program;
MENU.BAS:	an operation program which displays the main menu of operation and subsequently loads the program selected by the operator;
MENUED.BAS	an operation program which displays the editing menu and subsequently loads the program selected by the operator;
RUNCPG.BAS:	an operation program which performs file management, including saving the pre-existing output file, checking the available storage volume, and executing the PRESTO-EPA-POP program;
COPFIL.BAT:	a batch program which copies an input data file from the standard input data file;
COPY1.BAT:	a batch program which duplicates the current input file, standard file and dosimetric file for editing use;
COPY2.BAT:	a batch program which replaces the current file with the updated file for editing use;
COPY3.BAT:	a batch program which replaces the old files with updated final files and deletes all the temporary files during the course of editing;
PRINTPOP.BAT:	a batch program which gives the instruction to print out the PRESTO-EPA-POP output file;

RUNPOP.BAT:	a batch program which prepares the files and executes the PRESTO-EPA-POP model;
SYSPOP.BAT:	a batch program which loads and runs the LOGO.BAS program;
INPOP.DAT:	an input file containing environmental and radionuclide-specific data;
STPOP.DAT:	a standardized input file equivalent to the INPOP.DAT file;
POPFAC.DAT:	an input data file which contains the fatal health effect and genetic health effect conversion factors; and
POPPC.EXE:	an executable PRESTO-EPA-POP module used primarily to calculate the fatal health effect and serious genetic health effect.

3. SYSTEM INSTALLATION

The PRESTO-EPA-POP operation system is designed to be operated on an IBM PC/AT-level microcomputer or its compatible. The computer should be equipped with a math co-processor (8087/80287 or equivalent) and a color monitor having having video graphic array (VGA). The available disk storage after all of the software has been stored should be at least one megabytes.

The system software may be installed either in a hard disk drive or in a Bernoulli box. The same disk will also be used to store the output file and the temporal output file. Normally all of the system operation software, objective module of PRESTO-EPA-POP, the sample input and output, and the standard input file will be transmitted to a user in a high density 5.25-inch floppy diskette. To install the system, simply copy all of the files into the same directory or subdirectory. The system will then be ready for operation.

4. SYSTEM OPERATIONS

The PRESTO-EPA-POP operation system program is a menu-directed, user-friendly system. Detailed instructions of the operations are displayed on the screen so that the user may proceed with the operations by simply following the instructions.

This chapter provides the supplemental instructions for the system operation.

4.1 START UP

To start the system proceed as follows:

a. Turn on the power switch, access the disk operating system (DOS), and change the directory to the DOS prompt corresponding to the drive in which the software disk is placed;

b. Type "SYSPOP"; the logo of the operation system will appear, and finally,

c. Press any key to display the main menu; see Figure 4-1.

```
                    MAIN MENU

1.  Copy a New Input File from the
      Standard Input File

2.  Edit the Existing Input File

3.  Test the Input File

4.  Execute PRESTO-EPA-POP

5.  Print Out POP.OUT

6.  End of Operation
```

*** Enter your selection number

Figure 4-1. Main menu of the operation system

The system is now ready to receive the user's selection for operation. Upon receiving the selected number, the system will transfer the operation to the corresponding subsystem. When "End of Operation" is selected, the system will return to the DOS system.

4.2 COPY A NEW INPUT FILE

This option allows the user to copy a preliminary new input file from the standard file provided in STPOP.DAT. This operation can prevent a massive typing of the new file if the new file is similar to the standard file. To obtain the final form of the input file, you may use the editing operation discussed in the following sections.

To copy the standard file into a new input file, simply respond "1" to the request (see figure 4-1). To avoid this selection being made by accident and subsequent loss of the existing input file, the system responds with a warning to make sure this is indeed your selection. This warning tells you that the copying of a new input file will result in the loss of the old input file. Upon your confirmation, the system will duplicate the standard file, save the copied file as the current input file, and then return to the main menu after informing you of the completion of the operation.

4.3 EDIT THE EXISTING INPUT FILE

This option is designed to allow the user to edit the input file which is stored in the INPOP.DAT file. This selection provides five functions: (1) edit the input file; (2) compare the input file with the standard file; (3) review the input file; (4) delete radionuclides; and (5) insert radionuclides.

When the selection is made by the user, the system displays the menu for input file editing. Figure 4-2 shows the display of the menu.

```
Menu for Editing

1.  Edit the Input File

2.  Compare the Input File with
      the Standard File

3.  Review the Input file

4.  Delete radionuclides

5.  Insert radionuclides

6.  End of Editing
```

***Enter selection number

Figure 4-2. Display of editing menu

4.3.1 Edit the Input File

When the option of editing an input file is selected the system will transfer the control to the INPOPE.BAS program which is followed by the read-in of the current input file.

If the input file is incomplete, the program will give an error message, "Input file is incomplete," and then return to the main menu.

If the input file is complete, the system will display the instructions for file editing, as shown in Figure 4-3. The system will continue to request the first card number of the block (altogether 21 lines or cards in a block) that you wish to edit. If the card number is No. 29, the program will make an additional request for the first radionuclide number of the block that you wish to edit. You should see the screen display a whole block of 21 line input data with its top line being highlighted indicating that the line is being edited.

To edit the highlighted line, proceed as instructed in Figure 4-3. If no edit is required for that line, all you need is to press the [enter] key. After the updated date are entered, the system will display the updated line of input data and move on to highlight the next line.

To terminate the editing of the current block of input data, you may simply press the [esc] key. The system will go back to request the first card number of the block that you wish to edit. This will commence another editing cycle for the newly requested block.

You may escape from the editing mode by pressing the [esc] key when the first card number of the editing block is requested. Based on your response, the system will either replace the input

file with an updated one or do nothing to the existing input file and return to the menu for editing.

```
                    Instructions for File Editing

1. Input the starting card number (and nuclide number
   if the starting number is above 28) of the block
   you wish to edit;

2. Highlight the succeeding lines by pressing "enter",
   "cursor up", or "cursor down" key until the line
   you wish to edit is highlighted;

3. Edit the line by using "cursor right" key to copy,
   new character to replace, "backspace" or "cursor
   left" key to change the Previous entry, "insert"
   key to insert, and "del" key to delete;

4. Press "enter" key when all of the necessary editing
   is completed;

5. Repeat steps 2, 3, and 4 until all of the lines you
   wish to edit are completed; and

6. To quit or to move to another block, simply press
   "esc" key.

                  ***Press any key to continue
```

Figure 4-3. Display of the instructions for file editing

4.3.2 Compare the Input File

This option provides the capability of a line-by-line comparison of the current input file, INPOP.DAT, with the standard file, STPOP.DAT, and is primarily designed for checking the format and numerical field of the input data in the current file. It is particularly useful in locating the invalid input

data which caused the run time error in the execution of the PRESTO-EPA-POP model.

When this option is selected, the system starts with the read-in of the standard and the current files. If the current file is incomplete, the system will issue the warning message, "INPOP.DAT is incomplete," and then return to the menu for editing. If the file is complete, the program displays a block of three line information for each card starting from card number 1. Because of the limited space available on the screen, seven blocks (only six blocks for the radionuclide-specific input data cards) are displayed on a page. Each block displays the data input from the standard input file on the first line, the input data from current input file on the second line, and the card number and the data field location on the third line.

You may move the display to the next page by pressing the "enter" key. To terminate the option, press the "esc" key. When the "esc" key is pressed, the system will return to the menu for editing and will be ready for another selection.

4.3.3 Review the Input File

This option provides the capability for quick review of the entire current input file. It can be used to check completeness of the file or to scan the input file for any obvious error.

When this option is selected, the system will start with a read-in of the current input file and check the completeness of the file. If the file is incomplete, the system will issue a

warning message "INPOP.DAT is incomplete," and then return to the menu for editing. If the file is complete, the system will display the input data starting from card No. 1 and displays 20 lines on a single page. To view the next page, you may simply press "enter" key. You may terminate the reviewing option at any time by pressing the "esc" key. When this is done, the system will return to the menu for editing and will be ready for another selection.

4.3.4 Delete Radionuclides

This option provides the capability of deleting radionuclides of no interest to the user. For maintaining the capability of comparing with the standard input file and matching the number of radionuclides with the health effects conversion factor table, the same deletion of a radionuclide is automatically conducted for the standard input file and health effects conversion file.

When this option is selected, the system will issue the warning, "Deletion of radionuclides from the input file will also result in the deletion of the same radionuclides from the standard input file and dose conversion factor table." This warning gives the user a chance to save the existing files.

Upon the approval of the user, the system will proceed with matching the radionuclide name among the current input file, standard file, and dose conversion factor file. If there are inconsistencies, the system will print them out and return to the

menu for editing. If no inconsistency is found, the system will proceed to print out the current radionuclide sequence and request for the range of radionuclide numbers to be deleted.

Upon receiving the range of radionuclide numbers to be deleted, the system will proceed with the deletion of the designated radionuclides from the current input file, the standard input file, and the health effects conversion file; and then print out the new radionuclide sequence. The system will then continue to ask for another deletion. If the user approves the request, the system will move on to request for the range of radionuclide numbers to be deleted and the whole cycle will be repeated. If the user denies this request, the system will move on to ask if the user wants to save the new files. If it is approved, the system will replace all three files with the updated files and return to the menu for editing; otherwise, the system will return to the menu for editing without replacing the updated files.

The PRESTO-EPA-POP model takes up to 40 radionuclides with each radionuclide assigned a number from 1 to 40. These numbers are used to identify radionuclides. The range of "radionuclide numbers" must fall between 1 and 40 or the program will not accept the entry.

4.3.5 Insert Radionuclides

This option provides the capability of inserting radionuclides which are of particular interest to the user. For

maintaining the capability of comparing with the standard input file and matching the number of radionuclides with the dose conversion file, the same insertion of radionuclides are also automatically processed for the standard input file and health effects conversion file.

When this option is selected, the system will issue the warning "insertion of radionuclides into the input file will also result in the insertion of the same radionuclides into the standard input file and dose conversion factor table." This warning gives the user a chance to save the existing files.

Upon approval from the user, the system will proceed with matching the radionuclide name between the current input file, standard file, and health effects conversion factor table. If there are inconsistencies, the system will print them out and return to the menu for editing. If no inconsistency is found, the system will proceed to print out the current radionuclide sequence and request for the range of radionuclides to be inserted. The total number of radionuclides that the program can take is limited to 40; consequently, the resulting number of radionuclides after the insertion should also be limited to 40.

Upon receiving the range of numbers of radionuclides to be inserted, the system will proceed to insert the designated radionuclides into the current input file, the standard input file, and the health effects conversion file; print out the new radionuclide sequence; and ask for another insertion. If the user approves the request, the system will continue to request

the range of radionuclide numbers to be inserted and the whole cycle will be repeated. If the user denies the request, the system will move on to ask if the user wants to save the new files. If it is approved, the system will replace all three files with the updated files and return to the menu for editing; otherwise, the system will return to the menu for editing without replacing the updated files.

4.3.6 End of Editing

When this selection is entered, the program will leave the editing mode and return to the main menu for another selection.

4.4 TEST THE INPUT FILE

This option allows the user to test the entire input file for the illegal real numbers and integers. Since the PRESTO-EPA-POP Computer Code will not take any illegal real numbers and integers, it is important to test the file before you run the code.

To test for the illegal real numbers and integers, simply respond "2" to the request (see figure 4-1). The system responds with an instruction and tests the input data line-by-line and page- by-page. Following a successful test of a line of data, it will display the line tested. When the test reaches the end of the page, and if no illegal numbers are found, a "No illegal numbers found" message will be displayed.

When an illegal number is found, the testing will be terminated with an error message. The search for the illegal number in the line shall be proceeded manually by the operator.

4.5 EXECUTE PRESTO-EPA-POP

The option for the execution of PRESTO-EPA-POP is designed to prepare and run PRESTO-EPA-POP. The preparation includes the reminders to check the saving of the existing output file, the availability of disk storage, and the status of the INFIL subroutine input file.

When the option is selected, the system will ask if the user wants to save the existing output file, POP.OUT. If the user's response is "no," the system will move directly to check the available disk storage space. If the user's response is "Yes," the system will ask for a new name of the file. Upon receiving the new name of the output file, the system will rename the POP.OUT file as designated and move on to check the available disk storage space.

The system will not check the available disk storage automatically. Instead, it will print out the existing available disk storage and let the user compare it with the minimum storage requirement of 1 megabyte. This is done by asking the user "Do you have enough free space?" If the answer is "no," the system will remind the user to secure more free space and return to the main menu. If the user's response is "yes," then the system will ask if the existing INFIL subroutine input file, INFIL.DAT, is

current. If the user's response is "no," the system will remind the user to update the INFIL.DAT and return to the main menu. If the user's response is "yes," the system will issue the message that the system is ready to run the PRESTO-EPA-POP model and remind the user that the output file will be saved in the POP.OUT file.

Upon final user approval, the system will automatically copy INFIL.DAT, INPOP.DAT, data files and then run the PRESTO-EPA-POP program.

The PRESTO-EPA-POP is a huge FORTRAN program consuming a lot of time to execute the entire program. It takes approximately 200 minutes to complete a run involving 40 radionuclides; whereas the number of radionuclides is reduced to 5, only 30 minutes is required. To inform the user of the status of the run during execution, the system will print out the year of the health effects that the model is calculating. This will continue to 10,000 years for a standard run.

When the execution is completed, the system will issue the message "Execution of PRESTO-EPA-POP completed, and your output is stored in POP.OUT" and then return to the main menu.

4.7 PRINT OUT POP.OUT

This option allows the user to print out the results of the PRESTO-EPA-POP run which is stored in the file, POP.OUT. Due to the fact that the capability of a word processor today is remarkable, one may prefer to print the output file out by using

a word processor. A word processor can print out a text file in variouse options to satisfy users' needs. For instance, a lanscape printing with a reduced character size can cosiderably reduce the number of pages to be printed and enhance the user's filing system.

When this option is selected, the system will simply suggest user to use his/her favorite word processor and then return to the main menu. Users should refer to the word processor manual for its printing procedures.

4.8 END OF OPERATION

When this option is selected, the system will leave the SYSCPG operation system and return to the DOS system.

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APPENDIX A

LISTING OF PRESTO-EPA-POP MODEL

```
$DEBUG
C*****************************************************************
C*****************************************************************
C*******************  PRESTO-EPA-POP – PC/AT  *******************
C*****************************************************************
C*****************************************************************
C
C--- A CODE FOR PREDICTING THE MIGRATION OF RADIOACTIVE WASTE FROM
C--- SHALLOW LAND BURIAL SITES AND THE HEALTH EFFECTS THAT RESULT
C--- FROM THESE LOW LEVEL RADIOACTIVE WASTES.
C
C--- MODIFIED OCTOBER 1985 BY ROGERS & ASSOC. ENGR. TO ALLOW DOSE
C--- AND HEALTH EFFECT OUTPUT TO BE PRINTED FOR INTERMEDIATE YEARS
C--- DURING THE SIMULATION PERIOD.
C
C--- THE MAIN PROGRAM ACTS AS A SUPERVISOR FOR THE REST OF THE
C--- CODE.  MOST OF THE BOOKEEPING, INCLUDING MATERIAL BALANCE,
C--- IS DONE HERE.  THE FOLLOWING SUBROUTINES ARE CALLED:
C--- SOURCE, AIRTRM, ERORF, TRENCH, LEACH, VERHOR, SURSOL,
C--- SUSPND, OUT, FOOD, IRRIG, HUMEX, AND HESTAB.                    IHUNG
C
C--- GLOBAL VARIABLES
C
C       ADEPTH  = AQUIFER DEPTH                          M
C       AQDISP  = AQUIFER DISPERSION ANGLE                  RADIANS
C       AQTHK   = AQUIFER THICKNESS                      M
C       AQVOL   = AQUIFER DILUTION FACTOR                  M**3
C       AQAM    = AMOUNT OF NUCLIDE AT WELL SITE              CI/M**3
C       AQAVG   = AVERAGE NUCLIDE CONCENTRATION AT WELL SITE     CI/M**3
C       AQCON   = NUCLIDE CONCENTRATION AT WELL SITE            CI/M**3
C       ATAVG   = AVERAGE NUCLIDE CONCENTRATION IN ATMOSPHERE    CI/M**3
C       ATCON   = NUCLIDE CONCENTRATION IN ATMOSPHERE DOWNWIND   CI/M**3
C       ATMASS  = NUCLIDE MASS NUMBER
C       BDENS   = BULK DENSITY OF SOIL                   G/CC
C       CPL1    = NUCLIDE CONCENTRATION IN LEAFY VEGETABLES FOR
C                 M.I.E. BY ATMOSPHERIC DEPOSITION          PCI/KG
C       CPL2    = NUCLIDE CONCENTRATION IN PRODUCE FOR M.I.E.
C                 BY ATMOSPHERIC DEPOSITION                 PCI/KG
C       CPL3    = NUCLIDE CONCENTRATION IN LEAFY VEGETABLES AND
C                 PRODUCE FOR G.P.E. BY ATMOSPHERIC DEPOSITION   PCI/KG
C       CS      = CONCENTRATION IN SURFACE SOIL                CI/KG
C       CW      = CONCENTRATION IN SURFACE WATER                  CI/M**3
C       CWAT    = NUCLIDE CONCENTRATION IN WATER
C       CCMI1   = NUCLIDE CONCENTRATION IN COW'S MILK FOR M.I.E.
C                 BY ATMOSPHERIC DEPOSITION                 PCI/L
C       CCMI2   = NUCLIDE CONCENTRATION IN COW'S MILK FOR G.P.E.
C                 BY ATMOSPHERIC DEPOSITION                 PCI/L
C       CGMI1   = NUCLIDE CONCENTRATION IN GOAT'S MILK FOR
C                 M.I.E. BY ATMOSPHERIC DEPOSITION          PCI/L
C       CGMI2   = NUCLIDE CONCENTRATION IN GOAT'S MILK FOR
C                 G.P.E.BY ATMOSPHERIC DEPOSITION           PCI/L
C       COPL1   = NUCLIDE CONCENTRATION IN LEAFY VEGETABLES FOR
C                 M.I.E. BY IRRIGATION                      PCI/KG
C       COPL2   = NUCLIDE CONCENTRATION IN PRODUCE FOR M.I.E. BY
C                 IRRIGATION                                PCI/KG
C       COPL3   = NUCLIDE CONCENTRATION IN LEAFY VEGETABLES AND
C                 PRODUCE FOR G.P.E. BY IRRIGATION          PCI/KG
C       CGMEAT  = NUCLIDE CONCENTRATION IN BEEF MEAT BY
C                 ATMOSPHERIC DEPOSITION                    PCI/KG
C       COCMI1  = NUCLIDE CONCENTRATION IN COW'S MILK FOR M.I.E.
```

```
C            BY IRRIGATION                                PCI/L
C      COCMI2 = NUCLIDE CONCENTRATION IN COW' MILK FOR G.P.E.
C            BY IRRIGATION                                PCI/L
C      COGMI1 = NUCLIDE CONCENTRATION IN GOAT'S MILK FOR
C            M.I.E. BY IRRIGATION                         PCI/L
C      COGMI2 = NUCLIDE CONCENTRATION IN GOAT'S MILK FOR
C            M.I.E. BY IRRIGATION                         PCI/L
C      COMEAT = NUCLIDE CONC IN BEEF MEAT BY IRRIGATION        PCI/KG
C      CONTRL = EROSION CONTROL PRACTICE FACTOR
C      COVER  = COVER FACTOR
C      DECN   = DECAY CORRECTION FACTOR
C      DDETA  = DECAY-DISPERSION CORRECTION FACTOR
C      DECAY  = RADIOACTIVE DECAY CONSTANT                  1/Y
C      DOVER  = ANNUAL THICKNESS OF TRENCH OVER BURDEN ERODED  M
C      DTRAQ  = DISTANCE FROM TRENCH TO AQUIFER             M
C      DWELL  = DISTANCE FROM TRENCH TO WELL                M
C      DDETA1 = DDETA FOR VERTICAL TRANSPORT
C      DDETA2 = DDETA FOR HORIZONTAL TRANSPORT
C      DERATE = ATMOSPHERIC DEPOSITION RATE
C      ERODF  = ERODIBILITY FACTOR
C      EXPOS  = NORMALIZED DOWN WIND ATMOSPHERIC EXPOSURE PER
C            UNIT SOURCE RELEASE
C      EXTENT = CROSS SLOPE EXTENT OF SPILLAGE              M
C      FTWIND = FRACTION OF TIME WIND BLOWS TOWARD POPULATION
C      FI     = FRACTION OF YEAR CROPS ARE IRRIGATED
C      GWV    = GROUND WATER VELOCITY                      M/Y
C      GNDCON = INSOLUBLE SURFACE SPILLAGE GROUND CONCENTRATION
C      HTIME  = HORIZONTAL OR AQUIFER TRANSPORT TIME       Y
C      IDELT  = INCREMENTAL YEAR FOR PRINTING ANNUAL SUMMARIES
C      INTYR  = INTERMEDIATE YEARS DURING THE SIMULATION FOR   Y
C            WHICH DOSE & HEALTH EFFECT OUTPUT IS DESIRED
C      IPRT1  = INITIAL YEAR FOR PRINTING ANNUAL SUMMARIES
C      IPRT2  = FINAL YEAR FOR PRINTING ANNUAL SUMMARIES
C      ITIME  = TOTAL TRANSPORT TIME FROM TRENCH TO WELL       Y
C      IOPSAT = OPTION INDICATOR FOR CALCULATING LENGTH OF
C            SATURATED ZONE
C      IOPVWV = OPTION IDICATOR FOR CALCULATING VERTICAL WATER
C            VELOCITY
C      LU2    = LOGICAL UNIT FOR OUTPUT
C      MAXYR  = NUMBER OF YEARS IN SIMULATION
C      NYEAR  = CURRENT YEAR OF SIMULATION
C      NONCLD = NUMBER OF NUCLIDES IN SIMULATION
C      NUCLID = NUCLIDE NAMES
C      OVER   = TRENCH OVER BURDEN THICKNESS               M
C      PC     = FRACTION OF TRENCH CAP THAT HAS FAILED
C      PCON1  = AIR CONCENTRATION                       CI/M**3
C      PCON2  = GROUND SURFACE CONCENTRATION                CI/M**2
C      PCON3  = COLLECTIVE INGESTION RATE                 PCI.PER
C      PCON4  = COLLECTIVE INHALATION                     PCI.PER
C      PD     = DOWNSLOPE DISTANCE TO STREAM               M
C      POLB   = AMOUNT OF NUCLIDE LEAVING BOTTOM OF TRENCH     CI
C      POLO   = AMOUNT OF NUCLIDE OVERFLOWING TRENCH           CI
C      POP    = POPULATION
C      PORS   = POSOSITY OF SOIL
C      PORT   = POROSITY OF TRENCH CONTENTS
C      PERMS  = PERMEABILITY OF SOIL                       M/Y
C      QING   = ANNUAL INTAKE OF RADIONUCLIDE BY INGESTION
C             OF CONTAMINATED FOOD CONSIDERING ATMOSPHERIC
C             AND AQUATIC PATHWAYS                        PCI/Y
C      QINH   = ANNUAL INTAKE OF NUCLIDE BY INHALATION        PCI/Y
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C       QFRAC  = FRACTION OF INGESTION DUE TO WATER
C       RAINF  = RAINFALL FACTOR
C       RETARH = HORIZONTAL RETARDATION FACTOR
C       RETARV = VERTICAL RETARDATION FACTOR
C       SOAM   = AMOUNT OF SURFACE SPILLAGE                    CI
C       SAREA  = AREA OF SPILLAGE                          M**2
C       SDEEP  = AMOUNT OF SOLUBLE SURFACE COMPONENT GOING TO
C              TRENCH                                      CI
C       SEDELR = SEDIMENT DELIVERY RATIO
C       STAVG  = AVERAGE NUCLIDE CONCENTRATION IN STREAM        CI/M**3
C       STCON  = NUCLIDE CONCENTRATION IN STREAM              CI/M**3
C       STPLNG = SLOPE-STEEPNESS AND SLOPE LENGTH FACTOR
C       SOILOS = ANNUAL SOIL LOSS DUE TO EROSION
C       SSTREM = AMOUNT SURFACE COMPONENT GOING TO STREAM       CI
C       STFLOW = STREAM FLOW RATE                          M**3/Y
C       TRAM   = AMOUNT OF NUCLIDE IN TRENCH                   CI
C       VD     = ATMOSPHERIC DEPOSITION VELOCITY               M/S
C       VOLB   = VOLUME OF WATER LEAVING TRENCH BOTTOM          M**3
C       VOLO   = VOLUME OF WATER OVERFLOWING TRENCH             M**3
C       VOLUSD = HYPOTHETICAL VOLUME OF WATER USED FROM WELL    M**3
C       VTIME  = VERTICAL TRANSPORT TIME                        Y
C       VWV    = VERTICAL WATER VELOCITY (TRENCH TO AQUIFER)    M/Y
C       WIRATE = IRRIGATION RATE                           L/M**2-
C       XINFL  = ANNUAL INFILTRATION RATE                      M
C       XKD    = CHEMICAL EXCHANGE COEFFICIENT                 ML/G
C       XLSAT  = LENGTH OF SATURATED ZONE                      M
C       YSO    = ATMOSPHERIC SOURCE AMOUNT AT SPILLAGE         CI
C
C--- OTHER VARIABLES ARE DEFINED IN SUBROUTINES WHERE THEY
C--- ARE USED MOST FREQUENTLY.
C
      DOUBLE PRECISION NUCLID,FLAG,PNUC                          !LC
      COMMON/STREAM/DWS
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &      PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &      IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &      INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP          !LC
      COMMON/TRCH/TAREA,TDEPTH,OVER,PORT,RELFAC,DENCON,OLDWAT,FN
      COMMON/WATER/DTRAQ,DWELL,GWV,XLSAT,STFLOW,AQTHK,AQDISP,
     & PORA,PORV,PERMV,IAQSTF,CPRJ
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),          !PC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,PORS,
     &      BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,INSITE
      COMMON/AIR/H,VG,U,IT,IS,VD,XG,HLID,ROUGH,FTWIND,CHIQ          !PC/AT
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &      ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,QFC,QFG,TF1,
     &      TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),CCMI1(40),CCMI2(40),
     &      CGMI1(40),CGMI2(40),CMEAT(40),COL1(40),COL2(40),COP1(40),
     &      COP2(40),COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &      COMEAT(40),QING(40),QINH(40),POP,CSP(40),CSPT(40),CSPO(40),
     &      CSPOT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      COMMON/PASS/PNUC(40),PCON1(40),PCON2(40),PCON3(40),PCON4(40),PPOP,
     &      LLIND,LDIST
```

```
      COMMON/PCV/SOCON(40)
      COMMON/PDCF/GESE,GESN(40),HEFCTR(40,2,4),HESE,HESN(40)
      COMMON/RESUS/ARG1,RES,RE1,RE2,RE3                                  !PC/AT
      DIMENSION ITIME(40),DDETA(40),DECN(40)
      DIMENSION DDETA3(40),JTIME(40),DETWS(40),DEWS(40)
      DIMENSION QLB(40,10),TRAP(40),QLBPTH(40),HE(40),QLBTTH(40)
      DIMENSION NUCL(40,8),NUMBER(11),IDIG(3),BSMT(40),SAVE(40,21)
      DIMENSION AQMAX(40),STMAX(40),ATMAX(40),MXAQ(40),MXST(40),MXAT(40)
      DIMENSION PC1(40),PC2(40),PC3(40),PC4(40),NPC1(40),NPC2(40),
     &          NPC3(40),NPC4(40),BSMTA(40),CCNRS(40,4),FICANS(40,4),
     &          GNRS(40,4),HEF(40,4),POSS(40,4),POWS(40,4),
     &          QBASIN(40,4),RTAS(40,4),TCCNRS(4),TFICS(4),TGNRS(4)
      DIMENSION QDWSB(40),POW(40),POS(40),PLBT(40),OFT(40),RTA(40)
      DIMENSION CIOT(40),CINEWT(40)
      DATA LU2/6/
      DATA ISW/0/
      DATA MINUS/'-'/
      DATA AGEX/70.7565/
      DATA NUMBER/'1','2','3','4','5','6','7','8','9','0',' '/
      IBK=0
      RESAT=0.
      DO 11 K=1,10
      DO 11 I=1,40
   11 QLB(I,K)=0.0
      DO 10 I=1,40
      QDWSB(I)=0.
      QLBPTH(I)=0.0
      QLBTTH(I)=0.0
      POW(I)=0.
      POS(I)=0.
      PLBT(I)=0.
      OFT(I)=0.
      RTA(I)=0.
      AQAVG(I)=0.
      STAVG(I)=0.
      ATAVG(I)=0.
      SOAVG(I)=0.
      BSMT(I)=0.0
      AQMAX(I)=0.0
      STMAX(I)=0.0
      ATMAX(I)=0.0
      MXAQ(I)=0
      MXST(I)=0
      MXAT(I)=0
      PC1(I)=0.
      PC2(I)=0.
      PC3(I)=0.
      PC4(I)=0.
      NPC1(I)=0
      NPC2(I)=0
      NPC3(I)=0
      NPC4(I)=0
      CSP(I)=0.
      CSPT(I)=0.
      CSPO(I)=0.
      CSPOT(I)=0.
      SDEEP(I)=0.                                                        !LC
      CIOT(I)=0.                                                           !PC/AT
   10 CONTINUE
      OLDWAT=0.
```

```
C---- CIOT IS A VARIABLE TO BE USED IN SUB. LEACH INTRODUCED FOR OCT11
C---- VERSION (HUNG) INITIALIZE VARIABLES AND INPUT CONTROL PARAMETER.
C---- PRINT OUT INITIAL CONDITIONS.
      CALL SOURCE(NUCL,CFT1,DCFT,FGAM,IRST,PERMT,RTGR,SSAT,XRTM)
C----  PRJ=PERCENTAGE OF AQUIFER WATER FLOWING TO STREAM
       PRJ=1.-CPRJ
C---- THE FOLLOWING EXTRACTS THE ATOMIC MASS FROM THE NUCLIDE NAME. THE
C---- NUCLIDE NAME MUST CONSIST OF ONE OR TWO LETTERS, A MINUS SIGN, AND
C---- ONE TO THREE DIGITS.  NO IMBEDDED BLANKS ARE ALLOWED.  THE NAME
C---- MUST BE LEFT JUSTIFIED.
      WRITE(LU2,5000)
      DO 50 I=1,NONCLD
      NDASH=2
      IF(NUCL(I,NDASH) .EQ. MINUS) GO TO 20
      NDASH=3
   20 NNUM=NDASH+1
      DO 30 K=1,3
      ICHAR=NUCL(I,NNUM+K-1)
      DO 25 L=1,11
      IF(ICHAR .EQ. NUMBER(L)) GO TO 27
   25 CONTINUE
   27 IDIG(K)=L
      IF(IDIG(K) .EQ. 10) IDIG(K)=0
   30 CONTINUE
      NDIG=3
      IF(IDIG(3) .EQ. 11) NDIG=2
      IF(IDIG(2) .EQ. 11) NDIG=1
      INUCN=0
      DO 40 L=1,NDIG
      INUCN=INUCN+IDIG(L)*10**(NDIG-L)
   40 CONTINUE
      ATMASS(I)=FLOAT(INUCN)
      WRITE(6,5005)NUCLID(I),ATMASS(I)
   50 CONTINUE
C---- DETERMINE IF FARMING IS ONSITE
      INSITE=0
      XIRR=0.0
      IF(XG .LE. PD) THEN                                          ILC
        WRITE(LU2,5006)
        INSITE=1
        XIRR=WIRATE*FI*8760./1.0E3
        FARMGD=EXTENT*PD
        PEOPLE=FARMGD/4492.
        POP=AMAX1(PEOPLE,POP)                                      ILC
        WRITE(LU2,5007)POP
      ENDIF
C---- DETERMINE NORMALIZED ATMOSPHERIC EXPOSURE AND DEPOSITION.
      EXPOS=CHIQ
      IF(CHIQ .LE. 0.0)CALL AIRTRM(EXPOS,DEPO)
      PPOP=POP
      LLIND=LIND
      LDIST=XG
      DO 62 I=1,NONCLD
   62 PNUC(I)=NUCLID(I)
C---- DETERMINE ANNUAL INFILTRATION RATE THROUGH TRENCH CAP
      CALL INFIL(TXI,TP)
      XINFL=TXI
      PPN=TP
C---- DETERMINE VERTICAL WATER VELOCITY, RETARDATION FACTOR, VERTICAL
C---- TRANSIT TIME, HORIZONTAL TRANSIT TIME, AND TOTAL TRANSIT TIME.
```

```
      VWV=PERMV/PORV
      RESAT=RESAT/PORV
      TINFL=(PCT2*(PPN+XIRR)+(2.-PCT2)*XINFL)*0.5
      IF(SSAT .LE. 0.) SSAT=RESAT+(1.-RESAT)*(TINFL/PERMV)**0.25          !LC
      IF(SSAT .GT. 1.) SSAT=1.
      WRITE(LU2,1005) SSAT,RESAT
      IF(SSAT .GT. 0.0 .AND. SSAT .LT. 1.) VWV=TINFL/(PORV*SSAT)
       XLSAT=DTRAQ
      WRITE(LU2,6200)
      DO 100 I=1,NONCLD
      RETARV=1.+(BDENS*XKD(3,I))/PORV
      IF(SSAT .GT. 0.0 .AND. SSAT .LT. 1.) RETARV=1.+(RETARV-1.)/SSAT
      VTIME=DTRAQ*RETARV/VWV
      DDETA1=1.0
      IF (VTIME .GT. 1000. .OR. VTIME .GT. 50.*.693/DECAY(I)) GO TO 70
      UUV=DECAY(I)*RETARV                                          !HUNG
      DDETA1=HUNG(UUV,DTRAQ,VWV)                                      !HUNG
   70 RETARH=1.+(BDENS*XKD(4,I))/PORA
      HTIME=DWELL*RETARH/GWV
      DDETA2=1.0
      IF(HTIME .GT. 1000. .OR. HTIME .GT. 50.*.693/DECAY(I)) GO TO 80
      UUH=DECAY(I)*RETARH                                          !HUNG
      DDETA2=HUNG(UUH,DWELL,GWV)                                      !HUNG
   80 DDETA(I)=DDETA1*DDETA2
      TEMP=VTIME+HTIME
      IF(TEMP .GT. FLOAT(MAXYR) .AND. TEMP .LT. 1.1*FLOAT(MAXYR))IBK=1
      IF(TEMP .GT. 10000.) TEMP=10001.
      ITIME(I)=INT(TEMP)
      WRITE(LU2,6210)NUCLID(I),RETARV,VTIME,DDETA1,RETARH,HTIME,
     &               DDETA2,DDETA(I),TEMP
      WSTIME=DWS*RETARH/GWV
      DDETA3(I)=1.0
      IF(WSTIME .GT .1000. .OR. WSTIME .GT. 50.*.693/DECAY(I))GO TO 90
      UUS=DECAY(I)*RETARH                                          !HUNG
      DDETA3(I)=HUNG(UUS,DWS,GWV)                                     !HUNG
   90 IF(WSTIME.GT.10000) WSTIME=10000
      JTIME(I)=INT(WSTIME)
  100 CONTINUE
      IF(IBK .EQ. 1)WRITE(LU2,6220)
C---- DETERMINE ANNUAL SOIL LOSS DUE TO EROSION OF INSOLUBLE
C---- MATERIALS (UNIVERSAL SOIL LOSS EQUATION).
      SOILOS=RAINF*ERODF*STPLNG*COVER*CONTRL*SEDELR*.22412                !LC
      DOVER=SOILOS/(1000.*BDENS)
      WRITE(LU2,602)SOILOS,DOVER
      WRITE(LU2,603)XINFL
      WRITE(LU2,604)VWV
      WRITE(LU2,605)EXPOS
  300 CONTINUE
C---- CALCULATE AQUIFER VOLUME
      AQVOL=GWV*PORA*AQTHK*(SQRT(TAREA)+2.*TAN(AQDISP/2.)*DWELL)
C---- COMPUTE HYPOTHETICAL RADIONUCLIDE WITHDRAWL FROM WELL PER YEAR.
      VOLUSW=(WIRATE*4492.*FI*8760.*WWATL +
     &        UWAT*WWATH + 15000.*WWATA)*POP*1.0E-3
      VOLUSS=(WIRATE*4492.*FI*8760.*SWATL +
     &        UWAT*SWATH + 15000.*SWATA)*POP*1.0E-3
C---- OPEN DIRECT ACCESS FILE FOR AQAM AND INTIALIZE
      OPEN(33,FILE='AQAM',FORM='FORMATTED',ACCESS='DIRECT',RECL=12)       !PC/AT

      DO 33 K=1,40                                                 !PC/AT
      DO 33 J=1,1000                                               !PC/AT
```

```
      WRITE(33,'(E12.4)',REC=(K-1)*1000+J) 0.0                    !PC/AT
 33   CONTINUE                                                   !PC/AT
C---- LOOP 260 CALCULATES RADIOACTIVITY IN TRENCH AFTER 10000 YEARS
C---- ASSUMING PERFECT TRENCH ISOLATION
      DO 260 I=1,NONCLD
  260 TRAP(I)=TRAM(I)*EXP(-DECAY(I)*10000.)
      DO 999 I=1,NONCLD
      DECN(I)=EXP(-DECAY(I))
      DETW(I)=EXP(-DECAY(I)*ITIME(I))
      DETWS(I)=EXP(-DECAY(I)*(ITIME(I)+JTIME(I)))
  999 DEWS(I)=EXP(-DECAY(I)*JTIME(I))
C----- THE FOLLOWING LOOP WILL BE PROCESSED FOR EACH YEAR IN SIMULATION
      JYR=1
      ARG1=SQRT(PD*EXTENT)                                        !PC/AT
      CFT2 = CFT1 + DCFT                                          !LC
      DO 1000 N=1,MAXYR
      NYEAR=N
      WRITE(*,*) 'NYEAR = ',NYEAR
C----- MOVE DEFINITION OF RESUSPENSION FACTOR
      DUMMY2=FLOAT(NYEAR)*365.                                    !PC/AT
      RES=RE1*EXP(RE2*SQRT(DUMMY2))+RE3
      AUX=FLOAT(N)
      TRLS=AMAX1(0.,DOVER-OVER)                                   !LC
      TDEPTH=TDEPTH-TRLS
      OVER=AMAX1(0.,OVER-DOVER)                                   !LC
      FONSIT=0.
      IF(NYEAR .LT. IRST .OR. INSITE .EQ. 0) GO TO 1068
      RSTR=FLOAT(NYEAR-IRST)
      XRT=XRTM
      IF(RSTR*RTGR .GT. 9.0 .OR. RTGR .LE. 0.001) GO TO 1069
      XRT=XRTM*(1.-EXP(-RTGR*RSTR))
 1069 IF(XRT .LE. OVER) GO TO 1068
      D1R=TDEPTH
      IF(XRT .LE. D1R) FONSIT=1.-OVER/XRT
      IF(XRT .GT. D1R) FONSIT=(TDEPTH-OVER)/XRT
 1068 IF(FONSIT .LE. 0.) FONSIT=0.
C---- CALCULATE TRENCH WATER BALANCE.
      CALL TRENCH(NYEAR,VOLB,VOLO,DMAX,PC,TINFL)
      IF(VOLB .LE. .1*AQVOL .OR. ISW .GT. 0)GO TO 450
      ISW=ISW+1
      WRITE(LU2,615)NYEAR
  450 CONTINUE
      CFF=1.
      IF(CFT1 .LT. 0.5 .AND. DCFT .LT. 0.5) GO TO 451
      IF(AUX .LT. CFT1) CFF=0.
      IF(DCFT .LT. 0.5) GO TO 451
      IF(AUX .GE. CFT1 .AND. AUX .LE. CFT2) CFF=(AUX-CFT1)/DCFT
  451 CONTINUE
C---- THE FOLLOWING LOOP IS EXECUTED FOR EACH NUCLIDE.
      DO 500 I=1,NONCLD
      II=I
      XDECN=DECN(II)
      TRAM(II)=TRAM(II)*XDECN
      CS(II)=CS(II)*XDECN
      CW(II)=CW(II)*XDECN
C---- CALCULATE THE AMOUNT OF LEACHING.
      CALL LEACH(II,VOLB,VOLO,DMAX,CIOT,CFF,XDECN,TINFL,PERMT)    !LC
      PLBT(II)=PLBT(II)+POLB(II)
      OFT(II)=OFT(II)+POLO(II)
C---- CALCULATE ADDITIONS TO AQUIFER.
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```
      CALL VERHOR(II,NYEAR,ITIME,DDETA)
C---- ITMP IS THE YEAR OF ARRIVAL OF POLB AND SDEEP TO A POINT IN
C---- THE AQUIFER EXACTLY BELOW THE WELL
      ITMP=ITIME(II)+NYEAR
      IF(ITMP.GT.1000) THEN                                          !LC
C---- IF R-ACTIVITY POLB AND SDEEP GET TO THE WELL POINT AFTER YEAR
C---- 1000 NO DECREASE BY WATER COMMUNITY USE IS CONSIDERED IN THE
C---- CALCULATION OF R-ACTIVITY FLOW FROM THE WELL POINT TO THE STREAM
        JTMP=NYEAR+ITIME(II)+JTIME(II)
        KIN=AMIN0(10.,INT(FLOAT(JTMP-1)/1000.))                      !LC
        IF (KIN.LT.10) THEN                                          !LC
          QLB(II,KIN)=QLB(II,KIN)+DETWS(II)*PRJ*(POLB(II)+SDEEP(II))*
     &                DDETA(II)*DDETA3(II)
        ELSE
          QLB(II,10)=QLB(II,10)+EXP(-DECAY(II)*(10000.-AUX))*(POLB(II)
     &                +SDEEP(II))*DDETA(II)*DDETA3(II)
        ENDIF
      ENDIF
      READ(33,'(E12.4)',REC=(II-1)*1000+NYEAR) AQAM                  !PC/AT
      AQCON(II)=AQAM/AQVOL                                           !PC/AT
      AMT1=VOLUSW*AQCON(II)
      IF(AMT1 .LE. AQAM) GO TO 350                                   !LC,PC/AT
      AQCON(II)=AQAM/VOLUSW                                          !PC/AT
  350 IF(N .GE. IAVG1 .AND. N .LE. IAVG2)AQAVG(II)=AQAVG(II)+AQCON(II)
      IF(AQCON(II) .GT. AQMAX(II)) THEN                              !LC
        AQMAX(II)=AQCON(II)
        MXAQ(II)=N
      ENDIF
C---- ACTIVITY PUMPED OUT FROM THE WELL FOR COMMUNITY USE
      AMT1=VOLUSW*AQCON(II)
      POW(II)=POW(II)+AMT1
      IF(VOLUSW.LT.AQVOL) THEN                                       !LC
C---- IF MORE WATER IS PUMPED OUT FROM THE WELL THAN IS AVAILABLE IN
C---- AQUIFER VOLUME NO ACTIVITY WILL FLOW FROM WELL POINT TO STREAM
        JTMP=NYEAR+ITIME(II)+JTIME(II)
        KIND=AMIN0(10.,INT(FLOAT(JTMP-1)/1000.))                     !LC
        IF(KIND.EQ.0) THEN                                           !LC
          QDWSB(II)=QDWSB(II)+DEWS(II)*PRJ*(AQAM-AMT1)*DDETA3(II)    !PC/AT
        ELSEIF(KIND.EQ.10) THEN
          QLB(II,10)=QLB(II,10)+EXP(-DECAY(II)*(10000-FLOAT(NYEAR)))*
     &                (AQAM-AMT1)*DDETA3(II)                         !PC/AT
        ELSE
          QLB(II,KIND)=QLB(II,KIND)+DEWS(II)*PRJ*(AQAM-AMT1)*
     &                DDETA3(II)                                     !PC/AT
        ENDIF
      ENDIF
C---- CALCULATE TRANSPORT OF SOLUBLE SURFACE COMPONENT
      CALL SURSOL(II,VOLO)                                           !LC
      IF(NYEAR .EQ. 1)SSTREM(II)=STAM(II)+SSTREM(II)
      STCON(II)=SSTREM(II)/STFLOW
      AMT=VOLUSS*STCON(II)
      IF(AMT .GT. SSTREM(II)) STCON(II)=SSTREM(II)/(VOLUSS)          !LC
      IF(N .GE. IAVG1 .AND. N .LE. IAVG2)STAVG(II)=STAVG(II)+STCON(II)
      IF(STCON(II) .GT. STMAX(II)) THEN                              !LC
        STMAX(II)=STCON(II)
        MXST(II)=N
      ENDIF
      POS(II)=POS(II)+VOLUSS*STCON(II)
C---- RESIDUAL R-ACTIVITY FROM STREAM "DITCH" AFTER COMMUNITY USE
C---- IS PASSED TO THE BASIN IN THE SAME YEAR.
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      IF(VOLUSS.LE.STFLOW)QDWSB(II)=(STFLOW-VOLUSS)*STCON(II)+QDWSB(II)
C---- CALCULATE ATMOSPHERIC CONCENTRATION AND AMOUNT ABOVE SPILLAGE
AREA
      GNDCON=CS(II)*BDENS*ADEPTH*1.0E3
      IF(INSITE .EQ. 0 .OR. IRRES1 .GE. NYEAR) THEN                    ILC
        CALL SUSPND(NYEAR,II,GNDCON)
        RTA(II)=RTA(II)+YSO(II)*3.1536E7
        ATCON(II)=YSO(II)*EXPOS*FTWIND
      ELSE
        D1R=TRAM(II)/(TAREA*TDEPTH*DENCON*1000.)
        CALL SUSPND(NYEAR,II,D1R)
        ATCON(II)=YSO(II)
      ENDIF
      IF(N .GE. IAVG1 .AND. N .LE. IAVG2)ATAVG(II)=ATAVG(II)+ATCON(II)
      IF(ATCON(II) .GT. ATMAX(II)) THEN                              ILC
        ATMAX(II)=ATCON(II)
        MXAT(II)=N
      ENDIF
      BSMTA(II)=0.
      IF(IBSMT .GT. 0 .AND. NYEAR .GE. IBSMT) THEN                     ILC
        BSMT(II)=BSMT(II)+TRAM(II)
        BSMTA(II)=+TRAM(II)
      ENDIF
      IF(NYEAR .EQ. 1 .AND. IVAP .EQ. 1) THEN                        ILC
        BSMTA(II)=TRAM(II)
        BSMT(II)=BSMTA(II)
      ENDIF
C---- MATERIAL BALANCE; 3.1536E7 = SECONDS/YEAR
      CS(II)=CS(II)+((TRLS/(TDEPTH+TRLS)*TRAM(II)-YSO(II)*3.1536E7)/
     1  (EXTENT*PD*ADEPTH))*1.0E-3/BDENS
      TRAM(II)=TRAM(II)*(1.0-TRLS/(TDEPTH+TRLS))
      IF(LEAOPT.EQ.5 .AND. DMAX.GT.0.)TRAM(II)=TRAM(II)*(1-RELFAC)
      IF(LEAOPT.NE.5)TRAM(II)=TRAM(II)-POLB(II)-POLO(II)
      IF(TRAM(II) .LT. 0.) TRAM(II)=0.
      CW(II)=CW(II)+(POLO(II)/(EXTENT*PD*ADEPTH*PORS))
      IF(CW(II) .LT. 0.) CW(II)=0.
      IF(CS(II) .LT. 0.) CS(II)=0.
C---- COMPUTE SOIL CONCENTRATION
      D1R=0.
      SOCON(II)=1.0E12*ADEPTH*(CW(II)*PORS+1000.*CS(II)*BDENS+D1R)
      IF(IOPVWV .GE. 0) THEN                                         ILC
       IF(IRST .LT. N .AND. TDEPTH .GT. 0.) D1R=FONSIT*TRAM(II)/
     &          (TAREA*TDEPTH)
        IF(IOPVWV .EQ. 1) D1R=D1R*BV(II)
        SOCON(II)=1.0E12*ADEPTH*D1R
      ENDIF
      IF(N .GE. IAVG1 .AND. N .LE. IAVG2)SOAVG(II)=SOAVG(II)+SOCON(II)
  500 CONTINUE
      DO 900 I=1,NONCLD
      II=I
      DERATE(II)=ATCON(II)*3.6E15*VD
      CALL FOODA(II)
      IF(N .GE. IAVG1 .AND. N .LE. IAVG2)CSPT(II)=CSPT(II)+CSP(II)
      CWAT(II)=(WWATL*AQCON(II)+SWATL*STCON(II))*1.0E9
      CALL IRRIGA(II)
      IF(N .GE. IAVG1 .AND. N .LE. IAVG2)CSPOT(II)=CSPOT(II)+CSPO(II)
      CWAT(II)=(WWATH*AQCON(II)+SWATH*STCON(II))*1.0E9
      CALL HUMEXA(II)
      BSMTA(II)=BSMTA(II)*.03333333*FGAM/(TDEPTH*TAREA)
      QSUR=(CSP(II)+CSPO(II))/1.0E12
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      TEMP=ATCON(II)
      IF(PC1(II) .LT. TEMP) THEN                                ILC
        PC1(II)=TEMP
        NPC1(II)=NYEAR
      ENDIF
      TEMP=QSUR+BSMTA(II)
      IF(PC2(II) .LT. TEMP) THEN                                ILC
        PC2(II)=TEMP
        NPC2(II)=NYEAR
      ENDIF
      TEMP=QING(II)*POP
      IF(PC3(II) .LT. TEMP) THEN                                ILC
        PC3(II)=TEMP
        NPC3(II)=NYEAR
      ENDIF
      TEMP=QINH(II)*POP
      IF(PC4(II) .LT. TEMP) THEN                                ILC
        PC4(II)=TEMP
        NPC4(II)=NYEAR
      ENDIF
  900 CONTINUE
      WD=DMAX
      IF(WD .GT. TDEPTH)WD=TDEPTH
      IF(MOD(NYEAR-IPRT1,IDELT) .EQ. 0 .OR. NYEAR .EQ. 1)
     &   CALL OUT(NYEAR,PC,WD,VOLO,VOLB)
C---- CALCULATE AVERAGE NUCLIDE CONCENTRATIONS AND CALL HESTAB FOR
C---- INTERMEDIATE YEARS
      IF(NYEAR .NE. INTYR(JYR)) GO TO 1000
C---- SAVE VALUES OF PERTINENT VARIABLES
      ISAV1=IAVG1
      ISAV2=IAVG2
      DO 990 I=1,NONCLD
        SAVE(I,1)=CL1(I)
        SAVE(I,2)=CL2(I)
        SAVE(I,3)=CP1(I)
        SAVE(I,4)=CP2(I)
        SAVE(I,5)=CSP(I)
        SAVE(I,6)=CWAT(I)
        SAVE(I,7)=CMEAT(I)
        SAVE(I,8)=CCMI1(I)
        SAVE(I,9)=CCMI2(I)
        SAVE(I,10)=CGMI1(I)
        SAVE(I,11)=CGMI2(I)
        SAVE(I,12)=COL1(I)
        SAVE(I,13)=COL2(I)
        SAVE(I,14)=COP1(I)
        SAVE(I,15)=COP2(I)
        SAVE(I,16)=COCMI1(I)
        SAVE(I,17)=COCMI2(I)
        SAVE(I,18)=COGMI1(I)
        SAVE(I,19)=COGMI2(I)
        SAVE(I,20)=COMEAT(I)
        SAVE(I,21)=CSPO(I)
        AQAVG(I)=AQAVG(I)/NYEAR
        ATAVG(I)=ATAVG(I)/NYEAR
        SOAVG(I)=SOAVG(I)/NYEAR
  990   STAVG(I)=STAVG(I)/NYEAR
C---- PREPARE CONCENTRATION ARRAYS, PCON, FOR HESTAB
      IAVG1=1
      IAVG2=NYEAR
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      DO 992 I=1,NONCLD
        II=I
        DERATE(II)=ATAVG(II)*VD*3.6E15
        CALL FOOD(II)
        CWAT(II)=(WWATL*AQAVG(II)+SWATL*STAVG(II))*1.E9
        CALL IRRIG(II)
        CWAT(II)=(WWATH*AQAVG(II)+SWATH*STAVG(II))*1.E9
        CALL HUMEX(II)
C---- PREPARE ARRAYS TO PASS TO HESTAB
        PCON1(II)=ATAVG(II)*POP
        PCON2(II)=(CSP(II)+CSPO(II))*POP*1.E-12
        PCON3(II)=QING(II)*POP
        PCON4(II)=QINH(II)*POP
  992 CONTINUE
C---- RESTORE SAVED VALUES
      DO 994 I=1,NONCLD
        CL1(I)=SAVE(I,1)
        CL2(I)=SAVE(I,2)
        CP1(I)=SAVE(I,3)
        CP2(I)=SAVE(I,4)
        CSP(I)=SAVE(I,5)
        CWAT(I)=SAVE(I,6)
        CMEAT(I)=SAVE(I,7)
        CCMI1(I)=SAVE(I,8)
        CCMI2(I)=SAVE(I,9)
        CGMI1(I)=SAVE(I,10)
        CGMI2(I)=SAVE(I,11)
        COL1(I)=SAVE(I,12)
        COL2(I)=SAVE(I,13)
        COP1(I)=SAVE(I,14)
        COP2(I)=SAVE(I,15)
        COCMI1(I)=SAVE(I,16)
        COCMI2(I)=SAVE(I,17)
        COGMI1(I)=SAVE(I,18)
        COGMI2(I)=SAVE(I,19)
        COMEAT(I)=SAVE(I,20)
        CSPO(I)=SAVE(I,21)
        AQAVG(I)=AQAVG(I)*NYEAR
        ATAVG(I)=ATAVG(I)*NYEAR
        SOAVG(I)=SOAVG(I)*NYEAR
  994   STAVG(I)=STAVG(I)*NYEAR
      IAVG1=ISAV1
      IAVG2=ISAV2
C---- CALL HESTAB FOR INTERMEDIATE YEAR OUTPUT
      CALL HESTAB
C---- SAVE DATA FOR ACCOUNTING MODEL TABLE
      DO 996 I=1,NONCLD
        POSS(I,JYR)=POS(I)
        POWS(I,JYR)=POW(I)
        RTAS(I,JYR)=RTA(I)
        QBASIN(I,JYR)=QDWSB(I)
        HEF(I,JYR)=QDWSB(I)*CON(I)
        FICANS(I,JYR)=HESN(I)*AGEX/POP
        CCNRS(I,JYR)=HESN(I)
        GNRS(I,JYR)=GESN(I)
        TFICS(JYR)=HESE/POP
        TCCNRS(JYR)=HESE/AGEX
  996   TGNRS(JYR)=GESE
      JYR=JYR+1
 1000 CONTINUE
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      NEXYR=IAVG2-IAVG1+1
      WRITE(LU2,700)IAVG1,IAVG2
      DO 1100 II=1,NONCLD
      AQAVG(II)=AQAVG(II)/FLOAT(NEXYR)
      STAVG(II)=STAVG(II)/FLOAT(NEXYR)
      ATAVG(II)=ATAVG(II)/FLOAT(NEXYR)
      SOAVG(II)=SOAVG(II)/FLOAT(NEXYR)
      WRITE(LU2,6215)NUCLID(II),ATAVG(II),ATMAX(II),MXAT(II),AQAVG(II),
     &              AQMAX(II),MXAQ(II),STAVG(II),STMAX(II),MXST(II)
 1100 CONTINUE
C---- CALCULATE RADIONUCLIDE CONCENTRATIONS IN FOOD DUE TO ATMOSPERIC
C---- DEPOSITION.
      WRITE(LU2,6000)
      WRITE(LU2,6005)
      DO 1200 I=1,NONCLD
      II=I
      DERATE(II)=ATAVG(II)*VD*3.6E15
      CALL FOOD(II)
      WRITE(LU2,6210)NUCLID(II),CL1(II),CP1(II),CL2(II),CP2(II),
     &              CCMI1(II),CCMI2(II),CGMI1(II),CGMI2(II),CMEAT(II)
 1200 CONTINUE
C---- CALCULATE RADIONUCLIDE CONCENTRATIONS IN FOOD DUE TO WATER
C---- IRRIGATION.  ALSO CALCULATE ANNUAL RADIONUCLIDE INTAKE BY MAN.
      WRITE(LU2,6010)
      WRITE(LU2,6005)
      DO 1300 I=1,NONCLD
      II=I
      CWAT(II)=(WWATL*AQAVG(II)+SWATL*STAVG(II))*1.0E9
      CALL IRRIG(II)
      WRITE(LU2,6210)NUCLID(II),COL1(II),COP1(II),COL2(II),COP2(II),
     &     COCMI1(II),COCMI2(II),COGMI1(II),COGMI2(II),COMEAT(II)
      CWAT(II)=(WWATH*AQAVG(II)+SWATH*STAVG(II))*1.0E9
      CALL HUMEX(II)
 1300 CONTINUE
      WRITE(LU2,6020)
      IF(LIND .EQ. 0)WRITE(LU2,6024)
      IF(LIND .NE. 0)WRITE(LU2,6026)
      WRITE(LU2,6030)
      DO 1310 I=1,NONCLD
      WRITE(LU2,6040)NUCLID(I),QING(I),QINH(I)
 1310 CONTINUE
C---- TABLE OF CUMULATIVE (AGGREGATED) VALUES OF RADIOACTIVITY
C---- PRODUCED HERE
      WRITE(LU2,6041)
      DO 1313 I=1,NONCLD
      WRITE(LU2,6042) NUCLID(I),POW(I),POS(I),PLBT(I),OFT(I),RTA(I),
     &QDWSB(I)
 1313 CONTINUE
      WRITE(LU2,6045)
C---- CALCULATE VARIABLES NECESSARY TO PASS TO HESTAB. HESTAB COMBINES
C---- RADIONUCLIDE ENVIRONMENTAL EXPOSURE DATA WITH DOSIMETRIC AND
C---- HEALTH EFFECTS DATA TO GENERATE TABULATIONS OF PREDICTED IMPACTS.
      DO 1320 I=1,NONCLD
      QSUR=(CSP(I)+CSPO(I))/1.0E12
      QFRAC=0.
      BSMT(I)=BSMT(I)/FLOAT(MAXYR-IBSMT+1)*.03333333/(TDEPTH*TAREA)
      IF(QING(I) .NE. 0.0) QFRAC=CWAT(I)*UWAT/QING(I)                    ILC
      WRITE(LU2,6050)NUCLID(I),QFRAC
      PCON1(I)=ATAVG(I)*POP
      PCON2(I)=QSUR*POP
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      PCON3(I)=QING(I)*POP
      PCON4(I)=QINH(I)*POP
 1320 CONTINUE
      WRITE(LU2,6300)
      DO 1340 I=1,NONCLD
      WRITE(LU2,6310)NUCLID(I),PC1(I),NPC1(I),PC2(I),NPC2(I),
     &                    PC3(I),NPC3(I),PC4(I),NPC4(I)
 1340 CONTINUE
      CALL HESTAB
      IF(IXTS.NE.0) STOP
C--- SAVE DATA FOR ACCOUNTING MODEL TABLE
      DO 1350 I=1,NONCLD
        POSS(I,JYR)=POS(I)
        POWS(I,JYR)=POW(I)
        RTAS(I,JYR)=RTA(I)
        QBASIN(I,JYR)=QDWSB(I)
        HEF(I,JYR)=QDWSB(I)*CON(I)
        FICANS(I,JYR)=HESN(I)*AGEX/POP
        CCNRS(I,JYR)=HESN(I)
 1350 GNRS(I,JYR)=GESN(I)
      TFICS(JYR)=HESE/POP                                        ILC
      TCCNRS(JYR)=HESE/AGEX
      TGNRS(JYR)=GESE
      INTYR(JYR)=MAXYR
C---- NPTH1 IS THE FIRST YEAR AFTER LOCAL SIMULATION PERIOD, NPTH2 IS
C---- THE LAST YEAR OF GLOBAL SIMULATION.
      NPTH1=MAXYR+1
      NPTH2=MAXYR+9000
      DO 1001 N=NPTH1,NPTH2
      NYEAR=N
      TRLS=AMAX1(0.,DOVER-OVER)                                  ILC
      TDEPTH=TDEPTH-TRLS
      OVER=AMAX1(0.,OVER-DOVER)                                  ILC
      FONSIT=0.
      IF(NYEAR .GE. IRST .AND. INSITE .NE. 0) THEN               ILC
        RSTR=FLOAT(NYEAR-IRST)
        XRT=XRTM
        IF(RSTR*RTGR .LE. 9.0 .AND. RTGR .GT. 0.001) XRT=XRTM*(1.-EXP      ILC
     &        (-RTGR*RSTR))
        IF(XRT .GT. OVER) THEN                                   ILC
          D1R=OVER+TDEPTH
          IF(XRT .LE. D1R) FONSIT=1.-OVER/XRT
          IF(XRT .GT. D1R) FONSIT=TDEPTH/XRT
        ENDIF
      ENDIF
C--- CALCULATE TRENCH WATER BALANCE.
      CALL TRENCH(NYEAR,VOLB,VOLO,DMAX,PC,TINFL)
      IF(VOLB .LE. .1*AQVOL .OR. ISW .GT. 0)GO TO 455
      ISW=ISW+1
      WRITE(LU2,615)NYEAR
  455 CONTINUE
C---- THE FOLLOWING LOOP IS EXECUTED FOR EACH NUCLIDE.
      DO 505 I=1,NONCLD
      II=I
      XDECN=DECN(II)
      TRAM(II)=TRAM(II)*XDECN
      CS(II)=CS(II)*XDECN
      CW(II)=CW(II)*XDECN
C---- CALCULATE THE AMOUNT OF LEACHING.
      CALL LEACH(II,VOLB,VOLO,DMAX,CIOT,CFF,XDECN,TINFL,PERMT)   ILC
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      PLBT(II)=PLBT(II)+POLB(II)
      OFT(II)=OFT(II)+POLO(II)
C---- CALCULATE ADDITIONS TO AQUIFER.
      ITMP=ITIME(II)+JTIME(II)+NYEAR
      KIND=AMIN0(10.,INT(FLOAT(ITMP-1)/1000.))                          !LC
C---- POLB AND SDEEP ARE AMOUNTS OF RADIOACTIVITY RELEASED TO THE BASIN
C---- IN MILLENIUM KIND+1
      IF(KIND.NE.10) THEN                                              !LC
C---- NUCLIDE ARRIVES AT STREAM AFTER YEAR 1000 BUT BEFORE YEAR 10001
        QLB(II,KIND)=QLB(II,KIND)+DETWS(II)*PRJ*(POLB(II)+
     &              SDEEP(II))*DDETA(II)*DDETA3(II)
      ELSE
        QLB(II,10)=QLB(II,10)+EXP(-DECAY(II)*(10000.-FLOAT(N)))*
     &            (POLB(II)+SDEEP(II))*DDETA(II)*DDETA3(II)
      ENDIF
C---- CALCULATE TRANSPORT OF SOLUBLE SURFACE COMPONENT
      CALL SURSOL(II,VOLO)                                             !LC
      KIND=AMIN0(10.,INT(FLOAT(NYEAR-1)/1000.))                         !LC
C---- SSTREM IS RADIOACTIVITY FROM SURFACE RUN-OFF RELEASED DOWNSTREAM
IN
C---- MILLENIUM KIND+1
      QLB(II,KIND)=QLB(II,KIND)+SSTREM(II)
C---- CALCULATE ATMOSPHERIC CONCENTRATION AND AMOUNT ABOVE SPILLAGE
AREA
      GNDCON=CS(II)*BDENS*ADEPTH*1.0E3
      IF(INSITE .NE. 0 .AND. IRRES1 .LE. NYEAR) THEN                    !LC
        D1R=TRAM(II)/(TAREA*TDEPTH*DENCON*1000.)
        CALL SUSPND(NYEAR,II,D1R)
        ATCON(II)=YSO(II)
        RTA(II)=RTA(II)+YSO(II)
      ELSE
        CALL SUSPND(NYEAR,II,GNDCON)
        RTA(II)=RTA(II)+YSO(II)*3.1536E7
      ENDIF
C---- MATERIAL BALANCE; 3.1536E7 = SECONDS/YEAR
      CS(II)=CS(II)+((TRLS/(TDEPTH+TRLS)*TRAM(II)-YSO(II)*3.1536E7)/
     1  (EXTENT*PD*ADEPTH))*1.0E-3/BDENS
      TRAM(II)=TRAM(II)*(1.0-TRLS/(TDEPTH+TRLS))
      IF(LEAOPT.EQ.5 .AND. DMAX.GT.0.)TRAM(II)=TRAM(II)*(1-RELFAC)
      IF(LEAOPT.NE.5)TRAM(II)=TRAM(II)-POLB(II)-POLO(II)
      IF(TRAM(II) .LT. 0.) TRAM(II)=0.
      CW(II)=CW(II)+(POLO(II)/(EXTENT*PD*ADEPTH*PORS))
      IF(CW(II) .LT. 0.) CW(II)=0.
      IF(CS(II) .LT. 0.) CS(II)=0.
C---- COMPUTE SOIL CONCENTRATION
      D1R=0.
      IF(IOPVWV .GE. 0) THEN                                           !LC
        IF(IRST .LT. N .AND. TDEPTH .GT. 0.) D1R=FONSIT*TRAM(II)/
     &              (TAREA*TDEPTH)
        IF(IOPVWV .EQ. 1) D1R=D1R*BV(II)
      ENDIF
      SOCON(II)=1.0E12*ADEPTH*(CW(II)*PORS+1000.*CS(II)*BDENS)
      IF(N .GE. IAVG1 .AND. N .LE. IAVG2)SOAVG(II)=SOAVG(II)+SOCON(II)
  505 CONTINUE
      WD=AMIN1(DMAX,TDEPTH)                                            !LC
 1001 CONTINUE
C---- QLBPTH IS THE AMOUNT OF RADIOACTIVITY LEAVING THE BASIN WITH
C---- THE STREAM WATER BETWEEN YEARS 1001 AND 10000
      DO 506 II=1,NONCLD
        DO 250 L=1,9
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  250   QLBPTH(II)=QLBPTH(II)+QLB(II,L)
C---- FIRST MILLENNIUM RELEASE INCLUDED FOR HEALTH EFFECTS CALC.
      QLBTTH(II)=QLBPTH(II)+QDWSB(II)
  506 CONTINUE
C---- HE IS THE HEALTH EFFECT CALCULATED USING CONVERSION FACTOR CON
      DO 270 L=1,NONCLD
  270 HE(L)=QLBTTH(L)*CON(L)
C---- OUTPUT FOR THE EXTENDED SIMULATION PERIOD IS PRODUCED IN DO LOOP
C---- 1004. DO LOOPS 1007 AND 1010 REPORT THE HEALTH EFFECTS FROM THE
C---- RESIDUAL RELEASE DOWNSTREAM THE BASIN
      WRITE(6,1002)
      DO 1004 I=1,NONCLD
 1004 WRITE(6,1003) NUCLID(I),QDWSB(I),(QLB(I,K),K=1,9)
      WRITE(6,2002)
      DO 2004 I=1,NONCLD
 2004 WRITE(6,2003) NUCLID(I),QLB(I,10),TRAM(I),RTA(I)
      DO 1420 J=1,JYR
        WRITE(6,1400) INTYR(J)
        DO 1410 I=1,NONCLD
 1410   WRITE(6,1008) NUCLID(I),QBASIN(I,J),CON(I),HEF(I,J)
 1420 CONTINUE
      WRITE(6,1006)
      DO 1007 I=1,NONCLD
 1007 WRITE(6,1008) NUCLID(I),QLBTTH(I),CON(I),HE(I)
C---- WRITE ACCOUNTING MODEL TABLE FOR INTERMEDIATE & FINAL YEARS
      DO 1020 J=1,JYR
      LASTYR=10000-INTYR(J)
      WRITE(6,1009) (INTYR(J),I=1,5),LASTYR
      DO 1010 I=1,NONCLD
      QLAST=QDWSB(I)-QBASIN(I,J)
      QLAST=QLAST+QLBPTH(I)
      WRITE(6,1011) NUCLID(I),FICANS(I,J),CCNRS(I,J),
     & GNRS(I,J),POWS(I,J),POSS(I,J),RTAS(I,J),QBASIN(I,J),QLAST,
     & TRAP(I)
 1010 CONTINUE
      WRITE(6,1012) TFICS(J),TCCNRS(J),TGNRS(J)
 1020 CONTINUE
      CLOSE(33,STATUS='DELETE')                                  IPC/AT
      STOP
C---- FORMAT STATEMENTS
 1002 FORMAT('1',32X,'RESIDUAL RADIOACTIVITY RELEASED ',
     & 'OUTSIDE THE BASIN'/43X,'WITH THE STREAM WATER'// ',
     & 'NUCLIDE',5X,'FIRST',6X,'SECOND',5X,'THIRD',6X,'FOURTH',5X,
     & 'FIFTH',5X,'SIXTH',6X,'SEVENTH',4X,'EIGHTH',5X,'NINTH',6X,
     & 'TENTH'/' ',10X,10('MILLENNIUM',1X),/)
 1003 FORMAT(' ',A8,2X,12(1PE10.4,1X))
 1005 FORMAT(' DEGREE OF SATURATION = ',F6.3,/,
     &       ' RESIDUAL SATURATION  = ',F6.3)
 1006 FORMAT(////,32X,'HEALTH EFFECTS RESULTING FROM RESIDUAL',/,
     & 32X,'RADIOACTIVITY RELEASED IN 10000 YEARS',//,30X,
     & 'NUCLIDE',5X,'RESIDUAL',3X,'CONVERSION',3X,'HEALTH',/,42X,
     & 'ACTIVITY',5X,'FACTOR',5X,'EFFECTS',/)
 1008 FORMAT(30X,A8,1X,3(2X,1PE10.4))
 1009 FORMAT('1',///,30X,'TABLE FOR ACCOUNTING MODEL  --  YEAR ',I5,
     & /,' COLUMN  1: INDIVIDUAL CANCER RISK (UNITLESS)',
     & /,' COLUMN  2: COLLECTIVE CANCER RISK (DEATHS/YEAR)',
     & /,' COLUMN  3: GENETIC RISK (EFFECTS/YEAR)',
     & /,' COLUMN  4: R-ACTIVITY PUMPED OUT THE WELL 1ST ',I5,
     & ' YEARS (CI)',
     & /,' COLUMN  5: R-ACTIVITY PUMPED OUT THE STREAM 1ST ',I5,
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     &  ' YEARS (CI)',
     &  /,' COLUMN  6: R-ACTIVITY RELEASED TO ATMOSPHERE 1ST ',I5,
     &  ' YEARS (CI)',
     &  /,' COLUMN  7: R-ACTIVITY RELEASED DOWNSTREAM 1ST ',I5,
     &  ' YEARS (CI)',
     &  /,' COLUMN  8: R-ACTIVITY RELEASED DOWNSTREAM LAST ',I5,
     &  ' YEARS (CI)',
     &  /,' COLUMN  9: R-ACTIVITY IN TRENCH AFTER 10000 YEARS ',
     &  'ASSUMING PERFECT CONTAINMENT (CI)',/)
 1011 FORMAT(1X,A8,1X,1P10E11.4)
 1012 FORMAT(1X,'TOTALS:',2X,1P4E11.4)
 1400  FORMAT(////,32X,'HEALTH EFFECTS RESULTING FROM RESIDUAL',/,
     &  32X,'RADIOACTIVITY RELEASED IN ',I5,' YEARS',//,30X,
     &  'NUCLIDE',5X,'RESIDUAL',3X,'CONVERSION',3X,'HEALTH',/,42X,
     &  'ACTIVITY',5X,'FACTOR',5X,'EFFECTS',/)
 2002 FORMAT('1',10X,'RESIDUAL RADIOACTIVITY IN',10X,'REMAINING IN',
     & 11X,'RELEASED TO THE',/,10X,'TRANSIT IN YEAR 10000',
     & 16X,'TRENCH',20X,'ATMOSPHERE',/)
 2003 FORMAT(' ',A8,6X,1PE11.4,20X,1PE11.4,16X,1PE11.4)
 6200 FORMAT('1',51X,'INITIAL CALCULATIONS',
     &      // ',2X,'NUCLIDE',4X,'VERTICAL',5X,'VERTICAL',
     &      5X,'VERTICAL',4X,'HORIZONTAL',3X,'HORIZONTAL',
     &      3X,'HORIZONTAL',5X,'DDETA',5X,'BREAK THRU',
     &      / ',11X,'RETARDATION',5X,'TIME Y',7X,'DDETA',5X,
     &      'RETARDATION',4X,'TIME Y',8X,'DDETA',21X,'TIME Y')
 6210 FORMAT(' ',A8,3X,9(1PE11.4,2X))
 6215 FORMAT(' ',A8,3X,3(2(1PE11.4,2X),0P!4,5X))
 6220 FORMAT(/ ',5X,'RADIONUCLIDE BREAKTHROUGH TIME IS ONLY SLIGHTLY',
     &       ' GREATER THAN SIMULATION TIME AND LEADING EDGE OF PULSE',
     &       ' MAY BE MISSED')
  602 FORMAT(// ',10X,'ANNUAL SOIL LOSS IS ',1PE11.4,' KILOGRAMS PER',
     &       ' SQUARE METER',/ ',20X,'OR ',E11.4,
     &       ' METERS IS REMOVED FROM THE SURFACE')
  603 FORMAT(' ',10X,'ANNUAL INFILTRATION INTO TRENCH IS ',
     &      F8.4,' METERS')
  604 FORMAT(' ',10X,'VERTICAL WATER VELOCITY IS ',F8.4,' METERS',
     &       ' PER YEAR')
  605 FORMAT(' ',10X,'NORMALIZED DOWN WIND ATMOSPHERIC EXPOSURE',
     &  ' PER UNIT SOURCE RELEASE IS ',E11.4,' CI/M**3 PER CI/SEC')
  615 FORMAT(// ',5X,'WATER OUTFLOW FROM TRENCH BOTTOM IS APPROACHING',
     & ' DILUTION VOLUME IN AQUIFER FOR YEAR ',I4)
  700 FORMAT('1',35X,'AVERAGE CONCENTRATIONS OVER THE YEARS ',I3,
     &       ' TO ',I4,' OF THE SIMULATION',
     &       / ',50X,'MAXIMUM ANNUAL CONCENTRATIONS',
     &       /// ',1X,'NUCLIDE',8X,'ATMOSPHERE DOWNWIND',
     &       24X,'IN WELL',26X,'IN STREAM',
     &       // ',7X,3(6X,'AVERAGE',6X,'MAXIMUM',4X,'YEAR',1X),
     &       / ',7X,3(2(6X,'CI/M**3'),9X))
 5000 FORMAT('1',51X,'INITIAL CALCULATIONS',// ',50X,'NUCLIDE',
     &   10X,'MASS',//)
 5005 FORMAT(' ',51X,A8,8X,F5.0)
 5006 FORMAT(' ',5X,'THE POPULATION RESIDES ONSITE')
 5007 FORMAT(' ',5X,'POPULATION SET TO ',F10.0,' FOR ONSITE FARM')          ILC
 6000 FORMAT('1',30X,'RADIONUCLIDE CONCENTRATION IN FOODS DUE TO',
     & ' ATMOSPHERIC DEPOSITION',/ ',55X,'PICO CURIES PER KILOGRAM')
 6005 FORMAT(// ',1X,'NUCLIDE',4X,'LEAFY VEG',6X,'PRODUCE',5X,
     &      'LEAFY VEG',6X,'PRODUCE',4X,'COW''S MILK',3X,'COW''S MILK',
     &      3X,'GOAT''S MILK',2X,'GOAT''S MILK',3X,'BEEF MEAT',
     &      / ',14X,'M.I.E.',7X,'M.I.E.',7X,2('G.P.E.',7X),'M.I.E.',
     &      7X,'G.P.E.',7X,'M.I.E.',7X,'G.P.E.')
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 6010 FORMAT(////' ',35X,'RADIONUCLIDE CONCENTRATION IN FOODS DUE TO',
    &       ' IRRIGATION'/' ',55X,'PICO CURIES PER KILOGRAM')
 6020 FORMAT(///' ',5X,'NOTE: G.P.E. - GENERAL POPULATION',
    & ' EXPOSURE'/' ',11X,'M.I.E. - MAXIMUM INDIVIDUAL',
    & ' EXPOSURE')
 6024 FORMAT('0',11X,'M.I.E. WILL BE USED TO CALCULATE',
    &       ' HEALTH EFFECTS')
 6026 FORMAT('0',11X,'G.P.E. WILL BE USED TO CALCULATE',
    &       ' HEALTH EFFECTS')
 6030 FORMAT('1',1X,'NUCLIDE',10X,'ANNUAL INTAKE',10X,
    & 'ANNUAL INTAKE'/' ',
    & 18X,'BY INGESTION',11X,'BY INHALATION'/' ',20X,
    & 'PCI/Y',18X,'PCI/Y')
 6040 FORMAT(' ',1X,A8,9X,1PE11.4,12X,1PE11.4)
 6041 FORMAT('1',10X,'AGGREGATED VALUES OF RADIOACTIVITY:'/,
    &1X,'NUCLIDE',6X,'PUMPED OUT ',5X,'PUMPED OUT ',5X,'LEFT BOTTOM',
    &5X,'OVERFLOWED ',5X,'RELEASED TO',5X,'RELEASED TO'/' ',13X,
    &'  THE WELL ',5X,' THE STREAM',5X,' OF TRENCH ',5X,'   TRENCH  ',
    &3X,'THE ATMOSPHERE',4X,'   BASIN')
 6042 FORMAT(' ',1X,A8,5X,6(1PE11.4,5X))
 6050 FORMAT(' ',50X,A8,8X,F8.4)
 6045 FORMAT('1',50X,'FRACTION OF INGESTION DUE TO WATER',
    &  //' ',50X,'NUCLIDE',10X,'FRACTION')
 6300 FORMAT('1',55X,'MAXIMUM ANNUAL EXPOSURE',
    &       ///,2X,'NUCLIDE',12X,'AIR',8X,'YEAR',8X,
    &       'SURFACE',6X,'YEAR',7X,'INGESTION',5X,'YEAR',6X,
    &       'INHALATION',5X,'YEAR',
    &       /' ',15X,2('CONCENTRATION',12X),5X,
    &       2('RATE',19X),
    &       /' ',18X,'CI/M**3',18X,'CI/M**2',
    &       16X,2('PERSON.PCI/Y',12X)/)
 6310 FORMAT(' ',A8,8X,4(1PE11.4,4X,0PI4,6X))
      END
C
C
      SUBROUTINE AIRTRM(EXPOS,DEPO)
C
C---- D.E. FIELDS,  2/81. COMPUTES ATMOSPHERIC EXPOSURE VALUES AT POINTS
C---- DOWNWIND FROM RELEASE SITE FOR 22.5 DEG. SECTOR RECEPTOR ASSUMED
C---- AT GROUND LEVEL
C
C       DEPO    =DEPOSITION RATE PER UNIT SOURCE STRENGTH
C       EXPN    =NORMALIZED EXPOSURE = EU/Q, S/M**2,
C       EXPOS   =EXPOSURE PER SOURCE STRENGTH NORMALIZED TO
C               WIND VELOCITY
C       H       =SOURCE HGT, M
C       HLID    =LID HEIGHT
C       IPLU    =1 IMPLIES TRANSVERSE PLUME CALCULATION REQUIRED
C       ISEC    =1 IMPLIES SECTOR AVERAGE REQUIRED
C       IS      =STABILITY CLASS
C       IT      =TYPE OF STABILITY FORMULATION,
C                    =1 FOR PG
C                    =2 FOR BRIGGS-SMITH
C       ROUGH   =HOSKER ROUGHNESS PARAMETER, M, ABOUT
C               .01*PHYSICAL ROUGHNESS
C       U       =VELOCITY, WIND, M/S
C       VD      =VELOCITY, DEPOSITION, M/S
C       VG      =VELOCITY, GRAVITATIONAL FALL, M/S
C       XG      =GAUGE DISTANCE FROM SOURCE BASE, M
C
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      COMMON/AIR/H,VG,U,IT,IS,VD,XG,HLID,ROUGH,FTWIND,CHIQ                !PC/AT
C---- TEST FOR INVALID COMBINATIONS OF IS AND IT:
36     IF(IS.LT.1.OR.IS.GT.6)WRITE(6,38)IT,IS
      IF(IT.EQ.5.AND.(IS.EQ.1.OR.IS.EQ.5))WRITE(6,38)IT,IS
      IF(IT.EQ.6.AND.(IS.EQ.1.OR.IS.EQ.6))WRITE(6,38)IT,IS
C---- INITIALIZE PARAMETERS
      IF(HLID.EQ.0.)HLID=12000.                                          !LC
      XG = XG + EXTENT/0.3978247
C---- ACCOUNT FOR PLUME TILT
      HH=AMAX1(0.,H-VG*XG/U)                                             !LC
C---- COMPUTE PLUME WIDTH FACTORS AT DISTANCE XG
      CALL SIGMAZ(XG,IT,IS,ROUGH,SIGZ, IKPM,HLID,HH)
C---- RESTRICT HLID TO TROPOPAUSE IF INPUT SPEC. =0.0
C---- COMPUTE CORRECTION FACTOR FOR PLUME DEPLETION
      COR=1.
      IF(VG.NE.0..OR.VD.NE.0.) CALL DPLT(HH,VD,U,IT,IS,XG,ROUGH,         !LC
     &                                   HLID,COR)
      EXPO=EXP(-HH*HH/2./SIGZ/SIGZ)
C---- COMPUTE SECTOR AVERAGE VALUES
      EXPN=COR*2.032*EXPO/SIGZ/XG
      EXPOS=EXPN/U
      DEPO=EXPOS*VD
38     FORMAT(2X,'INVALID COMBINATION OF IT=',I2,'AND IS=',I2)
40     FORMAT(2X,'DEPLETION CORRECTION FACTOR =',F8.4)
      RETURN                                                             !LC
      END
C
C
        SUBROUTINE DPLT(HH,VD,U,IT,IS,XG,ROUGH,HLID,COR)                 !LC
C
C---- COMPUTES PLUME DEPLETION CORRECTION
C
      DIMENSION XX(50),FX(50),AX(50)
      COMMON/C/BY(6),BZ1(6),BZ2(6),BZ3(6),A1(6),A2(6),B1(6),B2(6),
     & B3(6),PY(6,5),PZ(6,5),QY(6,5),QZ(6,5),XM(50)
      DATA PI/3.141593/                                                  !LC
      IF(IS.GT.6)IS=6
      IKPM=1
      IDUM=1
      CALL SIGMAZ(XG,IT,IS,ROUGH,SIGZ,IKPM,HLID,HH)                      !LC
C---- IKPM HAS BEEN RECOMPUTED
      IKP=IKPM+1
      SQRTPI=.79785
      FX(IKP)=EXP(-.5*(HH/SIGZ)**2)/SIGZ
      XX(IKP)=XG
      DO 20 I=1,IKPM
        XX(I)=XM(I)
        CALL SIGMAZ(XX(I),IT,IS,ROUGH,SIGZ,IDUM,HLID,HH)                 !LC
        FX(I)=EXP(-.5*(HH/SIGZ)**2)/SIGZ
20     CONTINUE
      CALL SIMPUN(XX,FX,IKP,1,AX)                                        !LC
      COR=EXP(-SQRTPI*VD/U*AX(IKP))
      RETURN
      END
C
C
      SUBROUTINE SIGMAZ(XG,IT,IS,ROUGH,SIGZ,IKPM,HLID,HH)                !LC
C---- D.E. FIELDS, 2/81; COMPUTES VERTICAL DISPERSION COFFICIENT
      COMMON/C/BY(6),BZ1(6),BZ2(6),BZ3(6),A1(6),A2(6),B1(6),B2(6),
     & B3(6),PY(6,5),PZ(6,5),QY(6,5),QZ(6,5),XM(50)
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```
      DIMENSION AONE(6),BONE(6),ATWO(6),BTWO(6),CONE(6),DONE(6),
     & CTWO(6),DTWO(6),RGH(6)
      DATA AONE/0.112,0.130,0.112,0.098,0.0609,0.0638/
      DATA BONE/1.06,0.950,0.920,0.889,0.895,0.783/
      DATA ATWO/5.38E-4,6.52E-4,9.05E-4,1.35E-3,1.96E-3,1.36E-3/
      DATA BTWO/0.815,0.750,0.718,0.688,0.684,0.672/
      DATA CONE/1.56,2.02,2.72,5.16,7.37,11.7/
      DATA DONE/0.0480,0.0269,0.,-0.060,-0.0957,-0.128/
      DATA CTWO/6.25E-4,7.76E-4,0.,186.,4.29E+3,4.59E+4/
      DATA DTWO/0.45,0.37,0.,-0.225,-0.60,-0.78/
      DATA RGH/0.01,0.04,0.10,0.40,1.0,4.0/
      P=0.0
      DO 8 I=1,50
        IKP=I
        IF(XM(I).GE.XG)GOTO9
8     CONTINUE
9     IF(IKP.LT.2)IKP=2
      IKPM=IKP-1
C---- CHOOSE TYPE OF COMPUTATION
      IPOINT=IT
      IF(IT.GT.3)IPOINT=4
      GOTO(10,20,30,40),IPOINT
C---- PASQUILL-GIFFORD DISPERSION VALUES, FROM VOGT
10    ALX=ALOG(XG)
      SIGZ=(EXP(B1(IS)+(B2(IS)+B3(IS)*ALX)*ALX))/2.15
      GOTO99
C---- HOSKER'S FORM. OF BRIGGS-SMITH DISPERSION VALUES, FROM ATM
   20 ABS=ROUGH
      C1 =YLAG(ABS,RGH,CONE,0,3,6,0)
      D1 =YLAG(ABS,RGH,DONE,0,2,6,0)
      C2 =YLAG(ABS,RGH,CTWO,0,3,6,0)
      D2 =YLAG(ABS,RGH,DTWO,0,2,6,0)
      G=AONE(IS)*XG**BONE(IS)/(1.0+ATWO(IS)*XG**BTWO(IS))
      F=C1*(XG**D1)
      F=ALOG(F)
      IF(ROUGH.GT.0.10) THEN                                    ILC
        F=F+ALOG(1.+1./(C2*XG**D2))
      ELSE
        F=F-ALOG(1.+C2*XG**D2)
      ENDIF
      SIGZ=G*F
      IF(SIGZ.LT.1.0) SIGZ=1.0
      GOTO99
C---- BRIGGS DISPERSION VALUES, FROM AIRDOS II
30    SIGZ=BZ1(IS)*XG*(1+BZ2(IS)*XG)**BZ3(IS)
      GOTO99
C---- DISPERSION VALUES AFTER KLUG, AND OTHERS
40    J=IT-3
C----      =1 FOR KLUG
C----      =2 FOR BROOKHAVEN
C----      =3 FOR ST. LOUIS
C----      =4 FOR JULICH(50M)
C----      =5 FOR JULICH(100M)
      SIGZ=PZ(IS,J)*XG**QZ(IS,J)
99    SIGCAL=2.*(HLID-HH*.5)/2.15
      IF(SIGZ.GT.SIGCAL) SIGZ=SIGCAL                            ILC
      RETURN
      END
C
C
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```
      SUBROUTINE SIMPUN(XX,FX,NX,I,AX)
C---- PROGRAM AUTHOR J. BARISH, COMPUTING TECHNOLOGY CENTER, UNION
C---- CARBIDE CORP., NUCLEAR DIV., OAK RIDGE, TENN.
      DIMENSION XX(50),FX(50),AX(50)
      IF (I.LT.0) GO TO 30
      AX(1)=0.0
      DO 10 IX=2,NX,2
        D1=XX(IX)-XX(IX-1)
        AX(IX)=AX(IX-1)+D1/2.0*(FX(IX)+FX(IX-1))
        IF (NX.EQ.IX) GO TO 20
        D2=XX(IX+1)-XX(IX-1)
        D3=D2/D1
        A2=D3/6.0*D2**2/(XX(IX+1)-XX(IX))
        A3=D2/2.0-A2/D3
   10 AX(IX+1)=AX(IX-1)+(D2-A2-A3)*FX(IX-1)+A2*FX(IX)+A3* FX(IX+1)
   20 RETURN
   30 AX(NX)=0.0
      DO 40 IX=2,NX,2
        IC=NX+1-IX
        D1=XX(IC+1)-XX(IC)
        AX(IC)=AX(IC+1)+D1/2.0*(FX(IC+1)+FX(IC))
        IF (NX.EQ.IX) GO TO 20
        D2=XX(IC+1)-XX(IC-1)
        D3=D2/(XX(IC)-XX(IC-1))
        A2=D3/6.0*D2**2/D1
        A3=D2/2.0-A2/D3
   40 AX(IC-1)=AX(IC+1)+(D2-A2-A3)*FX(IC-1)+A2*FX(IC)+ A3*FX(IC+1)
      RETURN
      END
C
C
      FUNCTION YLAG(XI,X,Y,IND1,N1,IMAX, IEX)
C---- PROGRAM AUTHORS  A. A. BROOKS AND E.C. LONG, COMPUTING TECHNOLOGY
C---- CENTER, UNION CARBIDE CORP., NUCLEAR DIV., OAK RIDGE, TENN.
C      LAGRANGIAN INTERPOLATION
C          XI   = INTEPOLATED ENTRY INTO X-ARRAY
C          N    = THE ORDER OF LAGRANGRAN INTERPOLATION
C          Y    = ARRAY FROM WHICH YLAG IS OBTAINED BY INTERPOLATION
C          IND  = THE MIN-I FOR X(I).GT.XI
C          IF IND = 0,X-ARRAY WILL BE SEARCHED
C          IMAX = MAX INDEX OF X-AND Y-ARRAYS
C          EXTRAPOLATION CAN OCCUR,IEX=-1 OR +1
C
      DIMENSION X(1),Y(1)
      IND=IND1
      N=N1
      IEX=0
      IF (N.LE.IMAX) GO TO 10
      N=IMAX
      IEX=N
   10 IF (IND.GT.0) GO TO 40
      DO 20 J = 1,IMAX
        IF (XI-X(J)) 30,130,20
   20 CONTINUE
      IEX=1
      GO TO 70
   30 IND=J
   40 IF (IND.LE.1) IEX=-1                                    ILC
      INL=IND-(N+1)/2
      IF (INL.LE.0) INL=1                                     ILC
```

```
      INU=INL+N-1
      IF (INU.LE.IMAX) GO TO 80
   70 INL=IMAX-N+1
      INU=IMAX
   80 S=0.
      P=1.
      DO 110 J=INL,INU
        P=P*(XI-X(J))
        D=1.
        DO 100 I=INL,INU
          IF (I.EQ.J) THEN                                          ILC
            XD=XI
          ELSE
            XD=X(J)
          ENDIF
  100   D=D*(XD-X(I))
  110 S=S+Y(J)/D
      YLAG=S*P
  120 RETURN
  130 YLAG=Y(J)
      GO TO 120
      END
C
C
        BLOCK DATA
C
C---- D.E. FIELDS,  2/81
C
      COMMON/C/BY(6),BZ1(6),BZ2(6),BZ3(6),A1(6),A2(6),B1(6),B2(6),
     & B3(6),PY(6,5),PZ(6,5),QY(6,5),QZ(6,5),XM(50)
C---- FOR BRIGGS
      DATA BY/.22,.16,.11,.08,.06,.04/,
     & BZ1/.2,.12,.08,.06,.03,.016/,
     & BZ2/0.,0.,.0002,.0015,.0003,.0003/,
     & BZ3/1.,1.,-.5,-.5,-1.,-1./
C---- FOR PG
      DATA A1/-.0234,-.0147,-.0117,-.0059,-.0059,-.0029/,
     & A2/.35,.248,.175,.108,.088,.054/,
     & B1/.88,-.985,-1.186,-1.35,-2.88,-3.8/,
     & B2/-.152,.82,.85,.793,1.255,1.419/,
     & B3/.1475,.0168,.0045,.0022,-.042,-.055/
C---- FOR KLUG, ET. AL. TYPES OF DISPERSION...
      DATA PY/.469,.306,.23,.219,.237,.273,0.,.4,.36,.32,.0,.31,
     & .0,1.7,1.44,.91,1.02,.0,.66,.66,.63,.53,.41,7.56,
     & .34,.37,.40,.43,.46,7.56/
      DATA QY/.903,.885,.855,.764,.691,.594,0.,.91,.86,.78,.0,.71,
     & 0.,.717,.71,.729,.648,.0,.83,.83,.80,.80,.87,.52,
     & 1.00,.94,.88,.82,.76,.52/
      DATA PZ/.017,.072,.076,.14,.217,.262,.0,.411,.326,.223,.0,
     & .062,.0,.079,.131,.91,1.93,.0,.14,.14,.21,.26,.13,.56,
     & .037,.076,.16,.32,.66,1.37/
      DATA QZ/1.38,1.021,.879,.727,.61,.5,.0,.907,.859,.776,.0,.709,
     & .0,1.2,1.046,.702,.465,.0,1.09,1.09,.98,.89,.83,.55,1.28,
     & 1.12,.96,.88,.63,.47/
      DATA XM/
     & 1.000E+00,2.000E+00,3.000E+00,4.000E+00,5.000E+00,
     & 1.000E+01,1.500E+01,2.000E+01,2.500E+01,3.000E+01,
     & 3.500E+01,4.000E+01,4.500E+01,5.000E+01,1.500E+02,
     & 2.000E+02,3.000E+02,4.000E+02,5.000E+02,6.000E+02,
     & 7.000E+02,8.000E+02,9.000E+02,1.000E+03,1.100E+03,
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     & 1.200E+03,1.300E+03,1.400E+03,1.600E+03,1.800E+03,
     & 2.000E+03,2.500E+03,3.000E+03,3.500E+03,4.000E+03,
     & 4.500E+03,5.000E+03,6.000E+03,7.000E+03,8.000E+03,
     & 1.000E+04,1.500E+04,2.000E+04,3.000E+04,4.000E+04,
     & 5.000E+04,6.000E+04,7.000E+04,8.000E+04,1.000E+05/
      END
C
C
      FUNCTION CAP(NYEAR)
C
C---- THIS FUNCTION CALCULATES AND RETURNS THE FRACTION OF THE TRENCH
C---- CAP THAT HAS FAILED.  FAILURE CAN BE CAUSED BY EROSION AS
C---- DETERMINED FROM THE UNIVERSAL SOIL LOSS EQUATION OR BY USER
C---- INPUTS.  CAP=1 INDICATES TOTAL CAP FAILURE.  THIS FUNCTION
C---- IS CALLED BY TRENCH.
C
C  INPUT VARIABLES
C
C     NYEAR = CURRENT YEAR OF SIMULATION
C     NYR1  = FIRST YEAR OF FAILURE
C     NYR2  = LAST YEAR OF FAILURE
C     PCT1  = PER CENT FAILURE IN NYR1
C     PCT2  = PER CENT FAILURE IN NYR2
C     OVER  = THICKNESS OF TRENCH CAP
C
C  OUTPUT VARIABLE
C
C     CAP   = FRACTION OF CAP THAT HAS FAILED
C
      DOUBLE PRECISION NUCLID
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &       PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &       IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &       INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/TRCH/TAREA,TDEPTH,OVER,PORT,RELFAC,DENCON,OLDWAT,FN
      CAP=0.0
      IF(OVER .LE. 1.E-2) THEN                                  ILC
        CAP=1.0
      ELSEIF (NYEAR .GE. NYR1 .AND. NYR1 .LT. NYR2) THEN
        CAP=((PCT2-PCT1)/(NYR2-NYR1))*(NYEAR-NYR1)+PCT1
        IF(NYEAR .GT. NYR2) CAP=PCT2
      ENDIF
      RETURN
      END

      SUBROUTINE FOOD(NN)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN VEGETABLES, MILK AND
C---- MEAT CONSUMED BY MAN RESULTING FROM ATMOSPHERIC DEPOSITION
C---- CALLED BY MAIN.
C
C    INPUT VARIABLES
C
C     NN    = NUCLIDE NUMBER
C     DECAY = RADIOACTIVE DECAY CONSTANT                        1/Y
C     XAMBWE = WEATHER DECAY CONSTANTE                          1/H
C              AIRBORNE MATERIAL
C     TA    = PERIOD OF TIME FOR WHICH SOIL IS EXPOSED TO THE
C              CONTAMINATED AIRBORNE MATERIAL                   H
C     PP    = SURFACE DENSITY FOR SOIL                       KG/M**2
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C     RA    = RETENTION FRACTION
C     BV    = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C             FROM SOIL BY VEGETATIVE PARTS OF CROPS
C     BR    = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C             FROM SOIL BY REPRODUCTIVE PARTS OF CROPS
C     DERATE= RADIONUCLIDE DEPOSITION RATE                    PCI/M**
C     IOPT  = OPTIONS FOR SPECIALS RADIONUCLIDES H-3 AND C-14
C             IOPT = 1 IF H-3 AND C-14 IS NOT INCLUDED IN THIS RUN
C             IOPT = 2 IF ONLY H-3 IS INCLUDED
C             IOPT = 3 IF ONLY C-14 IS INCLUDED
C             IOPT = 4 IF BOTH ARE INCLUDED
C     Y1    = AG PRODUCTIVITY FOR GRASS CONSUMED BY ANIMALS     KG/M**2
C     Y2    = AG PRODUCTIVITY FOR VEGETATION CONSUMED BY MAN    KG/M**2
C     TE1   = TIME PASTURE GRASS EXPOSED DURING GROWING SEASON  H
C     TE2   = TIME CROP/VEG EXPOSED DURING GROWING SEASON       H
C     TH1   = PERIOD DELAY BETWEEN HARVEST OF PASTURE GRASS
C             AND INGESTION BY ANIMALS                          H
C     TH2   = PERIOD DELAY BETWEEN HARVEST OF STORED FEED AND
C             INGESTION BY ANIMAL                               H
C     TH3   = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEG AND
C             INGESTION BY MAN FOR MAXIMUM INDIVIDUAL EXPOSURE  H
C     TH4   = PERIOD DELAY BETWEEN HARVEST OF PRODUCE AND
C             INGESTION BY MAN FOR MAXIMUM INDIVIDUAL EXPOSURE  H
C     TH5   = TIME DELAY BETWEEN HARVEST  LEAFY VEG AND
C             INGESTION BY MAN FOR GENERAL POPULATION EXPOSURE  H
C     TH6   = TIME DELAY BETWEEN HARVEST OF PRODUCE AND
C             INGESTION BY MAN FOR GENERAL POPULATION EXPOSURE  H
C     FP    = FRACTION OF YEAR THAT ANIMAL GRAZE ON PASTURE
C     FS    = FRACTION OF DAILY FEED THAT IS FRESH GRASS WHEN
C             ANIMALS GRAZE ON PASTURE
C     FMC   = FRACTION OF THE COW'S DAILY INTAKE OF
C             RADIONUCLIDE WHICH APPEARS IN EACH LITER OF MILK  D/L
C     FMG   = FRACTION OF THE GOAT'S DAILY INTAKE OF
C             RADIONUCLIDE WHICH APPEARS IN EACH LITER OF MILK  D/L
C     QFC   = AMOUNT OF FEED CONSUMED BY CATTLE                 KG/D
C     QFG   = AMOUNT OF FEED CONSUMED BY GOATS                  KG/D
C     TF1   = TRANSPORT TIME OF RADIONUCLIDE FROM
C             FEED-MILK-RECEPTOR FOR M.I.E.                     H
C     TF2   = TRANSPORT TIME OF RADIONUCLIDE FROM
C             FEED-MILK-RECEPTOR FOR G.P.E.                     H
C     FF    = FRACTION OF THE ANIMAL'S DAILY INTAKE OF
C             RADIONUCLIDE WHICH APPEARS IN EACH KG OF FLESH    D/KG
C     TS    = TIME FROM SLAUGHTER OF MEAT TO CONSUMPTION        H
C     ABSH  = ABSOLUTE HUMIDITY OF THE ATMOSPHERE               G/M**3
C     P14   = FRACTIONAL EQUILIBRIUM RATIO FOR C-14
C     INTERMEDIATE VARIABLES
C     XAMBEF= EFFECTIVE DECAY CONSTANT
C     CPAST = NUCLIDE CONC IN PASTURE GRASS CONSUMED BY ANIMALS
C     CSTO  = NUCLIDE CONC IN STORED FEED CONSUMED BY ANIMALS
C     CFEED = RADIONUCLIDE CONCENTRATION IN ANIMALS'S FEED
C
C   OUTPUT VARIABLES
C
C     CL1   = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C             FOR M.I.E.                                        PCI/KG
C     CL2   = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C             FOR G.P.E.                                        PCI/KG
C     CP1   = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C             FOR M.I.E.                                        PCI/KG
C     CP2   = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
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C            FOR G.P.E.                                    PCI/KG
C      CCMI1 = RADIONUCLIDE CONC IN COW'S MILK FOR M.I.E.      PCI/L
C      CCMI2 = RADIONUCLIDE CONC IN COW'S MILK FOR G.P.E.      PCI/L
C      CGMI1 = RADIONUCLIDE CONC IN GOAT'S MILK FOR M.I.E.     PCI/L
C      CGMI2 = RADIONUCLIDE CONC IN GOAT'S MILK FOR G.P.E.     PCI/L
C      CMEAT = RADIONUCLIDE CONC IN BEEF CATTLE'S MEAT         PCI/KG
C
      DOUBLE PRECISION NUCLID,H3,C14
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                IPC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &      ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &      QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &      CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &      CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &      COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &      COMEAT(40),QING(40),QINH(40),POP,
     &      CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,
     &            QCW,QGW,QBW,ABSH,P14
      DATA H3/8HH-3     /,C14/8HC-14    /
      DECA=DECAY(NN)/8760.
      IF(NUCLID(NN) .EQ. H3) GO TO 200
      IF(NUCLID(NN) .EQ. C14) GO TO 300
C---- CALCULATION OF CPAST= RADIONUCLIDE CONCENTRATION IN PASTURE GRASS
C---- CONSUMED BY ANIMALS
  100 B=0.243*BV(NN)
      CPAST=CV(NN,Y1,TE1,TH1,B,1.)
C---- CALCULATION OF CSTO = RADIONUCLIDE CONCENTRATION IN STORED FEED
C---- CONSUMED BY ANIMALS
      B=0.680*(0.378*BR(NN)+0.622*BV(NN))
      CSTO=CV(NN,Y1,TE1,TH2,B,0.1)
C---- CALCULATION OF CFEED = RADIONUCLIDE CONCENTRATION IN ANIMAL'S FEED
      CFEED=FP*FS*CPAST+(1.0-FP*FS)*CSTO
C---- CALCULATION OF CLX = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN

      B=0.066*BV(NN)
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      CL1(NN)=CV(NN,Y2,TE2,TH3,B,1.)
C---- 2. FOR GENERAL POPULATION
      CL2(NN)=CV(NN,Y2,TE2,TH5,B,1.)
C---- CALCULATION OF CPX = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      B=0.187*BR(NN)
      CP1(NN)=CV(NN,Y2,TE2,TH4,B,0.1)
C---- 2. FOR GENERAL POPULATION
      CP2(NN)=CV(NN,Y2,TE2,TH6,B,0.1)
C---- CALCULATION OF CCMIX = RADIONUCLIDE CONCENTRATION IN COW'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      CCMI1(NN)=FMC(NN)*CFEED*QFC*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      CCMI2(NN)=FMC(NN)*CFEED*QFC*EXP(-DECA*TF2)
C---- CALCULATION OF CGMIX = RADIONUCLIDE CONCENTRATION IN GOAT'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      CGMI1(NN)=FMG(NN)*CFEED*QFG*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
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      CGMI2(NN)=FMG(NN)*CFEED*QFG*EXP(-DECA*TF2)
C---- CALCULATION OF CMEAT = RADIONUCLIDE CONCENTRATION IN BEEF CATTLE
      CMEAT(NN)=FF(NN)*CFEED*QFC*EXP(-DECA*TS)
      RETURN
C---- CALCULATION FOR SPECIAL RADIONUCLIDE: TRITIUM
C---- CALCULATION OF CV3 = TRITIUM CONCENTRATION IN ALL VEGETATION
  200 CV3=3.75E14*ATAVG(NN)/ABSH
C---- CALCULATION OF CONCENTRATION OF TRITIUM IN VEGETATION, MILK,
C---- AND MEAT CONSUMED BY MAN
      CL1(NN)=CV3
      CL2(NN)=CV3
      CP1(NN)=CV3
      CP2(NN)=CV3
      CCMI1(NN)=FMC(NN)*CV3*QFC
      CCMI2(NN)=CCMI1(NN)
      CGMI1(NN)=FMG(NN)*CV3*QFG
      CGMI2(NN)=CGMI1(NN)
      CMEAT(NN)=FF(NN)*CV3*QFC
      RETURN
C---- CALCULATION FOR SPECIAL RADIONUCLIDE: CARBON-14
C---- CALCULATION OF CV14 = C-14 CONCENTRATION IN ALL VEGETATION
  300 CV14=6.875E14*ATAVG(NN)*P14
C---- CALCULATION OF C-14 CONCENTRATION IN VEGETATION, MILK,
C---- AND MEAT CONSUMED BY MAN
      CL1(NN)=CV14
      CL2(NN)=CV14
      CP1(NN)=CV14
      CP2(NN)=CV14
      CCMI1(NN)=FMC(NN)*CV14*QFC
      CCMI2(NN)=CCMI1(NN)
      CGMI1(NN)=FMG(NN)*CV14*QFG
      CGMI2(NN)=CGMI1(NN)
      CMEAT(NN)=FF(NN)*CV14*QFC
      RETURN
      END
C
C
      FUNCTION CV(I,Y,TE,TH,B,TV)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN FORAGE, PRODUCE AND
C      VEGETABLES  CALLED BY FOOD
C
      DOUBLE PRECISION NUCLID
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &        AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                IPC/AT
     &        SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &        AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &        ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &        FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,
     &        PORS,BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,
     &        INSITE
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &        ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &        QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &        CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &        CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &        COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &        COMEAT(40),QING(40),QINH(40),POP,
     &        CSP(40),CSPT(40),CSPO(40),CSPOT(40)
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      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                !LC
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &       PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &       IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &       INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      NEXYR=IAVG2-IAVG1+1
      DECA=DECAY(I)/8760.
      XAMBEF=DECA+XAMBWE
      TERM1=DERATE(I)*RA(I)*TV*(1.0-EXP(-XAMBEF*TE))/(Y*XAMBEF)
      CSP(I)=CSPT(I)/FLOAT(NEXYR)
      IF(INSITE .EQ. 1)CSP(I)=SOAVG(I)
      TERM2=CSP(I)*B/PP
      CV=(TERM1+TERM2)*EXP(-DECA*TH)
      RETURN
      END
C
C
      SUBROUTINE FOODA(NN)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN VEGETABLES, MILK AND
C---- MEAT CONSUMED BY MAN RESULTING FROM ATMOSPHERIC DEPOSITION
C---- CALLED BY MAIN.
C
C     INPUT VARIABLES
C
C       NN     = NUCLIDE NUMBER
C       DECAY = RADIOACTIVE DECAY CONSTANT                    1/Y
C       XAMBWE = WEATHER DECAY CONSTANTE                      1/H
C              AIRBORNE MATERIAL
C       TA     = PERIOD OF TIME FOR WHICH SOIL IS EXPOSED TO THE
C              CONTAMINATED AIRBORNE MATERIAL                 H
C       PP     = SURFACE DENSITY FOR SOIL                     KG/M**2
C       RA     = RETENTION FRACTION
C       BV     = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C              FROM SOIL BY VEGETATIVE PARTS OF CROPS
C       BR     = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C              FROM SOIL BY REPRODUCTIVE PARTS OF CROPS
C       DERATE = RADIONUCLIDE DEPOSITION RATE                 PCI/M**
C       IOPT   = OPTIONS FOR SPECIALS RADIONUCLIDES H-3 AND C-14
C              IOPT = 1 IF H-3 AND C-14 IS NOT INCLUDED IN THIS RUN
C              IOPT = 2 IF ONLY H-3 IS INCLUDED
C              IOPT = 3 IF ONLY C-14 IS INCLUDED
C              IOPT = 4 IF BOTH ARE INCLUDED
C       Y1     = AG PRODUCTIVITY FOR GRASS CONSUMED BY ANIMALS     KG/M**2
C       Y2     = AG PRODUCTIVITY FOR VEGETATION CONSUMED BY MAN    KG/M**2
C       TE1    = TIME PASTURE GRASS EXPOSED DURING GROWING SEASON  H
C       TE2    = TIME CROP/VEG EXPOSED DURING GROWING SEASON       H
C       TH1    = PERIOD DELAY BETWEEN HARVEST OF PASTURE GRASS
C              AND INGESTION BY ANIMALS                           H
C       TH2    = PERIOD DELAY BETWEEN HARVEST OF STORED FEED AND
C              INGESTION BY ANIMAL                                H
C       TH3    = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEG AND
C              INGESTION BY MAN FOR MAXIMUM INDIVIDUAL EXPOSURE  H
C       TH4    = PERIOD DELAY BETWEEN HARVEST OF PRODUCE AND
C              INGESTION BY MAN FOR MAXIMUM INDIVIDUAL EXPOSURE  H
C       TH5    = TIME DELAY BETWEEN HARVEST  LEAFY VEG AND
C              INGESTION BY MAN FOR GENERAL POPULATION EXPOSURE  H
C       TH6    = TIME DELAY BETWEEN HARVEST OF PRODUCE AND
C              INGESTION BY MAN FOR GENERAL POPULATION EXPOSURE  H
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C     FP    = FRACTION OF YEAR THAT ANIMAL GRAZE ON PASTURE
C     FS    = FRACTION OF DAILY FEED THAT IS FRESH GRASS WHEN
C             ANIMALS GRAZE ON PASTURE
C     FMC   = FRACTION OF THE COW'S DAILY INTAKE OF
C             RADIONUCLIDE WHICH APPEARS IN EACH LITER OF MILK  D/L
C     FMG   = FRACTION OF THE GOAT'S DAILY INTAKE OF
C             RADIONUCLIDE WHICH APPEARS IN EACH LITER OF MILK  D/L
C     QFC   = AMOUNT OF FEED CONSUMED BY CATTLE                 KG/D
C     QFG   = AMOUNT OF FEED CONSUMED BY GOATS                  KG/D
C     TF1   = TRANSPORT TIME OF RADIONUCLIDE FROM
C             FEED-MILK-RECEPTOR FOR M.I.E.                     H
C     TF2   = TRANSPORT TIME OF RADIONUCLIDE FROM
C             FEED-MILK-RECEPTOR FOR G.P.E.                     H
C     FF    = FRACTION OF THE ANIMAL'S DAILY INTAKE OF
C             RADIONUCLIDE WHICH APPEARS IN EACH KG OF FLESH    D/KG
C     TS    = TIME FROM SLAUGHTER OF MEAT TO CONSUMPTION        H
C     ABSH  = ABSOLUTE HUMIDITY OF THE ATMOSPHERE               G/M**3
C     P14   = FRACTIONAL EQUILIBRIUM RATIO FOR C-14
C     INTERMEDIATE VARIABLES
C     XAMBEF= EFFECTIVE DECAY CONSTANT
C     CPAST = NUCLIDE CONC IN PASTURE GRASS CONSUMED BY ANIMALS
C     CSTO  = NUCLIDE CONC IN STORED FEED CONSUMED BY ANIMALS
C     CFEED = RADIONUCLIDE CONCENTRATION IN ANIMALS'S FEED
C
C
C   OUTPUT VARIABLES
C
C     CL1   = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C             FOR M.I.E.                                        PCI/KG
C     CL2   = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C             FOR G.P.E.                                        PCI/KG
C     CP1   = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C             FOR M.I.E.                                        PCI/KG
C     CP2   = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C             FOR G.P.E.                                        PCI/KG
C     CCMI1 = RADIONUCLIDE CONC IN COW'S MILK FOR M.I.E.        PCI/L
C     CCMI2 = RADIONUCLIDE CONC IN COW'S MILK FOR G.P.E.        PCI/L
C     CGMI1 = RADIONUCLIDE CONC IN GOAT'S MILK FOR M.I.E.       PCI/L
C     CGMI2 = RADIONUCLIDE CONC IN GOAT'S MILK FOR G.P.E.       PCI/L
C     CMEAT = RADIONUCLIDE CONC IN BEEF CATTLE'S MEAT           PCI/KG
C
      DOUBLE PRECISION NUCLID,H3,C14
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                !PC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &      ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &      QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &      CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &      CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &      COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &      COMEAT(40),QING(40),QINH(40),POP,
     &      CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,
     &      PORS,BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,
     &      INSITE
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                !LC
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      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      COMMON/PCV/SOCON(40)
      DATA H3,C14/8HH-3     ,8HC-14    /
      IF(NUCLID(NN) .EQ. H3) GO TO 200
      IF(NUCLID(NN) .EQ. C14) GO TO 300
      DECA=DECAY(NN)/8760.
      DECSL=SINFL/(0.15*(1.+BDENS/PORS*XKD(1,NN)))/8760.
      CSP(NN)=(CSP(NN)+DERATE(NN)*8760.)*EXP(-(DECA+DECSL)*8760.)
      IF(INSITE .EQ. 1) CSP(NN)=SOCON(NN)
C---- CALCULATION OF CPAST= RADIONUCLIDE CONCENTRATION IN PASTURE GRASS
C---- CONSUMED BY ANIMALS
      B=0.243*BV(NN)
      TERM2=CSP(NN)*B/PP
      CPAST=CVA(NN,Y1,TE1,TH1,TERM2,1.)
C---- CALCULATION OF CSTO = RADIONUCLIDE CONCENTRATION IN STORED FEED
C---- CONSUMED BY ANIMALS
      B=0.680*(0.378*BR(NN)+0.622*BV(NN))
      TERM2=CSP(NN)*B/PP
      CSTO=CVA(NN,Y1,TE1,TH2,TERM2,0.1)
C---- CALCULATION OF CFEED = RADIONUCLIDE CONCENTRATION IN ANIMAL'S FEED
      CFEED=FP*FS*CPAST+(1.0-FP*FS)*CSTO
C---- CALCULATION OF CLX = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN

      B=0.066*BV(NN)
      TERM2=CSPO(NN)*B/PP
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      CL1(NN)=CVA(NN,Y2,TE2,TH3,TERM2,1.)
C---- 2. FOR GENERAL POPULATION
      CL2(NN)=CVA(NN,Y2,TE2,TH5,TERM2,1.)
C---- CALCULATION OF CPX = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      B=0.187*BR(NN)
      TERM2=CSP(NN)*B/PP
      CP1(NN)=CVA(NN,Y2,TE2,TH4,TERM2,0.1)
C---- 2. FOR GENERAL POPULATION
      CP2(NN)=CVA(NN,Y2,TE2,TH6,TERM2,0.1)
C---- CALCULATION OF CCMIX = RADIONUCLIDE CONCENTRATION IN COW'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      CCMI1(NN)=FMC(NN)*CFEED*QFC*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      CCMI2(NN)=FMC(NN)*CFEED*QFC*EXP(-DECA*TF2)
C---- CALCULATION OF CGMIX = RADIONUCLIDE CONCENTRATION IN GOAT'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      CGMI1(NN)=FMG(NN)*CFEED*QFG*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      CGMI2(NN)=FMG(NN)*CFEED*QFG*EXP(-DECA*TF2)
C---- CALCULATION OF CMEAT = RADIONUCLIDE CONCENTRATION IN BEEF CATTLE
      CMEAT(NN)=FF(NN)*CFEED*QFC*EXP(-DECA*TS)
      RETURN
C---- CALCULATION FOR SPECIAL RADIONUCLIDE: TRITIUM
C---- CALCULATION OF CV3 = TRITIUM CONCENTRATION IN ALL VEGETATION
  200 CV3=3.75E14*ATCON(NN)/ABSH
C---- CALCULATION OF CONCENTRATION OF TRITIUM IN VEGETATION, MILK,
C---- AND MEAT CONSUMED BY MAN
      CL1(NN)=CV3
      CL2(NN)=CV3
      CP1(NN)=CV3
      CP2(NN)=CV3
      CCMI1(NN)=FMC(NN)*CV3*QFC
      CCMI2(NN)=CCMI1(NN)
```

```
      CGMI1(NN)=FMG(NN)*CV3*QFG
      CGMI2(NN)=CGMI1(NN)
      CMEAT(NN)=FF(NN)*CV3*QFC
      RETURN
C---- CALCULATION FOR SPECIAL RADIONUCLIDE: CARBON-14
C---- CALCULATION OF CV14 = C-14 CONCENTRATION IN ALL VEGETATION
  300 CV14=6.875E14*ATCON(NN)*P14
C---- CALCULATION OF C-14 CONCENTRATION IN VEGETATION, MILK,
C---- AND MEAT CONSUMED BY MAN
      CL1(NN)=CV14
      CL2(NN)=CV14
      CP1(NN)=CV14
      CP2(NN)=CV14
      CCMI1(NN)=FMC(NN)*CV14*QFC
      CCMI2(NN)=CCMI1(NN)
      CGMI1(NN)=FMG(NN)*CV14*QFG
      CGMI2(NN)=CGMI1(NN)
      CMEAT(NN)=FF(NN)*CV14*QFC
      RETURN
      END
C
C
      FUNCTION CVA(I,Y,TE,TH,TERM2,TV)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN FORAGE, PRODUCE AND
C---- VEGETABLES.  CALLED BY FOODA
C
      DOUBLE PRECISION NUCLID
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                IPC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,
     &            QCW,QGW,QBW,ABSH,P14
      DECA=DECAY(I)/8760.
      XAMBEF=DECA+XAMBWE
      TERM1=DERATE(I)*RA(I)*TV*(1.0-EXP(-XAMBEF*TE))/(Y*XAMBEF)
      CVA=(TERM1+TERM2)*EXP(-DECA*TH)
      RETURN
      END
C
C
       SUBROUTINE HUMEX(NN)
C
C---- CALCULATION OF ANNUAL RADIONUCLIDE INTAKE BY MAN.  CALLED BY MAIN
C
C    INPUT VARIABLES
C
C      NN     = RADIONUCLIDE NUMBER
C      ULEAFY = ANNUAL INTAKE OF LEAFY VEGETABLES (KG/Y)
C      UPROD  = ANNUAL INTAKE OF PRODUCE (KG/Y)
C      UCMILK = ANNUAL INTAKE OF COW'S MILK(L/Y)
C      UGMILK = ANNUAL INTAKE OF GOAT'S MILK(L/Y)
C      UMEAT  = ANNUAL INTAKE OF BEEF CATTLE'S MEAT(KG/Y)
C      UWAT   = ANNUAL INTAKE OF DRINKING WATER(L/Y)
C      UAIR   = ANNUAL INHALATION RATE OF AIR(M3/Y)
C
C    OUTPUT VARIABLES
```

```
C
C     QING   = ANNUAL INTAKE OF RADIONUCLIDE BY INGESTION OF CONTAMINED
C              FOOD CONSIDERING ATMOSPHERIC AND AQUATIC PATHWAYS(PCI/Y)
C     QINH   = ANNUAL INTAKE OF RADIONUCLIDE BY INHALATION(PCI/Y)
C
      DOUBLE PRECISION NUCLID,PNUC
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &       ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &       QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &       CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &       CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &       COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &       COMEAT(40),QING(40),QINH(40),POP,
     &       CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &       AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                !PC/AT
     &       SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &       AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &       ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &       FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/PASS/PNUC(40),PCON1(40),PCON2(40),PCON3(40),
     &      PCON4(40),PPOP,LLIND,LDIST
C---- CALCULATION OF RADIONUCLIDE INTAKE BY CONSUMPTION OF VEGETATION,
C---- MILK, MEAT AND DRINKING WATER
      IF(LLIND .NE. 0) THEN                                          !LC
        QVEG=(CL2(NN)+COL2(NN))*ULEAFY+(CP2(NN)+COP2(NN))*UPROD
        QMILK=(CCMI2(NN)+COCMI2(NN))*UCMILK+(CGMI2(NN)+COGMI2(NN))*
     &        UGMILK
      ELSE
        QVEG=(CL1(NN)+COL1(NN))*ULEAFY+(CP1(NN)+COP1(NN))*UPROD
        QMILK=(CCMI1(NN)+COCMI1(NN))*UCMILK+(CGMI1(NN)+COGMI1(NN))*
     &        UGMILK
      ENDIF
      QMEAT=(CMEAT(NN)+COMEAT(NN))*UMEAT
      QWAT=CWAT(NN)*UWAT
      QING(NN)=QVEG+QMILK+QMEAT+QWAT
C---- CALCULATION OF RADIONUCLIDE INTAKE BY INHALATION
      COAIR=ATAVG(NN)*1.0E12
      QINH(NN)=COAIR*UAIR
      RETURN
      END
C
C
      SUBROUTINE HUMEXA(NN)
C
C---- CALCULATION OF ANNUAL RADIONUCLIDE INTAKE BY MAN.  CALLED BY MAIN
C
C     INPUT VARIABLES
C
C       NN     = RADIONUCLIDE NUMBER
C       ULEAFY = ANNUAL INTAKE OF LEAFY VEGETABLES (KG/Y)
C       UPROD  = ANNUAL INTAKE OF PRODUCE (KG/Y)
C       UCMILK = ANNUAL INTAKE OF COW'S MILK(L/Y)
C       UGMILK = ANNUAL INTAKE OF GOAT'S MILK(L/Y)
C       UMEAT  = ANNUAL INTAKE OF BEEF CATTLE'S MEAT(KG/Y)
C       UWAT   = ANNUAL INTAKE OF DRINKING WATER(L/Y)
C       UAIR   = ANNUAL INHALATION RATE OF AIR(M3/Y)
C
C     OUTPUT VARIABLES
C
```

```
C       QING   = ANNUAL INTAKE OF RADIONUCLIDE BY INGESTION OF CONTAMINED
C              FOOD CONSIDERING ATMOSPHERIC AND AQUATIC PATHWAYS(PCI/Y)
C       QINH   = ANNUAL INTAKE OF RADIONUCLIDE BY INHALATION(PCI/Y)
C
      DOUBLE PRECISION NUCLID,PNUC
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &       ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &       QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &       CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &       CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &       COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &       COMEAT(40),QING(40),QINH(40),POP,
     &       CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &       AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                IPC/AT
     &       SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &       AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &       ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &       FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/PASS/PNUC(40),PCON1(40),PCON2(40),PCON3(40),
     &      PCON4(40),PPOP,LLIND,LDIST
C---- CALCULATION OF RADIONUCLIDE INTAKE BY CONSUMPTION OF VEGETATION,
C---- MILK, MEAT AND DRINKING WATER
      IF(LLIND .NE. 0) THEN                                          ILC
        QVEG=(CL2(NN)+COL2(NN))*ULEAFY+(CP2(NN)+COP2(NN))*UPROD
        QMILK=(CCMI2(NN)+COCMI2(NN))*UCMILK+(CGMI2(NN)+COGMI2(NN))*
     &        UGMILK
      ELSE
        QVEG=(CL1(NN)+COL1(NN))*ULEAFY+(CP1(NN)+COP1(NN))*UPROD
        QMILK=(CCMI1(NN)+COCMI1(NN))*UCMILK+(CGMI1(NN)+COGMI1(NN))*
     &        UGMILK
      ENDIF
      QMEAT=(CMEAT(NN)+COMEAT(NN))*UMEAT
      QWAT=CWAT(NN)*UWAT
      QING(NN)=QVEG+QMILK+QMEAT+QWAT
C---- CALCULATION OF RADIONUCLIDE INTAKE BY INHALATION
      COAIR=ATCON(NN)*1.0E12
      QINH(NN)=COAIR*UAIR
      RETURN
      END
C
C
      SUBROUTINE INFIL(TXI,TP)
C
C---- THIS SUBROUTINE, WITH SUBROUTINES SOIL AND ROUT, CALCULATES
C---- INFILRATION THROUGH THE TRENCH CAP FOR A SINGLE YEAR AND
C---- RETURNS THAT VALUE TO THE MAIN PROGRAM.  THE ORIGINAL MODEL AND
C---- PROGRAM WERE WRITTEN BY C.Y.HUNG, OFFICE OF RADIATION PROGRAMS,
C---- USEPA, WASHINGTON D.C.
C
      COMMON /BLOCK1/R(25),EP(25),H(25),QL(25),YP(25),YG(25),ETO(25),
     1 ETS(25),VP(25),VG(25),YTP(25),YTG(25),XI(25),P(12,31,25)
      COMMON /BLOCK2/HT(4),YPT(4),YGT(4)
      COMMON /BLOCK3/RT,EPT,YPTE,XKL,ETOT,QLT,XL,VGT,VPT,DELT,ETST,EPSP,
     1YTGPP,HUPMAX,VPMAX,HUGMAX,VGMAX,YPMAX,XNS,UYMAX,XKI,I,XIT,
     2EPSG,YTGPG,YGMAX,XDE,XKE
      DIMENSION MODAY(12),TMP(12,31),DTH(12)
      DATA IAMP/99/,MODAY/31,28,31,30,31,30,31,31,30,31,30,31/
      WRITE(6,3010)
C---- READ CONTROL PARAMETERS
```

```
      OPEN(4,FILE='INFIL.INP',STATUS='OLD')                          IPC/AT
      READ(4,1010)TWT,SLOP,XKI,EPSG,EPSP,YGMAX,XDE,XKE,YPI,YGI
      WRITE(6,9010)TWT,SLOP,XKI,EPSG,EPSP,YGMAX,XDE,XKE,YPI,YGI
 9010 FORMAT(//,' INPUT DATA AS READ IN',//,5X,6F7.3,2E10.3,2F7.3)
      YP(1)=YPI
      YG(1)=YGI
      YPMAX=YGMAX
      VPMAX=0.0
      VGMAX=XKI
C---- CREATE A 3-DIMENSIONAL ZERO-RATE RAINFALL MATRIX
      DO 100 IM=1,12
      NODAY=MODAY(IM)
      DO 100 ID=1,NODAY
      DO 100 IH=2,25
      P(IM,ID,IH)=0.
  100 CONTINUE
C---- READ MONTHLY MAXIMUM DAY LENGTH
      READ(4,1020) (DTH(IM),IM=1,12)
      WRITE (6,3020) (DTH(IM),IM=1,12)
C----- READ DAILY MEAN TEMPERATURES (DEG C)
      WRITE(6,3030)                                                  ILC
      DO 200 ID=1,31
        READ(4,1030) (TMP(IM,ID),IM=1,12)
        WRITE(6,3031) ID,(TMP(IM,ID),IM=1,12)
  200 CONTINUE
C---- OVERLAY PERTINENT DATA (0.1MM/HR) ONTO PRECIP ARRAY AS READ IN
      WRITE(6,3040)
  400 READ(4,1040) MO,IDA,(P(MO,IDA,IH),IH=2,25)
      IF(IAMP.EQ.MO) GO TO 500
      WRITE(6,3041) MO,IDA,(P(MO,IDA,IH),IH=2,25)
      GO TO 400
C---- CONVERT RAINFALL TO M/HR
  500 DO 600 MO=1,12
      NODAY=MODAY(MO)
      DO 600 IDA=1,NODAY
      DO 600 IH=2,25
      P(MO,IDA,IH)=P(MO,IDA,IH)*1E-4
  600 CONTINUE
C---- CALCULATE OR DEFINE CONSTANTS
      DELT=1.0
      TAU=0.66
      TEP=0.
      TP=0.
      TXI=0.
      TXIL=0.0
      H(1)=0.
      HSNW=0.
      TRO=0.
      XKCMMD=120./39.37
      CEP=.14/(24. * 1000.)
      XL=TWT/2.
      XKL=SQRT(SLOP)*3600./0.05
      XKCM=XKCMMD/(1000.*24)
      XKI=VGMAX+VPMAX
      WRITE(6,3050)
      WRITE(6,3051) XKCMMD,YGMAX,TWT,SLOP,XKI
      WRITE(6,3052)EPSP,EPSG,XDE,XKE,DELT
C---- STEADY STATE INFILTRATION LOOP
      DO 80 IY=1,10
      TP=0.0
```

```
      TEP=0.0
      TRO=0.0
      TXI=0.0
C---- MONTHLY LOOP
      DO 70 IM=1,12
      NODAY=MODAY(IM)
      DT=DTH(IM)/12.
C---- DAILY LOOP
      DO 60 ID=1,NODAY
      TC=TMP(IM,ID)
      IF(TC .LT. -20.8) XT = 0.
      IF(TC .LT. -20.8) GO TO 5
      BB=(TC+20.8)/31.98
      XT=BB**0.861
    5 PT=10.**XT
      EP(1)=CEP*DT*DT*PT
      HR=1.0
C---- HOURLY LOOP
      DO 50 IH=2,25
      I=IH
      EP(I)=EP(1)
C---- CONVERT BACK TO FAHRENHEIT TEMP (TF)
      TF=(1.8*TC)+32.
      IF(TF.GE.32.) GO TO 10
      HSNW = HSNW + P(IM,ID,I)
      R(I) = 0.
      GO TO 40
   10 SM=XKCM*(TF-24.)
      IF(SM .GT. HSNW) SM=HSNW                                    ILC
      HSNW=HSNW-SM
      R(I)=SM+P(IM,ID,I)
   40 CONTINUE
      CALL ROUT
      TEP=TEP+(ETS(I)+ETO(I))*DELT
      TP=TP+P(IM,ID,I)*DELT
      TXI=TXI+XI(I)*DELT
      TRO=TRO+QL(I)*DELT
      ETSO=ETS(I)+ETO(I)
      I1=I-1
      HR=HR+1.
   50 CONTINUE
      H(1)=H(25)
      YG(1)=YG(25)
      YP(1)=YP(25)
   60 CONTINUE
   70 CONTINUE
      WRITE(6,81) IY
   81 FORMAT(//,10X,'YEAR=',I2)
      WRITE(6,3060) TP,TEP,TRO,TXI
      WRITE(6,3061) YP(25),YG(25),HSNW
      PERTXI=TXI-TXIL
      WRITE(6,82) PERTXI
      PER=0.02*TXIL
      IF(PERTXI.LE.PER.AND.IY.NE.1) RETURN
      TXIL=TXI
   80 CONTINUE
C---- FORMAT STATEMENTS
   82 FORMAT(//,' CHANGE OF TOTAL ANNUAL INFILTRATION='
    1 ,1PE11.2,////)
 1010 FORMAT(10F7.3)
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```
1020 FORMAT(12F5.1)
1030 FORMAT(2X,12F6.2)
1040 FORMAT(I2,1X,I2,1X,24(F3.0),2X)
3010 FORMAT(1X,'OUTPUT FROM SUBROUTINE INFIL'/,28('*'),//)
3020 FORMAT(1X,'DAILY SUNSHINE BY MONTH (HOURS)'/,3X,12F8.1//)
3030 FORMAT(1X,'DAILY TEMPERATURES (DEGREES CELSIUS):'//,
   1 2X,'MONTH=   JAN    FEB    MAR    APR    MAY    JUN    JUL    AUG
   2    SEP    OCT    NOV    DEC'/,3X,'DAY'/)
3031 FORMAT(3X,I2,3X,12(F6.2,1X),/)
3040 FORMAT(//,1X,'MONTH,DAY,& RAINFALL AS READ IN (0.1MM/HR):'/)
3041 FORMAT(1X,2(I2,1X),24F4.0)
3050 FORMAT(/,1X,'TRENCH CHARACTERISTICS: '/)
3051 FORMAT(15X,'SNOWMELT COEFFICIENT =',F10.2,'MM/DEG-DAY'/,
   1 15X,'THICKNESS OF TRENCH COVER =',F10.2,' M'/,
   2 15X,'TOTAL WIDTH OF TRENCH COVER =',F10.2,' M'/,
   3 15X,'AVERAGE SLOPE OF TRENCH COVER =',F10.2,' M/M'/,
   4 15X,'PERMEABLITY OF TRENCH CAP =',E12.3,'M/HR')
3052 FORMAT(15X,'POROSITY FOR PELLIC WATER =', F10.2,' (UNITLESS)'/,
   1 15X,'POROSITY FOR GRAVITY WATER =',F10.2,'(UNITLESS)'/,
   2 15X,'EQUIVALENT UPWARD DIFFUSIVITY =',E12.2,' M**2/HR',/,
   3 15X,'EQUIVALENT UPWARD HYDRAULIC CONDUCTIVITY =',E12.2,' M/HR',/
   4 15X,'TIME STEP FOR MODEL =', F10.2,' HOURS'/)
3060 FORMAT(///,1X,12('*'),'CUMULATIVE ANNUAL VALUES (M)',12('*')//
   1 8X,'PRECIP',6X,'EVAP',6X,'RUNOFF',6X,'INFIL',/,5X,50('-')/,
   2 4X,4(1PE11.2)/)
3061 FORMAT(5X,'PELLICULAR',4X,'GRAVITY',5X,'SNOW'/,5X,'DEFICIT',
   1 7X,'DEFICIT'/,5X,50('-')/,4X,3(1PE11.2)/)
     RETURN
     END
C
C
     SUBROUTINE ROUT
C
     COMMON /BLOCK1/R(25),EP(25),H(25),QL(25),YP(25),YG(25),ETO(25),
    1 ETS(25),VP(25),VG(25),YTP(25),YTG(25),XI(25),P(12,31,25)
     COMMON /BLOCK2/HT(4),YPT(4),YGT(4)
     COMMON /BLOCK3/RT,EPT,YPTE,XKL,ETOT,QLT,XL,VGT,VPT,DELT,ETST,EPSP,
    1 YTGPP,HUPMAX,VPMAX,HUGMAX,VGMAX,YPMAX,XNS,UYMAX,XKI,I,XIT,
    2 EPSG,YTGPG,YGMAX,XDE,XKE
     RT=R(I)
     EPT=EP(I)
     CALL SOIL
     IF(ETOT .NE. 0.0) THEN                                          ILC
       HT(1) = H(I-1)
       DO 200 J=1,4
         QLT=XKL*HT(J)**1.667
         HT(J)=(RT-ETOT-ETST-QLT/XL-VPT-VGT)*DELT + H(I-1)
         IF(HT(J) .LT. 0.0) HT(J)=0.
         IF(J.LT.3) HT(J+1)=(HT(J) + H(I-1))*0.5                     ILC
         IF(J .EQ. 3) HT(J+1) = HT(J)
 200   CONTINUE
       H(I)=(HT(1)+2.0*(HT(2)+HT(3)) + HT(4))/6.0
       QL(I)=(R(I)-ETOT-VGT-VPT-(H(I)-H(I-1))/DELT)
     ELSE
       H(I)=0.
       QL(I)=0.
     ENDIF
     YP(I)=YP(I-1)+(ETST-VPT)*DELT/EPSP
     IF(YP(I).GT.1.E30) YP(I)=1.E30                                  IPC/AT
     IF(YP(I).LT.1.E-30) YP(I)=1.E-30                                IPC/AT
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```
      YG(I)=YG(I-1)+(XIT-VGT)*DELT/EPSG
      ETO(I) = ETOT
      ETS(I)=ETST
      XI(I)=XIT
      VP(I)=VPT
      VG(I)=VGT
      RETURN
      END
C
C
      SUBROUTINE SOIL
C
      COMMON /BLOCK1/R(25),EP(25),H(25),QL(25),YP(25),YG(25),ETO(25),
     1 ETS(25),VP(25),VG(25),YTP(25),YTG(25),XI(25),P(12,31,25)
      COMMON /BLOCK2/HT(4),YPT(4),YGT(4)
      COMMON /BLOCK3/RT,EPT,YPTE,XKL,ETOT,QLT,XL,VGT,VPT,DELT,ETST,EPSP,
     1 YTGPP,HUPMAX,VPMAX,HUGMAX,VGMAX,YPMAX,XNS,UYMAX,XKI,I,XIT,
     2 EPSG,YTGPG,YGMAX,XDE,XKE
      TSWE=(RT-EPT)*DELT+H(I-1)
      IF(TSWE .GE. 0.0) THEN                                    ILC
        ETOT=EPT
        ETST=0.0
        VPT=VGMAX
        AUX=TSWE/DELT
        IF(AUX .LT. VGMAX) VPT=TSWE/DELT
        YPTT=VPT*DELT/EPSP
        IF(YPTT .GT. YP(I-1)) VPT=YP(I-1)*EPSP/DELT
        IF(YPTT .GE. YP(I-1)) YPTT=VPT*DELT/EPSP
        TGHW=TSWE-VPT*DELT
        IF(TGHW .LT. 0.0) TGHW=0.
        VGT=VGMAX-VPT
        IF(TGHW .LT. VGT) VGT=TGHW/DELT
        YGTT= VGT*DELT/EPSG
        IF(YGTT .GT. YG(I-1)) VGT = YG(I-1)*EPSG/DELT
        IF(YGTT .GT. YG(I-1)) YGTT=VGT*DELT/EPSG
      ELSE
        ETOT=TSWE/DELT+EPT
        IF(ETOT .LT.0.) ETOT=0.
        EPSPG=EPSP+EPSG
        EPTE=EPT-ETOT
        IF(YP(I-1).NE.0.) THEN                                  ILC
          ETSTW=(XDE*EPSP/YP(I-1))-XKE
          IF(ETSTW.GT.EPTE) ETSTW=EPTE
        ELSE
          ETSTW=EPTE
        ENDIF
        ETSTV=EPTE/(1+(YP(I-1)*0.5/(0.66*EPSPG)))
        IF(ETSTV.GE.ETSTW) ETST=ETSTV
        IF(ETSTW.GE.ETSTV) ETST=ETSTW
        VPT=0.
        VGT=0.
      ENDIF
      IF(YG(I-1) .GE. YGMAX) THEN                               ILC
        XIT=0.
      ELSE
        XIT=XKI
        YGIT=XIT*DELT/EPSG
        XX=YGMAX-YG(I-1)
        IF(YGIT .GT. XX)  XIT=XX*EPSG/DELT
      ENDIF
```

```
      RETURN
      END
C
C
      SUBROUTINE IRRIG(NN)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN VEGETABLE, MILK AND
C      CONSUMED BY MAN RESULTING FROM WATER IRRIGATION.  CALLED BY MAIN.
C
C     INPUT VARIABLES
C
C      NN     = NUCLIDE NUMBER
C      DECAY = RADIOACTIVE DECAY CONSTANTE                    1/Y
C      XAMBWE = WEATHER DECAY CONSTANTE                       1/H
C      TW     = PERIOD OF TIME FOR WHICH SOIL IS EXPOSED TO THE
C               CONTAMINATED WATER                           H
C      PP     = SURFACE DENSITY FOR SOIL                     KG/M**2
C      RW     = RETENTION FRACTION
C      BV     = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C               FROM SOIL BY VEGETATIVE PARTS OF CROPS
C      BR     = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C               FROM SOIL BY REPRODUCTIVE PARTS OF CROPS
C      FI    =FRACTION OF THE YEAR CROPS ARE IRRIGATED
C      WIRATE= IRRIGATION RATE                              L/M**2-YR
C      CWAT  = RADIONUCLIDE CONCENTRATION IN WATER                PCI/L
C      IOPT  = OPTIONS FOR SPECIAL RADIONUCLIDE H-3
C               IOPT = 1 IF H-3 IS NOT INCLUDED IN THIS RUN
C               IOPT = 2 IF H-3 IS INCLUDED
C      Y1     = AG PRODUCTIVITY FOR GRASS CONSUMED BY ANIMALS     KG/M**2
C      Y2     = AG PRODUCTIVITY FOR VEGETATION CONSUMED BY MAN    KG/M**2
C      TE1.   = TIME PASTURE GRASS EXPOSED DURING GROWING SEASON  H
C      TE2    = TIME CROP/VEG EXPOSED DURING GROWING SEASON       H
C      TH1    = PERIOD DELAY BETWEEN HARVEST OF PASTURE GRASS
C               AND INGESTION BY ANIMALS                         H
C      TH2    = PERIOD DELAY BETWEEN HARVEST OF STORED FEED
C               AND INGESTION BY ANIMAL                          H
C      TH3    = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEGETABLE
C               AND INGESTION BY MAN FOR M.I.E.                  H
C      TH4    = PERIOD DELAY BETWEEN HARVEST OF PRODUCE AND
C               INGESTION BY MAN FOR M.I.E.                      H
C      TH5    = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEG
C               AND INGESTION BY MAN FOR G.P.E.                  H
C      TH6    = PERIOD DELAY BETWEEN HARVEST OF PRODUCE
C      TH5    = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEG
C      FP     = FRACTION OF YEAR THAT ANIMAL GRAZE ON PASTURE
C      FS     = FRACTION OF DAILY FEED THAT IS FRESH GRASS WHEN
C               ANIMALS GRAZE ON PASTURE
C      FMC    = FRACTION OF THE COW'S DAILY INTAKE OF
C               RADIONUCLIDE WHICH APPEARS IN EACH L OF MILK     D/L
C      FMG    = FRACTION OF THE GOAT'S DAILY INTAKE OF
C               RADIONUCLIDE WHICH APPEARS IN EACH L OF MILK     D/L
C      QFC    = AMOUNT OF FEED CONSUMED BY CATTLE                KG/D
C      QFG    = AMOUNT OF FEED CONSUMED BY GOATS                 KG/D
C      TF1    = TRANSPORT TIME OF RADIONUCLIDE FROM
C               FEED-MILK-RECEPTOR FOR M.I.E.                    H
C      TF2    = TRANSPORT TIME OF RADIONUCLIDE FROM
C               FEED-MILK-RECEPTOR FOR G.P.E.                    H
C      FF     = FRACTION OF THE ANIMAL'S DAILY INTAKE OF
C               RADIONUCLIDE WHICH APPEARS IN EACH KG OF FLESH   D/KG
C      TS     = TIME FROM SLAUGHTER OF MEAT TO CONSUMPTION       H
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C      QCW   = AMOUNT OF WATER CONSUMED BY COW                    L/D
C      QGW   = AMOUNT OF WATER CONSUMED BY GOAT                   L/D
C      QBW   = AMOUNT OF WATER CONSUMED BY BEEF CATTLE              L/D
C
C    INTERMEDIATE VARIABLES
C
C      XAMBEF= EFFECTIVE DECAY CONSTANT
C      COPAST= RADIONUCLIDE CONCENTRATION IN PASTURE GRASS CONSUMED BY
A
C      COPAST= RADIONUCLIDE CONCENTRATION IN STORED FEED CONSUMED BY ANI

C      COFEED= RADIONUCLIDE CONCENTRATION IN ANIMALS'S FEED
C
C    OUTPUT VARIABLES
C
C      COL1  = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C            FOR M.I.E.                                    PCI/KG
C      COL2  = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C            FOR G.P.E.                                     PCI/KG
C      COP1  = RADIONUCLIDE CONC IN PROCUCE CONSUMED BY MAN
C            FOR M.I.E.                                    PCI/KG
C      COP2  = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C            FOR G.P.E.                                     PCI/KG
C      COCMI1= RADIONUCLIDE CONC IN COW'S MILK FOR M.I.E.       PCI/L
C      COCMI2= RADIONUCLIDE CONC IN COW'S MILK FOR G.P.E.        PCI/L
C      COGMI1= RADIONUCLIDE CONC IN GOAT'S MILK FOR M.I.E.      PCI/L
C      COGMI2= RADIONUCLIDE CONC IN GOAT'S MILK FOR G.P.E.       PCI/L
C      COMEAT= RADIONUCLIDE CONC IN BEEF CATTLE'S MEAT            PCI/KG
C
      DOUBLE PRECISION NUCLID,H3,C14
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &      PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &      IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &      INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                !PC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &      ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &      QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &      CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &      CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &      COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &      COMEAT(40),QING(40),QINH(40),POP,
     &      CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,
     &            QCW,QGW,QBW,ABSH,P14
      DATA H3,C14/8HH-3     ,8HC-14    /
      DECA=DECAY(NN)/8760.
      IF(NUCLID(NN) .EQ. H3)GO TO 200
      IF(NUCLID(NN) .EQ. C14) GO TO 300
C--- CALCULATION OF COPAST=RADIONUCLIDE CONCENTRATION IN PASTURE GRASS
C--- CONSUMED BY ANIMALS
      B=0.243*BV(NN)
      COPAST=COV(NN,Y1,TE1,TH1,B,1.)
C--- CALCULATION OF COSTO = RADIONUCLIDE CONCENTRATION IN STORED FEED
C--- CONSUMED BY ANIMALS
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      B=0.680*(0.378*BR(NN)+0.622*BV(NN))
      COSTO=COV(NN,Y1,TE1,TH2,B,0.1)
C---- CALCULATION OF COFEED = RADIONUCLIDE CONCENTRATION IN ANIMAL FEED
      COFEED=FP*FS*COPAST+(1.0-FP*FS)*COSTO
C---- CALCULATION OF COPLX = RADIONUCLIDE CONCENTRATION IN LEAFY
C---- VEGETABLE CONSUMED BY MAN
      B=0.066*BV(NN)
C---- 1. FOR  MAXIMUM INDIVIDUAL EXPOSURE
      COL1(NN)=COV(NN,Y2,TE2,TH3,B,1.)
C---- 2. FOR GENERAL POPULATION EXPOSURE
      COL2(NN)=COV(NN,Y2,TE2,TH5,B,1.)
C---- CALCULATION OF COPX = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY
MAN
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      B=0.187*BR(NN)
      COP1(NN)=COV(NN,Y2,TE2,TH4,B,0.1)
C---- 2. FOR GENERAL POPULATION
      COP2(NN)=COV(NN,Y2,TE2,TH6,B,0.1)
C---- CALCULATION OF COCMIX = RADIONUCLIDE CONCENTRATION IN COW'S MILK
      CWAT(NN)= WWATA*AQAVG(NN)+SWATA*STAVG(NN)
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      COCMI1(NN)=FMC(NN)*(COFEED*QFC+CWAT(NN)*QCW)*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      COCMI2(NN)=FMC(NN)*(COFEED*QFC+CWAT(NN)*QCW)*EXP(-DECA*TF2)
C---- CALCULATION OF COGMIX = RADIONUCLIDE CONCENTRATION IN GOAT'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      COGMI1(NN)=FMG(NN)*(COFEED*QFG+CWAT(NN)*QGW)*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      COGMI2(NN)=FMG(NN)*(COFEED*QFG+CWAT(NN)*QGW)*EXP(-DECA*TF2)
C---- CALCULATION OF COMEAT = RADIONUCLIDE CONCENTRATION IN BEEF CATTLE
      COMEAT(NN)=FF(NN)*(COFEED*QFC+CWAT(NN)*QBW)*EXP(-DECA*TS)
      RETURN
C---- CALCULATION FOR SPECIAL RADIONUCLIDE: TRITIUM
C---- TRITIUM CONC. IN VEGETATION = TRITIUM CONC. IN ANIMAL FEED = TRITIUM
C---- CONC. IN WATER = CWAT(1). CALCULATION OF H-3 CONCENTRATION IN
C---- VEGETATION, MILK, AND MEAT CONSUMED BY MAN.
  200 COL1(NN)=CWAT(NN)
      COL2(NN)=CWAT(NN)
      COP1(NN)=CWAT(NN)
      COP2(NN)=CWAT(NN)
      CWAT(NN)= WWATA*AQAVG(NN)+SWATA*STAVG(NN)
      COCMI1(NN)=FMC(NN)*CWAT(NN)*(QFC+QCW)
      COCMI2(NN)=COCMI1(NN)
      COGMI1(NN)=FMG(NN)*CWAT(NN)*(QFG+QGW)
      COGMI2(NN)=COGMI1(NN)
      COMEAT(NN)=FF(NN)*CWAT(NN)*(QFC+QCW)
      RETURN
  300 CO14=0.
      COL1(NN)=CO14
      COL2(NN)=CO14
      COP1(NN)=CO14
      COP2(NN)=CO14
      CWAT(NN)= WWATA*AQAVG(NN)+SWATA*STAVG(NN)
      COCMI1(NN)=FMC(NN)*CO14*(QFC+QCW)
      COCMI2(NN)=COCMI1(NN)
      COGMI1(NN)=FMG(NN)*CO14*(QFG+QGW)
      COGMI2(NN)=COGMI1(NN)
      COMEAT(NN)=FF(NN)*CO14*(QFC+QCW)
      RETURN
      END
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C
C
      FUNCTION COV(I,Y,TE,TH,B,TV)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN FORAGE, PRODUCE AND
C---- VEGETABLES.  CALLED BY IRRIG.
C
      DOUBLE PRECISION NUCLID
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &        AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                !PC/AT
     &        SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &        AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &        ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &        FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,
     &        PORS,BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,
     &        INSITE
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &        ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &        QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &        CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &        CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &        COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &        COMEAT(40),QING(40),QINH(40),POP,
     &        CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                  !LC
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &        PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &        IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &        INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      NEXYR=IAVG2-IAVG1+1
      DECA=DECAY(I)/8760.
      XAMBEF=DECA+XAMBWE
      TERM1=WIRATE*CWAT(I)*TV*RW(I)*(1.0-EXP(-XAMBEF*TE))/(Y*XAMBEF)
      CSPO(I)=CSPOT(I)/FLOAT(NEXYR)
      IF(INSITE .EQ. 1)CSPO(I)=SOAVG(I)
      TERM2=CSPO(I)*B/PP
      COV=(TERM1+TERM2)*EXP(-DECA*TH)
      RETURN
      END
C
C
      SUBROUTINE IRRIGA(NN)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN VEGETABLE, MILK AND
C---- CONSUMED BY MAN RESULTING FROM WATER IRRIGATION.  CALLED BY MAIN.
C
C     INPUT VARIABLES
C
C       NN    = NUCLIDE NUMBER
C       DECAY = RADIOACTIVE DECAY CONSTANTE                    1/Y
C       XAMBWE = WEATHER DECAY CONSTANTE                       1/H
C       TW    = PERIOD OF TIME FOR WHICH SOIL IS EXPOSED TO THE
C               CONTAMINATED WATER                             H
C       PP    = SURFACE DENSITY FOR SOIL                       KG/M**2
C       RW    = RETENTION FRACTION
C       BV    = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
C               FROM SOIL BY VEGETATIVE PARTS OF CROPS
C       BR    = CONCENTRATION FRACTION FOR UPTAKE OF RADIONUCLIDE
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C          FROM SOIL BY REPRODUCTIVE PARTS OF CROPS
C     FI   =FRACTION OF THE YEAR CROPS ARE IRRIGATED
C     WIRATE= IRRIGATION RATE                          L/M**2-YR
C     CWAT  = RADIONUCLIDE CONCENTRATION IN WATER              PCI/L
C     IOPT  = OPTIONS FOR SPECIAL RADIONUCLIDE H-3
C           IOPT = 1 IF H-3 IS NOT INCLUDED IN THIS RUN
C           IOPT = 2 IF H-3 IS INCLUDED
C     Y1    = AG PRODUCTIVITY FOR GRASS CONSUMED BY ANIMALS     KG/M**2
C     Y2    = AG PRODUCTIVITY FOR VEGETATION CONSUMED BY MAN    KG/M**2
C     TE1   = TIME PASTURE GRASS EXPOSED DURING GROWING SEASON  H
C     TE2   = TIME CROP/VEG EXPOSED DURING GROWING SEASON       H
C     TH1   = PERIOD DELAY BETWEEN HARVEST OF PASTURE GRASS
C           AND INGESTION BY ANIMALS                     H
C     TH2   = PERIOD DELAY BETWEEN HARVEST OF STORED FEED
C           AND INGESTION BY ANIMAL                      H
C     TH3   = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEGETABLE
C           AND INGESTION BY MAN FOR M.I.E.              H
C     TH4   = PERIOD DELAY BETWEEN HARVEST OF PRODUCE AND
C           INGESTION BY MAN FOR M.I.E.                  H
C     TH5   = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEG
C           AND INGESTION BY MAN FOR G.P.E.              H
C     TH6   = PERIOD DELAY BETWEEN HARVEST OF PRODUCE
C     TH5   = PERIOD DELAY BETWEEN HARVEST OF LEAFY VEG
C     FP    = FRACTION OF YEAR THAT ANIMAL GRAZE ON PASTURE
C     FS    = FRACTION OF DAILY FEED THAT IS FRESH GRASS WHEN
C           ANIMALS GRAZE ON PASTURE
C     FMC   = FRACTION OF THE COW'S DAILY INTAKE OF
C           RADIONUCLIDE WHICH APPEARS IN EACH L OF MILK     D/L
C     FMG   = FRACTION OF THE GOAT'S DAILY INTAKE OF
C           RADIONUCLIDE WHICH APPEARS IN EACH L OF MILK     D/L
C     QFC   = AMOUNT OF FEED CONSUMED BY CATTLE              KG/D
C     QFG   = AMOUNT OF FEED CONSUMED BY GOATS               KG/D
C     TF1   = TRANSPORT TIME OF RADIONUCLIDE FROM
C           FEED-MILK-RECEPTOR FOR M.I.E.                H
C     TF2   = TRANSPORT TIME OF RADIONUCLIDE FROM
C           FEED-MILK-RECEPTOR FOR G.P.E.                H
C     FF    = FRACTION OF THE ANIMAL'S DAILY INTAKE OF
C           RADIONUCLIDE WHICH APPEARS IN EACH KG OF FLESH    D/KG
C     TS    = TIME FROM SLAUGHTER OF MEAT TO CONSUMPTION      H
C     QCW   = AMOUNT OF WATER CONSUMED BY COW                 L/D
C     QGW   = AMOUNT OF WATER CONSUMED BY GOAT                L/D
C     QBW   = AMOUNT OF WATER CONSUMED BY BEEF CATTLE         L/D
C
C   INTERMEDIATE VARIABLES
C
C     XAMBEF= EFFECTIVE DECAY CONSTANT
C     COPAST= RADIONUCLIDE CONCENTRATION IN PASTURE GRASS CONSUMED BY
A
C     COPAST= RADIONUCLIDE CONCENTRATION IN STORED FEED CONSUMED BY ANI

C     COFEED= RADIONUCLIDE CONCENTRATION IN ANIMALS'S FEED
C
C   OUTPUT VARIABLES
C
C     COL1  = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C           FOR M.I.E.                                PCI/KG
C     COL2  = RADIONUCLIDE CONC IN LEAFY VEG CONSUMED BY MAN
C           FOR G.P.E.                                PCI/KG
C     COP1  = RADIONUCLIDE CONC IN PROCUCE CONSUMED BY MAN
C           FOR M.I.E.                                PCI/KG
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C       COP2  = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY MAN
C             FOR G.P.E.                                    PCI/KG
C       COCMI1= RADIONUCLIDE CONC IN COW'S MILK FOR M.I.E.        PCI/L
C       COCMI2= RADIONUCLIDE CONC IN COW'S MILK FOR G.P.E.        PCI/L
C       COGMI1= RADIONUCLIDE CONC IN GOAT'S MILK FOR M.I.E.       PCI/L
C       COGMI2= RADIONUCLIDE CONC IN GOAT'S MILK FOR G.P.E.       PCI/L
C       COMEAT= RADIONUCLIDE CONC IN BEEF CATTLE'S MEAT           PCI/KG
C
      DOUBLE PRECISION NUCLID,H3,C14
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &      PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &      IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &      INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                IPC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &      ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &      QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &      CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &      CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &      COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &      COMEAT(40),QING(40),QINH(40),POP,
     &      CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,PORS,
     &      BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,INSITE
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                  !LC
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      COMMON/PCV/SOCON(40)
      DATA H3,C14/8HH-3     ,8HC-14    /
      IF(NUCLID(NN) .EQ. H3)GO TO 200
      IF(NUCLID(NN) .EQ. C14) GO TO 300
      DECA=DECAY(NN)/8760.
      DECSL=SINFL/(0.15*(1.+BDENS/PORS*XKD(1,NN)))/8760.
      CSPO(NN)=(CSPO(NN)+CWAT(NN)*WIRATE*8760.*FI)*EXP(-(DECA+DECSL)
     &        *8760.)
      IF(INSITE .EQ. 1) CSPO(NN)=SOCON(NN)
      B=0.243*BV(NN)
      TERM2=CSPO(NN)*B/PP
C--- CALCULATION OF COPAST=RADIONUCLIDE CONCENTRATION IN PASTURE GRASS
C--- CONSUMED BY ANIMALS
      COPAST=COVA(NN,Y1,TE1,TH1,TERM2,1.)
C--- CALCULATION OF COSTO = RADIONUCLIDE CONCENTRATION IN STORED FEED
C--- CONSUMED BY ANIMALS
      B=0.680*(0.378*BR(NN)+0.622*BV(NN))
      TERM2=CSPO(NN)*B/PP
      COSTO=COVA(NN,Y1,TE1,TH2,TERM2,0.1)
C--- CALCULATION OF COFEED = RADIONUCLIDE CONCENTRATION IN ANIMAL FEED
      COFEED=FP*FS*COPAST+(1.0-FP*FS)*COSTO
C--- CALCULATION OF COPLX = RADIONUCLIDE CONCENTRATION IN LEAFY
C--- VEGETABLE CONSUMED BY MAN
      B=0.066*BV(NN)
      TERM2=CSPO(NN)*B/PP
C--- 1. FOR  MAXIMUM INDIVIDUAL EXPOSURE
      COL1(NN)=COVA(NN,Y2,TE2,TH3,TERM2,1.)
C--- 2. FOR GENERAL POPULATION EXPOSURE
      COL2(NN)=COVA(NN,Y2,TE2,TH5,TERM2,1.)
```

```
C---- CALCULATION OF COPX = RADIONUCLIDE CONC IN PRODUCE CONSUMED BY
MAN
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      B=0.187*BR(NN)
      TERM2=CSPO(NN)*B/PP
      COP1(NN)=COVA(NN,Y2,TE2,TH4,TERM2,0.1)
C---- 2. FOR GENERAL POPULATION
      COP2(NN)=COVA(NN,Y2,TE2,TH6,TERM2,0.1)
      CWAT(NN)= WWATA*AQCON(NN)+SWATA*STCON(NN)
C---- CALCULATION OF COCMIX = RADIONUCLIDE CONCENTRATION IN COW'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      COCMI1(NN)=FMC(NN)*(COFEED*QFC+CWAT(NN)*QCW)*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      COCMI2(NN)=FMC(NN)*(COFEED*QFC+CWAT(NN)*QCW)*EXP(-DECA*TF2)
C---- CALCULATION OF COGMIX = RADIONUCLIDE CONCENTRATION IN GOAT'S MILK
C---- 1. FOR MAXIMUM INDIVIDUAL EXPOSURE
      COGMI1(NN)=FMG(NN)*(COFEED*QFG+CWAT(NN)*QGW)*EXP(-DECA*TF1)
C---- 2. FOR GENERAL POPULATION
      COGMI2(NN)=FMG(NN)*(COFEED*QFG+CWAT(NN)*QGW)*EXP(-DECA*TF2)
C---- CALCULATION OF COMEAT = RADIONUCLIDE CONCENTRATION IN BEEF CATTLE
      COMEAT(NN)=FF(NN)*(COFEED*QFC+CWAT(NN)*QBW)*EXP(-DECA*TS)
      RETURN
C---- CALCULATION FOR SPECIAL RADIONUCLIDE: TRITIUM
C---- TRITIUM CONC. IN VEGETATION = TRITIUM CONC. IN ANIMAL FEED = TRITIUM
C---- CONC. IN WATER = CWAT(1). CALCULATION OF H-3 CONCENTRATION IN
C---- VEGETATION, MILK, AND MEAT CONSUMED BY MAN
  200 COL1(NN)=CWAT(NN)
      COL2(NN)=CWAT(NN)
      COP1(NN)=CWAT(NN)
      COP2(NN)=CWAT(NN)
      CWAT(NN)= WWATA*AQCON(NN)+SWATA*STCON(NN)
      COCMI1(NN)=FMC(NN)*CWAT(NN)*(QFC+QCW)
      COCMI2(NN)=COCMI1(NN)
      COGMI1(NN)=FMG(NN)*CWAT(NN)*(QFG+QGW)
      COGMI2(NN)=COGMI1(NN)
      COMEAT(NN)=FF(NN)*CWAT(NN)*(QFC+QCW)
      RETURN
  300 CO14=0.
      COL1(NN)=CO14
      COL2(NN)=CO14
      COP1(NN)=CO14
      COP2(NN)=CO14
      CWAT(NN)= WWATA*AQCON(NN)+SWATA*STCON(NN)
      COCMI1(NN)=FMC(NN)*CO14*(QFC+QCW)
      COCMI2(NN)=COCMI1(NN)
      COGMI1(NN)=FMG(NN)*CO14*(QFG+QGW)
      COGMI2(NN)=COGMI1(NN)
      COMEAT(NN)=FF(NN)*CO14*(QFC+QCW)
      RETURN
      END
C
C
      FUNCTION COVA(I,Y,TE,TH,TERM2,TV)
C
C---- CALCULATION OF RADIONUCLIDE CONCENTRATION IN FORAGE, PRODUCE AND
C---- VEGETABLES.  CALLED BY IRRIGA.
C
      DOUBLE PRECISION NUCLID
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &        AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                !PC/AT
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     &        SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &        AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &        ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &        FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      DECA=DECAY(I)/8760.
      XAMBEF=DECA+XAMBWE
      TERM1=WIRATE*CWAT(I)*TV*RW(I)*(1.0-EXP(-XAMBEF*TE))/(Y*XAMBEF)
      COVA=(TERM1+TERM2)*EXP(-DECA*TH)
      RETURN
      END
C
C
      SUBROUTINE LEACH(NN,VOLB,VOLO,DMAX,CIOT,CFF,XDECN,TINFL,PERMT)        !LC
C
C---- THIS SUBROUTINE CALCULATES THE AMOUNT OF EACH RADIONUCLIDE
C---- THAT LEAVES FROM THE BOTTOM OF THE TRENCH TO THE AQUIFER
C---- AND THE AMOUNT THAT LEAVES AS A RESULT OF WATER OVERFLOWING THE
C---- TRENCH.  THIS SUBROUTINE IS CALLED BY MAIN.
C
C---- THERE ARE FIVE METHODS THAT MAY BE USED TO CALCULATE THESE
C---- AMOUNTS.   THEY ARE GIVEN BY THE FOLLOWING VALUES OF
C---- LEAOPT:
C----        1 TOTAL CONTACT,CHEMICAL EXCHANGE
C----        2 IMMERSED FRACTION, CHEMICAL EXCHANGE
C----        3 TOTAL CONTACT, CHEMICAL SOLUBILITY
C----        4 IMMERSED FRACTION, CHEMICAL SOLUBILITY
C----        5 RELEASE FACTOR
C
C   INPUT VARIABLES
C
C      NN     = NUCLIDE NUMBER
C      NYEAR  = CURRENT YEAR OF SIMULATION
C      TAREA  = AREA OF TRENCH
C      TDEPTH = DEPTH OF TRENCH
C      PORT   = POROSITY OF TRENCH MATERIAL
C      RELFAC = RELEASE FACTOR
C      LEAOPT = LEACHING OPTION
C      SOL    = SOLUBILITY OF RADIONUCLIDE IN TRENCH
C      DENCON = DENSITY OF WASTE
C      VOLO   = VOLUME OF WATER OVERFLOWING TRENCH
C      VOLB   = VOLUME OF WATER LEAVING BOTTOM OF TRENCH
C      NONCLD = NUMBER OF NUCLIDES
C      TRAM   = AMOUNT OF NUCLIDE IN TRENCH
C      OLDWAT = AMOUNT OF WATER IN TRENCH
C      DILFAC = DILUTION FACTOR
C      DMAX   = MAXIMUM WATER DEPTH IN TRENCH
C      XKD    = CHEMICAL EXCHANGE COEFFICIENT
C
C   OUTPUT VARIABLES
C
C      POLB   = AMOUNT OF EACH NUCLIDE LEAVING BOTTOM OF TRENCH
C      POLO   = AMOUNT OF EACH NUCLIDE OVERFLOWING TRENCH
C
C   INTERMEDIATE VARIABLES
C
C      CCWAT  = CONCENTRATION OF NUCLIDE IN WATER
C      FWET   = WETTED OR IMMERSED FRACTION
C      POLOUT = TOTAL AMOUNT OF NUCLIDE LEAVING TRENCH
C
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      DOUBLE PRECISION NUCLID
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &      PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &      IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &      INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                ILC
      COMMON/TRCH/TAREA,TDEPTH,OVER,PORT,RELFAC,DENCON,OLDWAT,FN
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),              IPC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      DIMENSION CIOT(40),CINEWT(40)
      DATA LU6/6/
      IF(DMAX.LE.0.) THEN                                              ILC
        CCWAT=0.
        GOTO 600
      ENDIF
C---- FOR OPTIONS 1 AND 3 ASSUME WETTED FRACTION TO BE TOTAL CONTACT
AREA.
      FWET=1.
      TCON=1.
      GO TO (200,100,400,300,500),LEAOPT
      WRITE(LU6,6000)
      RETURN
C---- FOR OPTION 2 USE IMMERSED FRACTION TO COMPUTE WETTED FRACTION.
  100 FWET=AMIN1(1.,DMAX/TDEPTH)                                       ILC
      TCON=AMIN1(1.,TINFL/PERMT)
      IF(FWET.EQ.1.0)TCON=1.0
      FWAST=(DMAX-VOLB/(PORT*TAREA))/(TDEPTH-OVER)
      IF(FWAST.GT.1.0)FWAST=1.0
      IF(FWAST.GT.0.0)TCON=TCON*(1.-FWAST)+FWAST                          ILC
C---- FOR OPTIONS 1 AND 2 COMPUTE CONCENTRATIONS USING CHEMICAL
EXCHANGE.
  200 CCWAT=TRAM(NN)*FWET*TCON/(TAREA*(DMAX*PORT+TDEPTH*FWET*
     & XKD(2,NN)*DENCON))
      TEMP=5.163E11*SOL(NN)*DECAY(NN)/ATMASS(NN)
      IF(CCWAT.GT.TEMP.AND.SOL(NN).NE.0.0)CCWAT=TEMP
      CCWAT=CCWAT*CFF
      GO TO 600
C---- FOR OPTION 4 WETTED FRACTION IS THE IMMERSED FRACTION.
  300 FWET=AMIN1(1.,DMAX/TDEPTH)                                       ILC
C---- FOR OPTIONS 3 AND 4 USE CHEMICAL SOLUBILITY
  400 CCWAT=TRAM(NN)*FWET/(DMAX*TAREA*PORT)
      TEMP=5.163E11*SOL(NN)*DECAY(NN)/ATMASS(NN)
      IF(CCWAT.GT.TEMP)CCWAT=TEMP
      CCWAT=CCWAT*CFF
      GOTO 600
C---- FOR OPTION 5 USE RELEASE FACTOR.
  500 IF(DMAX.EQ.0.)GO TO 515
      CINEWT(NN)=CIOT(NN)+TRAM(NN)*RELFAC*CFF
      IF(DMAX.GT.TDEPTH)DMAX=TDEPTH
      CCWAT=CINEWT(NN)/(DMAX*PORT*TAREA+VOLB+VOLO+TAREA*DMAX*
     & XKD(2,NN)*DENCON)
      GO TO 525
  515 CINEWT(NN)=CIOT(NN)
      CCWAT=0.
  525 CIOT(NN)=CCWAT*DMAX*PORT*TAREA*XDECN
  600 POLOUT=(VOLB+VOLO)*CCWAT
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C---- DISTRIBUTE RADIONUCLIDE OUTPUT BETWEEN OVERFLOW AND SEEPAGE
  610 VOLS=VOLB+VOLO
      IF(VOLS.EQ.0.) THEN                                          !LC
        POLB(NN)=0.0
        POLO(NN)=0.0
      ELSE
        POLB(NN)=POLOUT*VOLB/VOLS
        POLO(NN)=POLOUT*VOLO/VOLS
      ENDIF
 6000 FORMAT(' ','*** ERROR *** - INVALID LEACHING PARAMETER')
      RETURN
      END
      SUBROUTINE OUT(NYEAR,PC,WDEPTH,VOLO,VOLB)
C
C---- THIS ROUTINE OUTPUTS AN ANNUAL SUMMARY FOR YEARS REQUESTED BY
USER
C---- INPUT.  OUT IS CALLED BY MAIN.
C
C     INPUT VARIABLES
C
C       NYEAR  = CURRENT YEAR OF SIMULATION
C       PC     = FRACTION OF TRENCH CAP THAT HAS FAILED
C       WDEPTH = MAXIMUM DEPTH OF WATER IN TRENCH
C
      DOUBLE PRECISION NUCLID
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &       PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &       IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &       INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &       AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),              !PC/AT
     &       SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &       AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &       ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &       FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      DATA LU6/6/
      WRITE(LU6,6000)NYEAR
      PER=100.*PC
      WRITE(LU6,6005)PER
      WRITE(LU6,6010)WDEPTH
      WRITE(LU6,6015)VOLB,VOLO
      WRITE(LU6,6020)
      DO 10 I=1,NONCLD
      READ(33,'(E12.4)',REC=(I-1)*1000+NYEAR) AQAM                  !PC/AT
      WRITE(LU6,6025)NUCLID(I),TRAM(I),POLO(I),POLB(I),AQAM          !PC/AT
   10 CONTINUE
      WRITE(LU6,6030)
      DO 20 I=1,NONCLD
      WRITE(LU6,6025)NUCLID(I),CS(I),CW(I),SSTREM(I),
     &              SDEEP(I),YSO(I),ATCON(I),AQCON(I)
   20 CONTINUE
      RETURN
C---- FORMAT STATEMENTS
 6000 FORMAT('1',20X,'ANNUAL SUMMARY FOR YEAR ',I5,' OF THE ',
     &       'SIMULATION')
 6005 FORMAT(///' ',10X,'THE TRENCH CAP HAS HAD ',F6.2,
     &       ' PER CENT FAILURE')
 6010 FORMAT(' ',10X,'THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH ',
     &       'DURING THE YEAR IS ',1PE10.2,' METERS')
 6015 FORMAT(' ',10X,1PE11.4,' CUBIC METERS OF WATER LEFT BOTTOM',
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     &       ' OF TRENCH'/' ',10X,1PE11.4,' CUBIC METERS OF WATER',
     &       '  OVERFLOWED TRENCH')
 6020 FORMAT(/////' ',51X,'NUCLIDE TRANSPORT INFORMATION',
     &       ///' ',2X,'NUCLIDE',3X,'AMOUNT IN',6X,'TRENCH',
     &       7X,'TRENCH',5X,'AMOUNT AT'/' ',14X,'TRENCH',6X,
     &       'OVERFLOW',4X,' DRAINAGE ',5X,'WELL',
     &       /' ',16X,4('CI',11X))
 6025 FORMAT(' ',A8,3X,9(1PE11.4,2X))
 6030 FORMAT(////' ',2X,'NUCLIDE',5X,'SURFACE',5X,'SURFACE',
     &       4X,'SOLUBLE TO',3X,'SOLUBLE TO',3X,'ATMOSPHERE',
     &       3X,'ATMOSPHERE',3X,'WELL WATER',
     &       /' ',13X,'SOIL CONC',3X,'WATER CONC',4X,'STREAM',4X,
     &       'DEEP LAYERS',2X,'AT SPILLAGE',3X,'DOWN WIND',6X,'CONC',
     &      /' ',15X,'CI/KG',6X,'CI/M**3',9X,'CI',11X,
     &      'CI',3X,3(5X,'CI/M**3'))
      END
C
C
      SUBROUTINE SOURCE(NUCL,CFT1,DCFT,FGAM,IRST,PERMT,RTGR,SSAT,XRTM)
C
C---- THIS SUBROUTINE PERFORMS THE NECESSARY INPUTS TO INITIALIZE
C---- PARAMETERS AND VARIABLES.  SOURCE IS CALLED FROM MAIN.
C
      DOUBLE PRECISION NUCLID,NU,NC,DATE,DTIME
      COMMON/STREAM/DWS
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &       PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &       IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &       INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                    !LC
      COMMON/TRCH/TAREA,TDEPTH,OVER,PORT,RELFAC,DENCON,OLDWAT,FN
      COMMON/WATER/DTRAQ,DWELL,GWV,XLSAT,STFLOW,AQTHK,AQDISP,
     & PORA,PORV,PERMV,IAQSTF,CPRJ
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &       AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),                   IPC/AT
     &       SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &       AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &       ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &       FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,PORS,
     &       BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,INSITE
      COMMON/AIR/H,VG,U,IT,IS,VD,XG,HLID,ROUGH,FTWIND,CHIQ                    IPC/AT
      COMMON/IRRFOO/Y1,Y2,TE1,TE2,TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,
     &       ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,
     &       QFC,QFG,TF1,TF2,TS,CL1(40),CL2(40),CP1(40),CP2(40),
     &       CCMI1(40),CCMI2(40),CGMI1(40),CGMI2(40),
     &       CMEAT(40),COL1(40),COL2(40),COP1(40),COP2(40),
     &       COCMI1(40),COCMI2(40),COGMI1(40),COGMI2(40),
     &       COMEAT(40),QING(40),QINH(40),POP,
     &       CSP(40),CSPT(40),CSPO(40),CSPOT(40)
      COMMON/FUNC/XAMBWE,TA,TW,FI,PP,WIRATE,QCW,QGW,QBW,ABSH,P14
      COMMON/PDCF/GESE,GESN(40),HEFCTR(40,2,4),HESE,HESN(40)
      COMMON/RESUS/ARG1,RES,RE1,RE2,RE3                                       IPC/AT
      DIMENSION MONTH(12),DAT(20),NUCL(40,8)
      DATA LU5/5/,LU6/6/
      OPEN(3,FILE='POPFAC.DAT',STATUS='OLD')                                  IPC/AT
      OPEN(5,FILE='POP.INP',STATUS='OLD')                                     IPC/AT
      OPEN(6,FILE='POP.OUT',STATUS='NEW')                                     IPC/AT
      WRITE(LU6,1010)                                                         IPC/AT
      WRITE(LU6,2010)
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    5 READ(LU5,3000,END=7)DAT
      WRITE(LU6,2005)DAT                                                ILC
      GO TO 5
    7 REWIND LU5
C---- CONTROL INFORMATION.
      READ(LU5,3000)TITLE
      READ(LU5,3000)LOCATE
      READ(LU5,3010)MAXYR,NONCLD,LEAOPT,NYR1,NYR2,IOPVWV,IOPSAT,
     &              IPRT1,IPRT2,IDELT,IRRES1,IRRES2,LIND,IAVG1,IAVG2
      READ(LU5,3010)IVAP,IBSMT,IAQSTF,IXTS,IRST,(INTYR(I),I=1,3)
      READ(LU5,3005)PCT1,PCT2,WWATL,WWATA,WWATH,SWATL,SWATA,SWATH
      IF(IAVG1 .LE. 0)IAVG1=1
      IF(IAVG2 .GT. MAXYR)IAVG2=MAXYR
      IF(IAVG1 .GT. IAVG2)IAVG1=1
      IF(IAVG1 .GT. IAVG2)IAVG2=MAXYR
C---- SORT INTYR ARRAY IN ASCENDING ORDER
      DO 20 I=1,3
      J=INTYR(I)
      IF(J.LE.0 .OR. J.EQ.MAXYR) INTYR(I)=MAXYR+1
   20 CONTINUE
      DO 30 K=1,2
      J=K
      J1=J+1
      DO 25 I=J1,3
        IF(INTYR(I) .LT. INTYR(J)) J=I
   25 CONTINUE
      IF(J .EQ. K) GO TO 30
      I=INTYR(K)
      INTYR(K)=INTYR(J)
      INTYR(J)=I
   30 CONTINUE
      WRITE(LU6,6000)
      WRITE(LU6,6005)TITLE
      WRITE(LU6,6008)
      WRITE(LU6,6010)LOCATE
      IF(NONCLD .LT. 1 .OR. NONCLD .GT. 40) THEN                        ILC
        WRITE(LU6,6015)
        STOP
      ENDIF
   10 CONTINUE
      WRITE(LU6,6020)MAXYR,NONCLD
      WRITE(LU6,6025)LEAOPT
      IF(NYR1 .LT. NYR2)WRITE(LU6,6030)NYR1,PCT1,PCT2,NYR2
      IF(IOPVWV .EQ. 1)WRITE(LU6,6035)
      IF(IOPVWV .EQ. 0)WRITE(LU6,6040)
      IF(IOPSAT .EQ. 1)WRITE(LU6,6045)
      IF(IOPSAT .EQ. 0)WRITE(LU6,6050)
      WRITE(LU6,6060)LIND
      IF(LIND .EQ. 0)WRITE(LU6,6064)
      IF(LIND .NE. 0)WRITE(LU6,6066)
      WRITE(LU6,6072)WWATL,WWATA,WWATH
      WRITE(LU6,6074)SWATL,SWATA,SWATH
      IF(IBSMT .GT. 0)WRITE(LU6,6088)IBSMT
C---- COMMENTS
      READ(LU5,3000)
      READ(LU5,3000)
      READ(LU5,3000)
      READ(LU5,3000)
      READ(LU5,3000)
      READ(LU5,3000)
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      READ(LU5,3000)
C---- TRENCH INFORMATION
      READ(LU5,3005)TAREA,TDEPTH,OVER,PORT,DENCON,RELFAC,
     & CPRJ,SINFL
      READ(LU5,3005) SSAT,RESAT
      WRITE(LU6,6200)
      WRITE(LU6,6205)TAREA,TDEPTH
      WRITE(LU6,6210)PORT
      WRITE(LU6,6215)SINFL
      READ(LU5,3005) PERMT,FACTIM,TMN,CFT1,DCFT,FGAM
C---- AQUIFER INFORMATION
      READ(LU5,3006)DTRAQ,DWS,DWELL,GWV,AQTHK,AQDISP,PORA,PORV,PERMV
      WRITE(LU6,6300)
      WRITE(LU6,6305)GWV
      WRITE(LU6,6310)DTRAQ
      WRITE(LU6,6315)DWELL
      WRITE(LU6,6316) DWS
      WRITE(LU6,6320)AQTHK,AQDISP
      WRITE(LU6,6325)PORA,PORV,PERMV
C---- ATMOSPHERIC INFORMATION
      READ(LU5,3005)H,VG,U,VD,XG,HLID,ROUGH
      READ(LU5,3005)FTWIND,CHIQ,RE1,RE2,RE3,RMECH,FTMECH
      READ(LU5,3011)RR,FTRR,IT,IS
      WRITE(LU6,6400)
      WRITE(LU6,6405)H
      WRITE(LU6,6410)VG
      WRITE(LU6,6415)U
      WRITE(LU6,6420)VD
      WRITE(LU6,6425)XG
      WRITE(LU6,6435)HLID
      WRITE(LU6,6440)ROUGH
      WRITE(LU6,6445)IT,IS
      WRITE(LU6,6450)FTWIND
      IF(CHIQ .LT. 0.0)WRITE(LU6,6470)
      IF(CHIQ .GE. 1.0E-10)WRITE(LU6,6460)CHIQ
      WRITE(LU6,6480)RE1,RE2,RE3
      WRITE(LU6,6055)IRRES1,IRRES2,RMECH,FTMECH
      WRITE(6,6057)RR,FTRR
C---- SURFACE INFORMATION
      READ(LU5,3005)RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR
      READ(LU5,3005)PORS,BDENS,STFLOW,EXTENT,ADEPTH
      READ(LU5,3005)PD,RUNOFF
      WRITE(LU6,6500)
      WRITE(LU6,6505)RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR
      WRITE(LU6,6510)PORS,BDENS
      WRITE(LU6,6515)RUNOFF
      WRITE(LU6,6520)STFLOW,EXTENT,ADEPTH,PD
C---- AIR-FOODCHAIN INFORMATION
      WRITE(LU6,7800)
      READ(LU5,3005)Y1,Y2,PP,XAMBWE,TA,TE1,TE2
      READ(LU5,3005)TH1,TH2,TH3,TH4,TH5,TH6,FP,FS
      READ(LU5,3005)QFC,QFG,TF1,TF2,TS,ABSH,P14
      READ(LU5,3005) XRTM,RTGR
      WRITE(LU6,7805)Y1,Y2,PP,XAMBWE,TE1,TE2
      WRITE(LU6,7815)TH1,TH2,TH3,TH4,TH5,TH6,FP,FS,QFC
      WRITE(LU6,7825)QFG,TF1,TF2,TS,ABSH,P14
C---- WATER-FOODCHAIN INFORMATION
      WRITE(LU6,7900)
      READ(LU5,3005)TW,FI,WIRATE,QCW,QGW,QBW
      WRITE(LU6,7905)FI,WIRATE,QCW,QGW,QBW
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C---- HUMAN INGESTION AND INHALATION INFORMATION
      READ(LU5,3005)ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,POP
      WRITE(LU6,6905)
      WRITE(LU6,6910)ULEAFY,UPROD,UCMILK,UGMILK,UMEAT,UWAT,UAIR,POP
C---- NUCLIDE INFORMATION
      WRITE(LU6,7000)
      SMASS=1000.*BDENS*EXTENT*PD*ADEPTH
      WMASS=1000.*PORS*EXTENT*PD*ADEPTH
      WDEEP=SINFL*EXTENT*PD
      DO 40 I=1,NONCLD
      READ(LU5,3012)NUCLID(I),(NUCL(I,K),K=1,8),TRAM(I),
     &              SOAM(I),STAM(I),ATAM(I),DECAY(I),SOL(I),CON(I)
      READ(LU5,3015)NU,(XKD(K,I),K=1,4)
      READ(LU5,3015)NC,RA(I),RW(I),BV(I),BR(I),FMC(I),FMG(I),FF(I)
      D1R=DECAY(I)
      FNCL=(EXP(D1R)-1.0)/D1R
      IF(FACTIM .GT. 0.) FNCL=FNCL*(1.-EXP(-D1R*FACTIM))/(D1R*FACTIM)
      IF(D1R.LT.0.01) FNCL = 1.0
      TRAM(I)=TRAM(I)*FNCL*EXP(-D1R*TMN)
      SOAM(I)=SOAM(I)*TRAM(I)
      CW(I)=1000.*SOAM(I)/(XKD(1,I)*SMASS+WMASS)
      CS(I)=CW(I)*XKD(1,I)*1.0E-3
      WRITE(LU6,7005)NUCLID(I),TRAM(I),SOAM(I),STAM(I),ATAM(I),
     &              DECAY(I),SOL(I),FNCL
   40 CONTINUE
      DO 35 I=1,NONCLD
      DO 35 K=1,2
      READ(3,3025) NUCLID(I),(HEFCTR(I,K,L),L=1,4)
 35   CONTINUE
      WRITE(LU6,7010)
      DO 50 I=1,NONCLD
      WRITE(LU6,7807)NUCLID(I),(XKD(K,I),K=1,4)
   50 CONTINUE
      WRITE(LU6,7806)
      DO 70 I=1,NONCLD
      WRITE(LU6,7807)NUCLID(I),RA(I),RW(I),BV(I),BR(I),FMC(I),
     1              FMG(I),FF(I)
   70 CONTINUE
      RETURN
C---- FORMAT STATEMENTS
 1010 FORMAT('1',47X,'** PRESTO-EPA-POP -- PC/AT VERSION **',///)          IPC/AT
 2005 FORMAT(' ',20A4)
 2010 FORMAT(5X,'** INPUT DATA AS READ IN **',//)                          IPC/AT
 3000 FORMAT(20A4)
 3005 FORMAT(8F10.0)
 3006 FORMAT(2F5.0,7F10.0)
 3010 FORMAT(16I5)
 3011 FORMAT(2F10.0,2I5)
 3012 FORMAT(A8,T1,8A1,2X,7F10.0)
 3015 FORMAT(A8,2X,7F10.0)
 3025 FORMAT(A8,3X,4(1PE11.4,2X))
 6000 FORMAT('1',30X,'PRESTO - A MODEL FOR PREDICTING THE',
     &       ' MIGRATION OF RADIOACTIVE WASTES',
     &       /' ',40X,'FROM SHALLOW TRENCH BURIAL SITES')
 6002 FORMAT('0',40X,'THIS RUN WAS MADE AT ',A8,' ON ',A8)
 6005 FORMAT('0',2(/' ',20X,20A4))
 6008 FORMAT(///' ',5X,'*** CONTROL INFORMATION ***')
 6010 FORMAT('0',10X,'THE BURIAL SITE IS LOCATED AT ',12A4)
 6015 FORMAT('0','*** ERROR :***  INVALID NUMBER OF NUCLIDES')
 6020 FORMAT(' ',10X,'THE SIMULATION WILL RUN FOR',I5,' YEARS AND',
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     &        ' WILL INCLUDE',I3,' NUCLIDES')
 6025 FORMAT(' ',10X,'LEACHING OPTION NUMBER',I2,' WILL BE USED')
 6030 FORMAT(' ',10X,'IN YEAR',I4,' ,',F4.2,' OF THE CAP WILL BE',
     &        ' ASSUMED TO FAIL'/' ',15X,'THIS WILL CONTINUE',
     &        ' UNTIL ',F4.2,' HAS FAILED IN YEAR ',I4,
     &        /' ',10X,'CAP MAY ALSO FAIL BY SURFACE EROSION')
 6035 FORMAT(' ',10X,'VERTICAL WATER VELOCITY WILL BE CALCULATED',
     &        ' USING INFILTRATION AND POROSITY')
 6040 FORMAT(' ',10X,'PERMEABILITY WILL BE USED FOR MINIMUM',
     &        ' VERTICAL WATER VELOCITY')
 6045 FORMAT(' ',10X,'LENGTH OF VERTICAL SATURATED ZONE WILL BE',
     &        ' CALCULATED USING INFILTRATION AND POROSITY')
 6050 FORMAT(' ',10X,'LENGTH OF VERTICAL SATURATED ZONE WILL BE',
     &        ' SET TO THE TRENCH TO AQUIFER DISTANCE')
 6055 FORMAT(' ',10X,'FROM YEAR ',I4,' TO YEAR ',I4,
     &        ' THE RESUSPENSION RATE DUE TO MECHANICAL DISTURBANCES',
     &        ' WILL BE ',1PE11.4,/' ',15X,'THIS WILL OCCUR DURING ',
     &        F5.2,' OF EACH YEAR')
 6057 FORMAT(' ',10X,'DUST LOADING FOR ON-SITE RECLAIMER WILL BE ',
     &        1PE11.4,/' ',15X,'THIS WILL OCCUR DURING ',0PF6.3,
     &        ' OF THE YEAR')
 6060 FORMAT(' ',10X,'POPULATION INDICATOR IS ',I2)
 6064 FORMAT(' ',15X,'MAXIMUM INDIVIDUAL EXPOSURE WILL BE USED',
     &        ' TO CALCULATE HEALTH EFFECTS')
 6066 FORMAT(' ',15X,'GENERAL POPULATION EXPOSURE WILL BE USED',
     &        ' TO CALCULATE HEALTH EFFECTS')
 6070 FORMAT(' ',10X,'THE POPULATION WILL BE EXPOSED TO CONTAMINATED ',
     &        'MATERIALS FROM YEAR ',I3,' TO ',I4)
 6072 FORMAT(' ',10X,F6.3,' OF IRRIGATION WATER WILL BE GOTTEN FROM ',
     &                    'WELL',
     &        /' ',10X,F6.3,' OF DRINKING WATER FOR ANIMALS WILL BE',
     &                    ' GOTTEN FROM WELL',
     &        /' ',10X,F6.3,' OF DRINKING WATER FOR HUMANS WILL',
     &        ' BE GOTTEN FROM WELL')
 6074 FORMAT(' ',10X,F6.3,' OF IRRIGATION WATER WILL BE GOTTEN FROM ',
     &                    'STREAM',
     &        /' ',10X,F6.3,' OF DRINKING WATER FOR ANIMALS WILL BE ',
     &        'GOTTEN FROM STREAM',
     &        /' ',10X,F6.3,' OF DRINKING WATER FOR HUMANS WILL',
     &        ' BE GOTTEN FROM STREAM')
 6088 FORMAT(' ',10X,'BEGINNING IN YEAR ',I4,', PEOPLE WILL LIVE ',
     &        'IN THE BASEMENT')
 6200 FORMAT('1',5X,'*** TRENCH INFORMATION ***')
 6205 FORMAT(//' ',10X,'THE TRENCH HAS AN AREA OF ',
     &        E11.4,' SQUARE METERS AND A DEPTH OF ',
     &        E11.4,' METERS')
 6210 FORMAT(' ',10X,'TRENCH POROSITY IS ',F8.2)
 6215 FORMAT(' ',10X,'ANNUAL INFILTRATION FOR THE WATERSHED IS',
     &        F7.4,' METERS')
 6300 FORMAT(//' ',5X,'*** AQUIFER INFORMATION ***')
 6305 FORMAT(//' ',10X,'THE GROUND WATER HAS A VELOCITY OF ',F10.3,
     &                ' METERS PER YEAR')
 6310 FORMAT(' ',10X,'TRENCH TO AQUIFER DISTANCE IS ',F6.1,' METERS')
 6315 FORMAT(' ',10X,'TRENCH TO WELL DISTANCE IS ',F8.2,' METERS')
 6316 FORMAT(' ',10X,'WELL TO STREAM DISTANCE IS',F8.2,'METERS')
 6320 FORMAT(' ',10X,'THE AQUIFER THICKNESS IS ',F8.2,' METERS',
     &        /' ',10X,'THE AQUIFER DISPERSION ANGLE IS ',F8.4,' RADIANS')
 6325 FORMAT(' ',10X,'POROSITY OF THE AQUIFER REGION IS ',F8.5,
     &        /' ',10X,'POROSITY BENEATH THE TRENCH IS ',F8.5,
     &        /' ',10X,'PERMEABILITY BENEATH THE TRENCH IS ',F8.3,
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   &              ' METERS/YEAR')
6400 FORMAT(//'1',5X,'*** ATMOSPHERIC INFORMATION ***')
6405 FORMAT(// ',10X,'SOURCE HEIGHT IS ',F6.1,' METERS')
6410 FORMAT(' ',10X,'VELOCITY OF GRAVITATION FALL IS ',
   &       F7.3,' METERS/SECOND')                                  !PC/AT
6425 FORMAT(' ',10X,'GAUGE DISTANCE FROM SOURCE IS ',F8.2,' METERS')
6420 FORMAT(' ',10X,'DEPOSITION VELOCITY IS ',F7.3,' METERS/SECOND')     !PC/AT
6415 FORMAT(' ',10X,'WIND VELOCITY IS ',F6.2,' METERS/SECOND')
6435 FORMAT(' ',10X,'LID HEIGHT IS ',F8.2,' METERS')
6440 FORMAT(' ',10X,'HOSKER ROUGHNESS FACTOR IS ',F7.3)                  !PC/AT
6445 FORMAT(' ',10X,'TYPE OF STABILITY FORMULATION IS ',I2,
   &      / ',10X,'STABILITY CLASS IS ',I2)
6450 FORMAT(' ',10X,'FRACTION OF TIME WIND BLOWS TOWARD POPULATION IS',
   &       F10.6)
6460 FORMAT(' ',10X,'NORMALIZED DOWN WIND ATMOSPHERIC EXPOSURE PER ',
   & 'UNIT SOURCE AREA IS ',1PE11.4,' CI/M**3 PER CI/SEC')
6470 FORMAT(' ',10X,'NORMALIZED DOWN WIND ATMOSPHERIC EXPOSURE PER ',
   & 'UNIT SOURCE AREA WILL BE CALCULATED INTERNALLY')
6480 FORMAT(' ',10X,'RESUSPENSION FACTOR PARAMETERS ',3(5X,E11.4))
6500 FORMAT(// ',5X,'*** SURFACE INFORMATION ***')
6505 FORMAT(// ',10X,'PARAMETERS FOR UNIVERSAL LOSS EQUATION',
   &      / ',15X,'RAINFALL        ',F8.2,
   &      / ',15X,'ERODIBILITY     ',F8.2,
   &      / ',15X,'STEEPNESS-SLOPE',F8.2,
   &      / ',15X,'COVER           ',F8.2,
   &      / ',15X,'EROSION CONTROL',F8.2,
   &      / ',15X,'DELIVERY RATIO ',F8.2)
6510 FORMAT(' ',10X,'SOIL POROSITY IS ',F8.5,
   &      / ',10X,'SOIL BULK DENSITY IS ',F8.5,' G/CC')
6515 FORMAT(' ',10X,'RUNOFF FRACTION IS ',F8.5)
6520 FORMAT(/ ',10X,
   &    10X,'STREAM FLOW RATE IS ',1PE11.4,' CUBIC METERS PER YEAR',
   &    / ',10X,'CROSS SLOPE EXTENT OF SPILLAGE IS ',0PF8.2,' METERS'
   &      / ',10X,'ACTIVE SOIL DEPTH IS ',F8.2,' METERS',
   &      / ',10X,'AVERAGE DOWN SLOPE DISTANCE TO STREAM IS ',F8.2,
   &              ' METERS')
7800 FORMAT('1',5X,'*** AIR-FOODCHAIN INFORMATION ***')
7805 FORMAT(/ ',10X,'AGRICULTURAL PRODUCTIVITY FOR GRASS',F10.2,
   & ' KG/M**2',
   &      / ',10X,'AGRICULTURAL PRODUCTIVITY FOR VEGETATION',
   &          F10.2,' KG/M**2',
   &      / ',10X,'SURFACE DENSITY FOR SOIL ',F10.2,' KG/M**2',
   &      / ',10X,'WEATHER DECAY CONSTANT',F10.4,' 1/HOURS',          !PC/AT
   &      / ',10X,'PERIOD PASTURE GRASS EXPOSURE GROWING SEASON',
   &          F10.2,' HOURS',
   &      / ',10X,'PERIOD CROP/VEGETATION EXPOSURE GROWING SEASON',
   &          F10.2,' HOURS')
7815 FORMAT(' ',10X,'PERIOD BETWEEN HARVEST PASTURE GRASS AND',
   &          ' INGESTION BY ANIMAL',F10.2,' HOURS',
   &      / ',10X,'PERIOD BETWEEN STORED FEED AND INGESTION',
   &          ' BY ANIMAL',F10.2,' HOURS',
   &      / ',10X,'PERIOD BETWEEN HARVEST LEAFY VEGETABLES AND',
   &          ' INGESTION BY MAN(M.I.E.)',F10.2,' HOURS',
   &      / ',10X,'PERIOD BETWEEN HARVEST PRODUCE AND INGESTION BY',
   &          ' MAN(M.I.E.)',F10.2,' HOURS',
   &      / ',10X,'PERIOD BETWEEN HARVEST LEAFY VEG ',
   &          'AND INGESTION BY MAN(G.P.E.)',F10.2,' HOURS',
   &      / ',10X,'PERIOD BETWEEN HARVEST PRODUCE',
   &          ' AND INGESTION BY MAN(G.P.E.)',F10.2,' HOURS',
   &      / ',10X,'FRACTION OF YEAR ANIMALS GRAZE ON PASTURE',F10.2
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     &      /' ',10X,'FRACTION OF DAILY FEED THAT IS FRESH GRASS',F10.2,
     &      /' ',10X,'AMOUNT OF FEED CONSUMED BY CATTLE',F10.2,' KG')
 7825 FORMAT(' ',10X,'AMOUNT OF FEED CONSUMED BY GOATS',F10.2,' KG',
     &      /' ',10X,'TRANSPORT TIME FEED-MILL-RECEPTOR FOR M.I.E.',
     &              F10.2,' HOURS',
     &      /' ',10X,'TRANSPORT TIME FEED-MILL-RECEPTOR FOR G.P.E.',
     &              F10.2,' HOURS',
     &      /' ',10X,'TIME FROM SLAUGHTER OF MEAT TO CONSUMPTION',F10.2,
     &      ' HOURS',
     &      /' ',10X,'ABSOLUTE HUMIDITY OF THE ATMOSPHERE',F10.2,
     &      ' G/M**3',
     &      /' ',10X,'FRACTIONAL EQUILIBRIUM RATIO FOR C-14',F10.2)
 7900 FORMAT('1',5X,'*** WATER-FOODCHAIN INFORMATION ***')
 7905 FORMAT(///' ',10X,'FRACTION OF YEAR CROPS ARE IRRIGATED',F10.2,
     &      /' ',10X,'IRRIGATION RATE ',F10.3,' L/(M**2-H)',
     &      /' ',10X,'AMOUNT OF WATER CONSUMED BY COWS ',F10.2,' L/D',
     &      /' ',10X,'AMOUNT OF WATER CONSUMED BY GOATS ',F10.2,' L/D',
     &      /' ',10X,'AMOUNT OF WATER CONSUMED BY BEEF CATTLE ',F10.2,
     &      ' L/D')
 6905 FORMAT(///' ',5X,'*** HUMAN INGESTION AND INHALATION RATE',
     &       ' INFORMATION ***')
 6910 FORMAT(/' ',10X,'ANNUAL INTAKE OF LEAFY VEG ',F8.2,
     &      ' KILOGRAMS PER YEAR',
     &      /' ',10X,'ANNUAL INTAKE OF PRODUCE ',F8.2,
     &      ' KILOGRAMS PER YEAR',
     &      /' ',10X,'ANNUAL INTAKE OF COW"S MILK ',F8.2,
     &      ' LITERS PER YEAR',
     &      /' ',10X,'ANNUAL INTAKE OF GOAT"S MILK',F8.2,
     &      ' LITERS PER YEAR',
     &      /' ',10X,'ANNUAL INTAKE OF MEAT ',F8.2,' KILOGRAMS PER YEAR'
     &      /' ',10X,'ANNUAL INTAKE OF DRINKING WATER',F8.2,
     &      ' LITERS PER YEAR',
     &      /' ',10X,'ANNUAL INHALATION RATE OF AIR ',F8.2,
     &      ' CUBIC METERS PER YEAR',/' ',10X,'A POPULATION OF ',
     &      F10.0,' WILL BE CONSIDERED')
 7005 FORMAT(' ',A8,3X,9(1PE11.4,2X))
 7000 FORMAT('1',5X,'*** NUCLIDE INFORMATION ***',
     & //' ',50X,'INFORMATION ON INDIVIDUAL NUCLIDES',
     & //' ','NUCLIDE',3X,'AMT IN TRENCH',3X,'SPILLAGE',4X,
     & 'STREAM AMT ',2X,'AIR CONCEN',2X,'DECAY CONST',
     & 2X,'SOLUBILITY CONST',2X,'DECAY CORRECTION FACTOR',
     & /' ',3X,3(12X,'CI'),8X,'CI/M**3',7X,'1/Y',11X,'G/ML')
 7010 FORMAT(////' ',25X,'DISTRIBUTION COEFFICIENTS  ML/G',
     & //' ','NUCLIDE',6X,'SURFACE',6X,'TRENCH',6X,'VERTICAL',
     & 5X,'AQUIFER'/)
 7807 FORMAT(' ',A8,1X,9(1PE11.2,2X))
 7806 FORMAT(///' ','NUCLIDE',4X,'RETENTION',4X,'RETENTION',
     &      4X,5('TRANS COEFF',2X),/' ',12X,'IN AIR',6X,'IN WATER',
     &      5X,'SOIL-V CROP',2X,'SOIL-R CROP',2X,'VEG-COW MILK',
     &      2X,'VEG-GOAT MILK',2X,'VEG-MEAT',/' ',40X,2('D/KG',9X),
     &      2('D/L ',9X),'D/KG')
      END
C
C
      SUBROUTINE SURSOL(II,VOLO)                                        ILC
C
C--- CALCULATES THE AMOUNT OF SOLUBLE SURFACE CONTAMINANT THAT
C--- ENTERS THE STREAM AND TRENCH ANNUALLY. SURSOL IS CALLED BY MAIN.
C
C   INPUT VARIABLES
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C
C     ADEPTH = SOIL DEPTH OF ACTIVE EXCHANGE
C     XINFL  = AVERAGE ANNUAL INFILTRATION
C     RUNOFF = FRACTION OF NET INPUT GOING TO STREAM
C     PD     = DOWNSLOPE DISTANCE TO STREAM
C     BDENS  = BULK DENSITY OF SOIL
C     EXTENT = CROSS SLOPE EXTENT OF SPILLAGE
C     SOAM   = AMOUNT OF SPILLAGE
C     XKD    = CHEMICAL EXCHANGE COEFFICIENT
C
C   INTERMEDIATE VARIABLES
C
C     SMASS  = SOIL MASS
C     WMASS  = WATER MASS
C
C   OUTPUT VARIABLES
C
C     SSTREM = AMOUNT OF NUCLIDE GOING TO STREAM
C     SDEEP  = AMOUNT OF NUCLIDE GOING TO TRENCH
C     CW     = NUCLIDE CONCENTRATION IN WATER
C     CS     = NUCLIDE CONCENTRATION IN SURFACE SOIL
C
      DOUBLE PRECISION NUCLID
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                !LC
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &       AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),              !PC/AT
     &       SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &       AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &       ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &       FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,PORS,
     &       BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,INSITE
      WSTREM=RUNOFF*(PPN*EXTENT*PD+VOLO)
      SUAM=CS(II)*SMASS+CW(II)*WMASS/1.0E3
      WMASS2=1000.*(PORS*EXTENT*PD*ADEPTH+WDEEP+WSTREM)
C---- COMPUTE NUCLIDE CONCENTRATION PER CUBIC METER OF WATER
      CW(II)=1000.*SUAM/(XKD(1,II)*SMASS+WMASS2)
C---- COMPUTE NUCLIDE CONCENTRATION PER KG OF SOIL
      CS(II)=CW(II)*XKD(1,II)*1.0E-3
      SSTREM(II)=WSTREM*CW(II)
      SDEEP(II)=WDEEP*CW(II)
      RETURN
      END
C
C
      SUBROUTINE SUSPND(IYR,II,GNDCON)
C
C---- COMPUTES AIR CONCENTRATION AND ATMOSPHERIC SOURCE TERM
C---- AT SPILLAGE AREA.  CALLED ANNUALLY BY MAIN.
C
C   INPUT VARIABLES
C
C     IYR    = CURRENT YEAR OF SIMULATION
C     II     = CURRENT NUCLIDE
C     SAREA  = AREA COVERED BY SPILLAGE
C     GNDCON= GROUND CONCENTRATION
C     IRRES1= FIRST YEAR OF RESUSPENSION RATE
C     IRRES2= LAST YEAR OF RESUSPENSION RATE
C     RMECH  = RESUSPENSION RATE DURING MECHANICAL DISTURBANCE (SEC**-1)
C     RR     = DUST LOADING FOR ON-SITE RECLAIMER (GM/M3)
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C       FTMECH= FRACTION OF YEAR FOR MECHANICAL DISTURBANCE
C       FTRR  = FRACTION OF YEAR ON-SITE RECLAIMER IS EXPOSED TO DUST
C       U     = WIND VELOCITY
C
C     INTERMEDIATE VARIABLES
C
C       RES   = RESUSPENSION FACTOR
C       YSO1  = NORMAL CONTRIBUTION TO ATMOSPHERIC SOURCE
C       YSO2  = CONTRIBUTION TO ATMOSPHERIC SOURCE FROM MECHANICAL
C               DISTURBANCE
C
C     OUTPUT VARIABLES
C
C       AIRCON= AIR CONCENTRATION AT SPILLAGE AREA
C       YSO   = ATMOSPHERIC SOURCE AMOUNT AT SPILLAGE AREA
C
C---- ASSUME ALL RADIONUCLIDES DEPOSITED ON SOIL SURFACE AT
C---- TIME ZERO.
C
      DOUBLE PRECISION NUCLID
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &      PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &      IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &      INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),              IPC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,PORS,
     &      BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,INSITE
      COMMON/AIR/H,VG,U,IT,IS,VD,XG,HLID,ROUGH,FTWIND,CHIQ                IPC/AT
      COMMON/RESUS/ARG1,RES,RE1,RE2,RE3                                   IPC/AT
      IF(INSITE .EQ. 1 .AND. IRRES1 .LT. IYR) GO TO 11
C---- RESUSPENSION FACTOR BY ANSPAUGH ET AL
      AIRCON(II)=RES*GNDCON                                               IPC/AT
      IF(IYR .EQ. 1) AIRCON(II)=AIRCON(II)+ATAM(II)
      F=ARG1*VG/U                                                         ILC,PC/AT
      IF(F .GT. 1.) F=1.0
      YSO1=AIRCON(II)*U*ARG1*F                                            ILC,PC/AT
C---- THE FOLLOWING IS FOR RESUSPENSION DUE TO MECHANICAL DISTURBANCES
      YSO2=0.
      IF((IYR .GE. IRRES1) .AND. (IYR .LE. IRRES2))                       ILC
     &      YSO2=PD*EXTENT*GNDCON*RMECH*FTMECH
      YSO(II)=(YSO1+YSO2)
      RETURN
   11 YSO(II)=GNDCON*RR*FTRR*.001                                         ILC
      RETURN
      END
C
C
      SUBROUTINE TRENCH(NYEAR,VOLB,VOLO,DMAX,PC,TINFL)
C
C---- THIS SUBROUTINE MAINTAINS A TRENCH WATER BALANCE.  WATER ENTERS
C---- THE TRENCH IN THE FORM OF PRECIPITATION AND EXITS FROM THE BOTTOM
C---- IF POSSIBLE.  IF MORE WATER ENTERS THE TRENCH THAN CAN EXIT FROM
C---- THE BOTTOM THE TRENCH MAY OVERFLOW.
C
C     INPUT VARIABLES
```

```
C
C     TDEPTH = TRENCH DEPTH
C     TAREA  = TRENCH AREA
C     PORT   = POROSITY OF TRENCH MATERIAL
C     OLDWAT = VOLUME OF WATER IN TRENCH FROM PREVIOUS YR
C     XLSAT  = LENGTH OF SATURATED ZONE
C     PPN    = ANNUAL PRECIPITATION
C     XINFL  = ANNUAL INFILTRATION
C     NYEAR  = CURRENT YEAR OF SIMULATION
C
C   OUTPUT VARIABLES
C
C     DMAX   = MAXIMUM DEPTH OF WATER IN TRENCH
C     OLDWAT = VOLUME OF WATER IN TRENCH AT END OF YEAR
C     VOLO   = VOLUME OF WATER OVERFLOWING TRENCH
C     VOLB   = VOLUME OF WATER GOING OUT BOTTOM OF TRENCH
C
C   INTERMEDIATE VARIABLES
C
C     WDEPTH = DEPTH OF WATER IN TRENCH
C     NEWWAT = VOLUME OF WATER ENTERING TRENCH
C     PC     = FRACTION OF TRENCH CAP THAT HAS FAILED
C
      REAL NEWWAT
      COMMON/EVAP/PPN,P,XIRR,XINFL,SINFL,SMASS,WMASS,WDEEP                !LC
      COMMON/TRCH/TAREA,TDEPTH,OVER,PORT,RELFAC,DENCON,OLDWAT,FN
      COMMON/WATER/DTRAQ,DWELL,GWV,XLSAT,STFLOW,AQTHK,AQDISP,
     & PORA,PORV,PERMV,IAQSTF,CPRJ
      COMMON/LAND/RAINF,ERODF,STPLNG,COVER,CONTRL,SEDELR,SOILOS,PORS,
     &      BDENS,DWET,EXTENT,ADEPTH,PD,RUNOFF,RESAT,INSITE
      VOLBT=0.
      VOLOT=0.
      PC=CAP(NYEAR)
      DELT=0.10
      DO 30 I=1,10
      NEWWAT=(TAREA*(PC*(PPN+XIRR)+(1.-PC)*XINFL))*DELT
      TINFL=NEWWAT/TAREA
      OLDWAT=OLDWAT+NEWWAT
      WDEPTH=OLDWAT/(PORT*TAREA)
      DMAX=WDEPTH
      IF(WDEPTH .GT. TDEPTH)WDEPTH=TDEPTH+(WDEPTH-TDEPTH)*PORT
      VOLO=0.
      IF(WDEPTH .GT. TDEPTH) VOLO=(WDEPTH-TDEPTH)*TAREA
      VOLB=0.
      IF(WDEPTH .GE. 1.E-7) VOLB=(WDEPTH+XLSAT)*PERMV*TAREA/XLSAT*DELT    !LC
      IF(VOLB .GT. OLDWAT-VOLO)VOLB=OLDWAT-VOLO
      OLDWAT=OLDWAT-VOLO-VOLB
      IF(OLDWAT .LT. 0.)OLDWAT=0.
      VOLOT=VOLOT+VOLO
      VOLBT=VOLBT+VOLB
   30 CONTINUE
      VOLO=VOLOT
      VOLB=VOLBT
      TINFL=TINFL/DELT
      RETURN
      END
C
C
      SUBROUTINE VERHOR(II,NYEAR,ITIME,DDETA)
C
```

```
C---- THIS ROUTINE CALCULATES AND DECAYS THE AMOUNT OF RADIOACTIVE
C---- MATERIAL THAT WILL REACH THE WELL IN A GIVEN YEAR. THIS SUBROUTINE
C---- IS CALLED FROM MAIN.
C
C   INPUT VARIABLES
C
C      II     = NUCLIDE NUMBER
C      NYEAR  = CURRENT YEAR OF SIMULATION
C      ITIME  = TRANSIT TIME FROM TRENCH TO WELL
C      VOLB   = VOLUME OF WATER LEAVING TRENCH
C      POLB   = AMOUNT OF NUCLIDE LEAVING BOTTOM OF TRENCH
C      DECAY  = RADIOACTIVE DECAY CONSTANT
C
C   OUTPUT VARIABLES
C
C      AQAM   = AMOUNT OF NUCLIDE AT WELL SITE
C
      DOUBLE PRECISION NUCLID
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &      PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &      IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &      INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &      AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),          !PC/AT
     &      SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &      AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &      ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &      FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      DIMENSION ITIME(40),DDETA(40)
C---- CALCULATE CORRECT POSITION IN ARRAY AND DECAY THE MATERIAL FOR THE
C---- PERIOD OF TIME MATERIAL IS IN TRANSIT FROM TRENCH TO WELL.
      ITMP=ITIME(II)
      IF((NYEAR+ITMP) .LE. (MAXYR) .AND. ITMP .GE. 0) THEN          !LC
        AQAM=DETW(II)*(POLB(II)+SDEEP(II))*DDETA(II)              !PC/AT
        WRITE(33,'(E12.4)',REC=(II-1)*1000+NYEAR+ITIME(II)) AQAM   !PC/AT
      ENDIF
      RETURN
      END
C
C
      FUNCTION HUNG(UU,DL,VV)                                     !HUNG
C
C---- CALCULATIONS FOR DISPERSION CONCENTRATION FACTOR - HUNG(X,Y,Z)
C---- DD IS THE DISPERSION COEFFICIENT FOR HUNG FUNCTION
C
      DD=0.3
      XDL=DL/(DD*2.)
      XUU=UU*DD/VV
      T2R=SQRT(4.*XUU*VV+VV*VV)
      ARG=XDL*(VV+2.*XUU-T2R)
      HUNG=1.0
      IF(ARG.GT.6.93) THEN
        HUNG=1000.
      ELSEIF(ARG.GT.0.) THEN
        HUNG=EXP(ARG)
      ENDIF
      RETURN
      END
C
C
```

```
      SUBROUTINE HESTAB
C
C----- CALCULATES HEALTH EFFECTS.
C
      DOUBLE PRECISION NUCLID,PATH,PNUC,TOTAL,ORGAN
      COMMON/PASS/PNUC(40),PCON1(40),PCON2(40),PCON3(40),
     &            PCON4(40),PPOP,LLIND,LDIST
      COMMON/PDCF/GESE,GESN(40),HEFCTR(40,2,4),HESE,HESN(40)
      COMMON/CNTRL/NONCLD,MAXYR,TITLE(20),LOCATE(12),NYR1,NYR2,
     &       PCT1,PCT2,LEAOPT,IOPVWV,IOPSAT,IPRT1,IPRT2,IDELT,IXTS,
     &       IRRES1,IRRES2,LIND,IAVG1,IAVG2,RMECH,RR,FTMECH,FTRR,
     &       INTYR(4),WWATL,WWATA,WWATH,SWATL,SWATA,SWATH,IVAP,IBSMT
      COMMON/NUC/NUCLID(40),ATMASS(40),TRAM(40),SOAM(40),ATAM(40),
     &       AQAM,STAM(40),POLO(40),POLB(40),CS(40),CW(40),              !PC/AT
     &       SSTREM(40),SDEEP(40),AIRCON(40),YSO(40),SOAVG(40),CON(40),
     &       AQCON(40),STCON(40),ATCON(40),AQAVG(40),STAVG(40),DETW(40),
     &       ATAVG(40),FMC(40),FMG(40),DECAY(40),XKD(4,40),SOL(40),
     &       FF(40),RA(40),RW(40),BV(40),BR(40),DERATE(40),CWAT(40)
      DIMENSION ABC(40),GESNP(40,4),HESNP(40,4),HESNPE(40,2,4),
     &          GENFAC(4),GESPTH(4),HESPTH(4),PATH(9,3),RISFAC(4)
      DATA AGEX,GSCFAC,GENFAC,REPPER,RISFAC/70.7565,0.5,3*1.,100.,
     &1.4133E-02,2*1.E-5,10.,1000./
      DATA TOTAL/'TOTAL   '/
      DATA PATH/'- ALL PA','- INGEST','- INHALA','- AIR IM',
     &          '- GROUND','- INTERN','- EXTERN','- DRINKI',
     &          '- NON-DR','THWAYS  ','ION     ','TION    ',
     &          'MERSION ','SURFACE','AL      ','AL      ',
     &          'NG WATER','INKING W','        ','        ',
     &          '        ','        ','        ','        ',
     &          '        ','        ','ATER    '/
C---- INITIALIZE VARIABLES
      HESE = 0.
      GESE = 0.
      DO 100 I=1,4
        HESPTH(I) = 0.
        GESPTH(I) = 0.
 100  CONTINUE
      DO 200 I=1,NONCLD
        HESN(I) = 0.
        GESN(I) = 0.
      DO 200 L=1,4
        HESNP(I,L) = 0.
        GESNP(I,L) = 0.
 200  CONTINUE
      DO 400 II=1,NONCLD
      HESNPE(II,1,1) = PCON1(II)*HEFCTR(II,1,3)*RISFAC(3)
      HESNPE(II,1,2) = PCON2(II)*HEFCTR(II,1,4)*GSCFAC*RISFAC(4)
      HESNPE(II,1,3) = PCON3(II)*HEFCTR(II,1,1)*RISFAC(1)
      HESNPE(II,1,4) = PCON4(II)*HEFCTR(II,1,2)*RISFAC(2)
      HESNPE(II,2,1) = PCON1(II)*HEFCTR(II,2,3)*GENFAC(3)*REPPER
      HESNPE(II,2,2) = PCON2(II)*HEFCTR(II,2,4)*GSCFAC*GENFAC(4)*REPPER
      HESNPE(II,2,3) = PCON3(II)*HEFCTR(II,2,1)*GENFAC(1)*REPPER
      HESNPE(II,2,4) = PCON4(II)*HEFCTR(II,2,2)*GENFAC(2)*REPPER
      DO 300 L=1,4
        HESE = HESE+HESNPE(II,1,L)
        GESE = GESE+HESNPE(II,2,L)
        HESNP(II,L) = HESNP(II,L)+HESNPE(II,1,L)/AGEX
        GESNP(II,L) = GESNP(II,L)+HESNPE(II,2,L)
        HESN(II) = HESN(II)+HESNPE(II,1,L)/AGEX
        GESN(II) = GESN(II)+HESNPE(II,2,L)
```

```
      HESPTH(L) = HESPTH(L)+HESNPE(II,1,L)/AGEX
      GESPTH(L) = GESPTH(L)+HESNPE(II,2,L)
300  CONTINUE
400  CONTINUE
     HP34 = HESPTH(3)+HESPTH(4)
     GP34 = GESPTH(3)+GESPTH(4)
     HP12 = HESPTH(1)+HESPTH(2)
     GP12 = GESPTH(1)+GESPTH(2)
     HP1234 = HP12+HP34
     GP1234 = GP12+GP34
C---- PRINT PATHWAY AND NUCLIDE RISK SUMMARIES
     WRITE(6,25)
     WRITE(6,50)
     WRITE(6,75) HESPTH(3),HESPTH(4),HESPTH(1),HESPTH(2),
    &            HP34,HP12,HP1234
     WRITE(6,125)
     WRITE(6,75) GESPTH(3),GESPTH(4),GESPTH(1),GESPTH(2),
    &            GP34,GP12,GP1234
     WRITE(6,150) (NUCLID(II),II=1,NONCLD),TOTAL
     WRITE(6,50)
     WRITE(6,75) (HESN(II),II=1,NONCLD),HP1234
     WRITE(6,125)
     WRITE(6,75) (GESN(II),II=1,NONCLD),GP1234
C---- PRINT FATAL CANCER RATE SUMMED OVER ALL CANCERS
     WRITE(6,175)
     WRITE(6,225) (NUCLID(I),I=1,NONCLD),TOTAL
     WRITE(6,250)
     DO 700 L=2,3
     WRITE(6,275) (PATH(L,I),I=1,3),(HESNP(II,L+1),II=1,NONCLD),
    &HESPTH(L+1)
     DO 500 II=1,NONCLD
       PCON1(II) = 0.
       IF (HESNP(II,3) .NE. 0. .OR. HESNP(II,4) .NE. 0.)
    &  PCON1(II) = HESNP(II,L+1)*100./(HESNP(II,3)+HESNP(II,4))
500  CONTINUE
     TEMP = 0.
     IF (HP34 .NE. 0.) TEMP = HESPTH(L+1)/HP34*100.
     WRITE(6,325) (PCON1(II),II=1,NONCLD),TEMP
     DO 600 II=1,NONCLD
       PCON1(II) = 0.
       IF (HESN(II) .NE. 0.) PCON1(II) = HESNP(II,L+1)*100./HESN(II)
600  CONTINUE
     TEMP = 0.
     IF (HP1234 .NE. 0.) TEMP = HESPTH(L+1)/HP1234*100.
     WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
700  CONTINUE
     DO 1000 L=4,5
     WRITE(6,275) (PATH(L,I),I=1,3),(HESNP(II,L-3),II=1,NONCLD),
    &HESPTH(L-3)
     DO 800 II=1,NONCLD
       PCON1(II) = 0.
       IF (HESNP(II,1) .NE. 0. .OR. HESNP(II,2) .NE. 0.)
    &  PCON1(II) = HESNP(II,L-3)*100./(HESNP(II,1)+HESNP(II,2))
800  CONTINUE
     TEMP = 0.
     IF (HP12 .NE. 0.) TEMP = HESPTH(L-3)/HP12*100.
     WRITE(6,375) (PCON1(II),II=1,NONCLD),TEMP
     DO 900 II=1,NONCLD
       PCON1(II) = 0.
       ABC(II) = HESNP(II,3)+HESNP(II,4)
```

```
      IF (HESN(II) .NE. 0.) PCON1(II) = HESNP(II,L-3)*100./HESN(II)
900  CONTINUE
     TEMP = 0.
     IF (HP1234 .NE. 0.) TEMP = HESPTH(L-3)/HP1234*100.
     WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
1000 CONTINUE
     WRITE(6,275) (PATH(6,I),I=1,3),(ABC(II),II=1,NONCLD),HP34
     DO 1100 II=1,NONCLD
       PCON1(II) = 0.
       IF (HESN(II) .NE. 0.) PCON1(II) = ABC(II)*100./HESN(II)
       ABC(II) = HESNP(II,1)+HESNP(II,2)
1100 CONTINUE
     TEMP = 0.
     IF (HP1234 .NE. 0.) TEMP = HP34/HP1234*100.
     WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
     WRITE(6,275) (PATH(7,I),I=1,3),(ABC(II),II=1,NONCLD),HP12
     DO 1200 II=1,NONCLD
       PCON1(II) = 0.
       IF (HESN(II) .NE. 0.) PCON1(II) = ABC(II)*100./HESN(II)
1200 CONTINUE
     TEMP = 0.
     IF (HP1234 .NE. 0.) TEMP = HP12/HP1234*100.
     WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
     WRITE(6,425) (HESN(II),II=1,NONCLD),HP1234
     DO 1300 II=1,NONCLD
       PCON1(II) = 0.
       IF (HP1234 .NE. 0.) PCON1(II) = HESN(II)/HP1234*100.
1300 CONTINUE
     WRITE(6,450) (PCON1(II),II=1,NONCLD)
C--- PRINT COLLECTIVE GENETIC EFFECTS SUMMED OVER ALL GONADS
     WRITE(6,475)
     WRITE(6,525) (NUCLID(I),I=1,NONCLD),TOTAL
     WRITE(6,250)
     DO 1600 L=2,3
     WRITE(6,275) (PATH(L,I),I=1,3),(GESNP(II,L+1),II=1,NONCLD),
    &GESPTH(L+1)
     DO 1400 II=1,NONCLD
       PCON1(II) = 0.
       IF (GESNP(II,3) .NE. 0. .OR. GESNP(II,4) .NE. 0.)
    &  PCON1(II) = GESNP(II,L+1)*100./(GESNP(II,3)+GESNP(II,4))
1400 CONTINUE
     TEMP = 0.
     IF (GP34 .NE. 0.) TEMP = GESPTH(L+1)/GP34*100.
     WRITE(6,325) (PCON1(II),II=1,NONCLD),TEMP
     DO 1500 II=1,NONCLD
       PCON1(II) = 0.
       IF (GESN(II) .NE. 0.) PCON1(II) = GESNP(II,L+1)*100./GESN(II)
1500 CONTINUE
     TEMP = 0.
     IF (GP1234 .NE. 0.) TEMP = GESPTH(L+1)/GP1234*100.
     WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
1600 CONTINUE
     DO 1900 L=4,5
     WRITE(6,275) (PATH(L,I),I=1,3),(GESNP(II,L-3),II=1,NONCLD),
    &GESPTH(L-3)
     DO 1700 II=1,NONCLD
       PCON1(II) = 0.
       IF (GESNP(II,1) .NE. 0. .OR. GESNP(II,2) .NE. 0.)
    &  PCON1(II) = GESNP(II,L-3)*100./(GESNP(II,1)+GESNP(II,2))
1700 CONTINUE
```

```
      TEMP = 0.
      IF (GP12 .NE. 0.) TEMP = GESPTH(L-3)/GP12*100.
      WRITE(6,375) (PCON1(II),II=1,NONCLD),TEMP
      DO 1800 II=1,NONCLD
        PCON1(II) = 0.
        ABC(II) = GESNP(II,3)+GESNP(II,4)
        IF (GESN(II) .NE. 0.) PCON1(II) = GESNP(II,L-3)*100./GESN(II)
 1800 CONTINUE
      TEMP = 0.
      IF (GP1234 .NE. 0.) TEMP = GESPTH(L-3)/GP1234*100.
      WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
 1900 CONTINUE
      WRITE(6,275) (PATH(6,I),I=1,3),(ABC(II),II=1,NONCLD),GP34
      DO 2000 II=1,NONCLD
        PCON1(II) = 0.
        IF (GESN(II) .NE. 0.) PCON1(II) = ABC(II)*100./GESN(II)
        ABC(II) = GESNP(II,1)+GESNP(II,2)
 2000 CONTINUE
      TEMP = 0.
      IF (GP1234 .NE. 0.) TEMP = GP34/GP1234*100.
      WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
      WRITE(6,275) (PATH(7,I),I=1,3),(ABC(II),II=1,NONCLD),GP12
      DO 2100 II=1,NONCLD
        PCON1(II) = 0.
        IF (GESN(II) .NE. 0.) PCON1(II) = ABC(II)*100./GESN(II)
 2100 CONTINUE
      TEMP = 0.
      IF (GP1234 .NE. 0.) TEMP = GP12/GP1234*100.
      WRITE(6,350) (PCON1(II),II=1,NONCLD),TEMP
      WRITE(6,425) (GESN(II),II=1,NONCLD),GP1234
      DO 2200 II=1,NONCLD
        PCON1(II) = 0.
        IF (GP1234 .NE. 0.) PCON1(II) = GESN(II)/GP1234*100.
 2200 CONTINUE
      WRITE(6,450) (PCON1(II),II=1,NONCLD)
C---- FORMAT STATEMENTS
 25   FORMAT(//,30X,' PATHWAY RISK SUMMARY'/
     &/'*** COLLECTIVE POPULATION ***'/
     &'                PATHWAYS:  INGESTION ',
     &'INHALATION     AIR      GROUND',
     &'    INTERNAL  EXTERNAL  TOTAL'/
     &47X,' IMMERSION  SURFACE')
 50   FORMAT(/,'COLLECTIVE FATAL CANCER RISK: (DEATHS/YR)'/)
 75   FORMAT(26X,1P10G10.3/(26X,1P10G10.3))
 125  FORMAT(/,'GENETIC RISKS: (EFFECTS/YR)'/)
 150  FORMAT(//,30X,'NUCLIDE RISK SUMMARY '/
     &/'*** COLLECTIVE POPULATION ***'/
     &15X,' NUCLIDES:',10(2X,A8)/(26X,10(2X,A8)))
 175  FORMAT(///,30X,'FATAL CANCER RATE (DEATHS/YR) - COMBINED LET',
     &/,30X,'-------------------------------')
 225  FORMAT(//,' ***SUMMED OVER ALL CANCERS',/' NUCLIDES',16X,10(2X,
     &A8),/,(26X,10(2X,A8)))
 250  FORMAT(' PATHWAYS')
 275  FORMAT(//,1X,3(A8),1X,1P10G10.3/(26X,1P10G10.3))
 325  FORMAT(/'  % OF INTERNAL',11X,1P10G10.3/(26X,1P10G10.3))
 350  FORMAT(/'  % OF ALL PATHWAYS',7X,1P10G10.3/(26X,1P10G10.3))
 375  FORMAT(/'  % OF EXTERNAL',11X,1P10G10.3/(26X,1P10G10.3))
 425  FORMAT(/,'  TOTAL OVER ALL PATHWAYS',1X,1P10G10.3/(26X,1P10G10.3))
 450  FORMAT(/,'  % OF TOTAL',14X,1P10G10.3/(26X,1P10G10.3))
 475  FORMAT(///,30X,'COLLECTIVE GENETIC EFFECT (EFFECTS/YR) -',
```

```
     &' COMBINED LET',/,30X,'-----------------------------',
     &'-------------')
525  FORMAT(//,' ***SUMMED OVER ALL GONADS',/' NUCLIDES',16X,10(2X,
     &A8),/,(26X,10(2X,A8)))
      RETURN
      END
```

APPENDIX B

INPUT FILE FORMAT

TABLE B-1

DESCRIPTION OF PRESTO-EPA-POP ENVIRONMENTAL AND NUCLIDES INPUT

Card	Variable (Input Format)	Description
CARD 1	Run Identification (20A4)	
	TITLE	- Identifies the run. Up to 80 characters are allowed.
CARD 2	Location and Site Description (20A4)	
	LOCATE	- Lists the location of the disposal site. Up to 80 characters are allowed.
CARD 3	Time, Nuclides, and Farming Control Parameters (16I5)	
	MAXYR	- The number of years for which the simulation will run.
	NONCLD	- The number of radionuclides which are used in the simulation. Must be 40 or less.
	LEAOPT	- The leaching option. Radionuclides will be removed from trench in different manners depending on the value of LEAOPT. Must be one of the following calculation methods.

Option	Leach Calculation Method
1	Total contact, distribution coefficient
2	Immersed fracton, distribution coefficient
3	Total contact, solubility
4	Immersed fraction, solubility
5	Release fraction

NYR1, NYR2	- Beginning and ending years of trench cap failure. Both values must be less than or equal to MAXYR. NYR2 must be greater than or equal to NYR1.
IOPVWV	- Option for direct farming in the waste.

< 0 no on-site farming
= 0 on-site farming
= 1 on-site farming with vegetation decay

IOPSAT	- Not used.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	IPRT1, IPRT2, IDELT	- Control parameters. An annual summary table will be produced for each year that is a multiple of IDELT and falls between the range of IPRT1 and IPRT2.
	IRRES1, IRRES2	- Beginning and ending year for the mechanical suspension of contaminated soil into atmosphere. Used in the farming scenario.
	LIND	- Option used in calculations of health effects. If LIND = 0 then HESTAB computes concentrations and rates for maximally exposed individuals. If LIND = 1 then general population concentrations are computed.
	IAVG1, IAVG2	- Beginning and ending years for averaging nuclide concentration values.
CARD 4	External Exposures and Time Duration Parameters (16I5)	
	IVAP	- Not used.
	IBSMT	- The beginning year for the basement correction factor for surface gamma exposure calculations made by HESTAB. If IBSMT > 0 correction factor is calculated beginning in that year. If IBSMT = -1 then no correction is calculated.
	IAQSTF	- Not used.
	IXTS	- Control parameter to extend global assessment for an additional 9000 years beyond the local impact analysis period (MAXYR). A blank field defaults to the extended analysis. A nonzero integer stops the global impact simulation at the end of the local assessment period.
	IRST	- Number of years of restricted site use after site closure.
	INTYR(I), I=1,3	- Intermediate years in the local assessment period for which dose and risk output is desired. Up to three times allowed.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
CARD 5	Water Infiltration and Use (8F10.0)	
	PCT1, PCT2	- The fraction of the waste cap that is assumed to fail between the years NYR1 and NYR2.
	WWATL	- Fraction of irrigation water supplied by contaminated water from well (1.0 if all water comes from well, 0.0 if none).
	WWATA	- Fraction of animal drinking water supplied by contaminated water from well (1.0 if all water comes from well, 0.0 if none).
	WWATH	- Fraction of human drinking water supplied by contaminated water from well (1.0 if all water comes from well, 0.0 if none).
	SWATL	- Fraction of irrigation water supplied by contaminated water from stream (1.0 if all water comes from stream, 0.0 if none).
	SWATA	- Fraction of animal drinking water supplied by contaminated water from stream (1.0 if all water comes from stream, 0.0 if none).
	SWATH	- Fraction of human drinking water supplied by contaminated water from stream (1.0 if all water comes from stream, 0.0 if none).
CARDS 6-12	Comments and References (20A4)	
		- These cards are available for comments and references pertaining to data set. Up to 80 characters allowed in each of six cards.
CARD 13	LLW Site Characteristics (8F10.1)	
	TAREA	- The total combined radioactive waste surface area for the facility being simulated (m^2). Must be nonzero.
	TDEPTH	- Nominal depth (m) of operating trench in the shallow disposal scenario. Includes cover thickness.
	OVER	- Thickness of trench overburden (m). This must be equal to YGMAX of INFIL.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	PORT	- Porosity of material within trench. Must be nonzero.
	DENCON	- Mean density of the waste materials in the trench (g/cm^3).
	RELFAC	- The annual release fraction of the total trench inventory of each radionuclide if LEAOPT = 5 (see Card 3).
	CPRJ	- Complement to one for the fraction of underground water flowing to the stream (0.0 means 100 percent to the regional basin river).
	SINFL	- Annual infiltration rate for the noncap portions of the site and for local farmland (m/yr).
CARD 14	Groundwater Saturation (2F10.0)	
	SSAT	- Fraction of water saturation in the ground formation beneath the buried waste. If SSAT = 0 or if left blank, the fraction of saturation is calculated internally by the code.
	RESAT	- Fraction of residual saturation.
CARD 15	Site Operations and Waste Containers (6F10.0)	
	PERMT	- Trench permeability (m/yr).
	FACTIM	- Number of years of active operation of the waste site.
	TMN	- Number of years of active maintenance after site closure. No nuclide migration is initiated during the maintenance period, although radioactive decay takes place.
	CFT1	- Number of years before waste containers begin failing.
	DCFT	- Number of years after CFT1 that containers fail completely. At time CFT1+DCFT all containers have failed.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	FGAM	- Dimensionless factor characterizing the intensity and duration of gamma exposure from the basement scenario.
CARD 16	Transport Parameters (2F5.0, 7F10.0)	
	DTRAQ	- The distance from the bottom of the trench to the nominal depth of the aquifer. DTRAQ + TDEPTH should equal the aquifer depth below the surface (m).
	DWS	- Distance between the well and stream for basin effects calculations (m).
	DWELL	- Distance from the trench to the well used for irrigation and drinking. Must be nonzero (m).
	GWV	- Velocity of the groundwater in the aquifer. Must be nonzero (m/yr).
	AQTHK	- Thickness of the aquifer at the location of the well (m). This is used to calculate the volume of water in which the available radionuclides are diluted. Must be nonzero.
	AQDISP	- Dispersion angle of the pollutant plume in the aquifer (radians). Used with AQTHK to calculate dilution volume. Must be in radians.
	PORA	- Aquifer porosity.
	PORV	- Sub-trench porosity.
	PERMV	- Sub-trench permeability (m/yr).
CARD 17	Atmospheric Parameters (7F10.0)	
	H	- Atmospheric source height of radionuclides (m). One meter is chosen because most resuspension rate measurements are expressed for that height.
	VG	- Settling velocity of contaminated soil particles due to gravity (m/s).

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	U	- Annual average wind speed (m/s) in the direction of interest. For population calculations this is the wind speed toward the population centroid. Must be nonzero.
	VD	- Deposition velocity (m/s). Nominal generic value is 0.01 m/s.
	XG	- Distance (m) from source (trench) to population or individual of interest. If XG is less than PD, the adjacent farming option will be triggered.
	HLID	- Height of the inversion layer or lid (m).
	ROUGH	- Hosker's roughness parameter (m).
CARD 18	Atmospheric Parameters (7F10.0)	
	FTWIND	- Fraction of the time the wind blows toward the population or individual of interest.
	CHIQ	- User specified atmospheric transport parameter which may be calculated by an external atmospheric dispersion code (s/m^3). A nonzero value will override any calculation of atmospheric dispersion performed within code.
	RE1, RE2, RE3	- Factors (including algebraic signs) used in the resuspension rate equation.
	RMECH	- The resuspension rate RR (sec^{-1}) during the period of mechanical disturbance (between years IRRES1 and IRRES2).
	FTMECH	- The fraction of the year mechanical disturbance occurs.
CARD 19	Atmospheric Stability (2F10.0,2I5)	
	RR	- Dust loading for on-site reclaimer (s/m^3).
	FTRR	- Fraction of year on-site reclaimer is exposed to dust.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	IT	- Indicator variable for the type of atmospheric stability class formation. Suggested formation is Pasquill-Gifford, IT = 1.
	IS	- Stability category indicator. Values of 1 to 6 correspond to stability categories of A-F. A single value represents the most common stability category from nearest meteorology station to site of interest.
CARD 20	Precipitation Parameters (6F10.0)	
	RAINF	- The rainfall factor (R/yr).
	ERODF	- The soil-erodibility factor has units of tons/acre-R, where R = RAINF given above.
	STPLNG	- The slope steepness-length factor.
	COVER	- The crop management factor.
	CONTRL	- The erosion control practices factor.
	SEDELR	- The sediment delivery ratio. This ratio is intended to apply to fouling of waterways from construction activity.
CARD 21	Soil and Surface Water (5F10.0)	
	PORS	- Porosity of the surface soil. Must be nonzero.
	BDENS	- Bulk density of the soil (g/cm^3). Must be nonzero.
	STFLOW	- Annual flow rate of the nearest stream (m^3/yr). Must be nonzero.
	EXTENT	- The cross slope extent of the surface region contaminated by operational spillage (m). Must be nonzero.
	ADEPTH	- The active depth of soil in the surface-contaminated region. Used for the calculation of radionuclide concentration in both surface soil and surface water. Must be nonzero.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
CARD 22	Surface Water Runoff (2F10.0)	
	PD	- Distance from the trench to nearest stream (m). Must be nonzero. If PD is greater than XG, the adjacent farming option will be triggered.
	RUNOFF	- Fraction of the annual precipitation that runs off.
CARD 23	Agricultural Data (7F10.0)	
	Y1, Y2	- Agricultural productivity for pasture grass and other consumed vegetation respectively (kg/m^2).
	PP	- Surface density of soil (kg/m^2). Assumes a 15 cm plow depth. For farming scenario, this value should be in agreement with the value of BDENS, CARD 20. Must be nonzero.
	XAMBWE	- The weathering removal decay constant for atmospheric deposition onto foodcrops (hr^{-1}).
	TA	- Not used.
	TE1, TE2	- Period of time that pasture grass or crops and leafy vegetables, respectively, are exposed to contaminated air during each growing season (hr).
CARD 24	Agricultural Delay Times and Fractions (8F10.0)	
	TH1 - TH6	- These six variables represent the delay time between harvest and consumption by animal or man of pasture grass, stored feed, leafy vegetables for maximum individual doses, produce for maximum individual doses; and leafy vegetables and produce for general population exposures, respectively (hr).
	FP	- Fraction of each year that animals graze on pasture grass.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	FS	- Fraction of an animal's daily feed that is fresh grass for the period of time animals are in pasture.
CARD 25	Animal Feed Data (7F10.0)	
	QFC	- The amount of feed consumed daily by cattle (kg).
	QFG	- The amount of feed consumed daily by dairy goats (kg).
	TF1, TF2	- The transport time (hr) from animal feed into milk and into the receptor human for the maximum individual and the general population exposures, respectively.
	TS	- Length of time between slaughter of animals and human consumption of the resultant meat (hr).
	ABSH	- The absolute humidity of the atmosphere (g/m^3). Used for specific activity food-chain calculations for tritium concentrations in foodstuffs. Must be nonzero.
	P14	- The fractional equilibrium ratio for C-14.
CARD 26	Plant Root Parameters (2F10.0)	
	XRTM	- Maximum root depth for on-site farming scenario (m).
	RTGR	- Root growth rate constant (yr^{-1}).
CARD 27	Irrigation Water Data (6F10.0)	
	TW	- Not used.
	FI	- Fraction of the year that crops are irrigated.
	WIRATE	- Irrigation rate (L/m^2-hr). Application time is set equivalent to the number of frost-free days for the area.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	QCW, QGW, QBW	- Values for the amount of water (L/d) consumed by milk cows, milk goats, and beef cattle, respectively.
CARD 28	Human Food Uptake (8F10.0)	
	ULEAFY	- The human uptake of leafy vegetables (kg/yr).
	UPROD	- The human uptake of produce (kg/yr).
	UCMILK	- The human uptake of cow milk (L/yr).
	UGMILK	- The human uptake of goat milk (L/yr).
	UMEAT	- The human uptake of meat (kg/yr).
	UWAT	- The human uptake of drinking water (L/yr).
	UAIR	- The inhalation rate (m^3/yr).
	POP	- Local Population.
CARD 29	Nuclide Specific Data (A8, T1, 8A1, 2X, 7F10.0)	
	NUCLID(I)	- The name of the radionuclide used in the code. Must be left justified and with no embedded blanks and with a hyphen separating the alphameric for the element and the numeric for the isotope. The names used must agree with the conventions used in RADRISK and DARTAB.
	NUCL(I,K), K=1,8	- Do not enter data for these variables as the data are read from NUCLID(I) - (see format statement).
	TRAM(I)	- The amount of each radionuclide found in the trench at the beginning of the simulation (Ci).
	SOAM(I)	- The amount of spillage onto the surface that exists at the beginning of the simulation (fraction of initial inventory.)
	STAM(I)	- The amount of radioactivity placed into the stream nearest the site at the beginning of the simulation (Ci).

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	ATAM(I)	- The amount of radioactivity of each radionuclide placed into the air directly above the trench at the beginning of the simulation (Ci).
	DECAY(I)	- The radiological decay constant (yr^{-1}). The constant is equal to 0.6931 divided by the radiological half-life in years.
	SOL(I)	- The solubility of the radionuclide stored in the trench (mg/l). SOL is used only if LEAOPT = 3 or 4.
	CON(I)	- Conversion factor for global health effects (health effects/Ci released).
CARD 30	Nuclide Transport Parameters (A8, 2X, 4F10.0)	
	NU	- Radionuclide name (same as on Card 29).
	XKD(1,I)	- Surface K_d of radionuclide I (ml/g).
	XKD(2,I)	- Waste K_d of radionuclide I (ml/g), used when LEAOPT = 1, 2, 3, or 4.
	XKD(3,I)	- Vertical zone K_d of radionuclide I (ml/g).
	XKD(4,I)	- Aquifer K_d of radionuclide I (ml/g).
CARD 31	Agricultural Data for Nuclides (A8, 2X, 7F10.0)	
	NC	- Radionuclide name (same as Card 29).
	RA(I)	- Radionuclide retention fraction for air.
	RW(I)	- Radionuclide retention fraction for irrigation.
	BV(I)	- Radionuclide soil-to-plant uptake factor for vegetative parts.
	BR(I)	- Radionuclide soil-to-plant uptake factor for grain.
	FMC(I)	- Radionuclide forage-to-milk transfer factor for cows.

TABLE B-1
(Continued)

Card	Variable (Input Format)	Description
	FMG(I)	- Radionuclide forage-to-milk transfer factor for goats.
	FF(I)	- Radionuclide forage-to-beef transfer factor.

NOTE: Cards 29, 30, and 31 are repeated, in sequence, NONCLD times.

TABLE B-2

INPUT DATA FOR SUBROUTINE INFIL

Card	Variable (Input Format)	Description
CARD 1	Trench Cap Characteristics (10F7.3)	
	TWT	- The width of the trench cap (m).
	SLOP	- The average slope of trench cover (m/m).
	EPSG	- The component of porosity for gravity water of trench cap (unitless).
	EPSP	- The component of porosity for pellicular water of trench cap (unitless).
	XKI	- The permeability of trench cover (m/hr).
	YGMAX	- The thickness of the trench cap (m). This must be equal to OVER.
	XDE	- The equivalent upward diffusivity (m^2/hr).
	XKE	- The equivalent upward hydraulic conductivity (m/hr).
	YPI	- The initial pellicular water deficit of the trench cap (m).
	YGI	- The initial gravity water deficit of the trench cap (m).
CARD 2	Day Length Data (12F5.1)	
	DTH(IM)	- The maximum day length for month IM (hr). There are 12 values; one for each month from January to December.
CARDS 3-33	Temperature Data (2X, 12F6.2)	
	TMP(IM)	- The mean daily temperatures (°C). Each card has 12 values, one for each month. There are 31 cards of this type, one for each day of the month.
CARD 34+	Precipitation Data (I2, 1X, I2, 1X, 24F3.0)	
	MO	- Month number.
	IDA	- Day number of month MO.

TABLE B-2
(Continued)

Card	Variable (Input Format)	Description
	P(MO,IDA)	- Amount of precipitation that fell in this hour (0.1 mm/hr). There are 24 values on each card, one for each hour of the day. Include only days with a nonzero amount of precipitation, and the first day of each month.
LAST CARD	End of File (I2)	
	IAMP	Must equal 99, which designates the end of the data set.

TABLE B-3

DOSIMETRIC INPUT DATA

Card	Variable (Input Format)	Description
Card 1	Cancer HECF[a](A8,3X,4(1PE11.4,2X))	
	NUCLID(I)	- The name of the radionuclide.
	HEFCTR(I,1,1)	- Health effect conversion factor for the ingestion exposure pathway ($\frac{\text{deaths}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}}$)
	HEFCTR(I,1,2)	- Health effect conversion factor for the inhalation exposure pathway ($\frac{\text{deaths}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}}$)
	HEFCTR(I,1,3)	- Health effect conversion factor for the air immersion exposure pathway ($\frac{\text{deaths}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}}$)
	HEFCTR(I,1,4)	- Health effect conversion factor for the ground surface exposure pathway ($\frac{\text{deaths}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}}$)
Card 2	Genetic Effects HECF (A8,3X,4(1PE11.4,2X))	
	NUCLID(I)	- The name of the radionuclide.

TABLE B-3
(Continued)

Card	Variable (Input Format)	Description
	GEFCTR(I,1,1)	- Genetic health effect conversion factor for the ingestion exposure pathway $\left(\frac{\text{genetic effects}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}} \right)$
	GEFCTR(I,1,2)	- Genetic health effect conversion factor for the inhalation exposure pathway $\left(\frac{\text{genetic effects}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}} \right)$
	GEFCTR(I,1,3)	- Genetic health effect conversion factor for the air immersion exposure pathway $\left(\frac{\text{genetic effects}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}} \right)$
	GEFCTR(I,1,4)	- Genetic health effect conversion factor for the ground surface exposure pathway $\left(\frac{\text{genetic effects}}{10^5 \text{ persons}} / \frac{\text{pCi}}{\text{yr}} \right)$

NOTE: Cards 1 and 2 are repeated, in sequence, NONCLD times.

(a) HECF = Health Effect Conversion Factors

APPENDIX C

SAMPLE INPUT AND OUTPUT FILES

Table C-1

Environmental and Nuclide-Specific Input File

TABLE C-1

SAMPLE INPUT DATA FILE FOR PRESTO-EPA-POP-PC/AT

```
SOUTHEAST-----PRODUCTION RUN SECSAW
 SOUTHEAST
 1000   40    2  100  300   -1    1    0 1000  100    0    0    1    0 1000
        -1    0    0  100  100  500
         0       0.2       0.0       0.5       1.0       0.0       0.0       0.0
C
C   SOUTHEAST .....PRODUCTION RUN SECSAW
C   DISPL: SHALLOW LAND DISPOSAL          WASTE: ABSORBING WASTE
C      DATE: JUNE 2, 1986
C      SPECIFIC RUN TITLE: SECSAW
C     NARM/LLW: LLW     BRC/DEEP/POP: POP    NO. NUCLIDES 40
C
       0.4       7.0       2.0       .39      1.20      .0E+0                0.43
        0.       .17
       2.2       20.        0.       20.       50.        0.
 14.6 457.      457.      27.8      30.5       0.3      0.39      0.35       2.2
       1.0      0.01      2.01      0.01      480.      300.      0.01
     .4458  3.856E-5     1.E-6      -.15    1.E-11        0.        0.
    1    4
      250.      0.23      0.27       0.3       0.3       1.0
      0.39       1.6    3.57E5      0.63       0.1
      460.      0.29
      0.67      0.65       240    0.0021                 720.     1440.
        0.     2160.       24.     1440.      336.      336.       1.0      0.83
       50.        6.       48.       96.      480.       9.9       1.0
        0.        0.
                 0.4     0.015       60.       8.0       50.
       14.      88.5      89.4        0.      62.8     481.9     8035.       25.
H-3                1.    1.0E-7        0.        0.   5.64E-2        0.   7.35E-6
H-3             0.01      0.01      0.01      0.01        .9
H-3             0.20      0.25        0.        0.        0.        0.        0.
C-14               1.    1.0E-7        0.        0.   1.21E-4        0.   4.61E-3
C-14            0.01      0.01      0.01      0.01       .75
C-14            0.20      0.25        0.        0.        0.        0.        0.
FE-55              1.    1.0E-7        0.        0.   2.57E-1        0.   3.19E-4
FE-55          6000.       50.     6000.     6000.     .0025
FE-55           0.20      0.25    4.0E-3    1.0E-3    2.5E-4    1.3E-4    2.0E-2
NI-59              1.    1.0E-7        0.        0.   8.66E-6        0.   2.00E-5
NI-59           150.       50.      150.      150.     .0025
NI-59           0.20      0.25    6.0E-2    6.0E-2    1.0E-3    6.7E-3    6.0E-3
CO-60              1.    1.0E-7        0.        0.   1.32E-1      100.   5.44E-4
CO-60            55.       50.       55.       55.     .0025
CO-60           0.20      0.25    2.0E-2    7.0E-3    2.0E-3    1.0E-3    2.0E-2
NI-63              1.    1.0E-7        0.        0.   7.53E-3        0.   4.98E-5
NI-63           150.       50.      150.      150.     .0025
NI-63           0.20      0.25    6.0E-2    6.0E-2    1.0E-3    6.7E-3    6.0E-3
SR-90              1.    1.0E-7        0.        0.   2.42E-2        0.   4.75E-4
SR-90           150.       30.      150.       20.     .0025
SR-90           0.20      0.25    2.5E+0    2.5E-1    1.5E-3    1.4E-2    3.0E-4
```

TABLE C-1
(Continued)

NB-94	1.	1.0E-7	0.	0.	3.47E-5	0.	5.21E-2
NB-94	350.	70.	350.	350.	.0025		
NB-94	0.20	0.25	2.0E-2	5.0E-3	2.0E-2	2.5E-3	2.5E-1
TC-99	1.	1.0E-7	0.	0.	3.25E-6	0.	2.15E-4
TC-99	0.5	0.5	0.5	0.5	.01		
TC-99	0.20	0.25	9.5E+0	1.5E+0	1.0E-2	2.5E-2	8.5E-3
RU-106	1.	1.0E-7	0.	0.	6.89E-1	0.	1.01E-3
RU-106	220.	70.	220.	220.	.01		
RU-106	0.20	0.25	7.5E-2	2.0E-2	6.0E-7	1.3E-4	2.0E-3
SB-125	1.	1.0E-7	0.	0.	2.50E-1	0.	2.86E-7
SB-125	45.	45.	45.	45.	.0025		
SB-125	0.20	0.25	2.0E-1	3.0E-2	1.0E-4	1.5E-3	1.0E-3
I-129	1.	1.0E-7	0.	0.	4.08E-8	0.	9.08E-3
I-129	3.	3.	3.	3.	.01		
I-129	0.20	0.25	1.5E-1	5.0E-2	1.0E-2	3.0E-1	7.0E-3
CS-134	1.	1.0E-7	0.	0.	3.36E-1	300.	6.03E-2
CS-134	100.	100.	1000.	500.	.0025		
CS-134	0.20	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
CS-135	1.	1.0E-7	0.	0.	2.3E-7	0.	5.93E-3
CS-135	100.	100.	1000.	500.	.0025		
CS-135	0.2	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
CS-137	1.	1.0E-7	0.	0.	2.31E-2	300.	4.04E-2
CS-137	100.	100.	1000.	500.	.0025		
CS-137	0.20	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
BA-137M	1.	1.0E-7	0.	0.	2.31E-2	300.	0.00E-0
BA-137M	100.	100.	1000.	500.	.0025		
BA-137M	0.20	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
EU-154	1.	1.0E-7	0.	0.	8.15E-2	0.	9.33E-5
EU-154	4000.	2000.	4000.	4000.	.0025		
EU-154	0.20	0.25	1.0E-2	4.0E-3	2.0E-5	2.0E-5	5.0E-3
TL-208	1.	1.0E-7	0.	0.	4.92E-11	0.	7.67E-4
TL-208	60000.	60000.	60000.	60000.	.0025		
TL-208	2.0E-1	2.5E-1	4.5E-2	9.0E-3	2.0E-3		4.0E-2
PO-210	1.	1.0E-7	0.	0.	4.33E-04	0.	1.03E-1
PO-210	220.	220.	220.	220.	.0025		
PO-210	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
PB-210	1.	1.0E-7			4.33E-04		1.80E-1
PB-210	220.	220.	220.	220.	.0025		
PB-210	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
PB-212	1.	1.0E-7			4.92E-11		1.73E-3
PB-212	60000.	60000.	60000.	60000.	.0025		
PB-212	2.0E-1	2.5E-1	4.5E-2	9.0E-3	2.0E-3		4.0E-2
BI-214	1.	1.0E-7			4.33E-04		1.89E-5
BI-214	220.	220.	220.	220.	.0025		
BI-214	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
PB-214	1.	1.0E-7			4.33E-04		3.59E-5
PB-214	220.	220.	220.	220.	.0025		
PB-214	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
RA-226	1.	1.0E-7	0.	0.	4.33E-4	0.	3.24E-2
RA-226	220.	220.	220.	220.	.0025		
RA-226	0.20	0.25	1.5E-2	1.5E-3	4.5E-4	5.0E-6	2.5E-4

TABLE C-1
(Continued)

TH-228	1.	1.0E-7			4.92E-11		3.90E-3
TH-228	60000.	60000.	60000.	60000.	.0025		
TH-228	2.0E-1	2.5E-1	8.5E-4	8.5E-5	5.0E-6		6.0E-6
AC-228	1.	1.0E-7			4.92E-11		2.28E-4
AC-228	220.	220.	220.	220.	.0025		
AC-228	2.0E-1	2.5E-1	3.5E-3	3.5E-4	2.0E-5		2.5E-5
RA-228	1.	1.0E-7			4.92E-11		2.28E-2
RA-228	220.	220.	220.	220.	.0025		
RA-228	2.0E-1	2.5E-1	1.5E-2	1.5E-3	4.5E-4		2.5E-4
TH-232	1.	1.0E-7			4.92E-11		7.35E-3
TH-232	60000.	60000.	60000.	60000.	.0025		
TH-232	2.0E-1	2.5E-1	8.5E-4	8.5E-5	5.0E-6		6.0E-6
U-234	1.	1.0E-7	0.	0.	1.55E-10	0.	3.05E-4
U-234	750.	750.	750.	750.	.0025		
U-234	0.20	0.25	8.5E-3	4.0E-3	6.0E-4	5.0E-4	2.0E-4
U-235	1.	1.0E-7	0.	0.	9.85E-10	0.	3.51E-4
U-235	750.	750.	750.	750.	.0025		
U-235	0.20	0.25	8.5E-3	4.0E-3	6.0E-4	5.0E-4	2.0E-4
NP-237	1.	1.0E-7	0.	0.	3.3E-7	0.	2.68E-1
NP-237	5.	5.	5.	5.	.0025		
NP-237	0.20	0.25	1.0E-1	1.0E-2	5.0E-6	5.0E-6	5.5E-5
U-238	1.	1.0E-7	0.	0.	1.55E-10	0.	3.04E-4
U-238	750.	750.	750.	750.	.0025		
U-238	0.20	0.25	8.5E-3	4.0E-3	6.0E-4	5.0E-4	2.0E-4
PU-238	1.	1.0E-7	0.	0.	7.90E-3	0.	5.94E-2
PU-238	3500.	700.	3500.	3500.	.0025		
PU-238	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
PU-239	1.	1.0E-7	0.	0.	2.87E-5	0.	6.54E-3
PU-239	3500.	700.	3500.	3500.	.0025		
PU-239	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
PU-241	1.	1.0E-7	0.	0.	5.25E-2	0.	1.08E-3
PU-241	3500.	700.	3500.	3500.	.0025		
PU-241	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
AM-241	1.	1.0E-7	0.	0.	1.51E-3	0.	1.01E-1
AM-241	8.00E+4	80.	8.00E+4	8.00E+4	.0025		
AM-241	0.20	0.25	5.5E-3	2.5E-4	4.0E-7	0.	3.5E-6
PU-242	1.	1.0E-7	0.	0.	1.83E-6	0.	6.21E-3
PU-242	3500.	700.	3500.	3500.	.0025		
PU-242	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
AM-243	1.	1.0E-7	0.	0.	9.4E-5	0.	1.00E-1
AM-243	8.00E+4	80.	8.00E+4	8.00E+4	.0025		
AM-243	0.20	0.25	5.5E-3	2.5E-4	4.0E-7	0.	3.5E-6
CM-243	1.	1.0E-7	0.	0.	2.17E-2	0.	5.54E-2
CM-243	3300.	700.	3300.	3300.	.0025		
CM-243	0.20	0.25	8.5E-4	1.5E-5	2.0E-5	0.	3.5E-6
CM-244	1.	1.0E-7	0.	0.	3.94E-2	0.	4.63E-2
CM-244	3300.	700.	3300.	3300.	.0025		
CM-244	0.20	0.25	8.5E-4	1.5E-5	2.0E-5	0.	3.5E-6

Table C-2

INFIL Subroutine Input File

TABLE C-2

SAMPLE INFILTRATION INPUT FILE FOR PRESTO-EPA-POP-PC/AT

```
  30.5   0.01   0.02   0.25   0.24   1.20 3.5E-4 1.4E-6    0.1   1.20
10.8 11.2 12.0 12.8 13.4 13.7 13.6 13.0 12.3 11.6 10.9 10.6
   8.88 10.16  6.00 20.92 17.80 25.34 26.30 24.99 21.89 13.96 19.89 19.77
   8.48  6.81  8.76 19.34 19.45 26.79 25.79 25.92 22.43 19.38 19.56 19.15
   7.05  7.79 12.65 20.61 20.04 25.34 27.73 25.28 22.71 20.17 19.56 19.73
  15.27 13.93 14.35 16.68 20.37 23.45 28.48 26.23 18.00 18.79 19.56 19.23
   6.13 12.14 17.74 11.78 11.90 25.40 25.39 23.77 16.67 20.95 19.56 20.96
   8.84 13.12 16.25 12.02 20.78 24.17 22.78 23.78 15.04 22.37 19.56 13.86
  15.54  6.94 10.90  8.20 20.90 23.86 18.01 25.78 15.87 22.63 19.56 11.56
  15.54  9.23  4.41  8.60 21.38 26.07 12.58 25.85 16.54 21.47 19.56 11.70
  15.54 13.06  7.93 12.57 20.27 27.60 21.33 25.12 18.09 22.77 19.56 13.60
  15.54  8.44 13.33 11.21 20.66 25.60 24.66 25.61 19.68 21.45 19.56  8.13
  15.54  8.13 17.32 12.79 21.81 24.10 25.09 24.93 21.19 17.03 19.56  9.71
  15.54  4.59 18.87 15.35 22.07 23.99 25.93 24.71 21.44 19.06 19.56  7.16
  15.54  7.46 21.13 17.93 15.08 23.10 23.91 24.22 24.27 19.10 19.56  0.08
  15.54  8.97 19.19 20.56 25.52 23.70 24.89 25.27 24.12 15.71 19.56  4.30
  15.54 14.71 19.25 20.36 25.06 26.20 24.26 24.69 25.82 12.18 19.56 13.68
  15.54 19.33 12.33 20.93 24.61 26.46 24.17 25.35 25.74 12.97 19.56 13.17
  15.54 16.27 17.60 21.36 23.36 21.95 24.74 24.29 25.48 10.93 19.56  4.78
   8.78  8.03 17.04 16.86 22.95 22.49 25.83 22.87 24.45 12.78 19.56  1.99
  12.54 10.02 20.02 14.26 21.02 25.70 25.59 24.17 23.35 17.31 19.56  2.85
  16.73 11.90 23.06 19.05 22.92 26.07 26.55 25.24 21.76 18.55 15.42  6.18
  15.27 14.61 23.56 20.29 23.55 26.62 27.56 26.62 21.76 18.82 17.86  5.16
   6.46  8.04 17.91 16.27 24.74 24.69 27.67 25.99 21.76 13.71 16.34  4.64
   8.41 10.49 15.05 11.65 23.82 24.88 24.88 27.02 21.76 10.64 16.61  8.33
   5.96 16.75 13.29 13.41 23.58 23.50 25.21 27.62 21.76  8.38 16.83 14.85
   7.04 12.71 16.55 16.35 24.17 24.63 26.21 25.31 21.76  9.97  9.64 17.31
   2.14  1.94 13.24 20.59 24.16 24.98 28.02 18.80 21.76 13.11 12.35 15.14
  -1.54  2.03  6.57 18.13 23.39 24.05 29.36 20.31 21.76 11.43 15.29 16.79
   5.18  3.65  6.58 17.02 25.76 25.13 27.35 25.31 21.76 12.19 13.85 18.56
   7.55       11.19 15.51 27.44 25.97 24.49 20.37 21.76 12.27 19.11 13.72
  11.00       16.00 15.75 23.84 27.27 25.53 20.49 20.81 14.62 15.48  7.34
  16.16       16.25       24.13       24.50 20.24       17.46       5.07
1  1   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
1  3   0  0  0  0 23  0 23 23 70 23  0  0  0  0  0  0  0  0  0  0  0  0
1  4   0  0  0  0 23 47 23 23 47  0  0  0  0  0  0  0  0  0  0  0  0  0
1 13   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0 23  0
1 14  23 23 23 23  0  0 23  0  0  0 47 23 23  0  0 23  0  0  0  0  0  0
1 19   0  0  0  0  0  0  0  0  0  0  0  0 23  0 23  0  0  0  0  0  0  0
1 20   0  0  0  0  0  0  0  0  0 23  0  0  0  0  0  0  0  0  0  0  0  0
1 23   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0 23 47 47  0  0  0  0
1 31   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0 23 23 23  0  0
2  1   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0
2  2   0  0  0  0  0  0  0  0  0  0  0  0 23  0  0  0  0  0 23  0  0  0
2  3   0  0 23  0  0  0  0 47  0  0  0 47 23 23  0 23  0  0  0  0  0  0
2  9   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0 23  0  0  0
2 12   0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0  0 93  0 47 23  0
2 16   0  0  0  0  0  0 23  0  0  0 23  0  0  0 23  0  0  0  0  0  0  0
2 17   0 23  0  0  0  0  0  0  0 23  0  0  0  0  0  0  0  0  0  0  0  0
```

2	26	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0
2	27	0	0	23	0	0	23	0	0	0	0	0	23	0	0	0	23	0	0	0	0	23	0	0
3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	7	23	0	0	0	0	0	0	0	47	0	23	23	0	0	0	0	0	0	0	0	0	0	0
3	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	23	0	0	0	0	0
3	24	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0
4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	3	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0
4	5	0	0	0	0	0	0	0	0	0	0	0	0	23	23	70	23	0	0	0	0	0	0	0
4	8	0	0	0	0	0	0	0	0	0	0	0	23	0	23	0	23	47	0	23	0	0	0	0
4	12	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0	0	140	0	0	0	23	0
4	20	0	0	0	0	0	0	23	93	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	70	93	93	23	23	0	0	0
4	26	0	0	0	0	23	23	47	23	0	0	0	0	0	0	0	0	0	0	350	0	0	0	0
4	27	0	0	23	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0
5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	23	0	0	23	0	23
5	19	0	0	0	0	0	0	0	0	0	47	23	0	0	0	0	0	0	0	0	0	0	0	0
5	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	117	23	0	0	0	0
5	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	326	186	23	0	0	0
5	30	0	0	0	0	0	0	0	0	0	0	0	0	0	47	0	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	0	0	0	0
6	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	153	0	0	0	0
6	13	0	0	0	0	0	23	0	0	93	47	0	0	23	0	0	0	0	0	0	0	0	0	0
6	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	0	0
6	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	23	0	0	0	0	0	0	0
6	22	0	0	0	0	0	0	0	0	0	0	0	0	23	47	0	0	0	0	0	0	0	0	0
6	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0	0	23	0	0
6	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	5	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0
7	9	0	0	0	0	0	0	0	0	0	0	0	0	117	70	23	0	0	0	0	0	0	0	0
7	13	0	0	0	0	0	0	0	0	0	0	23	0	0	47	210	0	0	0	0	0	0	0	0
7	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	0	0	0	0
7	15	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	23	0	23	0	0	0	0
7	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	70	23	0	0	0	0	0	0
7	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	280	163	0	0	0	0	0
7	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	117	0	0	
7	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	210	23	23	0	
7	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0
7	27	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0
7	29	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0
8	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	419	93	0	
8	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	7	23	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
8	9	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0
8	18	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	93	47	23	0	0	0	23	0

9	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	10	0	0	0	0	0	0	0	0	23	23	23	0	0	0	0	0	0	0	0	23	0	0
9	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140	233	0	0
9	19	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	47	0	0	0	0	0	0
9	21	0	0	0	0	0	0	0	0	0	47	0	23	0	23	0	0	0	0	0	0	0	0
9	25	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
10	10	23	0	0	23	23	0	23	0	0	0	0	0	23	23	23	23	23	0	0	0	0	0
10	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	23	23	0	0
10	25	0	23	0	0	0	0	0	0	0	23	0	23	70	47	0	0	0	0	0	0	0	0
10	26	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0
10	27	0	0	0	0	47	0	0	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	47
11	20	0	0	0	0	0	0	23	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	24	0	0	0	0	0	23	0	0	23	0	0	0	0	0	0	23	0	0	0	0	0	0
11	30	0	0	0	0	0	0	0	0	0	0	23	23	0	23	0	0	0	0	23	0	0	0
12	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	23	70	93	0	0	23
12	2	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	6	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0
12	14	0	0	0	0	0	0	0	0	23	23	47	47	23	0	23	0	0	0	0	0	0	0	0
12	15	0	0	0	0	0	23	23	23	93	117	23	0	0	0	0	0	0	0	0	0	0	0	0
12	18	0	23	23	47	0	23	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	24	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23	0	0	0	23
12	25	0	0	0	23	47	23	23	23	0	23	23	0	0	0	0	0	0	0	0	0	0	0	0
12	27	0	0	0	0	0	0	0	0	0	0	23	0	0	0	0	0	0	0	0	0	0	0	0
12	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47	163
12	29	0	23	47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	31	0	0	0	47	23	23	47	70	47	70	47	47	70	47	47	23	0	0	0	0	0	0	0
99																							

Table C-3

Dosimetric Input File

TABLE C-3

SAMPLE HEALTH EFFECT CONVERSION FACTOR INPUT FILE FOR PRESTO-EPA-POP-PC/AT

H-3	1.7102E-07	2.4693E-07	0.0000E+00	0.0000E+00
H-3	6.4700E-13	9.7110E-13	0.0000E+00	0.0000E+00
C-14	3.0575E-06	2.1602E-08	0.0000E+00	0.0000E+00
C-14	5.6900E-12	4.1770E-14	0.0000E+00	0.0000E+00
FE-55	8.7778E-07	3.6378E-06	1.7328E-01	3.3361E-04
FE-55	2.7880E-12	4.6920E-12	2.4600E-01	4.7450E-04
NI-59	2.6612E-07	3.3685E-06	2.9055E-01	6.2760E-04
NI-59	8.9930E-13	2.5880E-12	4.1400E-01	8.9280E-04
CO-60	1.1075E-05	7.5679E-04	2.2974E+04	4.0258E+00
CO-60	5.7200E-11	8.3020E-11	9.9420E+04	1.7400E+01
NI-63	6.6486E-07	8.5005E-06	0.0000E+00	0.0000E+00
NI-63	2.1520E-12	6.2890E-12	0.0000E+00	0.0000E+00
SR-90	1.0273E-05	3.4193E-04	0.0000E+00	0.0000E+00
SR-90	1.3100E-12	6.9610E-11	0.0000E+00	0.0000E+00
NB-94	5.3771E-06	1.0516E-03	1.4425E+04	2.8007E+00
NB-94	3.3190E-11	8.1480E-11	6.3060E+04	1.2200E+01
TC-99	3.8025E-06	4.3299E-05	4.2271E-03	9.9719E-07
TC-99	1.8010E-12	1.2040E-12	1.8170E-02	4.2860E-06
RU-106	2.2069E-05	2.3963E-03	0.0000E+00	0.0000E+00
RU-106	4.4600E-11	3.5170E-11	0.0000E+00	0.0000E+00
SB-125	0.0000E+00	5.5131E-05	3.7188E+03	7.6974E-01
SB-125	0.0000E+00	6.5670E-12	1.6160E+04	3.3400E+00
I-129	1.7031E-04	1.1363E-04	5.3599E+01	2.8138E-02
I-129	3.7840E-12	2.4870E-12	2.8600E+02	1.5100E-01
CS-134	1.3074E-04	8.8350E-05	1.4072E+04	2.7719E+00
CS-134	4.6400E-10	3.0750E-10	6.1330E+04	1.2100E+01
CS-135	1.2868E-05	8.9594E-06	0.0000E+00	0.0000E+00
CS-135	5.3060E-11	3.5250E-11	0.0000E+00	0.0000E+00
CS-137	8.7819E-05	6.0039E-05	0.0000E+00	0.0000E+00
CS-137	3.3690E-10	2.2360E-10	0.0000E+00	0.0000E+00
BA-137M	0.0000E+00	2.8227E-09	5.3689E+03	1.0707E+00
BA-137M	0.0000E+00	2.9220E-16	2.3460E+04	4.6800E+00
EU-154	0.0000E+00	5.8122E-04	1.1436E+04	2.1254E+00
EU-154	0.0000E+00	2.0210E-10	4.9640E+04	9.2200E+00
TL-208	0.0000E+00	0.0000E+00	3.5246E+04	5.3957E+00
TL-208	0.0000E+00	0.0000E+00	1.4830E+05	2.2800E+01
PO-210	5.0820E-04	1.3659E-02	7.8096E-02	1.5153E-05
PO-210	2.4340E-09	3.7480E-09	3.4100E-01	6.6230E-05
PB-210	2.4124E-03	6.1751E-03	9.4317E+00	4.2931E-03
PB-210	2.2946E-09	5.8751E-09	4.4400E+01	1.6460E-02
PB-212	2.3103E-05	2.3210E-04	1.2471E+03	2.7789E-01
PB-212	5.3458E-11	1.1626E-10	5.2380E+03	1.1700E+00
BI-214	3.7180E-07	1.1720E-05	1.4376E+04	2.4912E+00
BI-214	9.2050E-14	4.9256E-13	6.1760E+04	1.0700E+01
PB-214	4.7963E-07	1.5459E-05	2.1458E+03	4.6186E-01
PB-214	5.8350E-13	5.5548E-12	9.1200E+03	1.9600E+00
RA-226	5.5066E-04	1.6488E-02	5.7925E+01	1.2814E-02
RA-226	2.3455E-09	4.4469E-09	2.3900E+02	5.2960E-02
TH-228	7.4498E-05	4.2655E-01	1.6143E+01	4.4186E-03

TABLE C-3
(Continued)

TH-228	6.2869E-11	5.9141E-09	6.7700E+01	1.7140E-02
AC-228	0.0000E+00	3.9204E-05	8.5086E+03	1.6020E+00
AC-228	0.0000E+00	8.4777E-12	3.6800E+04	6.9400E+00
RA-228	3.8734E-04	3.3640E-03	4.8211E-07	1.0097E-09
RA-228	2.3440E-09	3.1659E-09	6.8600E-07	1.4310E-09
TH-232	1.4044E-04	1.7477E-01	1.4288E+00	9.7859E-04
TH-232	1.6177E-11	5.3435E-09	5.7600E+00	2.8100E-03
U-234	6.6389E-06	1.4613E-01	1.1544E+00	1.1561E-03
U-234	2.7878E-12	5.9253E-11	4.3600E+00	3.1990E-03
U-235	7.6452E-06	1.3584E-01	1.2985E+03	2.8867E-01
U-235	6.3180E-12	6.4995E-11	5.3680E+03	1.1900E+00
NP-237	1.3158E-03	1.7437E-01	1.8271E+02	5.0278E-02
NP-237	2.1250E-09	2.5604E-07	7.8500E+02	2.0900E-01
U-238	6.6233E-06	1.3109E-01	7.6756E-01	9.1950E-04
U-238	2.7609E-12	5.6362E-11	2.7900E+00	2.4620E-03
PU-238	1.3132E-03	2.2219E-01	6.2320E-01	1.1888E-03
PU-238	2.2533E-09	8.3699E-08	1.9500E+00	3.2150E-03
PU-239	1.4456E-04	2.1915E-01	6.4132E-01	5.4071E-04
PU-239	2.2853E-10	8.5196E-08	2.4000E+00	1.5840E-03
PU-241	2.3784E-05	1.4671E-03	0.0000E+00	0.0000E+00
PU-241	2.7936E-11	1.2070E-09	0.0000E+00	0.0000E+00
AM-241	1.4640E-03	1.9450E-01	1.4108E+02	4.4126E-02
AM-241	2.3968E-09	2.8882E-07	6.4600E+02	1.9500E-01
PU-242	1.3732E-04	2.0815E-01	5.2099E-01	9.4617E-04
PU-242	2.1676E-10	8.0798E-08	1.6800E+00	2.5770E-03
AM-243	1.4565E-03	1.9297E-01	3.9581E+02	1.0167E-01
AM-243	2.3438E-09	2.8228E-07	1.7460E+03	4.4400E-01
CM-243	1.0921E-03	1.5012E-01	1.0693E+03	2.4358E-01
CM-243	2.0518E-09	2.4656E-07	4.4730E+03	1.0100E+00
CM-244	9.1405E-04	1.2856E-01	5.7883E-01	1.1323E-03
CM-244	1.8162E-09	2.1832E-07	1.8400E+00	3.3030E-03

Table C-4

Output File

TABLE C-4

SAMPLE OUTPUT FROM PRESTO-EPA-POP-PC/AT

```
1                                   ** PRESTO-EPA-POP -- PC/AT VERSION **


    ** INPUT DATA AS READ IN **


 SOUTHEAST-----PRODUCTION RUN SECSAW
  SOUTHEAST
  1000   40    2  100  300   -1    1    0 1000  100    0    0    1    0 1000
         -1    0    0  100  100  500
          0       0.2       0.0       0.5       1.0       0.0       0.0       0.0
 C
 C   SOUTHEAST .....PRODUCTION RUN SECSAW
 C   DISPL: SHALLOW LAND DISPOSAL          WASTE: ABSORBING WASTE
 C      DATE: JUNE 2, 1986
 C      SPECIFIC RUN TITLE: SECSAW
 C     NARM/LLW: LLW     BRC/DEEP/POP: POP    NO. NUCLIDES 40
 C
        0.4       7.0       2.0       .39      1.20     .0E+0                0.43
         0.       .17
        2.2       20.        0.       20.       50.        0.
  14.6 457.      457.      27.8      30.5       0.3      0.39      0.35       2.2
        1.0      0.01      2.01      0.01      480.      300.      0.01
      .4458  3.856E-5     1.E-6      -.15    1.E-11        0.        0.
        0.0       0.0    1    4
       250.      0.23      0.27       0.3       0.3       1.0
       0.39       1.6    3.57E5      0.63       0.1
       460.      0.29
       0.67      0.65       240    0.0021                 720.     1440.
         0.     2160.       24.     1440.      336.      336.       1.0      0.83
        50.        6.       48.       96.      480.       9.9       1.0
         0.        0.
                   0.4     0.015       60.       8.0       50.
```

TABLE C-4
(Continued)

14.	88.5	89.4	0.	62.8	481.9	8035.	25.
H-3	1.	1.0E-7	0.	0.	5.64E-2	0.	7.35E-6
H-3	0.01	0.01	0.01	0.01	.9		
H-3	0.20	0.25	0.	0.	0.	0.	0.
C-14	1.	1.0E-7	0.	0.	1.21E-4	0.	4.61E-3
C-14	0.01	0.01	0.01	0.01	.75		
C-14	0.20	0.25	0.	0.	0.	0.	0.
FE-55	1.	1.0E-7	0.	0.	2.57E-1	0.	3.19E-4
FE-55	6000.	50.	6000.	6000.	.0025		
FE-55	0.20	0.25	4.0E-3	1.0E-3	2.5E-4	1.3E-4	2.0E-2
NI-59	1.	1.0E-7	0.	0.	8.66E-6	0.	2.00E-5
NI-59	150.	50.	150.	150.	.0025		
NI-59	0.20	0.25	6.0E-2	6.0E-2	1.0E-3	6.7E-3	6.0E-3
CO-60	1.	1.0E-7	0.	0.	1.32E-1	100.	5.44E-4
CO-60	55.	50.	55.	55.	.0025		
CO-60	0.20	0.25	2.0E-2	7.0E-3	2.0E-3	1.0E-3	2.0E-2
NI-63	1.	1.0E-7	0.	0.	7.53E-3	0.	4.98E-5
NI-63	150.	50.	150.	150.	.0025		
NI-63	0.20	0.25	6.0E-2	6.0E-2	1.0E-3	6.7E-3	6.0E-3
SR-90	1.	1.0E-7	0.	0.	2.42E-2	0.	4.75E-4
SR-90	150.	30.	150.	20.	.0025		
SR-90	0.20	0.25	2.5E+0	2.5E-1	1.5E-3	1.4E-2	3.0E-4
NB-94	1.	1.0E-7	0.	0.	3.47E-5	0.	5.21E-2
NB-94	350.	70.	350.	350.	.0025		
NB-94	0.20	0.25	2.0E-2	5.0E-3	2.0E-2	2.5E-3	2.5E-1
TC-99	1.	1.0E-7	0.	0.	3.25E-6	0.	2.15E-4
TC-99	0.5	0.5	0.5	0.5	.01		
TC-99	0.20	0.25	9.5E+0	1.5E+0	1.0E-2	2.5E-2	8.5E-3
RU-106	1.	1.0E-7	0.	0.	6.89E-1	0.	1.01E-3
RU-106	220.	70.	220.	220.	.01		
RU-106	0.20	0.25	7.5E-2	2.0E-2	6.0E-7	1.3E-4	2.0E-3
SB-125	1.	1.0E-7	0.	0.	2.50E-1	0.	2.86E-7
SB-125	45.	45.	45.	45.	.0025		
SB-125	0.20	0.25	2.0E-1	3.0E-2	1.0E-4	1.5E-3	1.0E-3
I-129	1.	1.0E-7	0.	0.	4.08E-8	0.	9.08E-3
I-129	3.	3.	3.	3.	.01		

TABLE C-4
(Continued)

I-129	0.20	0.25	1.5E-1	5.0E-2	1.0E-2	3.0E-1	7.0E-3
CS-134	1.	1.0E-7	0.	0.	3.36E-1	300.	6.03E-2
CS-134	100.	100.	1000.	500.	.0025		
CS-134	0.20	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
CS-135	1.	1.0E-7	0.	0.	2.3E-7	0.	5.93E-3
CS-135	100.	100.	1000.	500.	.0025		
CS-135	0.2	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
CS-137	1.	1.0E-7	0.	0.	2.31E-2	300.	4.04E-2
CS-137	100.	100.	1000.	500.	.0025		
CS-137	0.20	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
BA-137M	1.	1.0E-7	0.	0.	2.31E-2	300.	0.00E-0
BA-137M	100.	100.	1000.	500.	.0025		
BA-137M	0.20	0.25	8.0E-2	3.0E-2	7.0E-3	3.0E-1	2.0E-2
EU-154	1.	1.0E-7	0.	0.	8.15E-2	0.	9.33E-5
EU-154	4000.	2000.	4000.	4000.	.0025		
EU-154	0.20	0.25	1.0E-2	4.0E-3	2.0E-5	2.0E-5	5.0E-3
TL-208	1.	1.0E-7	0.	0.	4.92E-11	0.	7.67E-4
TL-208	60000.	60000.	60000.	60000.	.0025		
TL-208	2.0E-1	2.5E-1	4.5E-2	9.0E-3	2.0E-3		4.0E-2
PO-210	1.	1.0E-7	0.	0.	4.33E-04	0.	1.03E-1
PO-210	220.	220.	220.	220.	.0025		
PO-210	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
PB-210	1.	1.0E-7			4.33E-04		1.80E-1
PB-210	220.	220.	220.	220.	.0025		
PB-210	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
PB-212	1.	1.0E-7			4.92E-11		1.73E-3
PB-212	60000.	60000.	60000.	60000.	.0025		
PB-212	2.0E-1	2.5E-1	4.5E-2	9.0E-3	2.0E-3		4.0E-2
BI-214	1.	1.0E-7			4.33E-04		1.89E-5
BI-214	220.	220.	220.	220.	.0025		
BI-214	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
PB-214	1.	1.0E-7			4.33E-04		3.59E-5
PB-214	220.	220.	220.	220.	.0025		
PB-214	2.0E-1	2.5E-1	4.5E-2	9.0E-3	5.0E-4		4.0E-4
RA-226	1.	1.0E-7	0.	0.	4.33E-4	0.	3.24E-2
RA-226	220.	220.	220.	220.	.0025		

TABLE C-4
(Continued)

RA-226	0.20	0.25	1.5E-2	1.5E-3	4.5E-4	5.0E-6	2.5E-4
TH-228	1.	1.0E-7			4.92E-11		3.90E-3
TH-228	60000.	60000.	60000.	60000.	.0025		
TH-228	2.0E-1	2.5E-1	8.5E-4	8.5E-5	5.0E-6		6.0E-6
AC-228	1.	1.0E-7			4.92E-11		2.28E-4
AC-228	220.	220.	220.	220.	.0025		
AC-228	2.0E-1	2.5E-1	3.5E-3	3.5E-4	2.0E-5		2.5E-5
RA-228	1.	1.0E-7			4.92E-11		2.28E-2
RA-228	220.	220.	220.	220.	.0025		
RA-228	2.0E-1	2.5E-1	1.5E-2	1.5E-3	4.5E-4		2.5E-4
TH-232	1.	1.0E-7			4.92E-11		7.35E-3
TH-232	60000.	60000.	60000.	60000.	.0025		
TH-232	2.0E-1	2.5E-1	8.5E-4	8.5E-5	5.0E-6		6.0E-6
U-234	1.	1.0E-7	0.	0.	1.55E-10	0.	3.05E-4
U-234	750.	750.	750.	750.	.0025		
U-234	0.20	0.25	8.5E-3	4.0E-3	6.0E-4	5.0E-4	2.0E-4
U-235	1.	1.0E-7	0.	0.	9.85E-10	0.	3.51E-4
U-235	750.	750.	750.	750.	.0025		
U-235	0.20	0.25	8.5E-3	4.0E-3	6.0E-4	5.0E-4	2.0E-4
NP-237	1.	1.0E-7	0.	0.	3.3E-7	0.	2.68E-1
NP-237	5.	5.	5.	5.	.0025		
NP-237	0.20	0.25	1.0E-1	1.0E-2	5.0E-6	5.0E-6	5.5E-5
U-238	1.	1.0E-7	0.	0.	1.55E-10	0.	3.04E-4
U-238	750.	750.	750.	750.	.0025		
U-238	0.20	0.25	8.5E-3	4.0E-3	6.0E-4	5.0E-4	2.0E-4
PU-238	1.	1.0E-7	0.	0.	7.90E-3	0.	5.94E-2
PU-238	3500.	700.	3500.	3500.	.0025		
PU-238	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
PU-239	1.	1.0E-7	0.	0.	2.87E-5	0.	6.54E-3
PU-239	3500.	700.	3500.	3500.	.0025		
PU-239	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
PU-241	1.	1.0E-7	0.	0.	5.25E-2	0.	1.08E-3
PU-241	3500.	700.	3500.	3500.	.0025		
PU-241	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
AM-241	1.	1.0E-7	0.	0.	1.51E-3	0.	1.01E-1
AM-241	8.00E+4	80.	8.00E+4	8.00E+4	.0025		

TABLE C-4
(Continued)

AM-241	0.20	0.25	5.5E-3	2.5E-4	4.0E-7	0.	3.5E-6
PU-242	1.	1.0E-7	0.	0.	1.83E-6	0.	6.21E-3
PU-242	3500.	700.	3500.	3500.	.0025		
PU-242	0.20	0.25	4.5E-4	4.5E-5	1.0E-7	1.5E-6	5.0E-7
AM-243	1.	1.0E-7	0.	0.	9.4E-5	0.	1.00E-1
AM-243	8.00E+4	80.	8.00E+4	8.00E+4	.0025		
AM-243	0.20	0.25	5.5E-3	2.5E-4	4.0E-7	0.	3.5E-6
CM-243	1.	1.0E-7	0.	0.	2.17E-2	0.	5.54E-2
CM-243	3300.	700.	3300.	3300.	.0025		
CM-243	0.20	0.25	8.5E-4	1.5E-5	2.0E-5	0.	3.5E-6
CM-244	1.	1.0E-7	0.	0.	3.94E-2	0.	4.63E-2
CM-244	3300.	700.	3300.	3300.	.0025		
CM-244	0.20	0.25	8.5E-4	1.5E-5	2.0E-5	0.	3.5E-6

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1                    PRESTO - A MODEL FOR PREDICTING THE MIGRATION OF RADIOACTIVE WASTES
                                FROM SHALLOW TRENCH BURIAL SITES
0
                 SOUTHEAST-----PRODUCTION RUN SECSAW


     *** CONTROL INFORMATION ***
0         THE BURIAL SITE IS LOCATED AT  SOUTHEAST
          THE SIMULATION WILL RUN FOR 1000 YEARS AND WILL INCLUDE 40 NUCLIDES
          LEACHING OPTION NUMBER 2 WILL BE USED
          IN YEAR 100 , .00 OF THE CAP WILL BE ASSUMED TO FAIL
               THIS WILL CONTINUE UNTIL  .20 HAS FAILED IN YEAR  300
          CAP MAY ALSO FAIL BY SURFACE EROSION
          LENGTH OF VERTICAL SATURATED ZONE WILL BE CALCULATED USING INFILTRATION AND POROSITY
          POPULATION INDICATOR IS  1
               GENERAL POPULATION EXPOSURE WILL BE USED TO CALCULATE HEALTH EFFECTS
            .000 OF IRRIGATION WATER WILL BE GOTTEN FROM WELL
            .500 OF DRINKING WATER FOR ANIMALS WILL BE GOTTEN FROM WELL
           1.000 OF DRINKING WATER FOR HUMANS WILL BE GOTTEN FROM WELL
            .000 OF IRRIGATION WATER WILL BE GOTTEN FROM STREAM
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TABLE C-4
(Continued)

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      .000 OF DRINKING WATER FOR ANIMALS WILL BE GOTTEN FROM STREAM
      .000 OF DRINKING WATER FOR HUMANS WILL BE GOTTEN FROM STREAM
1   *** TRENCH INFORMATION ***

     THE TRENCH HAS AN AREA OF   .4000E+00 SQUARE METERS AND A DEPTH OF   .7000E+01 METERS
     TRENCH POROSITY IS      .39
     ANNUAL INFILTRATION FOR THE WATERSHED IS  .4300 METERS

    *** AQUIFER INFORMATION ***

     THE GROUND WATER HAS A VELOCITY OF     27.800 METERS PER YEAR
     TRENCH TO AQUIFER DISTANCE IS   14.6 METERS
     TRENCH TO WELL DISTANCE IS   457.00 METERS
     WELL TO STREAM DISTANCE IS  457.00METERS
     THE AQUIFER THICKNESS IS    30.50 METERS
     THE AQUIFER DISPERSION ANGLE IS    .3000 RADIANS
     POROSITY OF THE AQUIFER REGION IS   .39000
     POROSITY BENEATH THE TRENCH IS   .35000
     PERMEABILITY BENEATH THE TRENCH IS    2.200 METERS/YEAR

1   *** ATMOSPHERIC INFORMATION ***

     SOURCE HEIGHT IS    1.0 METERS
     VELOCITY OF GRAVITATION FALL IS    .010 METERS/SECOND
     WIND VELOCITY IS   2.01 METERS/SECOND
     DEPOSITION VELOCITY IS    .010 METERS/SECOND
     GAUGE DISTANCE FROM SOURCE IS   480.00 METERS
     LID HEIGHT IS   300.00 METERS
     HOSKER ROUGHNESS FACTOR IS    .010
     TYPE OF STABILITY FORMULATION IS  1
     STABILITY CLASS IS  4
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TABLE C-4
(Continued)

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FRACTION OF TIME WIND BLOWS TOWARD POPULATION IS   .445800
NORMALIZED DOWN WIND ATMOSPHERIC EXPOSURE PER UNIT SOURCE AREA IS  3.8560E-05 CI/M**3 PER CI/SEC
RESUSPENSION FACTOR PARAMETERS        .1000E-05      -.1500E+00       .1000E-10
FROM YEAR    0 TO YEAR    0 THE RESUSPENSION RATE DUE TO MECHANICAL DISTURBANCES WILL BE  0.0000E+00
     THIS WILL OCCUR DURING  0.00 OF EACH YEAR
DUST LOADING FOR ON-SITE RECLAIMER WILL BE  0.0000E+00
     THIS WILL OCCUR DURING   .000 OF THE YEAR


*** SURFACE INFORMATION ***


PARAMETERS FOR UNIVERSAL LOSS EQUATION
     RAINFALL          250.00
     ERODIBILITY          .23
     STEEPNESS-SLOPE      .27
     COVER                .30
     EROSION CONTROL      .30
     DELIVERY RATIO      1.00
SOIL POROSITY IS   .39000
SOIL BULK DENSITY IS  1.60000 G/CC
RUNOFF FRACTION IS   .29000

          STREAM FLOW RATE IS  3.5700E+05 CUBIC METERS PER YEAR
CROSS SLOPE EXTENT OF SPILLAGE IS      .63 METERS
ACTIVE SOIL DEPTH IS      .10 METERS
AVERAGE DOWN SLOPE DISTANCE TO STREAM IS   460.00 METERS
*** AIR-FOODCHAIN INFORMATION ***

AGRICULTURAL PRODUCTIVITY FOR GRASS       .67 KG/M**2
AGRICULTURAL PRODUCTIVITY FOR VEGETATION       .65 KG/M**2
SURFACE DENSITY FOR SOIL     240.00 KG/M**2
WEATHER DECAY CONSTANT     .0021 1/HOURS
PERIOD PASTURE GRASS EXPOSURE GROWING SEASON    720.00 HOURS
PERIOD CROP/VEGETATION EXPOSURE GROWING SEASON   1440.00 HOURS
PERIOD BETWEEN HARVEST PASTURE GRASS AND INGESTION BY ANIMAL       .00 HOURS
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TABLE C-4
(Continued)

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     PERIOD BETWEEN STORED FEED AND INGESTION BY ANIMAL   2160.00 HOURS
     PERIOD BETWEEN HARVEST LEAFY VEGETABLES AND INGESTION BY MAN(M.I.E.)     24.00 HOURS
     PERIOD BETWEEN HARVEST PRODUCE AND INGESTION BY MAN(M.I.E.)   1440.00 HOURS
     PERIOD BETWEEN HARVEST LEAFY VEG AND INGESTION BY MAN(G.P.E.)    336.00 HOURS
     PERIOD BETWEEN HARVEST PRODUCE AND INGESTION BY MAN(G.P.E.)    336.00 HOURS
     FRACTION OF YEAR ANIMALS GRAZE ON PASTURE      1.00
     FRACTION OF DAILY FEED THAT IS FRESH GRASS       .83
     AMOUNT OF FEED CONSUMED BY CATTLE     50.00 KG
     AMOUNT OF FEED CONSUMED BY GOATS      6.00 KG
     TRANSPORT TIME FEED-MILL-RECEPTOR FOR M.I.E.     48.00 HOURS
     TRANSPORT TIME FEED-MILL-RECEPTOR FOR G.P.E.     96.00 HOURS
     TIME FROM SLAUGHTER OF MEAT TO CONSUMPTION    480.00 HOURS
     ABSOLUTE HUMIDITY OF THE ATMOSPHERE      9.90 G/M**3
     FRACTIONAL EQUILIBRIUM RATIO FOR C-14      1.00
1  *** WATER-FOODCHAIN INFORMATION ***


     FRACTION OF YEAR CROPS ARE IRRIGATED       .40
     IRRIGATION RATE       .015 L/(M**2-H)
     AMOUNT OF WATER CONSUMED BY COWS      60.00 L/D
     AMOUNT OF WATER CONSUMED BY GOATS       8.00 L/D
     AMOUNT OF WATER CONSUMED BY BEEF CATTLE      50.00 L/D


   *** HUMAN INGESTION AND INHALATION RATE INFORMATION ***

     ANNUAL INTAKE OF LEAFY VEG    14.00 KILOGRAMS PER YEAR
     ANNUAL INTAKE OF PRODUCE    88.50 KILOGRAMS PER YEAR
     ANNUAL INTAKE OF COW'S MILK    89.40 LITERS PER YEAR
     ANNUAL INTAKE OF GOAT'S MILK     .00 LITERS PER YEAR
     ANNUAL INTAKE OF MEAT    62.80 KILOGRAMS PER YEAR
     ANNUAL INTAKE OF DRINKING WATER  481.90 LITERS PER YEAR
     ANNUAL INHALATION RATE OF AIR  8035.00 CUBIC METERS PER YEAR
     A POPULATION OF        25. WILL BE CONSIDERED
1  *** NUCLIDE INFORMATION ***
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TABLE C-4
(Continued)

INFORMATION ON INDIVIDUAL NUCLIDES

NUCLIDE	AMT IN TRENCH CI	SPILLAGE CI	STREAM AMT CI	AIR CONCEN CI/M**3	DECAY CONST 1/Y	SOLUBILITY CONST G/ML	DECAY CORRECTION FACTOR
H-3	6.1680E-01	6.1680E-08	0.0000E+00	0.0000E+00	5.6400E-02	0.0000E+00	6.1680E-01
C-14	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	1.2100E-04	0.0000E+00	1.0000E+00
FE-55	2.2054E-01	2.2054E-08	0.0000E+00	0.0000E+00	2.5700E-01	0.0000E+00	2.2054E-01
NI-59	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	8.6600E-06	0.0000E+00	1.0000E+00
CO-60	3.7603E-01	3.7603E-08	0.0000E+00	0.0000E+00	1.3200E-01	1.0000E+02	3.7603E-01
NI-63	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	7.5300E-03	0.0000E+00	1.0000E+00
SR-90	8.0241E-01	8.0241E-08	0.0000E+00	0.0000E+00	2.4200E-02	0.0000E+00	8.0241E-01
NB-94	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	3.4700E-05	0.0000E+00	1.0000E+00
TC-99	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	3.2500E-06	0.0000E+00	1.0000E+00
RU-106	1.0445E-01	1.0445E-08	0.0000E+00	0.0000E+00	6.8900E-01	0.0000E+00	1.0445E-01
SB-125	2.2569E-01	2.2569E-08	0.0000E+00	0.0000E+00	2.5000E-01	0.0000E+00	2.2569E-01
I-129	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.0800E-08	0.0000E+00	1.0000E+00
CS-134	1.7665E-01	1.7665E-08	0.0000E+00	0.0000E+00	3.3600E-01	3.0000E+02	1.7665E-01
CS-135	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	2.3000E-07	0.0000E+00	1.0000E+00
CS-137	8.1014E-01	8.1014E-08	0.0000E+00	0.0000E+00	2.3100E-02	3.0000E+02	8.1014E-01
BA-137M	8.1014E-01	8.1014E-08	0.0000E+00	0.0000E+00	2.3100E-02	3.0000E+02	8.1014E-01
EU-154	5.1395E-01	5.1395E-08	0.0000E+00	0.0000E+00	8.1500E-02	0.0000E+00	5.1395E-01
TL-208	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.9200E-11	0.0000E+00	1.0000E+00
PO-210	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.3300E-04	0.0000E+00	1.0000E+00
PB-210	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.3300E-04	0.0000E+00	1.0000E+00
PB-212	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.9200E-11	0.0000E+00	1.0000E+00
BI-214	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.3300E-04	0.0000E+00	1.0000E+00
PB-214	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.3300E-04	0.0000E+00	1.0000E+00
RA-226	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.3300E-04	0.0000E+00	1.0000E+00
TH-228	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.9200E-11	0.0000E+00	1.0000E+00
AC-228	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.9200E-11	0.0000E+00	1.0000E+00
RA-228	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.9200E-11	0.0000E+00	1.0000E+00
TH-232	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	4.9200E-11	0.0000E+00	1.0000E+00
U-234	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	1.5500E-10	0.0000E+00	1.0000E+00
U-235	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	9.8500E-10	0.0000E+00	1.0000E+00
NP-237	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	3.3000E-07	0.0000E+00	1.0000E+00
U-238	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	1.5500E-10	0.0000E+00	1.0000E+00

TABLE C-4
(Continued)

PU-238	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	7.9000E-03	0.0000E+00	1.0000E+00
PU-239	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	2.8700E-05	0.0000E+00	1.0000E+00
PU-241	6.3565E-01	6.3565E-08	0.0000E+00	0.0000E+00	5.2500E-02	0.0000E+00	6.3565E-01
AM-241	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	1.5100E-03	0.0000E+00	1.0000E+00
PU-242	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	1.8300E-06	0.0000E+00	1.0000E+00
AM-243	1.0000E+00	1.0000E-07	0.0000E+00	0.0000E+00	9.4000E-05	0.0000E+00	1.0000E+00
CM-243	8.2013E-01	8.2013E-08	0.0000E+00	0.0000E+00	2.1700E-02	0.0000E+00	8.2013E-01
CM-244	7.0575E-01	7.0575E-08	0.0000E+00	0.0000E+00	3.9400E-02	0.0000E+00	7.0575E-01

DISTRIBUTION COEFFICIENTS ML/G

NUCLIDE	SURFACE	TRENCH	VERTICAL	AQUIFER
H-3	1.00E-02	1.00E-02	1.00E-02	1.00E-02
C-14	1.00E-02	1.00E-02	1.00E-02	1.00E-02
FE-55	6.00E+03	5.00E+01	6.00E+03	6.00E+03
NI-59	1.50E+02	5.00E+01	1.50E+02	1.50E+02
CO-60	5.50E+01	5.00E+01	5.50E+01	5.50E+01
NI-63	1.50E+02	5.00E+01	1.50E+02	1.50E+02
SR-90	1.50E+02	3.00E+01	1.50E+02	2.00E+01
NB-94	3.50E+02	7.00E+01	3.50E+02	3.50E+02
TC-99	5.00E-01	5.00E-01	5.00E-01	5.00E-01
RU-106	2.20E+02	7.00E+01	2.20E+02	2.20E+02
SB-125	4.50E+01	4.50E+01	4.50E+01	4.50E+01
I-129	3.00E+00	3.00E+00	3.00E+00	3.00E+00
CS-134	1.00E+02	1.00E+02	1.00E+03	5.00E+02
CS-135	1.00E+02	1.00E+02	1.00E+03	5.00E+02
CS-137	1.00E+02	1.00E+02	1.00E+03	5.00E+02
BA-137M	1.00E+02	1.00E+02	1.00E+03	5.00E+02
EU-154	4.00E+03	2.00E+03	4.00E+03	4.00E+03
TL-208	6.00E+04	6.00E+04	6.00E+04	6.00E+04
PO-210	2.20E+02	2.20E+02	2.20E+02	2.20E+02
PB-210	2.20E+02	2.20E+02	2.20E+02	2.20E+02

TABLE C-4
(Continued)

PB-212	6.00E+04	6.00E+04	6.00E+04	6.00E+04
BI-214	2.20E+02	2.20E+02	2.20E+02	2.20E+02
PB-214	2.20E+02	2.20E+02	2.20E+02	2.20E+02
RA-226	2.20E+02	2.20E+02	2.20E+02	2.20E+02
TH-228	6.00E+04	6.00E+04	6.00E+04	6.00E+04
AC-228	2.20E+02	2.20E+02	2.20E+02	2.20E+02
RA-228	2.20E+02	2.20E+02	2.20E+02	2.20E+02
TH-232	6.00E+04	6.00E+04	6.00E+04	6.00E+04
U-234	7.50E+02	7.50E+02	7.50E+02	7.50E+02
U-235	7.50E+02	7.50E+02	7.50E+02	7.50E+02
NP-237	5.00E+00	5.00E+00	5.00E+00	5.00E+00
U-238	7.50E+02	7.50E+02	7.50E+02	7.50E+02
PU-238	3.50E+03	7.00E+02	3.50E+03	3.50E+03
PU-239	3.50E+03	7.00E+02	3.50E+03	3.50E+03
PU-241	3.50E+03	7.00E+02	3.50E+03	3.50E+03
AM-241	8.00E+04	8.00E+01	8.00E+04	8.00E+04
PU-242	3.50E+03	7.00E+02	3.50E+03	3.50E+03
AM-243	8.00E+04	8.00E+01	8.00E+04	8.00E+04
CM-243	3.30E+03	7.00E+02	3.30E+03	3.30E+03
CM-244	3.30E+03	7.00E+02	3.30E+03	3.30E+03

NUCLIDE	RETENTION IN AIR	RETENTION IN WATER	TRANS COEFF SOIL-V CROP D/KG	TRANS COEFF SOIL-R CROP D/KG	TRANS COEFF VEG-COW MILK D/L	TRANS COEFF VEG-GOAT MILK D/L	TRANS COEFF VEG-MEAT D/KG
H-3	2.00E-01	2.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
C-14	2.00E-01	2.50E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FE-55	2.00E-01	2.50E-01	4.00E-03	1.00E-03	2.50E-04	1.30E-04	2.00E-02
NI-59	2.00E-01	2.50E-01	6.00E-02	6.00E-02	1.00E-03	6.70E-03	6.00E-03
CO-60	2.00E-01	2.50E-01	2.00E-02	7.00E-03	2.00E-03	1.00E-03	2.00E-02
NI-63	2.00E-01	2.50E-01	6.00E-02	6.00E-02	1.00E-03	6.70E-03	6.00E-03
SR-90	2.00E-01	2.50E-01	2.50E+00	2.50E-01	1.50E-03	1.40E-02	3.00E-04
NB-94	2.00E-01	2.50E-01	2.00E-02	5.00E-03	2.00E-02	2.50E-03	2.50E-01
TC-99	2.00E-01	2.50E-01	9.50E+00	1.50E+00	1.00E-02	2.50E-02	8.50E-03
RU-106	2.00E-01	2.50E-01	7.50E-02	2.00E-02	6.00E-07	1.30E-04	2.00E-03

TABLE C-4
(Continued)

SB-125	2.00E-01	2.50E-01	2.00E-01	3.00E-02	1.00E-04	1.50E-03	1.00E-03
I-129	2.00E-01	2.50E-01	1.50E-01	5.00E-02	1.00E-02	3.00E-01	7.00E-03
CS-134	2.00E-01	2.50E-01	8.00E-02	3.00E-02	7.00E-03	3.00E-01	2.00E-02
CS-135	2.00E-01	2.50E-01	8.00E-02	3.00E-02	7.00E-03	3.00E-01	2.00E-02
CS-137	2.00E-01	2.50E-01	8.00E-02	3.00E-02	7.00E-03	3.00E-01	2.00E-02
BA-137M	2.00E-01	2.50E-01	8.00E-02	3.00E-02	7.00E-03	3.00E-01	2.00E-02
EU-154	2.00E-01	2.50E-01	1.00E-02	4.00E-03	2.00E-05	2.00E-05	5.00E-03
TL-208	2.00E-01	2.50E-01	4.50E-02	9.00E-03	2.00E-03	0.00E+00	4.00E-02
PO-210	2.00E-01	2.50E-01	4.50E-02	9.00E-03	5.00E-04	0.00E+00	4.00E-04
PB-210	2.00E-01	2.50E-01	4.50E-02	9.00E-03	5.00E-04	0.00E+00	4.00E-04
PB-212	2.00E-01	2.50E-01	4.50E-02	9.00E-03	2.00E-03	0.00E+00	4.00E-02
BI-214	2.00E-01	2.50E-01	4.50E-02	9.00E-03	5.00E-04	0.00E+00	4.00E-04
PB-214	2.00E-01	2.50E-01	4.50E-02	9.00E-03	5.00E-04	0.00E+00	4.00E-04
RA-226	2.00E-01	2.50E-01	1.50E-02	1.50E-03	4.50E-04	5.00E-06	2.50E-04
TH-228	2.00E-01	2.50E-01	8.50E-04	8.50E-05	5.00E-06	0.00E+00	6.00E-06
AC-228	2.00E-01	2.50E-01	3.50E-03	3.50E-04	2.00E-05	0.00E+00	2.50E-05
RA-228	2.00E-01	2.50E-01	1.50E-02	1.50E-03	4.50E-04	0.00E+00	2.50E-04
TH-232	2.00E-01	2.50E-01	8.50E-04	8.50E-05	5.00E-06	0.00E+00	6.00E-06
U-234	2.00E-01	2.50E-01	8.50E-03	4.00E-03	6.00E-04	5.00E-04	2.00E-04
U-235	2.00E-01	2.50E-01	8.50E-03	4.00E-03	6.00E-04	5.00E-04	2.00E-04
NP-237	2.00E-01	2.50E-01	1.00E-01	1.00E-02	5.00E-06	5.00E-06	5.50E-05
U-238	2.00E-01	2.50E-01	8.50E-03	4.00E-03	6.00E-04	5.00E-04	2.00E-04
PU-238	2.00E-01	2.50E-01	4.50E-04	4.50E-05	1.00E-07	1.50E-06	5.00E-07
PU-239	2.00E-01	2.50E-01	4.50E-04	4.50E-05	1.00E-07	1.50E-06	5.00E-07
PU-241	2.00E-01	2.50E-01	4.50E-04	4.50E-05	1.00E-07	1.50E-06	5.00E-07
AM-241	2.00E-01	2.50E-01	5.50E-03	2.50E-04	4.00E-07	0.00E+00	3.50E-06
PU-242	2.00E-01	2.50E-01	4.50E-04	4.50E-05	1.00E-07	1.50E-06	5.00E-07
AM-243	2.00E-01	2.50E-01	5.50E-03	2.50E-04	4.00E-07	0.00E+00	3.50E-06
CM-243	2.00E-01	2.50E-01	8.50E-04	1.50E-05	2.00E-05	0.00E+00	3.50E-06
CM-244	2.00E-01	2.50E-01	8.50E-04	1.50E-05	2.00E-05	0.00E+00	3.50E-06

1 INITIAL CALCULATIONS

NUCLIDE	MASS
H-3	3.
C-14	14.

TABLE C-4
(Continued)

FE-55	55.
NI-59	59.
CO-60	60.
NI-63	63.
SR-90	90.
NB-94	94.
TC-99	99.
RU-106	106.
SB-125	125.
I-129	129.
CS-134	134.
CS-135	135.
CS-137	137.
BA-137M	137.
EU-154	154.
TL-208	208.
PO-210	210.
PB-210	210.
PB-212	212.
BI-214	214.
PB-214	214.
RA-226	226.
TH-228	228.
AC-228	228.
RA-228	228.
TH-232	232.
U-234	234.
U-235	235.
NP-237	237.
U-238	238.
PU-238	238.
PU-239	239.
PU-241	241.
AM-241	241.
PU-242	242.
AM-243	243.

TABLE C-4
(Continued)

CM-243 243.
CM-244 244.

OUTPUT FROM SUBROUTINE INFIL
****

INPUT DATA AS READ IN

30.500 .010 .020 .250 .240 1.200 .350E-03 .140E-05 .100 1.200
DAILY SUNSHINE BY MONTH (HOURS)
10.8 11.2 12.0 12.8 13.4 13.7 13.6 13.0 12.3 11.6 10.9 10.6

DAILY TEMPERATURES (DEGREES CELSIUS):

MONTH= DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	8.88	10.16	6.00	20.92	17.80	25.34	26.30	24.99	21.89	13.96	19.89	19.77
2	8.48	6.81	8.76	19.34	19.45	26.79	25.79	25.92	22.43	19.38	19.56	19.15
3	7.05	7.79	12.65	20.61	20.04	25.34	27.73	25.28	22.71	20.17	19.56	19.73
4	15.27	13.93	14.35	16.68	20.37	23.45	28.48	26.23	18.00	18.79	19.56	19.23
5	6.13	12.14	17.74	11.78	11.90	25.40	25.39	23.77	16.67	20.95	19.56	20.96
6	8.84	13.12	16.25	12.02	20.78	24.17	22.78	23.78	15.04	22.37	19.56	13.86
7	15.54	6.94	10.90	8.20	20.90	23.86	18.01	25.78	15.87	22.63	19.56	11.56
8	15.54	9.23	4.41	8.60	21.38	26.07	12.58	25.85	16.54	21.47	19.56	11.70

TABLE C-4
(Continued)

9	15.54	13.06	7.93	12.57	20.27	27.60	21.33	25.12	18.09	22.77	19.56	13.60
10	15.54	8.44	13.33	11.21	20.66	25.60	24.66	25.61	19.68	21.45	19.56	8.13
11	15.54	8.13	17.32	12.79	21.81	24.10	25.09	24.93	21.19	17.03	19.56	9.71
12	15.54	4.59	18.87	15.35	22.07	23.99	25.93	24.71	21.44	19.06	19.56	7.16
13	15.54	7.46	21.13	17.93	15.08	23.10	23.91	24.22	24.27	19.10	19.56	.08
14	15.54	8.97	19.19	20.56	25.52	23.70	24.89	25.27	24.12	15.71	19.56	4.30
15	15.54	14.71	19.25	20.36	25.06	26.20	24.26	24.69	25.82	12.18	19.56	13.68
16	15.54	19.33	12.33	20.93	24.61	26.46	24.17	25.35	25.74	12.97	19.56	13.17
17	15.54	16.27	17.60	21.36	23.36	21.95	24.74	24.29	25.48	10.93	19.56	4.78
18	8.78	8.03	17.04	16.86	22.95	22.49	25.83	22.87	24.45	12.78	19.56	1.99
19	12.54	10.02	20.02	14.26	21.02	25.70	25.59	24.17	23.35	17.31	19.56	2.85
20	16.73	11.90	23.06	19.05	22.92	26.07	26.55	25.24	21.76	18.55	15.42	6.18
21	15.27	14.61	23.56	20.29	23.55	26.62	27.56	26.62	21.76	18.82	17.86	5.16
22	6.46	8.04	17.91	16.27	24.74	24.69	27.67	25.99	21.76	13.71	16.34	4.64
23	8.41	10.49	15.05	11.65	23.82	24.88	24.88	27.02	21.76	10.64	16.61	8.33
24	5.96	16.75	13.29	13.41	23.58	23.50	25.21	27.62	21.76	8.38	16.83	14.85
25	7.04	12.71	16.55	16.35	24.17	24.63	26.21	25.31	21.76	9.97	9.64	17.31
26	2.14	1.94	13.24	20.59	24.16	24.98	28.02	18.80	21.76	13.11	12.35	15.14

TABLE C-4
(Continued)

27	-1.54	2.03	6.57	18.13	23.39	24.05	29.36	20.31	21.76	11.43	15.29	16.79
28	5.18	3.65	6.58	17.02	25.76	25.13	27.35	25.31	21.76	12.19	13.85	18.56
29	7.55	.00	11.19	15.51	27.44	25.97	24.49	20.37	21.76	12.27	19.11	13.72
30	11.00	.00	16.00	15.75	23.84	27.27	25.53	20.49	20.81	14.62	15.48	7.34
31	16.16	.00	16.25	.00	24.13	.00	24.50	20.24	.00	17.46	.00	5.07

MONTH,DAY,& RAINFALL AS READ IN (0.1MM/HR):

1	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	3	0.	0.	0.	0.	23.	0.	23.	23.	70.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	4	0.	0.	0.	0.	23.	47.	23.	23.	47.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	13	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.
1	14	23.	23.	23.	23.	0.	0.	23.	0.	0.	0.	47.	23.	23.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.
1	19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.
1	20	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
1	23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	47.	47.	0.	0.	0.	0.	0.
1	31	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	23.	0.	0.	0.
2	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	2	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.
2	3	0.	0.	23.	0.	0.	0.	0.	47.	0.	0.	0.	47.	23.	23.	0.	23.	0.	0.	0.	0.	0.	0.	0.
2	9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.
2	12	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	93.	0.	47.	23.	0.	0.
2	16	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	23.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.
2	17	0.	23.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
2	27	0.	0.	23.	0.	0.	23.	0.	0.	0.	0.	0.	23.	0.	0.	0.	23.	0.	0.	0.	0.	23.	0.	0.
3	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	7	23.	0.	0.	0.	0.	0.	0.	0.	47.	0.	23.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
3	17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	23.	0.	0.	0.	0.	0.
3	24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TABLE C-4
(Continued)

4	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	70.	23.	0.	0.	0.	0.	0.	0.	0.
4	8	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	23.	0.	23.	47.	0.	23.	0.	0.	0.	0.
4	12	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	0.	0.	140.	0.	0.	0.	23.	0.
4	20	0.	0.	0.	0.	0.	0.	23.	93.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
4	25	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	70.	93.	93.	23.	23.	0.	0.	0.
4	26	0.	0.	0.	0.	23.	23.	47.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	350.	0.	0.	0.	0.
4	27	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.
5	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	70.	23.	0.	0.	23.	0.	23.
5	19	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
5	24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	117.	23.	0.	0.	0.	0.
5	27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	326.	186.	23.	0.	0.	0.
5	30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	3	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	0.	0.	0.	0.
6	12	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	163.	0.	0.	0.
6	13	0.	0.	0.	0.	0.	23.	0.	0.	93.	47.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	16	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	93.	0.	0.
6	17	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	23.	0.	0.	0.	0.	0.	0.	0.
6	22	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	47.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	26	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
6	27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	70.	0.	0.	0.	23.	0.	0.
6	28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	70.	0.	0.	0.	0.	0.	0.	0.	0.
7	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	4	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	5	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	7	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.
7	9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	117.	70.	23.	0.	0.	0.	0.	0.	0.	0.	0.
7	13	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	47.	210.	0.	0.	0.	0.	0.	0.	0.	0.
7	14	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	0.	0.	0.	0.
7	15	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	23.	0.	0.	0.	0.
7	16	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	70.	23.	0.	0.	0.	0.	0.	0.
7	19	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	280.	163.	0.	0.	0.	0.	0.

TABLE C-4
(Continued)

7	20	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	117.	0.	0.	0.
7	23	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	210.	23.	23.	0.	0.
7	24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.
7	27	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
7	29	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	5	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	419.	93.	0.	0.
8	6	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	7	23.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	8	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.
8	9	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
8	12	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.
8	18	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	93.	47.	23.	0.	0.	0.	23.	0.
9	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9	10	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.
9	18	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	140.	233.	0.	0.
9	19	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	0.	0.	0.	0.	0.	0.
9	21	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	0.	23.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.
9	26	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10	9	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.
10	10	23.	0.	0.	23.	23.	0.	23.	0.	0.	0.	0.	0.	23.	23.	23.	23.	23.	0.	0.	0.	0.	0.	0.
10	24	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	23.	0.	0.
10	25	0.	23.	0.	0.	0.	0.	0.	0.	0.	23.	0.	23.	70.	47.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10	26	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
10	27	0.	0.	0.	0.	47.	0.	0.	47.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	16	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	47.	0.
11	20	0.	0.	0.	0.	0.	0.	23.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
11	24	0.	0.	0.	0.	0.	23.	0.	0.	23.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.
11	30	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	0.	23.	0.	0.	0.	0.	23.	0.	0.	0.	0.
12	1	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	23.	70.	93.	0.	0.	23.
12	2	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12	6	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12	14	0.	0.	0.	0.	0.	0.	0.	0.	23.	23.	47.	47.	23.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.
12	15	0.	0.	0.	0.	0.	23.	23.	23.	93.	117.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.

TABLE C-4
(Continued)

12 18	0.	23.	23.	47.	0.	23.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12 24	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	23.	0.
12 25	0.	0.	0.	23.	47.	23.	23.	23.	0.	23.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12 27	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	23.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12 28	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	47.	163.	0.
12 29	0.	23.	47.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.	0.
12 31	0.	0.	0.	47.	23.	23.	47.	70.	47.	70.	47.	47.	70.	47.	47.	23.	0.	0.	0.	0.	0.	0.	0.	0.

TRENCH CHARACTERISTICS:

SNOWMELT COEFFICIENT = 3.05MM/DEG-DAY
THICKNESS OF TRENCH COVER = 1.20 M
TOTAL WIDTH OF TRENCH COVER = 30.50 M
AVERAGE SLOPE OF TRENCH COVER = .00 M/M
PERMEABLITY OF TRENCH CAP = .200E-01M/HR
POROSITY FOR PELLIC WATER = .24 (UNITLESS)
POROSITY FOR GRAVITY WATER = .25(UNITLESS)
EQUIVALENT UPWARD DIFFUSIVITY = .35E-03 M**2/HR
EQUIVALENT UPWARD HYDRAULIC CONDUCTIVITY = .14E-05 M/HR
TIME STEP FOR MODEL = 1.00 HOURS

YEAR= 1

**********CUMULATIVE ANNUAL VALUES (M)**********

PRECIP	EVAP	RUNOFF	INFIL
1.11E+00	8.99E-01	3.48E-02	1.48E-01

PELLICULAR DEFICIT	GRAVITY DEFICIT	SNOW
1.03E-03	1.20E+00	0.00E+00

TABLE C-4
(Continued)

CHANGE OF TOTAL ANNUAL INFILTRATION= 1.48E-01

YEAR= 2

**********CUMULATIVE ANNUAL VALUES (M)**********

PRECIP	EVAP	RUNOFF	INFIL
1.11E+00	8.99E-01	3.48E-02	1.72E-01

PELLICULAR DEFICIT	GRAVITY DEFICIT	SNOW
1.03E-03	1.20E+00	0.00E+00

CHANGE OF TOTAL ANNUAL INFILTRATION= 2.38E-02

YEAR= 3

**********CUMULATIVE ANNUAL VALUES (M)**********

TABLE C-4
(Continued)

PRECIP	EVAP	RUNOFF	INFIL
1.11E+00	8.99E-01	3.48E-02	1.72E-01

PELLICULAR DEFICIT	GRAVITY DEFICIT	SNOW
1.03E-03	1.20E+00	0.00E+00

CHANGE OF TOTAL ANNUAL INFILTRATION= 0.00E+00

DEGREE OF SATURATION = .789
RESIDUAL SATURATION = .486

1 INITIAL CALCULATIONS

NUCLIDE	VERTICAL RETARDATION	VERTICAL TIME Y	VERTICAL DDETA	HORIZONTAL RETARDATION	HORIZONTAL TIME Y	HORIZONTAL DDETA	DDETA	BREAK THRU TIME Y
H-3	1.0580E+00	1.6064E+01	1.0170E+00	1.0410E+00	1.7113E+01	1.0006E+00	1.0176E+00	3.3178E+01
C-14	1.0580E+00	1.6064E+01	1.0000E+00	1.0410E+00	1.7113E+01	1.0006E+00	1.0006E+00	3.3178E+01
FE-55	3.4773E+04	5.2800E+05	1.0000E+00	2.4616E+04	4.0467E+05	1.0000E+00	1.0000E+00	1.0001E+04
NI-59	8.7029E+02	1.3215E+04	1.0000E+00	6.1638E+02	1.0133E+04	1.0000E+00	1.0000E+00	1.0001E+04
CO-60	3.1974E+02	4.8551E+03	1.0000E+00	2.2664E+02	3.7257E+03	1.0000E+00	1.0000E+00	8.5808E+03
NI-63	8.7029E+02	1.3215E+04	1.0000E+00	6.1638E+02	1.0133E+04	1.0000E+00	1.0000E+00	1.0001E+04
SR-90	8.7029E+02	1.3215E+04	1.0000E+00	8.3051E+01	1.3653E+03	1.0000E+00	1.0000E+00	1.0001E+04
NB-94	2.0293E+03	3.0814E+04	1.0000E+00	1.4369E+03	2.3621E+04	1.0000E+00	1.0000E+00	1.0001E+04
TC-99	3.8976E+00	5.9183E+01	1.0000E+00	3.0513E+00	5.0160E+01	1.0002E+00	1.0002E+00	1.0934E+02
RU-106	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
SB-125	2.6179E+02	3.9751E+03	1.0000E+00	1.8562E+02	3.0513E+03	1.0000E+00	1.0000E+00	7.0264E+03
I-129	1.8386E+01	2.7918E+02	1.0000E+00	1.3308E+01	2.1876E+02	1.0000E+00	1.0000E+00	4.9794E+02
CS-134	5.7962E+03	8.8013E+04	1.0000E+00	2.0523E+03	3.3737E+04	1.0000E+00	1.0000E+00	1.0001E+04
CS-135	5.7962E+03	8.8013E+04	1.0000E+00	2.0523E+03	3.3737E+04	1.0000E+00	1.0000E+00	1.0001E+04

TABLE C-4
(Continued)

CS-137	5.7962E+03	8.8013E+04	1.0000E+00	2.0523E+03	3.3737E+04	1.0000E+00	1.0000E+00	1.0001E+04
BA-137M	5.7962E+03	8.8013E+04	1.0000E+00	2.0523E+03	3.3737E+04	1.0000E+00	1.0000E+00	1.0001E+04
EU-154	2.3182E+04	3.5201E+05	1.0000E+00	1.6411E+04	2.6978E+05	1.0000E+00	1.0000E+00	1.0001E+04
TL-208	3.4772E+05	5.2799E+06	1.0000E+00	2.4615E+05	4.0465E+06	1.0000E+00	1.0000E+00	1.0001E+04
PO-210	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
PB-210	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
PB-212	3.4772E+05	5.2799E+06	1.0000E+00	2.4615E+05	4.0465E+06	1.0000E+00	1.0000E+00	1.0001E+04
BI-214	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
PB-214	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
RA-226	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
TH-228	3.4772E+05	5.2799E+06	1.0000E+00	2.4615E+05	4.0465E+06	1.0000E+00	1.0000E+00	1.0001E+04
AC-228	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
RA-228	1.2760E+03	1.9375E+04	1.0000E+00	9.0356E+02	1.4854E+04	1.0000E+00	1.0000E+00	1.0001E+04
TH-232	3.4772E+05	5.2799E+06	1.0000E+00	2.4615E+05	4.0465E+06	1.0000E+00	1.0000E+00	1.0001E+04
U-234	4.3474E+03	6.6014E+04	1.0000E+00	3.0779E+03	5.0598E+04	1.0000E+00	1.0000E+00	1.0001E+04
U-235	4.3474E+03	6.6014E+04	1.0000E+00	3.0779E+03	5.0598E+04	1.0000E+00	1.0000E+00	1.0001E+04
NP-237	2.9976E+01	4.5517E+02	1.0000E+00	2.1513E+01	3.5365E+02	1.0001E+00	1.0001E+00	8.0882E+02
U-238	4.3474E+03	6.6014E+04	1.0000E+00	3.0779E+03	5.0598E+04	1.0000E+00	1.0000E+00	1.0001E+04
PU-238	2.0284E+04	3.0801E+05	1.0000E+00	1.4360E+04	2.3606E+05	1.0000E+00	1.0000E+00	1.0001E+04
PU-239	2.0284E+04	3.0801E+05	1.0000E+00	1.4360E+04	2.3606E+05	1.0000E+00	1.0000E+00	1.0001E+04
PU-241	2.0284E+04	3.0801E+05	1.0000E+00	1.4360E+04	2.3606E+05	1.0000E+00	1.0000E+00	1.0001E+04
AM-241	4.6362E+05	7.0398E+06	1.0000E+00	3.2821E+05	5.3953E+06	1.0000E+00	1.0000E+00	1.0001E+04
PU-242	2.0284E+04	3.0801E+05	1.0000E+00	1.4360E+04	2.3606E+05	1.0000E+00	1.0000E+00	1.0001E+04
AM-243	4.6362E+05	7.0398E+06	1.0000E+00	3.2821E+05	5.3953E+06	1.0000E+00	1.0000E+00	1.0001E+04
CM-243	1.9125E+04	2.9041E+05	1.0000E+00	1.3539E+04	2.2257E+05	1.0000E+00	1.0000E+00	1.0001E+04
CM-244	1.9125E+04	2.9041E+05	1.0000E+00	1.3539E+04	2.2257E+05	1.0000E+00	1.0000E+00	1.0001E+04

ANNUAL SOIL LOSS IS 3.1315E-01 KILOGRAMS PER SQUARE METER
OR 1.9572E-04 METERS IS REMOVED FROM THE SURFACE
ANNUAL INFILTRATION INTO TRENCH IS .1721 METERS
VERTICAL WATER VELOCITY IS .9615 METERS PER YEAR
NORMALIZED DOWN WIND ATMOSPHERIC EXPOSURE PER UNIT SOURCE RELEASE IS .3856E-04 CI/M**3 PER CI/SEC
1 ANNUAL SUMMARY FOR YEAR 1 OF THE SIMULATION

TABLE C-4
(Continued)

THE TRENCH CAP HAS HAD .00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 4.41E-02 METERS
6.8840E-02 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	5.8298E-01	0.0000E+00	0.0000E+00	0.0000E+00
C-14	9.9988E-01	0.0000E+00	0.0000E+00	0.0000E+00
FE-55	1.7056E-01	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.9999E-01	0.0000E+00	0.0000E+00	0.0000E+00
CO-60	3.2953E-01	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	9.9250E-01	0.0000E+00	0.0000E+00	0.0000E+00
SR-90	7.8323E-01	0.0000E+00	0.0000E+00	0.0000E+00
NB-94	9.9997E-01	0.0000E+00	0.0000E+00	0.0000E+00
TC-99	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
RU-106	5.2444E-02	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	1.7577E-01	0.0000E+00	0.0000E+00	0.0000E+00
I-129	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-134	1.2624E-01	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-137	7.9164E-01	0.0000E+00	0.0000E+00	0.0000E+00
BA-137M	7.9164E-01	0.0000E+00	0.0000E+00	0.0000E+00
EU-154	4.7373E-01	0.0000E+00	0.0000E+00	0.0000E+00
TL-208	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PO-210	9.9957E-01	0.0000E+00	0.0000E+00	0.0000E+00
PB-210	9.9957E-01	0.0000E+00	0.0000E+00	0.0000E+00
PB-212	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

BI-214	9.9957E-01	0.0000E+00	0.0000E+00	0.0000E+00
PB-214	9.9957E-01	0.0000E+00	0.0000E+00	0.0000E+00
RA-226	9.9957E-01	0.0000E+00	0.0000E+00	0.0000E+00
TH-228	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AC-228	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
RA-228	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TH-232	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U-234	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U-235	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NP-237	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U-238	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PU-238	9.9213E-01	0.0000E+00	0.0000E+00	0.0000E+00
PU-239	9.9997E-01	0.0000E+00	0.0000E+00	0.0000E+00
PU-241	6.0314E-01	0.0000E+00	0.0000E+00	0.0000E+00
AM-241	9.9849E-01	0.0000E+00	0.0000E+00	0.0000E+00
PU-242	1.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AM-243	9.9991E-01	0.0000E+00	0.0000E+00	0.0000E+00
CM-243	8.0252E-01	0.0000E+00	0.0000E+00	0.0000E+00
CM-244	6.7848E-01	0.0000E+00	0.0000E+00	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	2.4967E-15	2.5424E-10	2.3625E-08	3.1682E-08	6.7136E-20	1.1541E-24	0.0000E+00
C-14	4.2822E-15	4.3605E-10	4.0520E-08	5.4338E-08	1.1515E-19	1.9794E-24	0.0000E+00
FE-55	3.6093E-13	6.1256E-14	5.6922E-12	7.6333E-12	9.7054E-18	1.6684E-22	0.0000E+00
NI-59	2.0504E-12	1.3920E-11	1.2935E-09	1.7346E-09	5.5136E-17	9.4779E-22	0.0000E+00
CO-60	6.4045E-13	1.1858E-11	1.1019E-09	1.4776E-09	1.7222E-17	2.9604E-22	0.0000E+00
NI-63	2.0351E-12	1.3815E-11	1.2838E-09	1.7216E-09	5.4723E-17	9.4069E-22	0.0000E+00
SR-90	1.6060E-12	1.0902E-11	1.0131E-09	1.3586E-09	4.3184E-17	7.4234E-22	0.0000E+00
NB-94	2.0884E-12	6.0760E-12	5.6461E-10	7.5715E-10	5.6157E-17	9.6534E-22	0.0000E+00
TC-99	1.9483E-13	3.9678E-10	3.6871E-08	4.9445E-08	5.2389E-18	9.0057E-23	0.0000E+00
RU-106	1.0863E-13	5.0282E-13	4.6725E-11	6.2659E-11	2.9212E-18	5.0215E-23	0.0000E+00

TABLE C-4
(Continued)

SB-125	3.3547E-13	7.5912E-12	7.0542E-10	9.4597E-10	9.0207E-18	1.5507E-22	0.0000E+00
I-129	8.0069E-13	2.7178E-10	2.5255E-08	3.3868E-08	2.1531E-17	3.7011E-22	0.0000E+00
CS-134	2.5479E-13	2.5945E-12	2.4109E-10	3.2331E-10	6.8511E-18	1.1777E-22	0.0000E+00
CS-135	2.0183E-12	2.0552E-11	1.9098E-09	2.5611E-09	5.4272E-17	9.3294E-22	0.0000E+00
CS-137	1.5978E-12	1.6270E-11	1.5119E-09	2.0275E-09	4.2964E-17	7.3855E-22	0.0000E+00
BA-137M	1.5978E-12	1.6270E-11	1.5119E-09	2.0275E-09	4.2964E-17	7.3855E-22	0.0000E+00
EU-154	1.0021E-12	2.5510E-13	2.3706E-11	3.1789E-11	2.6946E-17	4.6320E-22	0.0000E+00
TL-208	2.1178E-12	3.5941E-14	3.3399E-12	4.4788E-12	5.6946E-17	9.7890E-22	0.0000E+00
PO-210	2.0706E-12	9.5838E-12	8.9057E-10	1.1943E-09	5.5677E-17	9.5709E-22	0.0000E+00
PB-210	2.0706E-12	9.5838E-12	8.9057E-10	1.1943E-09	5.5677E-17	9.5709E-22	0.0000E+00
PB-212	2.1178E-12	3.5941E-14	3.3399E-12	4.4788E-12	5.6946E-17	9.7890E-22	0.0000E+00
BI-214	2.0706E-12	9.5838E-12	8.9057E-10	1.1943E-09	5.5677E-17	9.5709E-22	0.0000E+00
PB-214	2.0706E-12	9.5838E-12	8.9057E-10	1.1943E-09	5.5677E-17	9.5709E-22	0.0000E+00
RA-226	2.0706E-12	9.5838E-12	8.9057E-10	1.1943E-09	5.5677E-17	9.5709E-22	0.0000E+00
TH-228	2.1178E-12	3.5941E-14	3.3399E-12	4.4788E-12	5.6946E-17	9.7890E-22	0.0000E+00
AC-228	2.0715E-12	9.5879E-12	8.9096E-10	1.1948E-09	5.5701E-17	9.5750E-22	0.0000E+00
RA-228	2.0715E-12	9.5879E-12	8.9096E-10	1.1948E-09	5.5701E-17	9.5750E-22	0.0000E+00
TH-232	2.1178E-12	3.5941E-14	3.3399E-12	4.4788E-12	5.6946E-17	9.7890E-22	0.0000E+00
U-234	2.1041E-12	2.8567E-12	2.6546E-10	3.5599E-10	5.6578E-17	9.7258E-22	0.0000E+00
U-235	2.1041E-12	2.8567E-12	2.6546E-10	3.5599E-10	5.6578E-17	9.7258E-22	0.0000E+00
NP-237	1.0659E-12	2.1707E-10	2.0171E-08	2.7050E-08	2.8661E-17	4.9268E-22	0.0000E+00
U-238	2.1041E-12	2.8567E-12	2.6546E-10	3.5599E-10	5.6578E-17	9.7258E-22	0.0000E+00
PU-238	2.0983E-12	6.1048E-13	5.6729E-11	7.6074E-11	5.6423E-17	9.6991E-22	0.0000E+00
PU-239	2.1149E-12	6.1530E-13	5.7177E-11	7.6675E-11	5.6869E-17	9.7758E-22	0.0000E+00
PU-241	1.2756E-12	3.7112E-13	3.4487E-11	4.6247E-11	3.4301E-17	5.8963E-22	0.0000E+00
AM-241	2.1146E-12	2.6916E-14	2.5012E-12	3.3541E-12	5.6861E-17	9.7745E-22	0.0000E+00
PU-242	2.1149E-12	6.1532E-13	5.7179E-11	7.6677E-11	5.6870E-17	9.7760E-22	0.0000E+00
AM-243	2.1176E-12	2.6954E-14	2.5047E-12	3.3589E-12	5.6942E-17	9.7883E-22	0.0000E+00
CM-243	1.6971E-12	5.2369E-13	4.8664E-11	6.5259E-11	4.5636E-17	7.8448E-22	0.0000E+00
CM-244	1.4348E-12	4.4275E-13	4.1143E-11	5.5173E-11	3.8582E-17	6.6323E-22	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 100 OF THE SIMULATION

THE TRENCH CAP HAS HAD .00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 4.41E-02 METERS

TABLE C-4
(Continued)

6.8840E-02 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	1.6795E-03	0.0000E+00	8.0738E-06	9.0420E-06
C-14	7.5717E-01	0.0000E+00	3.6399E-03	4.0080E-03
FE-55	1.5183E-12	0.0000E+00	4.8356E-17	0.0000E+00
NI-59	9.9737E-01	0.0000E+00	3.1765E-05	0.0000E+00
CO-60	6.9465E-07	0.0000E+00	2.2124E-11	0.0000E+00
NI-63	4.7012E-01	0.0000E+00	1.4973E-05	0.0000E+00
SR-90	7.1143E-02	0.0000E+00	3.7603E-06	0.0000E+00
NB-94	9.9528E-01	0.0000E+00	2.2683E-05	0.0000E+00
TC-99	8.9741E-01	0.0000E+00	1.7468E-03	0.0000E+00
RU-106	1.2459E-31	0.0000E+00	2.8395E-36	0.0000E+00
SB-125	3.1282E-12	0.0000E+00	1.1062E-16	0.0000E+00
I-129	9.7359E-01	0.0000E+00	4.6953E-04	0.0000E+00
CS-134	4.5126E-16	0.0000E+00	7.2093E-21	0.0000E+00
CS-135	9.9909E-01	0.0000E+00	1.5961E-05	0.0000E+00
CS-137	8.0344E-02	0.0000E+00	1.2836E-06	0.0000E+00
BA-137M	8.0344E-02	0.0000E+00	1.2836E-06	0.0000E+00
EU-154	1.4839E-04	0.0000E+00	1.1890E-10	0.0000E+00
TL-208	1.0000E+00	0.0000E+00	2.6712E-08	0.0000E+00
PO-210	9.5724E-01	0.0000E+00	6.9634E-06	0.0000E+00
PB-210	9.5724E-01	0.0000E+00	6.9634E-06	0.0000E+00
PB-212	1.0000E+00	0.0000E+00	2.6712E-08	0.0000E+00
BI-214	9.5724E-01	0.0000E+00	6.9634E-06	0.0000E+00
PB-214	9.5724E-01	0.0000E+00	6.9634E-06	0.0000E+00

TABLE C-4
(Continued)

RA-226	9.5724E-01	0.0000E+00	6.9634E-06	0.0000E+00
TH-228	1.0000E+00	0.0000E+00	2.6712E-08	0.0000E+00
AC-228	9.9960E-01	0.0000E+00	7.2716E-06	0.0000E+00
RA-228	9.9960E-01	0.0000E+00	7.2716E-06	0.0000E+00
TH-232	1.0000E+00	0.0000E+00	2.6712E-08	0.0000E+00
U-234	9.9988E-01	0.0000E+00	2.1358E-06	0.0000E+00
U-235	9.9988E-01	0.0000E+00	2.1358E-06	0.0000E+00
NP-237	9.8340E-01	0.0000E+00	2.9608E-04	0.0000E+00
U-238	9.9988E-01	0.0000E+00	2.1358E-06	0.0000E+00
PU-238	4.5379E-01	0.0000E+00	1.0385E-06	0.0000E+00
PU-239	9.9701E-01	0.0000E+00	2.2817E-06	0.0000E+00
PU-241	3.3351E-03	0.0000E+00	7.6328E-09	0.0000E+00
AM-241	8.5890E-01	0.0000E+00	1.7138E-05	0.0000E+00
PU-242	9.9969E-01	0.0000E+00	2.2879E-06	0.0000E+00
AM-243	9.8955E-01	0.0000E+00	1.9745E-05	0.0000E+00
CM-243	9.3628E-02	0.0000E+00	2.1428E-07	0.0000E+00
CM-244	1.3724E-02	0.0000E+00	3.1408E-08	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.9704E-10
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	8.7342E-08
FE-55	2.9486E-24	4.9143E-25	4.5667E-23	6.1240E-23	1.3672E-32	2.3502E-37	0.0000E+00
NI-59	9.6603E-14	6.4402E-13	5.9846E-11	8.0254E-11	4.4793E-22	7.6999E-27	0.0000E+00
CO-60	4.1894E-22	7.6170E-21	7.0782E-19	9.4919E-19	1.9425E-30	3.3392E-35	0.0000E+00
NI-63	4.5535E-14	3.0357E-13	2.8209E-11	3.7829E-11	2.1114E-22	3.6294E-27	0.0000E+00
SR-90	6.8988E-15	4.5992E-14	4.2738E-12	5.7312E-12	3.1988E-23	5.4988E-28	0.0000E+00
NB-94	5.5179E-13	1.5765E-12	1.4650E-10	1.9646E-10	2.5585E-21	4.3981E-26	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
RU-106	3.0829E-44	1.4293E-43	1.3282E-41	1.7812E-41	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	3.3915E-28	7.5367E-27	7.0035E-25	9.3917E-25	1.5726E-36	2.7032E-41	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

FATAL CANCER RATE (DEATHS/YR) - COMBINED LET

***SUMMED OVER ALL CANCERS

NUCLIDES	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
PATHWAYS										
- INGESTION	4.362E-11	1.151E-07	2.256E-18	4.710E-18	5.685E-17	1.017E-17	2.560E-16	1.033E-15	6.877E-18	5.980E-18
	.000	9.227E-16	3.013E-16	4.394E-16	1.842E-15	.000	.000	.000	3.990E-15	1.894E-14
	1.015E-15	2.919E-18	3.766E-18	3.683E-15	4.620E-16	.000	2.595E-15	8.710E-16	4.803E-17	5.531E-17
	3.245E-15	4.792E-17	7.962E-15	8.919E-16	8.438E-17	9.107E-15	8.473E-16	9.096E-15	5.298E-15	3.694E-15
	1.152E-07									
% OF INTERNAL	100.	100.	90.7	77.4	39.4	74.8	70.4	70.0	85.6	12.9
	.000	98.5	98.8	99.2	99.0	.000	.000	.000	41.3	88.1
	91.0	37.5	37.0	35.0	.250	.000	65.0	1.14	7.688E-02	9.522E-02
	9.96	8.549E-02	7.78	.934	18.7	9.79	.934	9.82	9.42	9.21
	100.									
% OF ALL PATHWAYS	100.	100.	85.8	10.3	.948	74.8	70.4	.494	85.6	12.9
	.000	95.7	34.3	99.2	99.0	.000	.000	.000	41.3	86.9
	4.16	1.730E-03	1.204E-02	32.3	.249	.000	65.0	1.14	7.677E-02	6.833E-02
	9.92	8.538E-02	7.78	.933	18.7	9.44	.933	8.99	8.45	9.21
	100.									
- INHALATION	8.212E-23	1.233E-23	2.321E-19	1.373E-18	8.728E-17	3.421E-18	1.074E-16	4.428E-16	1.155E-18	4.049E-17
	3.161E-18	1.370E-17	3.806E-18	3.558E-18	1.860E-17	8.744E-22	1.120E-16	.000	5.663E-15	2.560E-15
	1.005E-16	4.859E-18	6.409E-18	6.836E-15	1.847E-13	1.627E-17	1.396E-15	7.567E-14	6.243E-14	5.803E-14
	2.934E-14	5.600E-14	9.437E-14	9.461E-14	3.662E-16	8.394E-14	8.987E-14	8.354E-14	5.095E-14	3.641E-14
	1.018E-12									

TABLE C-4
(Continued)

% OF INTERNAL	1.883E-10	1.071E-14	9.33	22.6	60.6	25.2	29.6	30.0	14.4	87.1
	100.	1.46	1.25	.803	1.00	100.	100.	.000	58.7	11.9
	9.01	62.5	63.0	65.0	99.8	100.	35.0	98.9	99.9	99.9
	90.0	99.9	92.2	99.1	81.3	90.2	99.1	90.2	90.6	90.8
	8.836E-04									
% OF ALL PATHWAYS	1.883E-10	1.071E-14	8.82	2.99	1.45	25.2	29.6	.212	14.4	87.1
	1.10	1.42	.433	.803	1.00	4.319E-06	1.17	.000	58.7	11.7
	.411	2.880E-03	2.049E-02	60.0	99.6	1.468E-02	35.0	98.8	99.8	71.7
	89.7	99.8	92.2	99.0	81.3	87.0	99.0	82.6	81.2	90.8
	8.836E-04									
- AIR IMMERSION	.000	.000	1.376E-24	1.474E-23	3.297E-19	.000	.000	7.560E-19	1.404E-26	.000
	2.654E-20	8.044E-22	7.544E-20	.000	.000	2.070E-19	2.742E-19	1.899E-18	4.030E-24	4.867E-22
	6.720E-20	7.418E-19	1.107E-19	2.989E-21	8.699E-22	4.394E-19	2.490E-29	7.699E-23	6.138E-23	6.904E-20
	3.827E-21	4.081E-23	3.294E-23	3.446E-23	.000	7.578E-21	2.800E-23	2.133E-20	4.517E-20	2.040E-23
	5.080E-18									
% OF EXTERNAL	.000	.000	9.658E-04	3.703E-05	5.632E-03	.000	.000	3.643E-04	4.189E-02	.000
	9.314E-03	2.904E-03	1.317E-02	.000	.000	1.022E-03	2.905E-03	4.197E-04	3.927E-04	1.674E-04
	2.883E-04	4.397E-04	3.540E-04	3.445E-04	2.347E-04	3.965E-04	3.565E-05	9.380E-05	6.703E-05	3.019E-04
	3.285E-03	5.603E-05	4.905E-05	7.699E-05	.000	2.212E-04	3.570E-05	2.513E-04	6.962E-04	1.336E-04
	4.730E-04									
% OF ALL PATHWAYS	.000	.000	5.231E-05	3.212E-05	5.497E-03	.000	.000	3.617E-04	1.748E-07	.000
	9.212E-03	8.343E-05	8.593E-03	.000	.000	1.022E-03	2.871E-03	4.197E-04	4.174E-08	2.233E-06
	2.751E-04	4.397E-04	3.539E-04	2.625E-05	4.689E-07	3.965E-04	6.238E-13	1.005E-07	9.810E-08	8.528E-05
	1.170E-05	7.271E-08	3.217E-08	3.606E-08	.000	7.855E-06	3.083E-08	2.109E-05	7.200E-05	5.085E-08
	4.410E-09									
- GROUND SURFACE	.000	.000	1.425E-19	3.981E-17	5.854E-15	.000	.000	2.075E-13	3.350E-23	.000
	2.849E-16	2.770E-17	5.727E-16	.000	.000	2.025E-14	9.440E-15	4.526E-13	1.026E-18	2.907E-16
	2.331E-14	1.687E-13	3.128E-14	8.677E-16	3.706E-16	1.108E-13	6.984E-23	8.208E-17	9.157E-17	2.286E-14
	1.165E-16	7.283E-17	6.716E-17	4.475E-17	.000	3.426E-15	7.842E-17	8.488E-15	6.487E-15	1.527E-17
	1.074E-12									

TABLE C-4
(Continued)

% OF EXTERNAL	.000	.000	100.	100.	100.	.000	.000	100.	100.	.000
	100.	100.	100.	.000	.000	100.	100.	100.	100.	100.
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	100.	100.	100.	100.	.000	100.	100.	100.	100.	100.
	100.									
% OF ALL PATHWAYS	.000	.000	5.42	86.7	97.6	.000	.000	99.3	4.171E-04	.000
	98.9	2.87	65.2	.000	.000	100.	98.8	100.	1.063E-02	1.33
	95.4	100.	100.	7.62	.200	100.	1.750E-06	.107	.146	28.2
	.356	.130	6.559E-02	4.684E-02	.000	3.55	8.637E-02	8.39	10.3	3.806E-02
	9.325E-04									
- INTERNAL	4.362E-11	1.151E-07	2.488E-18	6.084E-18	1.441E-16	1.359E-17	3.633E-16	1.476E-15	8.032E-18	4.647E-17
	3.161E-18	9.364E-16	3.051E-16	4.430E-16	1.861E-15	8.744E-22	1.120E-16	.000	9.653E-15	2.150E-14
	1.116E-15	7.778E-18	1.018E-17	1.052E-14	1.852E-13	1.627E-17	3.991E-15	7.654E-14	6.248E-14	5.809E-14
	3.259E-14	5.605E-14	1.023E-13	9.551E-14	4.506E-16	9.305E-14	9.072E-14	9.264E-14	5.625E-14	4.011E-14
	1.152E-07									
% OF ALL PATHWAYS	100.	100.	94.6	13.3	2.40	100.	100.	.706	100.	100.
	1.10	97.1	34.8	100.	100.	4.319E-06	1.17	.000	100.	98.7
	4.57	4.610E-03	3.252E-02	92.4	99.8	1.468E-02	100.	99.9	99.9	71.8
	99.6	99.9	99.9	100.	100.	96.4	99.9	91.6	89.7	100.
	100.									
- EXTERNAL	.000	.000	1.425E-19	3.981E-17	5.854E-15	.000	.000	2.075E-13	3.351E-23	.000
	2.849E-16	2.770E-17	5.728E-16	.000	.000	2.025E-14	9.441E-15	4.526E-13	1.026E-18	2.907E-16
	2.331E-14	1.687E-13	3.128E-14	8.678E-16	3.706E-16	1.108E-13	6.984E-23	8.208E-17	9.157E-17	2.286E-14
	1.165E-16	7.283E-17	6.716E-17	4.475E-17	.000	3.426E-15	7.842E-17	8.488E-15	6.487E-15	1.527E-17
	1.074E-12									
% OF ALL PATHWAYS	.000	.000	5.42	86.7	97.6	.000	.000	99.3	4.173E-04	.000
	98.9	2.87	65.2	.000	.000	100.	98.8	100.	1.063E-02	1.33
	95.4	100.	100.	7.62	.200	100.	1.750E-06	.107	.146	28.2
	.356	.130	6.559E-02	4.684E-02	.000	3.55	8.637E-02	8.39	10.3	3.806E-02
	9.325E-04									

TABLE C-4
(Continued)

TOTAL OVER ALL PATHWAYS	4.362E-11	1.151E-07	2.630E-18	4.589E-17	5.999E-15	1.359E-17	3.633E-16	2.090E-13	8.032E-18	4.647E-17
	2.881E-16	9.641E-16	8.779E-16	4.430E-16	1.861E-15	2.025E-14	9.553E-15	4.526E-13	9.654E-15	2.179E-14
	2.442E-14	1.687E-13	3.129E-14	1.139E-14	1.855E-13	1.108E-13	3.991E-15	7.663E-14	6.257E-14	8.095E-14
	3.270E-14	5.612E-14	1.024E-13	9.555E-14	4.506E-16	9.647E-14	9.080E-14	1.011E-13	6.274E-14	4.012E-14
	1.152E-07									
% OF TOTAL	3.787E-02	100.	2.284E-09	3.984E-08	5.208E-06	1.180E-08	3.155E-07	1.815E-04	6.974E-09	4.035E-08
	2.501E-07	8.370E-07	7.622E-07	3.846E-07	1.615E-06	1.758E-05	8.294E-06	3.929E-04	8.382E-06	1.892E-05
	2.121E-05	1.465E-04	2.716E-05	9.886E-06	1.611E-04	9.623E-05	3.465E-06	6.653E-05	5.432E-05	7.029E-05
	2.839E-05	4.873E-05	8.891E-05	8.296E-05	3.912E-07	8.376E-05	7.883E-05	8.780E-05	5.447E-05	3.484E-05

COLLECTIVE GENETIC EFFECT (EFFECTS/YR) - COMBINED LET

***SUMMED OVER ALL GONADS

NUCLIDES	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
PATHWAYS										
- INGESTION	1.650E-11	2.143E-08	7.165E-19	1.592E-18	2.936E-17	3.293E-18	3.264E-18	6.379E-16	3.257E-19	1.209E-18
	.000	2.050E-18	1.069E-16	1.812E-16	7.067E-16	.000	.000	.000	1.911E-15	1.801E-15
	2.350E-16	7.227E-20	4.581E-19	1.569E-15	3.899E-17	.000	1.570E-15	1.003E-17	2.017E-18	4.571E-18
	5.241E-16	1.997E-18	1.366E-15	1.410E-16	9.912E-18	1.491E-15	1.337E-16	1.464E-15	9.954E-16	7.341E-16
	2.144E-08									
% OF INTERNAL	100.	100.	96.0	93.8	96.8	92.9	59.9	99.5	99.0	95.3
	.000	98.6	98.8	99.2	99.0	.000	.000	.000	92.5	88.1
	97.9	78.0	66.5	89.5	13.2	.000	92.3	4.16	44.3	62.2
	10.8	45.3	27.8	3.69	24.8	10.7	3.69	10.7	10.6	10.6
	100.									

TABLE C-4
(Continued)

% OF ALL PATHWAYS	100.	100.	93.5	21.6	1.15	92.9	59.9	.701	99.0	95.3
	.000	12.1	29.8	99.2	99.0	.000	.000	.000	92.5	83.5
	2.34	9.973E-05	3.451E-03	74.3	8.89	.000	92.3	3.79	6.75	4.846E-02
	10.7	8.36	27.7	3.68	24.8	9.64	3.67	8.42	8.26	10.6
	100.									
- INHALATION	3.230E-23	2.385E-24	2.994E-20	1.055E-19	9.574E-19	2.531E-19	2.186E-18	3.431E-18	3.213E-21	5.943E-20
	3.766E-20	2.999E-20	1.325E-18	1.400E-18	6.926E-18	9.051E-24	3.894E-18	.000	1.554E-16	2.436E-16
	5.034E-18	2.042E-20	2.303E-19	1.844E-16	2.561E-16	3.518E-19	1.314E-16	2.314E-16	2.531E-18	2.777E-18
	4.309E-15	2.408E-18	3.555E-15	3.678E-15	3.013E-17	1.246E-14	3.489E-15	1.222E-14	8.368E-15	6.184E-15
	5.553E-14									
% OF INTERNAL	1.957E-10	1.113E-14	4.01	6.22	3.16	7.14	40.1	.535	.977	4.69
	100.	1.44	1.22	.767	.971	100.	100.	.000	7.52	11.9
	2.10	22.0	33.5	10.5	86.8	100.	7.72	95.8	55.7	37.8
	89.2	54.7	72.2	96.3	75.2	89.3	96.3	89.3	89.4	89.4
	2.590E-04									
% OF ALL PATHWAYS	1.957E-10	1.113E-14	3.90	1.43	3.739E-02	7.14	40.1	3.769E-03	.977	4.69
	3.045E-02	.177	.370	.767	.971	1.023E-07	9.499E-02	.000	7.52	11.3
	5.007E-02	2.818E-05	1.735E-03	8.73	58.4	7.328E-04	7.72	87.3	8.47	2.944E-02
	88.3	10.1	72.0	96.0	75.2	80.6	95.7	70.3	69.4	89.3
	2.590E-04									
- AIR IMMERSION	.000	.000	1.953E-25	2.101E-24	1.427E-19	.000	.000	3.305E-19	6.034E-27	.000
	1.153E-20	4.292E-22	3.288E-20	.000	.000	9.044E-20	1.190E-19	7.992E-19	1.760E-24	2.291E-22
	2.823E-20	3.187E-19	4.706E-20	1.233E-21	3.648E-22	1.900E-19	3.543E-30	3.104E-23	2.318E-23	2.854E-20
	1.644E-21	1.483E-23	1.031E-23	1.290E-23	.000	3.470E-21	9.027E-24	9.407E-21	1.889E-20	6.486E-24
	2.175E-18									
% OF EXTERNAL	.000	.000	9.640E-04	3.710E-05	5.639E-03	.000	.000	3.656E-04	4.189E-02	.000
	9.328E-03	2.887E-03	1.315E-02	.000	.000	1.022E-03	2.907E-03	4.179E-04	3.923E-04	2.055E-04
	2.876E-04	4.398E-04	3.546E-04	3.439E-04	2.538E-04	3.959E-04	3.579E-05	1.317E-04	9.149E-05	3.028E-04
	3.395E-03	7.607E-05	5.675E-05	9.836E-05	.000	2.292E-04	4.226E-05	2.538E-04	7.024E-04	1.456E-04
	4.736E-04									

TABLE C-4
(Continued)

% OF ALL PATHWAYS	.000	.000	2.548E-05	2.854E-05	5.573E-03	.000	.000	3.630E-04	1.834E-06	.000
	9.325E-03	2.533E-03	9.176E-03	.000	.000	1.022E-03	2.904E-03	4.179E-04	8.514E-08	1.062E-05
	2.808E-04	4.398E-04	3.545E-04	5.840E-05	8.313E-05	3.959E-04	2.082E-13	1.171E-05	7.757E-05	3.026E-04
	3.368E-05	6.205E-05	2.087E-07	3.365E-07	.000	2.243E-05	2.478E-07	5.409E-05	1.567E-04	9.370E-08
	1.014E-08									
- GROUND SURFACE	.000	.000	2.026E-20	5.663E-18	2.530E-15	.000	.000	9.039E-14	1.440E-23	.000
	1.236E-16	1.487E-17	2.500E-16	.000	.000	8.850E-15	4.095E-15	1.912E-13	4.485E-19	1.115E-16
	9.814E-15	7.246E-14	1.327E-14	3.586E-16	1.438E-16	4.801E-14	9.899E-24	2.357E-17	2.534E-17	9.426E-15
	4.842E-17	1.950E-17	1.816E-17	1.311E-17	.000	1.514E-15	2.136E-17	3.707E-15	2.690E-15	4.454E-18
	4.592E-13									
% OF EXTERNAL	.000	.000	100.	100.	100.	.000	.000	100.	100.	.000
	100.	100.	100.	.000	.000	100.	100.	100.	100.	100.
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	100.	100.	100.	100.	.000	100.	100.	100.	100.	100.
	100.									
% OF ALL PATHWAYS	.000	.000	2.64	76.9	98.8	.000	.000	99.3	4.377E-03	.000
	100.	87.7	69.8	.000	.000	100.	99.9	100.	2.170E-02	5.17
	97.6	100.	100.	17.0	32.8	100.	5.817E-07	8.90	84.8	99.9
	.992	81.6	.368	.342	.000	9.79	.586	21.3	22.3	6.435E-02
	2.141E-03									
- INTERNAL	1.650E-11	2.143E-08	7.464E-19	1.697E-18	3.032E-17	3.546E-18	5.450E-18	6.413E-16	3.289E-19	1.268E-18
	3.766E-20	2.080E-18	1.083E-16	1.826E-16	7.136E-16	9.051E-24	3.894E-18	.000	2.066E-15	2.045E-15
	2.400E-16	9.269E-20	6.884E-19	1.753E-15	2.951E-16	3.518E-19	1.702E-15	2.414E-16	4.548E-18	7.348E-18
	4.833E-15	4.405E-18	4.921E-15	3.819E-15	4.004E-17	1.396E-14	3.622E-15	1.368E-14	9.364E-15	6.918E-15
	2.144E-08									
% OF ALL PATHWAYS	100.	100.	97.4	23.1	1.18	100.	100.	.704	100.	100.
	3.045E-02	12.3	30.2	100.	100.	1.023E-07	9.499E-02	.000	100.	94.8
	2.39	1.279E-04	5.186E-03	83.0	67.2	7.328E-04	100.	91.1	15.2	7.789E-02
	99.0	18.4	99.6	99.7	100.	90.2	99.4	78.7	77.7	99.9
	100.									

TABLE C-4
(Continued)

- EXTERNAL	.000	.000	2.026E-20	5.663E-18	2.530E-15	.000	.000	9.039E-14	1.440E-23	.000
	1.236E-16	1.487E-17	2.500E-16	.000	.000	8.850E-15	4.095E-15	1.912E-13	4.485E-19	1.115E-16
	9.814E-15	7.246E-14	1.327E-14	3.586E-16	1.438E-16	4.801E-14	9.899E-24	2.357E-17	2.534E-17	9.426E-15
	4.842E-17	1.950E-17	1.816E-17	1.311E-17	.000	1.514E-15	2.136E-17	3.707E-15	2.690E-15	4.454E-18
	4.592E-13									
% OF ALL PATHWAYS	.000	.000	2.64	76.9	98.8	.000	.000	99.3	4.379E-03	.000
	100.	87.7	69.8	.000	.000	100.	99.9	100.	2.170E-02	5.17
	97.6	100.	100.	17.0	32.8	100.	5.817E-07	8.90	84.8	99.9
	.992	81.6	.368	.342	.000	9.79	.586	21.3	22.3	6.435E-02
	2.141E-03									
TOTAL OVER ALL PATHWAYS	1.650E-11	2.143E-08	7.667E-19	7.360E-18	2.561E-15	3.546E-18	5.450E-18	9.104E-14	3.289E-19	1.268E-18
	1.237E-16	1.695E-17	3.583E-16	1.826E-16	7.136E-16	8.850E-15	4.099E-15	1.912E-13	2.067E-15	2.157E-15
	1.005E-14	7.246E-14	1.327E-14	2.112E-15	4.388E-16	4.801E-14	1.702E-15	2.650E-16	2.989E-17	9.433E-15
	4.881E-15	2.391E-17	4.940E-15	3.832E-15	4.004E-17	1.547E-14	3.644E-15	1.739E-14	1.205E-14	6.922E-15
	2.144E-08									
% OF TOTAL	7.696E-02	99.9	3.575E-09	3.432E-08	1.194E-05	1.654E-08	2.542E-08	4.245E-04	1.534E-09	5.913E-09
	5.768E-07	7.903E-08	1.671E-06	8.515E-07	3.328E-06	4.127E-05	1.912E-05	8.919E-04	9.638E-06	1.006E-05
	4.689E-05	3.379E-04	6.190E-05	9.848E-06	2.047E-06	2.239E-04	7.936E-06	1.236E-06	1.394E-07	4.399E-05
	2.276E-05	1.115E-07	2.304E-05	1.787E-05	1.867E-07	7.214E-05	1.699E-05	8.110E-05	5.621E-05	3.228E-05

1 ANNUAL SUMMARY FOR YEAR 200 OF THE SIMULATION

THE TRENCH CAP HAS HAD 10.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 6.81E-02 METERS
1.0618E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

TABLE C-4
(Continued)

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	2.7040E-06	0.0000E+00	3.1134E-08	3.4580E-08
C-14	3.3899E-01	0.0000E+00	3.9032E-03	4.2620E-03
FE-55	1.0416E-23	0.0000E+00	7.8932E-28	0.0000E+00
NI-59	9.9129E-01	0.0000E+00	7.5119E-05	0.0000E+00
CO-60	1.2788E-12	0.0000E+00	9.6906E-17	0.0000E+00
NI-63	2.2025E-01	0.0000E+00	1.6690E-05	0.0000E+00
SR-90	6.2713E-03	0.0000E+00	7.8870E-07	0.0000E+00
NB-94	9.8811E-01	0.0000E+00	5.3582E-05	0.0000E+00
TC-99	6.5105E-01	0.0000E+00	3.0232E-03	1.7770E-03
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	4.3192E-23	0.0000E+00	3.6342E-27	0.0000E+00
I-129	8.9923E-01	0.0000E+00	1.0325E-03	0.0000E+00
CS-134	1.1508E-30	0.0000E+00	4.3742E-35	0.0000E+00
CS-135	9.9644E-01	0.0000E+00	3.7875E-05	0.0000E+00
CS-137	7.9541E-03	0.0000E+00	3.0234E-07	0.0000E+00
BA-137M	7.9541E-03	0.0000E+00	3.0234E-07	0.0000E+00
EU-154	4.2840E-08	0.0000E+00	8.1667E-14	0.0000E+00
TL-208	9.9999E-01	0.0000E+00	6.3554E-08	0.0000E+00
PO-210	9.1558E-01	0.0000E+00	1.5847E-05	0.0000E+00
PB-210	9.1558E-01	0.0000E+00	1.5847E-05	0.0000E+00
PB-212	9.9999E-01	0.0000E+00	6.3554E-08	0.0000E+00
BI-214	9.1558E-01	0.0000E+00	1.5847E-05	0.0000E+00
PB-214	9.1558E-01	0.0000E+00	1.5847E-05	0.0000E+00
RA-226	9.1558E-01	0.0000E+00	1.5847E-05	0.0000E+00
TH-228	9.9999E-01	0.0000E+00	6.3554E-08	0.0000E+00
AC-228	9.9840E-01	0.0000E+00	1.7280E-05	0.0000E+00
RA-228	9.9840E-01	0.0000E+00	1.7280E-05	0.0000E+00
TH-232	9.9999E-01	0.0000E+00	6.3554E-08	0.0000E+00
U-234	9.9953E-01	0.0000E+00	5.0798E-06	0.0000E+00
U-235	9.9953E-01	0.0000E+00	5.0798E-06	0.0000E+00
NP-237	9.3578E-01	0.0000E+00	6.7060E-04	0.0000E+00
U-238	9.9953E-01	0.0000E+00	5.0798E-06	0.0000E+00
PU-238	2.0587E-01	0.0000E+00	1.1210E-06	0.0000E+00

TABLE C-4
(Continued)

PU-239	9.9378E-01	0.0000E+00	5.4112E-06	0.0000E+00
PU-241	1.7495E-05	0.0000E+00	9.5259E-11	0.0000E+00
AM-241	7.3610E-01	0.0000E+00	3.4947E-05	0.0000E+00
PU-242	9.9913E-01	0.0000E+00	5.4403E-06	0.0000E+00
AM-243	9.7707E-01	0.0000E+00	4.6387E-05	0.0000E+00
CM-243	1.0686E-02	0.0000E+00	5.8187E-08	0.0000E+00
CM-244	2.6680E-04	0.0000E+00	1.4527E-09	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	7.5356E-13
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.2877E-08
FE-55	1.8801E-35	3.1334E-36	2.9117E-34	3.9047E-34	8.5479E-44	0.0000E+00	0.0000E+00
NI-59	4.4573E-15	2.9716E-14	2.7613E-12	3.7030E-12	2.0668E-23	3.5528E-28	0.0000E+00
CO-60	2.2354E-31	4.0643E-30	3.7768E-28	5.0647E-28	1.0365E-39	1.8217E-44	0.0000E+00
NI-63	9.9033E-16	6.6022E-15	6.1351E-13	8.2273E-13	4.5920E-24	7.8936E-29	0.0000E+00
SR-90	2.8329E-17	1.8886E-16	1.7550E-14	2.3535E-14	1.3136E-25	2.2581E-30	0.0000E+00
NB-94	1.4529E-13	4.1513E-13	3.8576E-11	5.1731E-11	6.7370E-22	1.1581E-26	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.8724E-08
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.4383E-43	5.4174E-42	5.0342E-40	6.7509E-40	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.2253E-16	2.2253E-15	2.0679E-13	2.7730E-13	1.0318E-24	1.7737E-29	0.0000E+00
CS-137	1.7763E-18	1.7763E-17	1.6507E-15	2.2136E-15	8.2365E-27	1.4159E-31	0.0000E+00
BA-137M	1.7763E-18	1.7763E-17	1.6507E-15	2.2136E-15	8.2365E-27	1.4159E-31	0.0000E+00
EU-154	7.1025E-20	1.7756E-20	1.6500E-18	2.2127E-18	3.2933E-28	5.6612E-33	0.0000E+00
TL-208	2.0631E-12	3.4386E-14	3.1953E-12	4.2850E-12	9.5664E-21	1.6445E-25	0.0000E+00
PO-210	2.8342E-14	1.2883E-13	1.1971E-11	1.6054E-11	1.3142E-22	2.2590E-27	0.0000E+00
PB-210	2.8342E-14	1.2883E-13	1.1971E-11	1.6054E-11	1.3142E-22	2.2590E-27	0.0000E+00
PB-212	2.0631E-12	3.4386E-14	3.1953E-12	4.2850E-12	9.5664E-21	1.6445E-25	0.0000E+00
BI-214	2.8342E-14	1.2883E-13	1.1971E-11	1.6054E-11	1.3142E-22	2.2590E-27	0.0000E+00

TABLE C-4
(Continued)

PB-214	2.8342E-14	1.2883E-13	1.1971E-11	1.6054E-11	1.3142E-22	2.2590E-27	0.0000E+00
RA-226	2.8342E-14	1.2883E-13	1.1971E-11	1.6054E-11	1.3142E-22	2.2590E-27	0.0000E+00
TH-228	2.0631E-12	3.4386E-14	3.1953E-12	4.2850E-12	9.5664E-21	1.6445E-25	0.0000E+00
AC-228	3.0906E-14	1.4048E-13	1.3054E-11	1.7506E-11	1.4330E-22	2.4634E-27	0.0000E+00
RA-228	3.0906E-14	1.4048E-13	1.3054E-11	1.7506E-11	1.4330E-22	2.4634E-27	0.0000E+00
TH-232	2.0631E-12	3.4386E-14	3.1953E-12	4.2850E-12	9.5664E-21	1.6445E-25	0.0000E+00
U-234	6.0216E-13	8.0288E-13	7.4608E-11	1.0005E-10	2.7921E-21	4.7996E-26	0.0000E+00
U-235	6.0216E-13	8.0288E-13	7.4608E-11	1.0005E-10	2.7921E-21	4.7996E-26	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	6.0216E-13	8.0288E-13	7.4608E-11	1.0005E-10	2.7921E-21	4.7996E-26	0.0000E+00
PU-238	3.3019E-13	9.4340E-14	8.7666E-12	1.1756E-11	1.5310E-21	2.6318E-26	0.0000E+00
PU-239	1.5939E-12	4.5540E-13	4.2318E-11	5.6749E-11	7.3906E-21	1.2704E-25	0.0000E+00
PU-241	2.8059E-17	8.0169E-18	7.4497E-16	9.9902E-16	1.3010E-25	2.2365E-30	0.0000E+00
AM-241	1.5313E-12	1.9142E-14	1.7788E-12	2.3853E-12	7.1005E-21	1.2206E-25	0.0000E+00
PU-242	1.6025E-12	4.5785E-13	4.2546E-11	5.7054E-11	7.4303E-21	1.2773E-25	0.0000E+00
AM-243	2.0326E-12	2.5408E-14	2.3611E-12	3.1662E-12	9.4250E-21	1.6202E-25	0.0000E+00
CM-243	1.6863E-14	5.1101E-15	4.7486E-13	6.3679E-13	7.8192E-23	1.3441E-27	0.0000E+00
CM-244	4.2103E-16	1.2758E-16	1.1856E-14	1.5899E-14	1.9522E-24	3.3559E-29	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR, 300 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH	TRENCH OVERFLOW	TRENCH DRAINAGE	AMOUNT AT WELL

TABLE C-4
(Continued)

	CI	CI	CI	CI
H-3	1.9330E-09	0.0000E+00	4.1054E-11	6.5770E-11
C-14	6.7387E-02	0.0000E+00	1.4312E-03	2.2550E-03
FE-55	7.1079E-35	0.0000E+00	9.8418E-39	0.0000E+00
NI-59	9.8001E-01	0.0000E+00	1.3569E-04	0.0000E+00
CO-60	2.3416E-18	0.0000E+00	3.2422E-22	0.0000E+00
NI-63	1.0263E-01	0.0000E+00	1.4211E-05	0.0000E+00
SR-90	5.4794E-04	0.0000E+00	1.2592E-07	0.0000E+00
NB-94	9.7726E-01	0.0000E+00	9.6827E-05	0.0000E+00
TC-99	3.4048E-01	0.0000E+00	2.8999E-03	2.9510E-03
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	5.9284E-34	0.0000E+00	9.1143E-38	0.0000E+00
I-129	7.6600E-01	0.0000E+00	1.6084E-03	0.0000E+00
CS-134	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.9114E-01	0.0000E+00	6.8835E-05	0.0000E+00
CS-137	7.8535E-04	0.0000E+00	5.4543E-08	0.0000E+00
BA-137M	7.8535E-04	0.0000E+00	5.4543E-08	0.0000E+00
EU-154	1.2366E-11	0.0000E+00	4.3071E-17	0.0000E+00
TL-208	9.9999E-01	0.0000E+00	1.1612E-07	0.0000E+00
PO-210	8.7466E-01	0.0000E+00	2.7659E-05	0.0000E+00
PB-210	8.7466E-01	0.0000E+00	2.7659E-05	0.0000E+00
PB-212	9.9999E-01	0.0000E+00	1.1612E-07	0.0000E+00
BI-214	8.7466E-01	0.0000E+00	2.7659E-05	0.0000E+00
PB-214	8.7466E-01	0.0000E+00	2.7659E-05	0.0000E+00
RA-226	8.7466E-01	0.0000E+00	2.7659E-05	0.0000E+00
TH-228	9.9999E-01	0.0000E+00	1.1612E-07	0.0000E+00
AC-228	9.9599E-01	0.0000E+00	3.1496E-05	0.0000E+00
RA-228	9.9599E-01	0.0000E+00	3.1496E-05	0.0000E+00
TH-232	9.9999E-01	0.0000E+00	1.1612E-07	0.0000E+00
U-234	9.9882E-01	0.0000E+00	9.2746E-06	0.0000E+00
U-235	9.9882E-01	0.0000E+00	9.2746E-06	0.0000E+00
NP-237	8.4661E-01	0.0000E+00	1.1091E-03	0.0000E+00
U-238	9.9882E-01	0.0000E+00	9.2746E-06	0.0000E+00
PU-238	9.3362E-02	0.0000E+00	9.2882E-07	0.0000E+00
PU-239	9.9018E-01	0.0000E+00	9.8509E-06	0.0000E+00
PU-241	9.1734E-08	0.0000E+00	9.1262E-13	0.0000E+00

TABLE C-4
(Continued)

AM-241	6.2875E-01	0.0000E+00	5.4541E-05	0.0000E+00
PU-242	9.9818E-01	0.0000E+00	9.9304E-06	0.0000E+00
AM-243	9.6153E-01	0.0000E+00	8.3407E-05	0.0000E+00
CM-243	1.2192E-03	0.0000E+00	1.2129E-08	0.0000E+00
CM-244	5.1849E-06	0.0000E+00	5.1582E-11	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.4333E-15
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	4.9141E-08
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	2.0566E-16	1.3711E-15	1.2741E-13	1.7086E-13	9.5363E-25	1.6393E-29	0.0000E+00
CO-60	1.1929E-40	2.1689E-39	2.0155E-37	2.7028E-37	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	2.1538E-17	1.4359E-16	1.3343E-14	1.7893E-14	9.9870E-26	1.7168E-30	0.0000E+00
SR-90	1.1633E-19	7.7556E-19	7.2069E-17	9.6646E-17	5.3942E-28	9.2726E-33	0.0000E+00
NB-94	3.8258E-14	1.0931E-13	1.0158E-11	1.3621E-11	1.7739E-22	3.0494E-27	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6.4308E-08
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.2951E-18	2.2951E-17	2.1327E-15	2.8600E-15	1.0642E-26	1.8293E-31	0.0000E+00
CS-137	1.8185E-21	1.8186E-20	1.6899E-18	2.2662E-18	8.4323E-30	1.4495E-34	0.0000E+00
BA-137M	1.8185E-21	1.8186E-20	1.6899E-18	2.2662E-18	8.4323E-30	1.4495E-34	0.0000E+00
EU-154	1.8234E-23	4.5584E-24	4.2359E-22	5.6804E-22	8.4546E-32	1.4533E-36	0.0000E+00
TL-208	2.0464E-12	3.4107E-14	3.1694E-12	4.2503E-12	9.4890E-21	1.6312E-25	0.0000E+00
PO-210	3.2967E-15	1.4985E-14	1.3925E-12	1.8673E-12	1.5286E-23	2.6277E-28	0.0000E+00
PB-210	3.2967E-15	1.4985E-14	1.3925E-12	1.8673E-12	1.5286E-23	2.6277E-28	0.0000E+00
PB-212	2.0464E-12	3.4107E-14	3.1694E-12	4.2503E-12	9.4890E-21	1.6312E-25	0.0000E+00
BI-214	3.2967E-15	1.4985E-14	1.3925E-12	1.8673E-12	1.5286E-23	2.6277E-28	0.0000E+00
PB-214	3.2967E-15	1.4985E-14	1.3925E-12	1.8673E-12	1.5286E-23	2.6277E-28	0.0000E+00
RA-226	3.2967E-15	1.4985E-14	1.3925E-12	1.8673E-12	1.5286E-23	2.6277E-28	0.0000E+00

TABLE C-4
(Continued)

TH-228	2.0464E-12	3.4107E-14	3.1694E-12	4.2503E-12	9.4890E-21	1.6312E-25	0.0000E+00
AC-228	3.7540E-15	1.7064E-14	1.5856E-12	2.1264E-12	1.7407E-23	2.9922E-28	0.0000E+00
RA-228	3.7540E-15	1.7064E-14	1.5856E-12	2.1264E-12	1.7407E-23	2.9922E-28	0.0000E+00
TH-232	2.0464E-12	3.4107E-14	3.1694E-12	4.2503E-12	9.4890E-21	1.6312E-25	0.0000E+00
U-234	3.2273E-13	4.3031E-13	3.9987E-11	5.3622E-11	1.4964E-21	2.5724E-26	0.0000E+00
U-235	3.2273E-13	4.3031E-13	3.9987E-11	5.3622E-11	1.4964E-21	2.5724E-26	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	3.2273E-13	4.3031E-13	3.9987E-11	5.3622E-11	1.4964E-21	2.5724E-26	0.0000E+00
PU-238	1.3103E-13	3.7437E-14	3.4788E-12	4.6651E-12	6.0755E-22	1.0444E-26	0.0000E+00
PU-239	1.3897E-12	3.9704E-13	3.6896E-11	4.9477E-11	6.4436E-21	1.1077E-25	0.0000E+00
PU-241	1.2874E-19	3.6784E-20	3.4181E-18	4.5837E-18	5.9695E-28	1.0262E-32	0.0000E+00
AM-241	1.3086E-12	1.6358E-14	1.5201E-12	2.0384E-12	6.0678E-21	1.0431E-25	0.0000E+00
PU-242	1.4009E-12	4.0025E-13	3.7194E-11	4.9877E-11	6.4956E-21	1.1166E-25	0.0000E+00
AM-243	2.0012E-12	2.5015E-14	2.3246E-12	3.1173E-12	9.2793E-21	1.5951E-25	0.0000E+00
CM-243	1.6699E-15	5.0604E-16	4.7024E-14	6.3059E-14	7.7431E-24	1.3310E-28	0.0000E+00
CM-244	7.1016E-18	2.1520E-18	1.9998E-16	2.6817E-16	3.2929E-26	5.6605E-31	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 400 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	8.3957E-13	0.0000E+00	1.7832E-14	3.6310E-14

TABLE C-4
(continued)

C-14	8.1391E-03	0.0000E+00	1.7287E-04	3.4610E-04
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.6570E-01	0.0000E+00	1.3371E-04	0.0000E+00
CO-60	4.2738E-24	0.0000E+00	5.9176E-28	0.0000E+00
NI-63	4.7670E-02	0.0000E+00	6.6005E-06	0.0000E+00
SR-90	4.7617E-05	0.0000E+00	1.0943E-08	0.0000E+00
NB-94	9.6427E-01	0.0000E+00	9.5541E-05	0.0000E+00
TC-99	1.4576E-01	0.0000E+00	1.2414E-03	2.9790E-03
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	7.0065E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	6.2105E-01	0.0000E+00	1.3041E-03	0.0000E+00
CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.8426E-01	0.0000E+00	6.8357E-05	0.0000E+00
CS-137	7.7415E-05	0.0000E+00	5.3765E-09	0.0000E+00
BA-137M	7.7415E-05	0.0000E+00	5.3765E-09	0.0000E+00
EU-154	3.5693E-15	0.0000E+00	1.2432E-20	0.0000E+00
TL-208	9.9997E-01	0.0000E+00	1.1612E-07	0.0000E+00
PO-210	8.3495E-01	0.0000E+00	2.6404E-05	0.0000E+00
PB-210	8.3495E-01	0.0000E+00	2.6404E-05	0.0000E+00
PB-212	9.9997E-01	0.0000E+00	1.1612E-07	0.0000E+00
BI-214	8.3495E-01	0.0000E+00	2.6404E-05	0.0000E+00
PB-214	8.3495E-01	0.0000E+00	2.6404E-05	0.0000E+00
RA-226	8.3495E-01	0.0000E+00	2.6404E-05	0.0000E+00
TH-228	9.9997E-01	0.0000E+00	1.1612E-07	0.0000E+00
AC-228	9.9284E-01	0.0000E+00	3.1397E-05	0.0000E+00
RA-228	9.9284E-01	0.0000E+00	3.1397E-05	0.0000E+00
TH-232	9.9997E-01	0.0000E+00	1.1612E-07	0.0000E+00
U-234	9.9789E-01	0.0000E+00	9.2660E-06	0.0000E+00
U-235	9.9789E-01	0.0000E+00	9.2660E-06	0.0000E+00
NP-237	7.4269E-01	0.0000E+00	9.7300E-04	0.0000E+00
U-238	9.9789E-01	0.0000E+00	9.2660E-06	0.0000E+00
PU-238	4.2330E-02	0.0000E+00	4.2112E-07	0.0000E+00
PU-239	9.8637E-01	0.0000E+00	9.8129E-06	0.0000E+00
PU-241	4.8090E-10	0.0000E+00	4.7842E-15	0.0000E+00
AM-241	5.3596E-01	0.0000E+00	4.6492E-05	0.0000E+00
PU-242	9.9701E-01	0.0000E+00	9.9187E-06	0.0000E+00

TABLE C-4
(Continued)

AM-243	9.4431E-01	0.0000E+00	8.1913E-05	0.0000E+00
CM-243	1.3907E-04	0.0000E+00	1.3835E-09	0.0000E+00
CM-244	1.0074E-07	0.0000E+00	1.0022E-12	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	7.9126E-19
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	7.5422E-09
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.4895E-18	6.3264E-17	5.8788E-15	7.8835E-15	4.4001E-26	7.5638E-31	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	4.6844E-19	3.1229E-18	2.9020E-16	3.8916E-16	2.1720E-27	3.7338E-32	0.0000E+00
SR-90	4.7772E-22	3.1848E-21	2.9595E-19	3.9687E-19	2.2151E-30	3.8078E-35	0.0000E+00
NB-94	1.0074E-14	2.8783E-14	2.6746E-12	3.5867E-12	4.6711E-23	8.0296E-28	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6.4918E-08
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.3670E-20	2.3671E-19	2.1996E-17	2.9497E-17	1.0976E-28	1.8867E-33	0.0000E+00
CS-137	1.8618E-24	1.8618E-23	1.7301E-21	2.3200E-21	8.6327E-33	1.4840E-37	0.0000E+00
BA-137M	1.8618E-24	1.8618E-23	1.7301E-21	2.3200E-21	8.6327E-33	1.4840E-37	0.0000E+00
EU-154	4.6809E-27	1.1702E-27	1.0874E-25	1.4583E-25	2.1705E-35	3.7310E-40	0.0000E+00
TL-208	2.0299E-12	3.3831E-14	3.1438E-12	4.2158E-12	9.4121E-21	1.6179E-25	0.0000E+00
PO-210	3.8347E-16	1.7430E-15	1.6197E-13	2.1721E-13	1.7781E-24	3.0565E-29	0.0000E+00
PB-210	3.8347E-16	1.7430E-15	1.6197E-13	2.1721E-13	1.7781E-24	3.0565E-29	0.0000E+00
PB-212	2.0299E-12	3.3831E-14	3.1438E-12	4.2158E-12	9.4121E-21	1.6179E-25	0.0000E+00
BI-214	3.8347E-16	1.7430E-15	1.6197E-13	2.1721E-13	1.7781E-24	3.0565E-29	0.0000E+00
PB-214	3.8347E-16	1.7430E-15	1.6197E-13	2.1721E-13	1.7781E-24	3.0565E-29	0.0000E+00
RA-226	3.8347E-16	1.7430E-15	1.6197E-13	2.1721E-13	1.7781E-24	3.0565E-29	0.0000E+00
TH-228	2.0299E-12	3.3831E-14	3.1438E-12	4.2158E-12	9.4121E-21	1.6179E-25	0.0000E+00
AC-228	4.5598E-16	2.0727E-15	1.9260E-13	2.5828E-13	2.1143E-24	3.6345E-29	0.0000E+00

TABLE C-4
(Continued)

RA-228	4.5598E-16	2.0727E-15	1.9260E-13	2.5828E-13	2.1143E-24	3.6345E-29	0.0000E+00
TH-232	2.0299E-12	3.3831E-14	3.1438E-12	4.2158E-12	9.4121E-21	1.6179E-25	0.0000E+00
U-234	1.7297E-13	2.3063E-13	2.1431E-11	2.8739E-11	8.0203E-22	1.3787E-26	0.0000E+00
U-235	1.7297E-13	2.3063E-13	2.1431E-11	2.8739E-11	8.0203E-22	1.3787E-26	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	1.7297E-13	2.3063E-13	2.1431E-11	2.8739E-11	8.0203E-22	1.3787E-26	0.0000E+00
PU-238	5.1995E-14	1.4856E-14	1.3805E-12	1.8512E-12	2.4109E-22	4.1444E-27	0.0000E+00
PU-239	1.2116E-12	3.4617E-13	3.2168E-11	4.3137E-11	5.6179E-21	9.6572E-26	0.0000E+00
PU-241	5.9070E-22	1.6877E-22	1.5683E-20	2.1031E-20	2.7390E-30	4.7083E-35	0.0000E+00
AM-241	1.1183E-12	1.3979E-14	1.2990E-12	1.7419E-12	5.1853E-21	8.9136E-26	0.0000E+00
PU-242	1.2247E-12	3.4990E-13	3.2515E-11	4.3603E-11	5.6785E-21	9.7614E-26	0.0000E+00
AM-243	1.9703E-12	2.4629E-14	2.2886E-12	3.0691E-12	9.1359E-21	1.5705E-25	0.0000E+00
CM-243	1.6537E-16	5.0111E-17	4.6566E-15	6.2445E-15	7.6677E-25	1.3181E-29	0.0000E+00
CM-244	1.1979E-19	3.6299E-20	3.3731E-18	4.5234E-18	5.5543E-28	9.5478E-33	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 500 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	3.6466E-16	0.0000E+00	7.7451E-18	1.5770E-17
C-14	9.8305E-04	0.0000E+00	2.0879E-05	4.1800E-05
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

NI-59	9.5160E-01	0.0000E+00	1.3176E-04	0.0000E+00
CO-60	7.8003E-30	0.0000E+00	1.0800E-33	0.0000E+00
NI-63	2.2142E-02	0.0000E+00	3.0658E-06	0.0000E+00
SR-90	4.1380E-06	0.0000E+00	9.5093E-10	0.0000E+00
NB-94	9.5146E-01	0.0000E+00	9.4271E-05	0.0000E+00
TC-99	6.2398E-02	0.0000E+00	5.3144E-04	1.3400E-03
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	5.0353E-01	0.0000E+00	1.0573E-03	1.3610E-08
CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.7742E-01	0.0000E+00	6.7882E-05	0.0000E+00
CS-137	7.6311E-06	0.0000E+00	5.2998E-10	0.0000E+00
BA-137M	7.6311E-06	0.0000E+00	5.2998E-10	0.0000E+00
EU-154	1.0302E-18	0.0000E+00	3.5883E-24	0.0000E+00
TL-208	9.9996E-01	0.0000E+00	1.1611E-07	0.0000E+00
PO-210	7.9704E-01	0.0000E+00	2.5205E-05	0.0000E+00
PB-210	7.9704E-01	0.0000E+00	2.5205E-05	0.0000E+00
PB-212	9.9996E-01	0.0000E+00	1.1611E-07	0.0000E+00
BI-214	7.9704E-01	0.0000E+00	2.5205E-05	0.0000E+00
PB-214	7.9704E-01	0.0000E+00	2.5205E-05	0.0000E+00
RA-226	7.9704E-01	0.0000E+00	2.5205E-05	0.0000E+00
TH-228	9.9996E-01	0.0000E+00	1.1611E-07	0.0000E+00
AC-228	9.8971E-01	0.0000E+00	3.1298E-05	0.0000E+00
RA-228	9.8971E-01	0.0000E+00	3.1298E-05	0.0000E+00
TH-232	9.9996E-01	0.0000E+00	1.1611E-07	0.0000E+00
U-234	9.9697E-01	0.0000E+00	9.2574E-06	0.0000E+00
U-235	9.9697E-01	0.0000E+00	9.2574E-06	0.0000E+00
NP-237	6.5153E-01	0.0000E+00	8.5357E-04	0.0000E+00
U-238	9.9697E-01	0.0000E+00	9.2574E-06	0.0000E+00
PU-238	1.9192E-02	0.0000E+00	1.9093E-07	0.0000E+00
PU-239	9.8256E-01	0.0000E+00	9.7751E-06	0.0000E+00
PU-241	2.5210E-12	0.0000E+00	2.5080E-17	0.0000E+00
AM-241	4.5687E-01	0.0000E+00	3.9631E-05	0.0000E+00
PU-242	9.9583E-01	0.0000E+00	9.9071E-06	0.0000E+00
AM-243	9.2739E-01	0.0000E+00	8.0446E-05	0.0000E+00
CM-243	1.5863E-05	0.0000E+00	1.5781E-10	0.0000E+00
CM-244	1.9572E-09	0.0000E+00	1.9471E-14	0.0000E+00

TABLE C-4
(Continued)

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.4366E-22
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.1090E-10
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	4.3785E-19	2.9190E-18	2.7125E-16	3.6375E-16	2.0302E-27	3.4900E-32	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	1.0188E-20	6.7920E-20	6.3115E-18	8.4637E-18	4.7239E-29	8.1205E-34	0.0000E+00
SR-90	1.9617E-24	1.3078E-23	1.2153E-21	1.6297E-21	9.0962E-33	1.5636E-37	0.0000E+00
NB-94	2.6526E-15	7.5788E-15	7.0427E-13	9.4443E-13	1.2300E-23	2.1143E-28	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9201E-08
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.9659E-13
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.4413E-22	2.4413E-21	2.2686E-19	3.0422E-19	1.1320E-30	1.9459E-35	0.0000E+00
CS-137	1.9060E-27	1.9060E-26	1.7712E-24	2.3752E-24	8.8378E-36	1.5192E-40	0.0000E+00
BA-137M	1.9060E-27	1.9060E-26	1.7712E-24	2.3752E-24	8.8378E-36	1.5192E-40	0.0000E+00
EU-154	1.2017E-30	3.0042E-31	2.7917E-29	3.7437E-29	5.5720E-39	9.5288E-44	0.0000E+00
TL-208	2.0134E-12	3.3557E-14	3.1183E-12	4.1817E-12	9.3359E-21	1.6048E-25	0.0000E+00
PO-210	4.4605E-17	2.0275E-16	1.8841E-14	2.5265E-14	2.0682E-25	3.5553E-30	0.0000E+00
PB-210	4.4605E-17	2.0275E-16	1.8841E-14	2.5265E-14	2.0682E-25	3.5553E-30	0.0000E+00
PB-212	2.0134E-12	3.3557E-14	3.1183E-12	4.1817E-12	9.3359E-21	1.6048E-25	0.0000E+00
BI-214	4.4605E-17	2.0275E-16	1.8841E-14	2.5265E-14	2.0682E-25	3.5553E-30	0.0000E+00
PB-214	4.4605E-17	2.0275E-16	1.8841E-14	2.5265E-14	2.0682E-25	3.5553E-30	0.0000E+00
RA-226	4.4605E-17	2.0275E-16	1.8841E-14	2.5265E-14	2.0682E-25	3.5553E-30	0.0000E+00
TH-228	2.0134E-12	3.3557E-14	3.1183E-12	4.1817E-12	9.3359E-21	1.6048E-25	0.0000E+00
AC-228	5.5387E-17	2.5176E-16	2.3395E-14	3.1373E-14	2.5682E-25	4.4147E-30	0.0000E+00
RA-228	5.5387E-17	2.5176E-16	2.3395E-14	3.1373E-14	2.5682E-25	4.4147E-30	0.0000E+00
TH-232	2.0134E-12	3.3557E-14	3.1183E-12	4.1817E-12	9.3359E-21	1.6048E-25	0.0000E+00
U-234	9.2704E-14	1.2361E-13	1.1486E-11	1.5403E-11	4.2985E-22	7.3891E-27	0.0000E+00
U-235	9.2704E-14	1.2361E-13	1.1486E-11	1.5403E-11	4.2985E-22	7.3891E-27	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	9.2704E-14	1.2361E-13	1.1486E-11	1.5403E-11	4.2985E-22	7.3891E-27	0.0000E+00
PU-238	2.0633E-14	5.8952E-15	5.4781E-13	7.3462E-13	9.5671E-23	1.6446E-27	0.0000E+00

TABLE C-4
(Continued)

PU-239	1.0563E-12	3.0181E-13	2.8046E-11	3.7610E-11	4.8980E-21	8.4197E-26	0.0000E+00
PU-241	2.7103E-24	7.7437E-25	7.1959E-23	9.6497E-23	1.2567E-32	2.1603E-37	0.0000E+00
AM-241	9.5564E-13	1.1946E-14	1.1100E-12	1.4886E-12	4.4311E-21	7.6172E-26	0.0000E+00
PU-242	1.0706E-12	3.0589E-13	2.8425E-11	3.8118E-11	4.9642E-21	8.5334E-26	0.0000E+00
AM-243	1.9399E-12	2.4248E-14	2.2533E-12	3.0217E-12	8.9947E-21	1.5462E-25	0.0000E+00
CM-243	1.6376E-17	4.9623E-18	4.6112E-16	6.1837E-16	7.5931E-26	1.3052E-30	0.0000E+00
CM-244	2.0205E-21	6.1227E-22	5.6895E-20	7.6297E-20	9.3686E-30	1.6105E-34	0.0000E+00

PATHWAY RISK SUMMARY

*** COLLECTIVE POPULATION ***

PATHWAYS:	INGESTION	INHALATION	AIR IMMERSION	GROUND SURFACE	INTERNAL	EXTERNAL	TOTAL
COLLECTIVE FATAL CANCER RISK: (DEATHS/YR)							
	4.586E-07	2.084E-13	1.034E-18	8.505E-13	4.586E-07	8.505E-13	4.586E-07
GENETIC RISKS: (EFFECTS/YR)							
	5.239E-08	1.133E-14	4.424E-19	3.626E-13	5.239E-08	3.626E-13	5.239E-08

NUCLIDE RISK SUMMARY

*** COLLECTIVE POPULATION ***

NUCLIDES:										
	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
COLLECTIVE FATAL CANCER RISK: (DEATHS/YR)										
	1.070E-11	2.211E-07	5.261E-19	2.122E-17	1.200E-15	3.034E-18	7.508E-17	1.457E-13	2.375E-07	9.294E-18
	5.762E-17	6.003E-13	1.756E-16	1.195E-16	3.762E-16	4.264E-15	1.911E-15	4.639E-13	2.172E-15	5.601E-15

TABLE C-4
(Continued)

2.438E-14	9.373E-14	1.738E-14	2.643E-15	3.900E-14	6.529E-14	8.424E-16	1.605E-14	1.268E-14	3.113E-14
6.541E-15	1.137E-14	2.059E-14	1.971E-14	9.013E-17	2.183E-14	1.876E-14	2.792E-14	1.272E-14	8.025E-15
4.586E-07									

GENETIC RISKS: (EFFECTS/YR)

4.047E-12	4.114E-08	1.533E-19	3.304E-18	5.121E-16	8.113E-19	1.121E-18	6.349E-14	1.125E-08	2.536E-19
2.474E-17	1.337E-15	7.166E-17	4.926E-17	1.443E-16	1.864E-15	8.201E-16	1.960E-13	5.284E-16	5.793E-16
1.017E-14	4.026E-14	7.374E-15	5.738E-16	2.090E-16	2.828E-14	3.670E-16	7.453E-17	2.252E-17	8.002E-15
9.762E-16	1.754E-17	9.955E-16	7.993E-16	8.009E-18	4.048E-15	7.671E-16	6.594E-15	2.481E-15	1.385E-15
5.239E-08									

FATAL CANCER RATE (DEATHS/YR) - COMBINED LET

***SUMMED OVER ALL CANCERS

NUCLIDES	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
PATHWAYS										
- INGESTION	1.070E-11	2.211E-07	4.512E-19	1.546E-18	1.137E-17	2.350E-18	5.360E-17	2.914E-16	2.375E-07	1.196E-18
	.000	6.003E-13	6.026E-17	1.188E-16	3.724E-16	.000	.000	.000	1.038E-15	4.927E-15
	4.623E-16	7.593E-19	9.795E-19	7.927E-16	9.730E-17	.000	5.631E-16	1.834E-16	1.202E-17	1.385E-17
	6.490E-16	1.200E-17	1.601E-15	1.845E-16	1.688E-17	1.922E-15	1.753E-16	1.970E-15	1.060E-15	7.389E-16
	4.586E-07									
% OF INTERNAL	100.	100.	90.7	84.9	39.4	77.5	71.4	76.7	100.	12.9
	.000	100.	98.8	99.4	99.0	.000	.000	.000	47.8	90.6
	95.7	43.8	43.3	36.7	.252	.000	66.8	1.15	9.538E-02	.118

TABLE C-4
(Continued)

	9.96	.106	7.79	.938	18.7	10.0	.939	10.2	9.42	9.21
	100.									
% OF ALL PATHWAYS	100.	100.	85.8	7.28	.948	77.5	71.4	.200	100.	12.9
	.000	100.	34.3	99.4	99.0	.000	.000	.000	47.8	88.0
	1.90	8.101E-04	5.636E-03	30.0	.250	.000	66.8	1.14	9.480E-02	4.448E-02
	9.92	.105	7.78	.936	18.7	8.80	.935	7.06	8.33	9.21
	100.									
- INHALATION	1.642E-23	2.467E-24	4.642E-20	2.747E-19	1.746E-17	6.842E-19	2.148E-17	8.876E-17	2.311E-19	8.098E-18
	6.323E-19	2.740E-18	7.611E-19	7.116E-19	3.720E-18	1.749E-22	2.240E-17	.000	1.133E-15	5.124E-16
	2.096E-17	9.724E-19	1.283E-18	1.368E-15	3.852E-14	3.256E-18	2.794E-16	1.578E-14	1.259E-14	1.171E-14
	5.869E-15	1.130E-14	1.896E-14	1.948E-14	7.325E-17	1.726E-14	1.851E-14	1.741E-14	1.020E-14	7.283E-15
	2.084E-13									
% OF INTERNAL	1.535E-10	1.116E-15	9.33	15.1	60.6	22.5	28.6	23.3	9.729E-11	87.1
	100.	4.565E-04	1.25	.596	.989	100.	100.	.000	52.2	9.42
	4.34	56.2	56.7	63.3	99.7	100.	33.2	98.9	99.9	99.9
	90.0	99.9	92.2	99.1	81.3	90.0	99.1	89.8	90.6	90.8
	4.545E-05									
% OF ALL PATHWAYS	1.535E-10	1.116E-15	8.82	1.29	1.45	22.5	28.6	6.091E-02	9.729E-11	87.1
	1.10	4.565E-04	.433	.596	.989	4.101E-06	1.17	.000	52.2	9.15
	8.598E-02	1.038E-03	7.381E-03	51.8	98.8	4.986E-03	33.2	98.3	99.3	37.6
	89.7	99.4	92.1	98.8	81.3	79.1	98.7	62.3	80.1	90.8
	4.545E-05									
- AIR IMMERSION	.000	.000	2.752E-25	2.949E-24	6.595E-20	.000	.000	1.515E-19	2.808E-27	.000
	5.308E-21	1.609E-22	1.509E-20	.000	.000	4.140E-20	5.485E-20	3.961E-19	8.065E-25	9.740E-23
	1.402E-20	1.485E-19	2.216E-20	5.982E-22	1.814E-22	8.794E-20	4.983E-30	1.606E-23	1.238E-23	1.393E-20
	7.653E-22	8.233E-24	6.619E-24	7.095E-24	.000	1.558E-21	5.765E-24	4.444E-21	9.038E-21	4.081E-24
	1.034E-18									
% OF EXTERNAL	.000	.000	9.658E-04	1.520E-05	5.632E-03	.000	.000	1.043E-04	4.189E-02	.000
	9.314E-03	2.904E-03	1.317E-02	.000	.000	9.708E-04	2.904E-03	8.539E-05	1.415E-04	6.030E-05

TABLE C-4
(Continued)

	5.866E-05	1.584E-04	1.275E-04	1.241E-04	4.776E-05	1.347E-04	1.211E-05	1.909E-05	1.593E-05	7.177E-05
	3.285E-03	1.332E-05	2.753E-05	1.621E-05	.000	5.879E-05	7.478E-06	5.201E-05	6.168E-04	1.310E-04
	1.215E-04									
% OF ALL PATHWAYS	.000	.000	5.231E-05	1.389E-05	5.497E-03	.000	.000	1.040E-04	1.182E-18	.000
	9.212E-03	2.680E-08	8.593E-03	.000	.000	9.708E-04	2.870E-03	8.539E-05	3.713E-08	1.739E-06
	5.750E-05	1.584E-04	1.275E-04	2.263E-05	4.652E-07	1.347E-04	5.914E-13	1.001E-07	9.762E-08	4.474E-05
	1.170E-05	7.240E-08	3.215E-08	3.600E-08	.000	7.137E-06	3.073E-08	1.592E-05	7.105E-05	5.085E-08
	2.254E-10									
- GROUND SURFACE	.000	.000	2.849E-20	1.940E-17	1.171E-15	.000	.000	1.453E-13	6.700E-24	.000
	5.698E-17	5.540E-18	1.145E-16	.000	.000	4.264E-15	1.889E-15	4.639E-13	5.701E-19	1.615E-16
	2.389E-14	9.372E-14	1.738E-14	4.821E-16	3.799E-16	6.529E-14	4.115E-23	8.414E-17	7.773E-17	1.941E-14
	2.330E-17	6.182E-17	2.404E-17	4.376E-17	.000	2.650E-15	7.709E-17	8.543E-15	1.465E-15	3.115E-18
	8.505E-13									
% OF EXTERNAL	.000	.000	100.	100.	100.	.000	.000	100.	100.	.000
	100.	100.	100.	.000	.000	100.	100.	100.	100.	100.
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	100.	100.	100.	100.	.000	100.	100.	100.	100.	100.
	100.									
% OF ALL PATHWAYS	.000	.000	5.42	91.4	97.6	.000	.000	99.7	2.821E-15	.000
	98.9	9.229E-04	65.2	.000	.000	100.	98.8	100.	2.625E-02	2.88
	98.0	100.	100.	18.2	.974	100.	4.885E-06	.524	.613	62.3
	.356	.544	.117	.222	.000	12.1	.411	30.6	11.5	3.882E-02
	1.855E-04									
- INTERNAL	1.070E-11	2.211E-07	4.976E-19	1.820E-18	2.883E-17	3.034E-18	7.508E-17	3.802E-16	2.375E-07	9.294E-18
	6.323E-19	6.003E-13	6.103E-17	1.195E-16	3.762E-16	1.749E-22	2.240E-17	.000	2.171E-15	5.439E-15
	4.832E-16	1.732E-18	2.262E-18	2.161E-15	3.862E-14	3.256E-18	8.424E-16	1.597E-14	1.261E-14	1.172E-14
	6.518E-15	1.131E-14	2.056E-14	1.967E-14	9.013E-17	1.918E-14	1.868E-14	1.938E-14	1.126E-14	8.022E-15
	4.586E-07									

TABLE C-4
(Continued)

% OF ALL PATHWAYS	100.	100.	94.6	8.58	2.40	100.	100.	.261	100.	100.
	1.10	100.	34.8	100.	100.	4.101E-06	1.17	.000	100.	97.1
	1.98	1.848E-03	1.302E-02	81.8	99.0	4.986E-03	100.	99.5	99.4	37.7
	99.6	99.5	99.9	99.8	100.	87.9	99.6	69.4	88.5	100.
	100.									
- EXTERNAL	.000	.000	2.849E-20	1.940E-17	1.171E-15	.000	.000	1.453E-13	6.703E-24	.000
	5.699E-17	5.540E-18	1.146E-16	.000	.000	4.264E-15	1.889E-15	4.639E-13	5.701E-19	1.615E-16
	2.389E-14	9.372E-14	1.738E-14	4.821E-16	3.799E-16	6.529E-14	4.115E-23	8.414E-17	7.773E-17	1.941E-14
	2.330E-17	6.182E-17	2.404E-17	4.376E-17	.000	2.650E-15	7.709E-17	8.543E-15	1.465E-15	3.115E-18
	8.505E-13									
% OF ALL PATHWAYS	.000	.000	5.42	91.4	97.6	.000	.000	99.7	2.822E-15	.000
	98.9	9.230E-04	65.2	.000	.000	100.	98.8	100.	2.625E-02	2.88
	98.0	100.	100.	18.2	.974	100.	4.885E-06	.524	.613	62.3
	.356	.544	.117	.222	.000	12.1	.411	30.6	11.5	3.882E-02
	1.855E-04									
TOTAL OVER ALL PATHWAYS	1.070E-11	2.211E-07	5.261E-19	2.122E-17	1.200E-15	3.034E-18	7.508E-17	1.457E-13	2.375E-07	9.294E-18
	5.762E-17	6.003E-13	1.756E-16	1.195E-16	3.762E-16	4.264E-15	1.911E-15	4.639E-13	2.172E-15	5.601E-15
	2.438E-14	9.373E-14	1.738E-14	2.643E-15	3.900E-14	6.529E-14	8.424E-16	1.605E-14	1.268E-14	3.113E-14
	6.541E-15	1.137E-14	2.059E-14	1.971E-14	9.013E-17	2.183E-14	1.876E-14	2.792E-14	1.272E-14	8.025E-15
	4.586E-07									
% OF TOTAL	2.333E-03	48.2	1.147E-10	4.628E-09	2.616E-07	6.617E-10	1.637E-08	3.178E-05	51.8	2.027E-09
	1.256E-08	1.309E-04	3.829E-08	2.606E-08	8.203E-08	9.299E-07	4.167E-07	1.012E-04	4.736E-07	1.221E-06
	5.315E-06	2.044E-05	3.790E-06	5.763E-07	8.503E-06	1.424E-05	1.837E-07	3.500E-06	2.766E-06	6.788E-06
	1.426E-06	2.480E-06	4.489E-06	4.298E-06	1.965E-08	4.760E-06	4.091E-06	6.088E-06	2.774E-06	1.750E-06

COLLECTIVE GENETIC EFFECT (EFFECTS/YR) - COMBINED LET

TABLE C-4
(Continued)

***SUMMED OVER ALL GONADS

NUCLIDES	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
PATHWAYS										
- INGESTION	4.047E-12	4.114E-08	1.433E-19	5.223E-19	5.872E-18	7.607E-19	6.836E-19	1.799E-16	1.125E-08	2.417E-19
	.000	1.334E-15	2.139E-17	4.898E-17	1.429E-16	.000	.000	.000	4.971E-16	4.686E-16
	1.070E-16	1.880E-20	1.192E-19	3.376E-16	8.211E-18	.000	3.408E-16	2.113E-18	5.049E-19	1.144E-18
	1.048E-16	5.001E-19	2.747E-16	2.917E-17	1.982E-18	3.146E-16	2.768E-17	3.170E-16	1.992E-16	1.468E-16
	5.239E-08									
% OF INTERNAL	100.	100.	96.0	96.1	96.8	93.8	61.0	99.6	100.	95.3
	.000	100.	98.8	99.4	99.0	.000	.000	.000	94.1	90.6
	99.0	82.1	72.1	90.1	13.3	.000	92.8	4.19	49.7	67.1
	10.8	50.7	27.8	3.71	24.8	10.9	3.71	11.1	10.6	10.6
	100.									
% OF ALL PATHWAYS	100.	100.	93.5	15.8	1.15	93.8	61.0	.283	100.	95.3
	.000	99.8	29.8	99.4	99.0	.000	.000	.000	94.1	80.9
	1.05	4.670E-05	1.616E-03	58.8	3.93	.000	92.8	2.84	2.24	1.430E-02
	10.7	2.85	27.6	3.65	24.8	7.77	3.61	4.81	8.03	10.6
	100.									
- INHALATION	6.459E-24	4.769E-25	5.987E-21	2.110E-20	1.915E-19	5.062E-20	4.373E-19	6.878E-19	6.425E-22	1.189E-20
	7.531E-21	5.998E-21	2.649E-19	2.800E-19	1.385E-18	1.810E-24	7.788E-19	.000	3.110E-17	4.875E-17
	1.050E-18	4.087E-21	4.609E-20	3.690E-17	5.341E-17	7.040E-20	2.629E-17	4.825E-17	5.107E-19	5.602E-19
	8.617E-16	4.858E-19	7.143E-16	7.573E-16	6.026E-18	2.562E-15	7.184E-16	2.546E-15	1.674E-15	1.237E-15
	1.133E-14									
% OF INTERNAL	1.596E-10	1.159E-15	4.01	3.88	3.16	6.24	39.0	.381	5.712E-12	4.69
	100.	4.497E-04	1.22	.568	.960	100.	100.	.000	5.89	9.42

TABLE C-4
(Continued)

	.972	17.9	27.9	9.85	86.7	100.	7.16	95.8	50.3	32.9
	89.2	49.3	72.2	96.3	75.2	89.1	96.3	88.9	89.4	89.4
	2.162E-05									
% OF ALL PATHWAYS	1.596E-10	1.159E-15	3.90	.639	3.739E-02	6.24	39.0	1.083E-03	5.712E-12	4.69
	3.045E-02	4.487E-04	.370	.568	.960	9.712E-08	9.496E-02	.000	5.89	8.42
	1.033E-02	1.015E-05	6.250E-04	6.43	25.6	2.489E-04	7.16	64.7	2.27	7.000E-03
	88.3	2.77	71.8	94.7	75.2	63.3	93.7	38.6	67.5	89.3
	2.162E-05									
- AIR IMMERSION	.000	.000	3.907E-26	4.202E-25	2.854E-20	.000	.000	6.624E-20	1.207E-27	.000
	2.307E-21	8.584E-23	6.576E-21	.000	.000	1.809E-20	2.381E-20	1.667E-19	3.521E-25	4.585E-23
	5.887E-21	6.378E-20	9.418E-21	2.468E-22	7.609E-23	3.803E-20	7.090E-31	6.473E-24	4.677E-24	5.758E-21
	3.288E-22	2.993E-24	2.071E-24	2.655E-24	.000	7.133E-22	1.859E-24	1.960E-21	3.781E-21	1.297E-24
	4.424E-19									
% OF EXTERNAL	.000	.000	9.640E-04	1.522E-05	5.639E-03	.000	.000	1.046E-04	4.189E-02	.000
	9.328E-03	2.887E-03	1.315E-02	.000	.000	9.705E-04	2.906E-03	8.502E-05	1.413E-04	7.404E-05
	5.852E-05	1.584E-04	1.277E-04	1.239E-04	5.163E-05	1.345E-04	1.216E-05	2.679E-05	2.174E-05	7.197E-05
	3.395E-03	1.808E-05	3.186E-05	2.071E-05	.000	6.091E-05	8.854E-06	5.254E-05	6.222E-04	1.428E-04
	1.220E-04									
% OF ALL PATHWAYS	.000	.000	2.548E-05	1.272E-05	5.573E-03	.000	.000	1.043E-04	1.073E-17	.000
	9.325E-03	6.422E-06	9.176E-03	.000	.000	9.705E-04	2.903E-03	8.502E-05	6.664E-08	7.915E-06
	5.790E-05	1.584E-04	1.277E-04	4.301E-05	3.641E-05	1.345E-04	1.932E-13	8.686E-06	2.076E-05	7.195E-05
	3.368E-05	1.706E-05	2.080E-07	3.322E-07	.000	1.762E-05	2.424E-07	2.973E-05	1.524E-04	9.370E-08
	8.443E-10									
- GROUND SURFACE	.000	.000	4.052E-21	2.760E-18	5.060E-16	.000	.000	6.331E-14	2.880E-24	.000
	2.473E-17	2.973E-18	5.000E-17	.000	.000	1.864E-15	8.193E-16	1.960E-13	2.492E-19	6.193E-17
	1.006E-14	4.026E-14	7.374E-15	1.992E-16	1.474E-16	2.828E-14	5.832E-24	2.416E-17	2.151E-17	8.001E-15
	9.684E-18	1.655E-17	6.501E-18	1.282E-17	.000	1.171E-15	2.100E-17	3.731E-15	6.076E-16	9.088E-19
	3.626E-13									

TABLE C-4
(Continued)

% OF EXTERNAL	.000	.000	100.	100.	100.	.000	.000	100.	100.	.000
	100.	100.	100.	.000	.000	100.	100.	100.	100.	100.
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	100.	100.	100.	100.	.000	100.	100.	100.	100.	100.
	100.									
% OF ALL PATHWAYS	.000	.000	2.64	83.6	98.8	.000	.000	99.7	2.560E-14	.000
	100.	.222	69.8	.000	.000	100.	99.9	100.	4.715E-02	10.7
	98.9	100.	100.	34.7	70.5	100.	1.589E-06	32.4	95.5	100.
	.992	94.4	.653	1.60	.000	28.9	2.74	56.6	24.5	6.564E-02
	6.921E-04									
- INTERNAL	4.047E-12	4.114E-08	1.493E-19	5.434E-19	6.064E-18	8.113E-19	1.121E-18	1.806E-16	1.125E-08	2.536E-19
	7.531E-21	1.334E-15	2.165E-17	4.926E-17	1.443E-16	1.810E-24	7.788E-19	.000	5.282E-16	5.174E-16
	1.080E-16	2.289E-20	1.653E-19	3.745E-16	6.162E-17	7.040E-20	3.670E-16	5.037E-17	1.016E-18	1.705E-18
	9.665E-16	9.858E-19	9.890E-16	7.865E-16	8.009E-18	2.877E-15	7.461E-16	2.863E-15	1.874E-15	1.384E-15
	5.239E-08									
% OF ALL PATHWAYS	100.	100.	97.4	16.4	1.18	100.	100.	.284	100.	100.
	3.045E-02	99.8	30.2	100.	100.	9.712E-08	9.496E-02	.000	100.	89.3
	1.06	5.685E-05	2.241E-03	65.3	29.5	2.489E-04	100.	67.6	4.51	2.130E-02
	99.0	5.62	99.3	98.4	100.	71.1	97.3	43.4	75.5	99.9
	100.									
- EXTERNAL	.000	.000	4.053E-21	2.760E-18	5.061E-16	.000	.000	6.331E-14	2.881E-24	.000
	2.473E-17	2.973E-18	5.001E-17	.000	.000	1.864E-15	8.193E-16	1.960E-13	2.492E-19	6.193E-17
	1.006E-14	4.026E-14	7.374E-15	1.992E-16	1.474E-16	2.828E-14	5.832E-24	2.416E-17	2.151E-17	8.001E-15
	9.684E-18	1.655E-17	6.501E-18	1.282E-17	.000	1.171E-15	2.100E-17	3.731E-15	6.076E-16	9.088E-19
	3.626E-13									
% OF ALL PATHWAYS	.000	.000	2.64	83.6	98.8	.000	.000	99.7	2.561E-14	.000
	100.	.222	69.8	.000	.000	100.	99.9	100.	4.715E-02	10.7
	98.9	100.	100.	34.7	70.5	100.	1.589E-06	32.4	95.5	100.
	.992	94.4	.653	1.60	.000	28.9	2.74	56.6	24.5	6.564E-02
	6.921E-04									

TABLE C-4
(Continued)

TOTAL OVER ALL PATHWAYS	4.047E-12	4.114E-08	1.533E-19	3.304E-18	5.121E-16	8.113E-19	1.121E-18	6.349E-14	1.125E-08	2.536E-19
	2.474E-17	1.337E-15	7.166E-17	4.926E-17	1.443E-16	1.864E-15	8.201E-16	1.960E-13	5.284E-16	5.793E-16
	1.017E-14	4.026E-14	7.374E-15	5.738E-16	2.090E-16	2.828E-14	3.670E-16	7.453E-17	2.252E-17	8.002E-15
	9.762E-16	1.754E-17	9.955E-16	7.993E-16	8.009E-18	4.048E-15	7.671E-16	6.594E-15	2.481E-15	1.385E-15
	5.239E-08									
% OF TOTAL	7.724E-03	78.5	2.927E-10	6.306E-09	9.775E-07	1.549E-09	2.139E-09	1.212E-04	21.5	4.840E-10
	4.721E-08	2.551E-06	1.368E-07	9.401E-08	2.753E-07	3.558E-06	1.565E-06	3.742E-04	1.009E-06	1.106E-06
	1.941E-05	7.683E-05	1.407E-05	1.095E-06	3.989E-07	5.398E-05	7.006E-07	1.422E-07	4.299E-08	1.527E-05
	1.863E-06	3.347E-08	1.900E-06	1.526E-06	1.529E-08	7.726E-06	1.464E-06	1.259E-05	4.736E-06	2.643E-06

1 ANNUAL SUMMARY FOR YEAR 600 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	1.5839E-19	0.0000E+00	3.3641E-21	6.8490E-21
C-14	1.1873E-04	0.0000E+00	2.5218E-06	5.0490E-06
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.3770E-01	0.0000E+00	1.2984E-04	0.0000E+00
CO-60	1.4237E-35	0.0000E+00	1.9713E-39	0.0000E+00
NI-63	1.0284E-02	0.0000E+00	1.4240E-06	0.0000E+00
SR-90	3.5960E-07	0.0000E+00	8.2637E-11	0.0000E+00

TABLE C-4
(Continued)

NB-94	9.3882E-01	0.0000E+00	9.3018E-05	0.0000E+00
TC-99	2.6712E-02	0.0000E+00	2.2751E-04	5.7350E-04
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	4.0825E-01	0.0000E+00	8.5723E-04	4.8420E-04
CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.7063E-01	0.0000E+00	6.7411E-05	0.0000E+00
CS-137	7.5223E-07	0.0000E+00	5.2243E-11	0.0000E+00
BA-137M	7.5223E-07	0.0000E+00	5.2243E-11	0.0000E+00
EU-154	2.9736E-22	0.0000E+00	1.0357E-27	0.0000E+00
TL-208	9.9995E-01	0.0000E+00	1.1611E-07	0.0000E+00
PO-210	7.6086E-01	0.0000E+00	2.4061E-05	0.0000E+00
PB-210	7.6086E-01	0.0000E+00	2.4061E-05	0.0000E+00
PB-212	9.9995E-01	0.0000E+00	1.1611E-07	0.0000E+00
BI-214	7.6086E-01	0.0000E+00	2.4061E-05	0.0000E+00
PB-214	7.6086E-01	0.0000E+00	2.4061E-05	0.0000E+00
RA-226	7.6086E-01	0.0000E+00	2.4061E-05	0.0000E+00
TH-228	9.9995E-01	0.0000E+00	1.1611E-07	0.0000E+00
AC-228	9.8658E-01	0.0000E+00	3.1199E-05	0.0000E+00
RA-228	9.8658E-01	0.0000E+00	3.1199E-05	0.0000E+00
TH-232	9.9995E-01	0.0000E+00	1.1611E-07	0.0000E+00
U-234	9.9604E-01	0.0000E+00	9.2488E-06	0.0000E+00
U-235	9.9604E-01	0.0000E+00	9.2488E-06	0.0000E+00
NP-237	5.7156E-01	0.0000E+00	7.4879E-04	0.0000E+00
U-238	9.9604E-01	0.0000E+00	9.2488E-06	0.0000E+00
PU-238	8.7015E-03	0.0000E+00	8.6568E-08	0.0000E+00
PU-239	9.7878E-01	0.0000E+00	9.7374E-06	0.0000E+00
PU-241	1.3216E-14	0.0000E+00	1.3148E-19	0.0000E+00
AM-241	3.8945E-01	0.0000E+00	3.3782E-05	0.0000E+00
PU-242	9.9466E-01	0.0000E+00	9.8954E-06	0.0000E+00
AM-243	9.1078E-01	0.0000E+00	7.9005E-05	0.0000E+00
CM-243	1.8093E-06	0.0000E+00	1.8000E-11	0.0000E+00
CM-244	3.8026E-11	0.0000E+00	3.7830E-16	0.0000E+00

TABLE C-4
(Continued)

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.4925E-25
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.1003E-10
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	2.0203E-20	1.3469E-19	1.2516E-17	1.6784E-17	9.3677E-29	1.6103E-33	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	2.2157E-22	1.4772E-21	1.3727E-19	1.8408E-19	1.0274E-30	1.7661E-35	0.0000E+00
SR-90	8.0558E-27	5.3706E-26	4.9906E-24	6.6925E-24	3.7353E-35	6.4211E-40	0.0000E+00
NB-94	6.9846E-16	1.9956E-15	1.8544E-13	2.4868E-13	3.2387E-24	5.5673E-29	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.2498E-08
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.0552E-08
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.5178E-24	2.5179E-23	2.3397E-21	3.1376E-21	1.1675E-32	2.0069E-37	0.0000E+00
CS-137	1.9513E-30	1.9513E-29	1.8133E-27	2.4316E-27	9.0479E-39	1.5554E-43	0.0000E+00
BA-137M	1.9513E-30	1.9513E-29	1.8133E-27	2.4316E-27	9.0479E-39	1.5554E-43	0.0000E+00
EU-154	3.0850E-34	7.7125E-35	7.1669E-33	9.6109E-33	1.4293E-42	0.0000E+00	0.0000E+00
TL-208	1.9971E-12	3.3286E-14	3.0931E-12	4.1479E-12	9.2603E-21	1.5919E-25	0.0000E+00
PO-210	5.1884E-18	2.3584E-17	2.1915E-15	2.9389E-15	2.4058E-26	4.1355E-31	0.0000E+00
PB-210	5.1884E-18	2.3584E-17	2.1915E-15	2.9389E-15	2.4058E-26	4.1355E-31	0.0000E+00
PB-212	1.9971E-12	3.3286E-14	3.0931E-12	4.1479E-12	9.2603E-21	1.5919E-25	0.0000E+00
BI-214	5.1884E-18	2.3584E-17	2.1915E-15	2.9389E-15	2.4058E-26	4.1355E-31	0.0000E+00
PB-214	5.1884E-18	2.3584E-17	2.1915E-15	2.9389E-15	2.4058E-26	4.1355E-31	0.0000E+00
RA-226	5.1884E-18	2.3584E-17	2.1915E-15	2.9389E-15	2.4058E-26	4.1355E-31	0.0000E+00
TH-228	1.9971E-12	3.3286E-14	3.0931E-12	4.1479E-12	9.2603E-21	1.5919E-25	0.0000E+00
AC-228	6.7276E-18	3.0580E-17	2.8417E-15	3.8107E-15	3.1195E-26	5.3624E-31	0.0000E+00
RA-228	6.7276E-18	3.0580E-17	2.8417E-15	3.8107E-15	3.1195E-26	5.3624E-31	0.0000E+00
TH-232	1.9971E-12	3.3286E-14	3.0931E-12	4.1479E-12	9.2603E-21	1.5919E-25	0.0000E+00
U-234	4.9685E-14	6.6247E-14	6.1560E-12	8.2553E-12	2.3038E-22	3.9603E-27	0.0000E+00
U-235	4.9685E-14	6.6247E-14	6.1560E-12	8.2553E-12	2.3038E-22	3.9603E-27	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	4.9685E-14	6.6247E-14	6.1560E-12	8.2553E-12	2.3038E-22	3.9603E-27	0.0000E+00
PU-238	8.1877E-15	2.3394E-15	2.1739E-13	2.9152E-13	3.7965E-23	6.5262E-28	0.0000E+00

TABLE C-4
(Continued)

PU-239	9.2098E-13	2.6314E-13	2.4452E-11	3.2791E-11	4.2704E-21	7.3409E-26	0.0000E+00
PU-241	1.2435E-26	3.5530E-27	3.3016E-25	4.4275E-25	5.7661E-35	9.9119E-40	0.0000E+00
AM-241	8.1665E-13	1.0208E-14	9.4860E-13	1.2721E-12	3.7867E-21	6.5093E-26	0.0000E+00
PU-242	9.3592E-13	2.6741E-13	2.4849E-11	3.3323E-11	4.3397E-21	7.4599E-26	0.0000E+00
AM-243	1.9099E-12	2.3874E-14	2.2185E-12	2.9750E-12	8.8557E-21	1.5223E-25	0.0000E+00
CM-243	1.6216E-18	4.9140E-19	4.5664E-17	6.1235E-17	7.5191E-27	1.2925E-31	0.0000E+00
CM-244	3.4080E-23	1.0327E-23	9.5968E-22	1.2869E-21	1.5802E-31	2.7164E-36	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 700 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	6.8796E-23	0.0000E+00	1.4612E-24	2.9750E-24
C-14	1.4341E-05	0.0000E+00	3.0459E-07	6.0980E-07
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.2401E-01	0.0000E+00	1.2794E-04	0.0000E+00
CO-60	2.5983E-41	0.0000E+00	4.2039E-45	0.0000E+00
NI-63	4.7768E-03	0.0000E+00	6.6141E-07	0.0000E+00
SR-90	3.1250E-08	0.0000E+00	7.1813E-12	0.0000E+00
NB-94	9.2634E-01	0.0000E+00	9.1782E-05	0.0000E+00
TC-99	1.1435E-02	0.0000E+00	9.7394E-05	2.4550E-04
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

SB-125	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	3.3100E-01	0.0000E+00	6.9502E-04	1.0510E-03
CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.6389E-01	0.0000E+00	6.6943E-05	0.0000E+00
CS-137	7.4150E-08	0.0000E+00	5.1498E-12	0.0000E+00
BA-137M	7.4150E-08	0.0000E+00	5.1498E-12	0.0000E+00
EU-154	8.5828E-26	0.0000E+00	2.9894E-31	0.0000E+00
TL-208	9.9994E-01	0.0000E+00	1.1611E-07	0.0000E+00
PO-210	7.2632E-01	0.0000E+00	2.2968E-05	0.0000E+00
PB-210	7.2632E-01	0.0000E+00	2.2968E-05	0.0000E+00
PB-212	9.9994E-01	0.0000E+00	1.1611E-07	0.0000E+00
BI-214	7.2632E-01	0.0000E+00	2.2968E-05	0.0000E+00
PB-214	7.2632E-01	0.0000E+00	2.2968E-05	0.0000E+00
RA-226	7.2632E-01	0.0000E+00	2.2968E-05	0.0000E+00
TH-228	9.9994E-01	0.0000E+00	1.1611E-07	0.0000E+00
AC-228	9.8347E-01	0.0000E+00	3.1100E-05	0.0000E+00
RA-228	9.8347E-01	0.0000E+00	3.1100E-05	0.0000E+00
TH-232	9.9994E-01	0.0000E+00	1.1611E-07	0.0000E+00
U-234	9.9512E-01	0.0000E+00	9.2403E-06	0.0000E+00
U-235	9.9512E-01	0.0000E+00	9.2403E-06	0.0000E+00
NP-237	5.0140E-01	0.0000E+00	6.5688E-04	0.0000E+00
U-238	9.9512E-01	0.0000E+00	9.2403E-06	0.0000E+00
PU-238	3.9452E-03	0.0000E+00	3.9249E-08	0.0000E+00
PU-239	9.7500E-01	0.0000E+00	9.6999E-06	0.0000E+00
PU-241	6.9282E-17	0.0000E+00	6.8925E-22	0.0000E+00
AM-241	3.3197E-01	0.0000E+00	2.8797E-05	0.0000E+00
PU-242	9.9348E-01	0.0000E+00	9.8837E-06	0.0000E+00
AM-243	8.9447E-01	0.0000E+00	7.7590E-05	0.0000E+00
CM-243	2.0638E-07	0.0000E+00	2.0532E-12	0.0000E+00
CM-244	7.3879E-13	0.0000E+00	7.3499E-18	0.0000E+00

NUCLIDE	SURFACE SOIL CONC	SURFACE WATER CONC	SOLUBLE TO STREAM	SOLUBLE TO DEEP LAYERS	ATMOSPHERE AT SPILLAGE	ATMOSPHERE DOWN WIND	WELL WATER CONC

TABLE C-4.
(Continued)

	CI/KG	CI/M**3	CI	CI	CI/M**3	CI/M**3	CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6.4831E-29
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.3289E-11
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.3217E-22	6.2145E-21	5.7749E-19	7.7441E-19	4.3223E-30	7.4301E-35	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	4.8190E-24	3.2127E-23	2.9854E-21	4.0034E-21	2.2345E-32	3.8411E-37	0.0000E+00
SR-90	3.3081E-29	2.2054E-28	2.0494E-26	2.7482E-26	1.5339E-37	2.6372E-42	0.0000E+00
NB-94	1.8392E-16	5.2548E-16	4.8830E-14	6.5482E-14	8.5278E-25	1.4659E-29	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	5.3499E-09
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.2903E-08
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.5968E-26	2.5968E-25	2.4131E-23	3.2360E-23	1.2041E-34	2.0698E-39	0.0000E+00
CS-137	1.9977E-33	1.9977E-32	1.8564E-30	2.4894E-30	9.2626E-42	0.0000E+00	0.0000E+00
BA-137M	1.9977E-33	1.9977E-32	1.8564E-30	2.4894E-30	9.2626E-42	0.0000E+00	0.0000E+00
EU-154	7.9202E-38	1.9801E-38	1.8400E-36	2.4674E-36	0.0000E+00	0.0000E+00	0.0000E+00
TL-208	1.9810E-12	3.3016E-14	3.0680E-12	4.1143E-12	9.1854E-21	1.5790E-25	0.0000E+00
PO-210	6.0351E-19	2.7432E-18	2.5492E-16	3.4184E-16	2.7984E-27	4.8104E-32	0.0000E+00
PB-210	6.0351E-19	2.7432E-18	2.5492E-16	3.4184E-16	2.7984E-27	4.8104E-32	0.0000E+00
PB-212	1.9810E-12	3.3016E-14	3.0680E-12	4.1143E-12	9.1854E-21	1.5790E-25	0.0000E+00
BI-214	6.0351E-19	2.7432E-18	2.5492E-16	3.4184E-16	2.7984E-27	4.8104E-32	0.0000E+00
PB-214	6.0351E-19	2.7432E-18	2.5492E-16	3.4184E-16	2.7984E-27	4.8104E-32	0.0000E+00
RA-226	6.0351E-19	2.7432E-18	2.5492E-16	3.4184E-16	2.7984E-27	4.8104E-32	0.0000E+00
TH-228	1.9810E-12	3.3016E-14	3.0680E-12	4.1143E-12	9.1854E-21	1.5790E-25	0.0000E+00
AC-228	8.1718E-19	3.7145E-18	3.4517E-16	4.6288E-16	3.7891E-27	6.5135E-32	0.0000E+00
RA-228	8.1718E-19	3.7145E-18	3.4517E-16	4.6288E-16	3.7891E-27	6.5135E-32	0.0000E+00
TH-232	1.9810E-12	3.3016E-14	3.0680E-12	4.1143E-12	9.1854E-21	1.5790E-25	0.0000E+00
U-234	2.6629E-14	3.5505E-14	3.2994E-12	4.4245E-12	1.2347E-22	2.1225E-27	0.0000E+00
U-235	2.6629E-14	3.5505E-14	3.2994E-12	4.4245E-12	1.2347E-22	2.1225E-27	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	2.6629E-14	3.5505E-14	3.2994E-12	4.4245E-12	1.2347E-22	2.1225E-27	0.0000E+00
PU-238	3.2491E-15	9.2832E-16	8.6264E-14	1.1568E-13	1.5065E-23	2.5898E-28	0.0000E+00
PU-239	8.0297E-13	2.2942E-13	2.1319E-11	2.8589E-11	3.7232E-21	6.4002E-26	0.0000E+00
PU-241	5.7057E-29	1.6302E-29	1.5149E-27	2.0315E-27	2.6456E-37	4.5472E-42	0.0000E+00

TABLE C-4
(Continued)

AM-241	6.9788E-13	8.7235E-15	8.1063E-13	1.0871E-12	3.2359E-21	5.5626E-26	0.0000E+00
PU-242	8.1818E-13	2.3377E-13	2.1723E-11	2.9131E-11	3.7938E-21	6.5215E-26	0.0000E+00
AM-243	1.8804E-12	2.3505E-14	2.1842E-12	2.9290E-12	8.7189E-21	1.4988E-25	0.0000E+00
CM-243	1.6058E-19	4.8662E-20	4.5219E-18	6.0639E-18	7.4459E-28	1.2800E-32	0.0000E+00
CM-244	5.7485E-25	1.7420E-25	1.6187E-23	2.1707E-23	2.6655E-33	4.5819E-38	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 800 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	2.9881E-26	0.0000E+00	6.3465E-28	1.2920E-27
C-14	1.7321E-06	0.0000E+00	3.6789E-08	7.3650E-08
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.1052E-01	0.0000E+00	1.2607E-04	0.0000E+00
CO-60	5.6052E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	2.2187E-03	0.0000E+00	3.0721E-07	0.0000E+00
SR-90	2.7157E-09	0.0000E+00	6.2407E-13	0.0000E+00
NB-94	9.1404E-01	0.0000E+00	9.0563E-05	0.0000E+00
TC-99	4.8954E-03	0.0000E+00	4.1693E-05	1.0510E-04
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	2.6836E-01	0.0000E+00	5.6350E-04	1.5980E-03

TABLE C-4
(Continued)

CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.5720E-01	0.0000E+00	6.6478E-05	0.0000E+00
CS-137	7.3093E-09	0.0000E+00	5.0763E-13	0.0000E+00
BA-137M	7.3093E-09	0.0000E+00	5.0763E-13	0.0000E+00
EU-154	2.4773E-29	0.0000E+00	8.6285E-35	0.0000E+00
TL-208	9.9993E-01	0.0000E+00	1.1611E-07	0.0000E+00
PO-210	6.9334E-01	0.0000E+00	2.1926E-05	0.0000E+00
PB-210	6.9334E-01	0.0000E+00	2.1926E-05	0.0000E+00
PB-212	9.9993E-01	0.0000E+00	1.1611E-07	0.0000E+00
BI-214	6.9334E-01	0.0000E+00	2.1926E-05	0.0000E+00
PB-214	6.9334E-01	0.0000E+00	2.1926E-05	0.0000E+00
RA-226	6.9334E-01	0.0000E+00	2.1926E-05	0.0000E+00
TH-228	9.9993E-01	0.0000E+00	1.1611E-07	0.0000E+00
AC-228	9.8036E-01	0.0000E+00	3.1002E-05	0.0000E+00
RA-228	9.8036E-01	0.0000E+00	3.1002E-05	0.0000E+00
TH-232	9.9993E-01	0.0000E+00	1.1611E-07	0.0000E+00
U-234	9.9420E-01	0.0000E+00	9.2317E-06	0.0000E+00
U-235	9.9420E-01	0.0000E+00	9.2317E-06	0.0000E+00
NP-237	4.3986E-01	0.0000E+00	5.7625E-04	0.0000E+00
U-238	9.9420E-01	0.0000E+00	9.2317E-06	0.0000E+00
PU-238	1.7887E-03	0.0000E+00	1.7795E-08	0.0000E+00
PU-239	9.7125E-01	0.0000E+00	9.6625E-06	0.0000E+00
PU-241	3.6320E-19	0.0000E+00	3.6133E-24	0.0000E+00
AM-241	2.8298E-01	0.0000E+00	2.4547E-05	0.0000E+00
PU-242	9.9231E-01	0.0000E+00	9.8720E-06	0.0000E+00
AM-243	8.7845E-01	0.0000E+00	7.6200E-05	0.0000E+00
CM-243	2.3541E-08	0.0000E+00	2.3419E-13	0.0000E+00
CM-244	1.4354E-14	0.0000E+00	1.4280E-19	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8155E-32

TABLE C-4
(Continued)

C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.6050E-12
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	4.3011E-23	2.8674E-22	2.6646E-20	3.5732E-20	1.9943E-31	3.4283E-36	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	1.0481E-25	6.9872E-25	6.4929E-23	8.7070E-23	4.8597E-34	8.3539E-39	0.0000E+00
SR-90	1.3585E-31	9.0564E-31	8.4157E-29	1.1286E-28	6.2989E-40	1.1210E-44	0.0000E+00
NB-94	4.8428E-17	1.3837E-16	1.2858E-14	1.7242E-14	2.2455E-25	3.8600E-30	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.2903E-09
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.4823E-08
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.6782E-28	2.6783E-27	2.4888E-25	3.3375E-25	1.2419E-36	2.1347E-41	0.0000E+00
CS-137	2.0451E-36	2.0452E-35	1.9005E-33	2.5485E-33	8.4078E-45	0.0000E+00	0.0000E+00
BA-137M	2.0451E-36	2.0452E-35	1.9005E-33	2.5485E-33	8.4078E-45	0.0000E+00	0.0000E+00
EU-154	2.0341E-41	5.0853E-42	4.7255E-40	6.3370E-40	0.0000E+00	0.0000E+00	0.0000E+00
TL-208	1.9649E-12	3.2749E-14	3.0432E-12	4.0810E-12	9.1110E-21	1.5662E-25	0.0000E+00
PO-210	7.0200E-20	3.1909E-19	2.9652E-17	3.9763E-17	3.2550E-28	5.5954E-33	0.0000E+00
PB-210	7.0200E-20	3.1909E-19	2.9652E-17	3.9763E-17	3.2550E-28	5.5954E-33	0.0000E+00
PB-212	1.9649E-12	3.2749E-14	3.0432E-12	4.0810E-12	9.1110E-21	1.5662E-25	0.0000E+00
BI-214	7.0200E-20	3.1909E-19	2.9652E-17	3.9763E-17	3.2550E-28	5.5954E-33	0.0000E+00
PB-214	7.0200E-20	3.1909E-19	2.9652E-17	3.9763E-17	3.2550E-28	5.5954E-33	0.0000E+00
RA-226	7.0200E-20	3.1909E-19	2.9652E-17	3.9763E-17	3.2550E-28	5.5954E-33	0.0000E+00
TH-228	1.9649E-12	3.2749E-14	3.0432E-12	4.0810E-12	9.1110E-21	1.5662E-25	0.0000E+00
AC-228	9.9260E-20	4.5118E-19	4.1927E-17	5.6224E-17	4.6025E-28	7.9118E-33	0.0000E+00
RA-228	9.9260E-20	4.5118E-19	4.1927E-17	5.6224E-17	4.6025E-28	7.9118E-33	0.0000E+00
TH-232	1.9649E-12	3.2749E-14	3.0432E-12	4.0810E-12	9.1110E-21	1.5662E-25	0.0000E+00
U-234	1.4272E-14	1.9029E-14	1.7683E-12	2.3713E-12	6.6176E-23	1.1376E-27	0.0000E+00
U-235	1.4272E-14	1.9029E-14	1.7683E-12	2.3713E-12	6.6176E-23	1.1376E-27	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	0.0000E+00
U-238	1.4272E-14	1.9029E-14	1.7683E-12	2.3713E-12	6.6176E-23	1.1376E-27	0.0000E+00
PU-238	1.2893E-15	3.6838E-16	3.4232E-14	4.5905E-14	5.9784E-24	1.0277E-28	0.0000E+00
PU-239	7.0008E-13	2.0002E-13	1.8587E-11	2.4926E-11	3.2461E-21	5.5801E-26	0.0000E+00
PU-241	2.6179E-31	7.4798E-32	6.9506E-30	9.3209E-30	1.2139E-39	2.1019E-44	0.0000E+00
AM-241	5.9638E-13	7.4547E-15	6.9273E-13	9.2896E-13	2.7653E-21	4.7535E-26	0.0000E+00
PU-242	7.1526E-13	2.0436E-13	1.8990E-11	2.5466E-11	3.3165E-21	5.7011E-26	0.0000E+00

TABLE C-4
(Continued)

AM-243	1.8513E-12	2.3141E-14	2.1504E-12	2.8837E-12	8.5841E-21	1.4756E-25	0.0000E+00
CM-243	1.5902E-20	4.8188E-21	4.4779E-19	6.0049E-19	7.3734E-29	1.2675E-33	0.0000E+00
CM-244	9.6962E-27	2.9382E-27	2.7304E-25	3.6615E-25	4.4959E-35	7.7285E-40	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 900 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	1.2979E-29	0.0000E+00	2.7565E-31	5.6120E-31
C-14	2.0921E-07	0.0000E+00	4.4434E-09	8.8960E-09
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	8.9722E-01	0.0000E+00	1.2423E-04	0.0000E+00
CO-60	5.6052E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	1.0305E-03	0.0000E+00	1.4269E-07	0.0000E+00
SR-90	2.3600E-10	0.0000E+00	5.4233E-14	0.0000E+00
NB-94	9.0189E-01	0.0000E+00	8.9360E-05	0.0000E+00
TC-99	2.0957E-03	0.0000E+00	1.7849E-05	4.4990E-05
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	2.1758E-01	0.0000E+00	4.5688E-04	1.2960E-03
CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.5055E-01	0.0000E+00	6.6016E-05	0.0000E+00

TABLE C-4
(Continued)

CS-137	7.2051E-10	0.0000E+00	5.0040E-14	0.0000E+00
BA-137M	7.2051E-10	0.0000E+00	5.0040E-14	0.0000E+00
EU-154	7.1504E-33	0.0000E+00	2.4905E-38	0.0000E+00
TL-208	9.9991E-01	0.0000E+00	1.1611E-07	0.0000E+00
PO-210	6.6186E-01	0.0000E+00	2.0930E-05	0.0000E+00
PB-210	6.6186E-01	0.0000E+00	2.0930E-05	0.0000E+00
PB-212	9.9991E-01	0.0000E+00	1.1611E-07	0.0000E+00
BI-214	6.6186E-01	0.0000E+00	2.0930E-05	0.0000E+00
PB-214	6.6186E-01	0.0000E+00	2.0930E-05	0.0000E+00
RA-226	6.6186E-01	0.0000E+00	2.0930E-05	0.0000E+00
TH-228	9.9991E-01	0.0000E+00	1.1611E-07	0.0000E+00
AC-228	9.7727E-01	0.0000E+00	3.0904E-05	0.0000E+00
RA-228	9.7727E-01	0.0000E+00	3.0904E-05	0.0000E+00
TH-232	9.9991E-01	0.0000E+00	1.1611E-07	0.0000E+00
U-234	9.9327E-01	0.0000E+00	9.2231E-06	0.0000E+00
U-235	9.9327E-01	0.0000E+00	9.2231E-06	0.0000E+00
NP-237	3.8587E-01	0.0000E+00	5.0552E-04	2.9670E-04
U-238	9.9327E-01	0.0000E+00	9.2231E-06	0.0000E+00
PU-238	8.1100E-04	0.0000E+00	8.0683E-09	0.0000E+00
PU-239	9.6750E-01	0.0000E+00	9.6252E-06	0.0000E+00
PU-241	1.9040E-21	0.0000E+00	1.8942E-26	0.0000E+00
AM-241	2.4122E-01	0.0000E+00	2.0924E-05	0.0000E+00
PU-242	9.9114E-01	0.0000E+00	9.8603E-06	0.0000E+00
AM-243	8.6271E-01	0.0000E+00	7.4835E-05	0.0000E+00
CM-243	2.6851E-09	0.0000E+00	2.6713E-14	0.0000E+00
CM-244	2.7888E-16	0.0000E+00	2.7744E-21	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.2230E-35
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.9386E-13
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

NI-59	1.9846E-24	1.3230E-23	1.2294E-21	1.6487E-21	9.2020E-33	1.5818E-37	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	2.2794E-27	1.5196E-26	1.4121E-24	1.8937E-24	1.0569E-35	1.8169E-40	0.0000E+00
SR-90	5.5784E-34	3.7190E-33	3.4559E-31	4.6344E-31	2.5868E-42	0.0000E+00	0.0000E+00
NB-94	1.2752E-17	3.6434E-17	3.3856E-15	4.5401E-15	5.9127E-26	1.0164E-30	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	9.8042E-10
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.8242E-08
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.7622E-30	2.7622E-29	2.5668E-27	3.4421E-27	1.2808E-38	2.2000E-43	0.0000E+00
CS-137	2.0942E-39	2.0942E-38	1.9461E-36	2.6097E-36	0.0000E+00	0.0000E+00	0.0000E+00
BA-137M	2.0942E-39	2.0942E-38	1.9461E-36	2.6097E-36	0.0000E+00	0.0000E+00	0.0000E+00
EU-154	2.2421E-44	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
TL-208	1.9490E-12	3.2484E-14	3.0185E-12	4.0479E-12	9.0372E-21	1.5535E-25	0.0000E+00
PO-210	8.1656E-21	3.7116E-20	3.4490E-18	4.6252E-18	3.7862E-29	6.5085E-34	0.0000E+00
PB-210	8.1656E-21	3.7116E-20	3.4490E-18	4.6252E-18	3.7862E-29	6.5085E-34	0.0000E+00
PB-212	1.9490E-12	3.2484E-14	3.0185E-12	4.0479E-12	9.0372E-21	1.5535E-25	0.0000E+00
BI-214	8.1656E-21	3.7116E-20	3.4490E-18	4.6252E-18	3.7862E-29	6.5085E-34	0.0000E+00
PB-214	8.1656E-21	3.7116E-20	3.4490E-18	4.6252E-18	3.7862E-29	6.5085E-34	0.0000E+00
RA-226	8.1656E-21	3.7116E-20	3.4490E-18	4.6252E-18	3.7862E-29	6.5085E-34	0.0000E+00
TH-228	1.9490E-12	3.2484E-14	3.0185E-12	4.0479E-12	9.0372E-21	1.5535E-25	0.0000E+00
AC-228	1.2057E-20	5.4804E-20	5.0927E-18	6.8293E-18	5.5905E-29	9.6101E-34	0.0000E+00
RA-228	1.2057E-20	5.4804E-20	5.0927E-18	6.8293E-18	5.5905E-29	9.6101E-34	0.0000E+00
TH-232	1.9490E-12	3.2484E-14	3.0185E-12	4.0479E-12	9.0372E-21	1.5535E-25	0.0000E+00
U-234	7.6491E-15	1.0199E-14	9.4773E-13	1.2709E-12	3.5468E-23	6.0969E-28	0.0000E+00
U-235	7.6491E-15	1.0199E-14	9.4773E-13	1.2709E-12	3.5468E-23	6.0969E-28	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	6.4657E-09
U-238	7.6491E-15	1.0199E-14	9.4773E-13	1.2709E-12	3.5468E-23	6.0969E-28	0.0000E+00
PU-238	5.1164E-16	1.4618E-16	1.3584E-14	1.8216E-14	2.3724E-24	4.0781E-29	0.0000E+00
PU-239	6.1037E-13	1.7439E-13	1.6205E-11	2.1732E-11	2.8302E-21	4.8651E-26	0.0000E+00
PU-241	1.2012E-33	3.4319E-34	3.1891E-32	4.2767E-32	5.5674E-42	0.0000E+00	0.0000E+00
AM-241	5.0964E-13	6.3705E-15	5.9198E-13	7.9385E-13	2.3631E-21	4.0622E-26	0.0000E+00
PU-242	6.2528E-13	1.7865E-13	1.6601E-11	2.2263E-11	2.8993E-21	4.9839E-26	0.0000E+00
AM-243	1.8227E-12	2.2784E-14	2.1172E-12	2.8392E-12	8.4515E-21	1.4528E-25	0.0000E+00
CM-243	1.5747E-21	4.7719E-22	4.4343E-20	5.9464E-20	7.3016E-30	1.2552E-34	0.0000E+00

TABLE C-4
(Continued)

CM-244	1.6355E-28	4.9561E-29	4.6054E-27	6.1759E-27	7.5835E-37	1.3036E-41	0.0000E+00

1 ANNUAL SUMMARY FOR YEAR 1000 OF THE SIMULATION

THE TRENCH CAP HAS HAD 20.00 PER CENT FAILURE
THE MAXIMUM POSSIBLE WATER DEPTH IN TRENCH DURING THE YEAR IS 9.20E-02 METERS
1.4353E-01 CUBIC METERS OF WATER LEFT BOTTOM OF TRENCH
0.0000E+00 CUBIC METERS OF WATER OVERFLOWED TRENCH

NUCLIDE TRANSPORT INFORMATION

NUCLIDE	AMOUNT IN TRENCH CI	TRENCH OVERFLOW CI	TRENCH DRAINAGE CI	AMOUNT AT WELL CI
H-3	5.6372E-33	0.0000E+00	1.1973E-34	2.4380E-34
C-14	2.5268E-08	0.0000E+00	5.3668E-10	1.0740E-09
FE-55	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	8.8412E-01	0.0000E+00	1.2242E-04	0.0000E+00
CO-60	5.6052E-45	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	4.7866E-04	0.0000E+00	6.6276E-08	0.0000E+00
SR-90	2.0509E-11	0.0000E+00	4.7130E-15	0.0000E+00
NB-94	8.8991E-01	0.0000E+00	8.8172E-05	0.0000E+00
TC-99	8.9714E-04	0.0000E+00	7.6409E-06	1.9260E-05
RU-106	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	0.0000E+00	0.0000E+00	0.0000E+00
I-129	1.7641E-01	0.0000E+00	3.7042E-04	1.0510E-03
CS-134	1.4013E-45	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	9.4395E-01	0.0000E+00	6.5557E-05	0.0000E+00
CS-137	7.1024E-11	0.0000E+00	4.9326E-15	0.0000E+00
BA-137M	7.1024E-11	0.0000E+00	4.9326E-15	0.0000E+00

TABLE C-4
(Continued)

EU-154	2.0639E-36	0.0000E+00	7.1887E-42	0.0000E+00
TL-208	9.9990E-01	0.0000E+00	1.1611E-07	0.0000E+00
PO-210	6.3182E-01	0.0000E+00	1.9980E-05	0.0000E+00
PB-210	6.3182E-01	0.0000E+00	1.9980E-05	0.0000E+00
PB-212	9.9990E-01	0.0000E+00	1.1611E-07	0.0000E+00
BI-214	6.3182E-01	0.0000E+00	1.9980E-05	0.0000E+00
PB-214	6.3182E-01	0.0000E+00	1.9980E-05	0.0000E+00
RA-226	6.3182E-01	0.0000E+00	1.9980E-05	0.0000E+00
TH-228	9.9990E-01	0.0000E+00	1.1611E-07	0.0000E+00
AC-228	9.7418E-01	0.0000E+00	3.0807E-05	0.0000E+00
RA-228	9.7418E-01	0.0000E+00	3.0807E-05	0.0000E+00
TH-232	9.9990E-01	0.0000E+00	1.1611E-07	0.0000E+00
U-234	9.9235E-01	0.0000E+00	9.2145E-06	0.0000E+00
U-235	9.9235E-01	0.0000E+00	9.2145E-06	0.0000E+00
NP-237	3.3850E-01	0.0000E+00	4.4347E-04	6.3680E-04
U-238	9.9235E-01	0.0000E+00	9.2145E-06	0.0000E+00
PU-238	3.6770E-04	0.0000E+00	3.6581E-09	0.0000E+00
PU-239	9.6377E-01	0.0000E+00	9.5881E-06	0.0000E+00
PU-241	9.9812E-24	0.0000E+00	9.9299E-29	0.0000E+00
AM-241	2.0562E-01	0.0000E+00	1.7837E-05	0.0000E+00
PU-242	9.8997E-01	0.0000E+00	9.8487E-06	0.0000E+00
AM-243	8.4726E-01	0.0000E+00	7.3495E-05	0.0000E+00
CM-243	3.0628E-10	0.0000E+00	3.0470E-15	0.0000E+00
CM-244	5.4183E-18	0.0000E+00	5.3904E-23	0.0000E+00

NUCLIDE	SURFACE SOIL CONC CI/KG	SURFACE WATER CONC CI/M**3	SOLUBLE TO STREAM CI	SOLUBLE TO DEEP LAYERS CI	ATMOSPHERE AT SPILLAGE CI/M**3	ATMOSPHERE DOWN WIND CI/M**3	WELL WATER CONC CI/M**3
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	5.3129E-39
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.3404E-14
FE-55	8.4078E-45	1.4013E-45	1.3032E-43	1.7516E-43	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	9.1569E-26	6.1046E-25	5.6727E-23	7.6072E-23	4.2459E-34	7.2987E-39	0.0000E+00
CO-60	5.6052E-45	9.3887E-44	8.7245E-42	1.1699E-41	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

NI-63	4.9575E-29	3.3050E-28	3.0712E-26	4.1185E-26	2.2987E-37	3.9517E-42	0.0000E+00
SR-90	2.2908E-36	1.5272E-35	1.4191E-33	1.9031E-33	1.2612E-44	0.0000E+00	0.0000E+00
NB-94	3.3577E-18	9.5935E-18	8.9148E-16	1.1955E-15	1.5569E-26	2.6763E-31	0.0000E+00
TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	4.1971E-10
RU-106	1.4013E-45	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	2.8026E-45	5.6052E-44	5.2086E-42	6.9855E-42	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	2.2903E-08
CS-134	1.4013E-45	1.4013E-44	1.3018E-42	1.7460E-42	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	2.8489E-32	2.8489E-31	2.6473E-29	3.5501E-29	1.3209E-40	2.8026E-45	0.0000E+00
CS-137	2.1440E-42	2.1445E-41	1.9928E-39	2.6724E-39	0.0000E+00	0.0000E+00	0.0000E+00
BA-137M	2.1440E-42	2.1445E-41	1.9928E-39	2.6724E-39	0.0000E+00	0.0000E+00	0.0000E+00
EU-154	2.2421E-44	5.6052E-45	5.2128E-43	6.9785E-43	0.0000E+00	0.0000E+00	0.0000E+00
TL-208	1.9332E-12	3.2221E-14	2.9941E-12	4.0151E-12	8.9640E-21	1.5409E-25	0.0000E+00
PO-210	9.4981E-22	4.3173E-21	4.0119E-19	5.3800E-19	4.4041E-30	7.5707E-35	0.0000E+00
PB-210	9.4981E-22	4.3173E-21	4.0119E-19	5.3800E-19	4.4041E-30	7.5707E-35	0.0000E+00
PB-212	1.9332E-12	3.2221E-14	2.9941E-12	4.0151E-12	8.9640E-21	1.5409E-25	0.0000E+00
BI-214	9.4981E-22	4.3173E-21	4.0119E-19	5.3800E-19	4.4041E-30	7.5707E-35	0.0000E+00
PB-214	9.4981E-22	4.3173E-21	4.0119E-19	5.3800E-19	4.4041E-30	7.5707E-35	0.0000E+00
RA-226	9.4981E-22	4.3173E-21	4.0119E-19	5.3800E-19	4.4041E-30	7.5707E-35	0.0000E+00
TH-228	1.9332E-12	3.2221E-14	2.9941E-12	4.0151E-12	8.9640E-21	1.5409E-25	0.0000E+00
AC-228	1.4645E-21	6.6568E-21	6.1859E-19	8.2953E-19	6.7906E-30	1.1673E-34	0.0000E+00
RA-228	1.4645E-21	6.6568E-21	6.1859E-19	8.2953E-19	6.7906E-30	1.1673E-34	0.0000E+00
TH-232	1.9332E-12	3.2221E-14	2.9941E-12	4.0151E-12	8.9640E-21	1.5409E-25	0.0000E+00
U-234	4.0996E-15	5.4661E-15	5.0794E-13	6.8116E-13	1.9009E-23	3.2677E-28	0.0000E+00
U-235	4.0996E-15	5.4661E-15	5.0794E-13	6.8116E-13	1.9009E-23	3.2677E-28	0.0000E+00
NP-237	1.4013E-45	1.4433E-43	1.3412E-41	1.7986E-41	0.0000E+00	0.0000E+00	1.3877E-08
U-238	4.0996E-15	5.4661E-15	5.0794E-13	6.8116E-13	1.9009E-23	3.2677E-28	0.0000E+00
PU-238	2.0303E-16	5.8009E-17	5.3905E-15	7.2287E-15	9.4142E-25	1.6183E-29	0.0000E+00
PU-239	5.3216E-13	1.5205E-13	1.4129E-11	1.8947E-11	2.4675E-21	4.2417E-26	0.0000E+00
PU-241	5.5113E-36	1.5747E-36	1.4633E-34	1.9622E-34	2.3822E-44	0.0000E+00	0.0000E+00
AM-241	4.3551E-13	5.4439E-15	5.0588E-13	6.7839E-13	2.0194E-21	3.4714E-26	0.0000E+00
PU-242	5.4663E-13	1.5618E-13	1.4513E-11	1.9462E-11	2.5346E-21	4.3570E-26	0.0000E+00
AM-243	1.7945E-12	2.2432E-14	2.0845E-12	2.7953E-12	8.3209E-21	1.4304E-25	0.0000E+00
CM-243	1.5594E-22	4.7254E-23	4.3911E-21	5.8885E-21	7.2305E-31	1.2429E-35	0.0000E+00
CM-244	2.7587E-30	8.3596E-31	7.7682E-29	1.0417E-28	1.2791E-38	2.2000E-43	0.0000E+00

AVERAGE CONCENTRATIONS OVER THE YEARS 1 TO 1000 OF THE SIMULATION
MAXIMUM ANNUAL CONCENTRATIONS

TABLE C-4
(Continued)

NUCLIDE	ATMOSPHERE DOWNWIND			IN WELL			IN STREAM		
	AVERAGE CI/M**3	MAXIMUM CI/M**3	YEAR	AVERAGE CI/M**3	MAXIMUM CI/M**3	YEAR	AVERAGE CI/M**3	MAXIMUM CI/M**3	YEAR
H-3	1.1715E-27	1.1541E-24	1	1.8368E-11	4.2363E-10	70	6.9547E-17	6.6177E-14	1
C-14	2.0110E-27	1.9794E-24	1	2.1274E-08	9.3400E-08	189	1.1963E-16	1.1350E-13	1
FE-55	2.2473E-25	1.6684E-22	1	0.0000E+00	0.0000E+00	0	6.8856E-20	1.5945E-17	1
NI-59	1.4362E-24	9.4779E-22	1	0.0000E+00	0.0000E+00	0	1.1647E-16	3.6232E-15	1
CO-60	4.0622E-25	2.9604E-22	1	0.0000E+00	0.0000E+00	0	1.5736E-17	3.0865E-15	1
NI-63	1.4177E-24	9.4069E-22	1	0.0000E+00	0.0000E+00	0	9.3263E-17	3.5961E-15	1
SR-90	1.1063E-24	7.4234E-22	1	0.0000E+00	0.0000E+00	0	5.1734E-17	2.8378E-15	1
NB-94	1.4866E-24	9.6534E-22	1	0.0000E+00	0.0000E+00	0	1.1609E-16	1.5816E-15	1
TC-99	9.3991E-26	9.0057E-23	1	2.1719E-08	6.9342E-08	350	1.1945E-16	1.0328E-13	1
RU-106	5.9518E-26	5.0215E-23	1	0.0000E+00	0.0000E+00	0	2.5475E-19	1.3088E-16	1
SB-125	2.0198E-25	1.5507E-22	1	0.0000E+00	0.0000E+00	0	6.6023E-18	1.9760E-15	1
I-129	4.2475E-25	3.7011E-22	1	1.0887E-08	3.5041E-08	797	1.1872E-16	7.0743E-14	1
CS-134	1.5172E-25	1.1777E-22	1	0.0000E+00	0.0000E+00	0	2.0946E-18	6.7532E-16	1
CS-135	1.3988E-24	9.3294E-22	1	0.0000E+00	0.0000E+00	0	1.1658E-16	5.3497E-15	1
CS-137	1.0911E-24	7.3855E-22	1	0.0000E+00	0.0000E+00	0	6.2089E-17	4.2350E-15	1
BA-137M	1.0911E-24	7.3855E-22	1	0.0000E+00	0.0000E+00	0	6.2089E-17	4.2350E-15	1
EU-154	6.7870E-25	4.6320E-22	1	0.0000E+00	0.0000E+00	0	8.1658E-19	6.6402E-17	1
TL-208	1.6690E-24	9.7890E-22	1	0.0000E+00	0.0000E+00	0	8.7373E-18	9.3554E-18	1
PO-210	1.4613E-24	9.5709E-22	1	0.0000E+00	0.0000E+00	0	1.1408E-16	2.4946E-15	1
PB-210	1.4613E-24	9.5709E-22	1	0.0000E+00	0.0000E+00	0	1.1408E-16	2.4946E-15	1
PB-212	1.6690E-24	9.7890E-22	1	0.0000E+00	0.0000E+00	0	8.7373E-18	9.3554E-18	1
BI-214	1.4613E-24	9.5709E-22	1	0.0000E+00	0.0000E+00	0	1.1408E-16	2.4946E-15	1
PB-214	1.4613E-24	9.5709E-22	1	0.0000E+00	0.0000E+00	0	1.1408E-16	2.4946E-15	1
RA-226	1.4613E-24	9.5709E-22	1	0.0000E+00	0.0000E+00	0	1.1408E-16	2.4946E-15	1
TH-228	1.6690E-24	9.7890E-22	1	0.0000E+00	0.0000E+00	0	8.7373E-18	9.3554E-18	1
AC-228	1.4625E-24	9.5750E-22	1	0.0000E+00	0.0000E+00	0	1.1644E-16	2.4957E-15	1
RA-228	1.4625E-24	9.5750E-22	1	0.0000E+00	0.0000E+00	0	1.1644E-16	2.4957E-15	1
TH-232	1.6690E-24	9.7890E-22	1	0.0000E+00	0.0000E+00	0	8.7373E-18	9.3554E-18	1
U-234	1.5191E-24	9.7258E-22	1	0.0000E+00	0.0000E+00	0	1.1609E-16	7.4360E-16	1
U-235	1.5191E-24	9.7258E-22	1	0.0000E+00	0.0000E+00	0	1.1609E-16	7.4360E-16	1
NP-237	5.9275E-25	4.9268E-22	1	1.2835E-09	1.3877E-08	1000	1.1835E-16	5.6502E-14	1
U-238	1.5191E-24	9.7258E-22	1	0.0000E+00	0.0000E+00	0	1.1609E-16	7.4360E-16	1

TABLE C-4
(Continued)

PU-238	1.5033E-24	9.6991E-22	1	0.0000E+00	0.0000E+00	0	1.6800E-17	1.5890E-16	1
PU-239	1.5960E-24	9.7758E-22	1	0.0000E+00	0.0000E+00	0	8.4810E-17	1.6016E-16	1
PU-241	8.7933E-25	5.8963E-22	1	0.0000E+00	0.0000E+00	0	1.7962E-18	9.6601E-17	1
AM-241	1.5889E-24	9.7745E-22	1	0.0000E+00	0.0000E+00	0	3.4371E-18	7.0061E-18	1
PU-242	1.5970E-24	9.7760E-22	1	0.0000E+00	0.0000E+00	0	8.5704E-17	1.6016E-16	1
AM-243	1.6631E-24	9.7883E-22	1	0.0000E+00	0.0000E+00	0	6.3179E-18	7.0160E-18	1
CM-243	1.1961E-24	7.8448E-22	1	0.0000E+00	0.0000E+00	0	5.8047E-18	1.3631E-16	1
CM-244	9.9773E-25	6.6323E-22	1	0.0000E+00	0.0000E+00	0	2.8065E-18	1.1525E-16	1

1 RADIONUCLIDE CONCENTRATION IN FOODS DUE TO ATMOSPHERIC DEPOSITION
PICO CURIES PER KILOGRAM

NUCLIDE	LEAFY VEG M.I.E.	PRODUCE M.I.E.	LEAFY VEG G.P.E.	PRODUCE G.P.E.	COW'S MILK M.I.E.	COW'S MILK G.P.E.	GOAT'S MILK M.I.E.	GOAT'S MILK G.P.E.	BEEF MEAT
H-3	4.4375E-14	4.4375E-14	4.4375E-14	4.4375E-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C-14	1.3826E-12	1.3826E-12	1.3826E-12	1.3826E-12	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
FE-55	1.1141E-09	1.0703E-10	1.1039E-09	1.1055E-10	9.4051E-12	9.3919E-12	5.8688E-13	5.8605E-13	7.4294E-10
NI-59	8.7925E-09	5.2115E-09	8.7925E-09	5.2115E-09	6.2362E-10	6.2362E-10	5.0139E-10	5.0139E-10	3.7417E-09
CO-60	2.0300E-09	2.0267E-10	2.0205E-09	2.0607E-10	1.3846E-10	1.3836E-10	8.3078E-12	8.3018E-12	1.3757E-09
NI-63	7.7136E-09	2.4136E-09	7.7115E-09	2.4159E-09	3.8400E-10	3.8399E-10	3.0874E-10	3.0872E-10	2.3032E-09
SR-90	1.3739E-08	2.8649E-09	1.3727E-08	2.8736E-09	2.8638E-09	2.8634E-09	3.2075E-09	3.2070E-09	5.7208E-10
NB-94	8.5621E-09	1.5265E-09	8.5621E-09	1.5265E-09	9.7729E-09	9.7729E-09	1.4659E-10	1.4659E-10	1.2216E-07
TC-99	5.2136E-10	6.9393E-11	5.2136E-10	6.9394E-11	2.6435E-10	2.6435E-10	7.9306E-11	7.9306E-11	2.2470E-10
RU-106	2.8931E-10	2.6109E-11	2.8230E-10	2.8478E-11	5.9127E-15	5.8905E-15	1.5373E-13	1.5315E-13	1.9051E-11
SB-125	1.0129E-09	1.0087E-10	1.0039E-09	1.0410E-10	3.6173E-12	3.6123E-12	6.5111E-12	6.5022E-12	3.5729E-11
I-129	2.1545E-09	2.3486E-10	2.1545E-09	2.3486E-10	7.6774E-10	7.6774E-10	2.7639E-09	2.7639E-09	5.3742E-10
CS-134	7.5168E-10	7.3537E-11	7.4274E-10	7.6718E-11	1.8081E-10	1.8047E-10	9.2986E-10	9.2815E-10	5.0810E-10
CS-135	8.4056E-09	2.1746E-09	8.4056E-09	2.1746E-09	3.7856E-09	3.7856E-09	1.9469E-08	1.9469E-08	1.0816E-08
CS-137	5.7175E-09	8.0740E-10	5.7128E-09	8.0975E-10	1.6697E-09	1.6695E-09	8.5872E-09	8.5861E-09	4.7652E-09
BA-137M	5.7175E-09	8.0740E-10	5.7128E-09	8.0975E-10	1.6697E-09	1.6695E-09	8.5872E-09	8.5861E-09	4.7652E-09
EU-154	3.3994E-09	3.4254E-10	3.3895E-09	3.4608E-10	2.3157E-12	2.3147E-12	2.7788E-13	2.7776E-13	5.7660E-10
TL-208	1.4541E-08	4.3313E-09	1.4541E-08	4.3313E-09	3.2014E-09	3.2014E-09	0.0000E+00	0.0000E+00	6.4027E-08
PO-210	8.8691E-9	1.6035E-09	8.8689E-09	1.6036E-09	2.8767E-10	2.8767E-10	0.0000E+00	0.0000E+00	2.3013E-10
PB-210	8.8691E-09	1.6035E-09	8.8689E-09	1.6036E-09	2.8767E-10	2.8767E-10	0.0000E+00	0.0000E+00	2.3013E-10
PB-212	1.4541E-08	4.3313E-09	1.4541E-08	4.3313E-09	3.2014E-09	3.2014E-09	0.0000E+00	0.0000E+00	6.4027E-08
BI-214	8.8691E-09	1.6035E-09	8.8689E-09	1.6036E-09	2.8767E-10	2.8767E-10	0.0000E+00	0.0000E+00	2.3013E-10

TABLE C-4
(Continued)

PB-214	8.8691E-09	1.6035E-09	8.8689E-09	1.6036E-09	2.8767E-10	2.8767E-10	0.0000E+00	0.0000E+00	2.3013E-10
RA-226	7.8452E-09	8.7831E-10	7.8451E-09	8.7836E-10	1.5960E-10	1.5960E-10	2.1280E-13	2.1280E-13	8.8665E-11
TH-228	8.4923E-09	8.7058E-10	8.4923E-09	8.7058E-10	1.5324E-12	1.5324E-12	0.0000E+00	0.0000E+00	1.8389E-12
AC-228	7.4733E-09	7.7187E-10	7.4733E-09	7.7187E-10	5.5052E-12	5.5052E-12	0.0000E+00	0.0000E+00	6.8815E-12
RA-228	7.9131E-09	8.9646E-10	7.9131E-09	8.9646E-10	1.6554E-10	1.6554E-10	0.0000E+00	0.0000E+00	9.1964E-11
TH-232	8.4923E-09	8.7058E-10	8.4923E-09	8.7058E-10	1.5324E-12	1.5324E-12	0.0000E+00	0.0000E+00	1.8389E-12
U-234	8.3498E-09	1.7310E-09	8.3498E-09	1.7310E-09	2.5112E-10	2.5112E-10	2.5112E-11	2.5112E-11	8.3706E-11
U-235	8.3498E-09	1.7310E-09	8.3498E-09	1.7310E-09	2.5112E-10	2.5112E-10	2.5112E-11	2.5112E-11	8.3706E-11
NP-237	3.0107E-09	3.0768E-10	3.0107E-09	3.0768E-10	5.3866E-13	5.3866E-13	6.4639E-14	6.4639E-14	5.9253E-12
U-238	8.3498E-09	1.7310E-09	8.3498E-09	1.7310E-09	2.5112E-10	2.5112E-10	2.5112E-11	2.5112E-11	8.3706E-11
PU-238	7.5482E-09	7.5518E-10	7.5461E-09	7.5593E-10	2.5539E-14	2.5538E-14	4.5970E-14	4.5968E-14	1.2765E-13
PU-239	8.0638E-09	8.1636E-10	8.0638E-09	8.1637E-10	2.8110E-14	2.8110E-14	5.0597E-14	5.0597E-14	1.4055E-13
PU-241	4.4022E-09	4.3661E-10	4.3939E-09	4.3951E-10	1.4836E-14	1.4832E-14	2.6705E-14	2.6697E-14	7.3989E-14
AM-241	8.3570E-09	8.4655E-10	8.3566E-09	8.4671E-10	1.3942E-13	1.3942E-13	0.0000E+00	0.0000E+00	1.2199E-12
PU-242	8.0697E-09	8.1709E-10	8.0697E-09	8.1709E-10	2.8142E-14	2.8142E-14	5.0656E-14	5.0656E-14	1.4071E-13
AM-243	9.0658E-09	9.2729E-10	9.0658E-09	9.2730E-10	1.7250E-13	1.7250E-13	0.0000E+00	0.0000E+00	1.5093E-12
CM-243	6.0000E-09	5.9770E-10	5.9954E-09	5.9934E-10	4.0541E-12	4.0537E-12	0.0000E+00	0.0000E+00	7.0872E-13
CM-244	4.9992E-09	4.9665E-10	4.9922E-09	4.9913E-10	3.3731E-12	3.3724E-12	0.0000E+00	0.0000E+00	5.8915E-13

RADIONUCLIDE CONCENTRATION IN FOODS DUE TO IRRIGATION
PICO CURIES PER KILOGRAM

NUCLIDE	LEAFY VEG M.I.E.	PRODUCE M.I.E.	LEAFY VEG G.P.E.	PRODUCE G.P.E.	COW'S MILK M.I.E.	COW'S MILK G.P.E.	GOAT'S MILK M.I.E.	GOAT'S MILK G.P.E.	BEEF MEAT
H-3	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C-14	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
FE-55	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NI-59	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CO-60	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NI-63	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SR-90	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NB-94	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

TABLE C-4
(Continued)

TC-99	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	6.5158E-09	6.5158E-09	2.1719E-09	2.1719E-09	4.6154E-09
RU-106	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
SB-125	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
I-129	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	3.2661E-09	3.2661E-09	1.3065E-08	1.3065E-08	1.9052E-09
CS-134	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-135	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CS-137	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
BA-137M	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
EU-154	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TL-208	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PO-210	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PB-210	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PB-212	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
BI-214	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PB-214	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
RA-226	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TH-228	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AC-228	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
RA-228	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
TH-232	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U-234	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
U-235	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
NP-237	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	1.9252E-13	1.9252E-13	2.5670E-14	2.5670E-14	1.7648E-12
U-238	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PU-238	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PU-239	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PU-241	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AM-241	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
PU-242	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
AM-243	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CM-243	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
CM-244	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00

NOTE: G.P.E. - GENERAL POPULATION EXPOSURE
M.I.E. - MAXIMUM INDIVIDUAL EXPOSURE

TABLE C-4
(Continued)

0 G.P.E. WILL BE USED TO CALCULATE HEALTH EFFECTS

1 NUCLIDE	ANNUAL INTAKE BY INGESTION PCI/Y	ANNUAL INTAKE BY INHALATION PCI/Y
H-3	8.8517E+00	9.4129E-12
C-14	1.0252E+04	1.6158E-11
FE-55	7.2735E-08	1.8057E-09
NI-59	8.7504E-07	1.1540E-08
CO-60	1.4528E-07	3.2640E-09
NI-63	5.0074E-07	1.1391E-08
SR-90	7.3841E-07	8.8891E-09
NB-94	8.8004E-06	1.1945E-08
TC-99	1.0467E+04	7.5522E-10
RU-106	7.6694E-09	4.7823E-10
SB-125	2.5835E-08	1.6229E-09
I-129	5.2465E+03	3.4129E-09
CS-134	6.5231E-08	1.2191E-09
CS-135	1.3278E-06	1.1239E-08
CS-137	6.0015E-07	8.7673E-09
BA-137M	6.0015E-07	8.7673E-09
EU-154	1.1450E-07	5.4533E-09
TL-208	4.8940E-06	1.3411E-08
PO-210	3.0625E-07	1.1742E-08
PB-210	3.0625E-07	1.1742E-08
PB-212	4.8940E-06	1.3411E-08
BI-214	3.0625E-07	1.1742E-08
PB-214	3.0625E-07	1.1742E-08
RA-226	2.0740E-07	1.1742E-08
TH-228	1.9619E-07	1.3411E-08
AC-228	1.7386E-07	1.1751E-08
RA-228	2.1069E-07	1.1751E-08
TH-232	1.9619E-07	1.3411E-08
U-234	2.9780E-07	1.2206E-08
U-235	2.9780E-07	1.2206E-08
NP-237	6.1851E+02	4.7628E-09
U-238	2.9780E-07	1.2206E-08

TABLE C-4
(Continued)

PU-238	1.7256E-07	1.2079E-08
PU-239	1.8515E-07	1.2824E-08
PU-241	1.0042E-07	7.0654E-09
AM-241	1.9202E-07	1.2767E-08
PU-242	1.8530E-07	1.2832E-08
AM-243	2.0910E-07	1.3363E-08
CM-243	1.3738E-07	9.6105E-09
CM-244	1.1440E-07	8.0168E-09

1 AGGREGATED VALUES OF RADIOACTIVITY:

NUCLIDE	PUMPED OUT THE WELL	PUMPED OUT THE STREAM	LEFT BOTTOM OF TRENCH	OVERFLOWED TRENCH	RELEASED TO THE ATMOSPHERE	RELEASED TO BASIN
H-3	3.6654E-06	0.0000E+00	5.3273E-03	0.0000E+00	2.1492E-12	3.2193E-04
C-14	4.2452E-03	0.0000E+00	9.7955E-01	0.0000E+00	3.6893E-12	9.7061E-01
FE-55	0.0000E+00	0.0000E+00	1.2390E-08	0.0000E+00	4.1228E-10	2.4581E-11
NI-59	0.0000E+00	0.0000E+00	1.0767E-01	0.0000E+00	2.6349E-09	4.1579E-08
CO-60	0.0000E+00	0.0000E+00	9.7811E-07	0.0000E+00	7.4523E-10	5.6176E-09
NI-63	0.0000E+00	0.0000E+00	6.0820E-03	0.0000E+00	2.6008E-09	3.3295E-08
SR-90	0.0000E+00	0.0000E+00	7.0824E-04	0.0000E+00	2.0296E-09	1.8469E-08
NB-94	0.0000E+00	0.0000E+00	7.7125E-02	0.0000E+00	2.7272E-09	4.1443E-08
TC-99	4.3341E-03	0.0000E+00	9.9823E-01	0.0000E+00	1.7243E-10	9.8592E-01
RU-106	0.0000E+00	0.0000E+00	9.9902E-14	0.0000E+00	1.0919E-10	9.0947E-11
SB-125	0.0000E+00	0.0000E+00	1.7117E-08	0.0000E+00	3.7054E-10	2.3570E-09
I-129	2.1725E-03	0.0000E+00	8.2355E-01	0.0000E+00	7.7922E-10	4.2384E-08
CS-134	0.0000E+00	0.0000E+00	5.9755E-10	0.0000E+00	2.7834E-10	7.4778E-10
CS-135	0.0000E+00	0.0000E+00	5.5816E-02	0.0000E+00	2.5661E-09	4.1620E-08
CS-137	0.0000E+00	0.0000E+00	2.4070E-04	0.0000E+00	2.0017E-09	2.2166E-08
BA-137M	0.0000E+00	0.0000E+00	2.4070E-04	0.0000E+00	2.0017E-09	2.2166E-08
EU-154	0.0000E+00	0.0000E+00	2.3889E-07	0.0000E+00	1.2451E-09	2.9152E-10
TL-208	0.0000E+00	0.0000E+00	9.6041E-05	0.0000E+00	3.0619E-09	3.1192E-09
PO-210	0.0000E+00	0.0000E+00	2.0193E-02	0.0000E+00	2.6809E-09	4.0726E-08
PB-210	0.0000E+00	0.0000E+00	2.0193E-02	0.0000E+00	2.6809E-09	4.0726E-08
PB-212	0.0000E+00	0.0000E+00	9.6041E-05	0.0000E+00	3.0619E-09	3.1192E-09
BI-214	0.0000E+00	0.0000E+00	2.0193E-02	0.0000E+00	2.6809E-09	4.0726E-08
PB-214	0.0000E+00	0.0000E+00	2.0193E-02	0.0000E+00	2.6809E-09	4.0726E-08
RA-226	0.0000E+00	0.0000E+00	2.0193E-02	0.0000E+00	2.6809E-09	4.0726E-08
TH-228	0.0000E+00	0.0000E+00	9.6041E-05	0.0000E+00	3.0619E-09	3.1192E-09

TABLE C-4
(Continued)

AC-228	0.0000E+00	0.0000E+00	2.5817E-02	0.0000E+00	2.6831E-09	4.1570E-08
RA-228	0.0000E+00	0.0000E+00	2.5817E-02	0.0000E+00	2.6831E-09	4.1570E-08
TH-232	0.0000E+00	0.0000E+00	9.6041E-05	0.0000E+00	3.0619E-09	3.1192E-09
U-234	0.0000E+00	0.0000E+00	7.6509E-03	0.0000E+00	2.7868E-09	4.1445E-08
U-235	0.0000E+00	0.0000E+00	7.6509E-03	0.0000E+00	2.7868E-09	4.1445E-08
NP-237	2.5611E-04	0.0000E+00	6.6126E-01	0.0000E+00	1.0874E-09	4.2252E-08
U-238	0.0000E+00	0.0000E+00	7.6509E-03	0.0000E+00	2.7868E-09	4.1445E-08
PU-238	0.0000E+00	0.0000E+00	4.0493E-04	0.0000E+00	2.7578E-09	5.9976E-09
PU-239	0.0000E+00	0.0000E+00	8.0596E-03	0.0000E+00	2.9280E-09	3.0277E-08
PU-241	0.0000E+00	0.0000E+00	3.4585E-06	0.0000E+00	1.6132E-09	6.4125E-10
AM-241	0.0000E+00	0.0000E+00	3.1031E-02	0.0000E+00	2.9149E-09	1.2270E-09
PU-242	0.0000E+00	0.0000E+00	8.1861E-03	0.0000E+00	2.9298E-09	3.0596E-08
AM-243	0.0000E+00	0.0000E+00	6.5593E-02	0.0000E+00	3.0510E-09	2.2555E-09
CM-243	0.0000E+00	0.0000E+00	4.0210E-05	0.0000E+00	2.1943E-09	2.0723E-09
CM-244	0.0000E+00	0.0000E+00	8.3913E-06	0.0000E+00	1.8304E-09	1.0019E-09

1 FRACTION OF INGESTION DUE TO WATER

NUCLIDE	FRACTION
H-3	1.0000
C-14	1.0000
FE-55	.0000
NI-59	.0000
CO-60	.0000
NI-63	.0000
SR-90	.0000
NB-94	.0000
TC-99	1.0000
RU-106	.0000
SB-125	.0000
I-129	1.0000
CS-134	.0000
CS-135	.0000
CS-137	.0000
BA-137M	.0000
EU-154	.0000
TL-208	.0000

TABLE C-4
(Continued)

PO-210	.0000
PB-210	.0000
PB-212	.0000
BI-214	.0000
PB-214	.0000
RA-226	.0000
TH-228	.0000
AC-228	.0000
RA-228	.0000
TH-232	.0000
U-234	.0000
U-235	.0000
NP-237	1.0000
U-238	.0000
PU-238	.0000
PU-239	.0000
PU-241	.0000
AM-241	.0000
PU-242	.0000
AM-243	.0000
CM-243	.0000
CM-244	.0000

1 MAXIMUM ANNUAL EXPOSURE

NUCLIDE	AIR CONCENTRATION CI/M**3	YEAR	SURFACE CONCENTRATION CI/M**2	YEAR	INGESTION RATE PERSON.PCI/Y	YEAR	INHALATION RATE PERSON.PCI/Y	YEAR
H-3	1.1541E-24	1	0.0000E+00	0	5.1037E+03	70	2.3182E-07	1
C-14	1.9794E-24	1	0.0000E+00	0	1.1252E+06	189	3.9761E-07	1
FE-55	1.6684E-22	1	4.0885E-17	2	1.3486E-03	1	3.3513E-05	1
NI-59	9.4779E-22	1	4.3514E-16	7	4.6277E-03	1	1.9039E-04	1
CO-60	2.9604E-22	1	8.9469E-17	2	2.6175E-03	1	5.9467E-05	1
NI-63	9.4069E-22	1	4.1393E-16	5	4.5899E-03	1	1.8896E-04	1
SR-90	7.4234E-22	1	3.0400E-16	4	2.8262E-03	1	1.4912E-04	1

TABLE C-4
(Continued)

NB-94	9.6534E-22	1	4.5600E-16	8	7.4226E-02	1	1.9391E-04	1
TC-99	9.0057E-23	1	1.1100E-17	1	8.3540E+05	350	1.8090E-05	1
RU-106	5.0215E-23	1	7.9256E-18	1	1.6129E-04	1	1.0087E-05	1
SB-125	1.5507E-22	1	3.7501E-17	1	4.8396E-04	1	3.1149E-05	1
I-129	3.7011E-22	1	9.4099E-17	1	4.2216E+05	797	7.4346E-05	1
CS-134	1.1777E-22	1	2.6357E-17	1	1.2478E-03	1	2.3657E-05	1
CS-135	9.3294E-22	1	4.1929E-16	6	1.0171E-02	1	1.8740E-04	1
CS-137	7.3855E-22	1	2.9923E-16	4	8.0355E-03	1	1.4836E-04	1
BA-137M	7.3855E-22	1	2.9923E-16	4	8.0355E-03	1	1.4836E-04	1
EU-154	4.6320E-22	1	1.6226E-16	3	1.9336E-03	1	9.3045E-05	1
TL-208	9.7890E-22	1	5.2055E-16	1000	1.3991E-02	1	1.9664E-04	1
PO-210	9.5709E-22	1	4.4483E-16	7	3.0319E-03	1	1.9226E-04	1
PB-210	9.5709E-22	1	4.4483E-16	7	3.0319E-03	1	1.9226E-04	1
PB-212	9.7890E-22	1	5.2055E-16	1000	1.3991E-02	1	1.9664E-04	1
BI-214	9.5709E-22	1	4.4483E-16	7	3.0319E-03	1	1.9226E-04	1
PB-214	9.5709E-22	1	4.4483E-16	7	3.0319E-03	1	1.9226E-04	1
RA-226	9.5709E-22	1	4.4483E-16	7	2.9708E-03	1	1.9226E-04	1
TH-228	9.7890E-22	1	5.2055E-16	1000	2.8097E-03	1	1.9664E-04	1
AC-228	9.5750E-22	1	4.4637E-16	7	2.7587E-03	1	1.9234E-04	1
RA-228	9.5750E-22	1	4.4637E-16	7	2.9722E-03	1	1.9234E-04	1
TH-232	9.7890E-22	1	5.2055E-16	1000	2.8097E-03	1	1.9664E-04	1
U-234	9.7258E-22	1	4.6597E-16	10	3.0624E-03	1	1.9537E-04	1
U-235	9.7258E-22	1	4.6597E-16	10	3.0624E-03	1	1.9537E-04	1
NP-237	4.9268E-22	1	1.4056E-16	2	1.6718E+05	1000	9.8967E-05	1
U-238	9.7258E-22	1	4.6597E-16	10	3.0624E-03	1	1.9537E-04	1
PU-238	9.6991E-22	1	4.4234E-16	6	2.7788E-03	1	1.9483E-04	1
PU-239	9.7758E-22	1	4.7370E-16	15	2.8026E-03	1	1.9637E-04	1
PU-241	5.8963E-22	1	2.2530E-16	3	1.6830E-03	1	1.1844E-04	1
AM-241	9.7745E-22	1	4.6725E-16	9	2.8029E-03	1	1.9634E-04	1
PU-242	9.7760E-22	1	4.7391E-16	16	2.8027E-03	1	1.9638E-04	1
AM-243	9.7883E-22	1	4.7659E-16	471	2.8072E-03	1	1.9662E-04	1
CM-243	7.8448E-22	1	3.3419E-16	4	2.2514E-03	1	1.5758E-04	1
CM-244	6.6323E-22	1	2.6356E-16	3	1.9006E-03	1	1.3323E-04	1

PATHWAY RISK SUMMARY

TABLE C-4
(Continued)

*** COLLECTIVE POPULATION ***

PATHWAYS:	INGESTION	INHALATION	AIR IMMERSION	GROUND SURFACE	INTERNAL	EXTERNAL	TOTAL
COLLECTIVE FATAL CANCER RISK: (DEATHS/YR)							
	6.284E-06	1.065E-13	5.271E-19	7.346E-13	6.284E-06	7.346E-13	6.284E-06
GENETIC RISKS: (EFFECTS/YR)							
	4.987E-07	5.763E-15	2.255E-19	3.124E-13	4.987E-07	3.124E-13	4.987E-07

NUCLIDE RISK SUMMARY

*** COLLECTIVE POPULATION ***

NUCLIDES:	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
COLLECTIVE FATAL CANCER RISK: (DEATHS/YR)										
	5.349E-12	1.108E-07	2.630E-19	1.161E-17	5.999E-16	1.518E-18	3.754E-17	9.934E-14	1.406E-07	4.647E-18
	2.881E-17	3.157E-06	8.779E-17	6.073E-17	1.881E-16	2.132E-15	9.556E-16	4.749E-13	1.117E-15	2.961E-15
	2.487E-14	5.462E-14	1.013E-14	1.368E-15	2.065E-14	3.935E-14	4.280E-16	8.465E-15	6.372E-15	2.172E-14
	2.875E-06	5.711E-15	1.030E-14	1.007E-14	4.506E-17	1.175E-14	9.602E-15	1.874E-14	6.360E-15	4.013E-15
	6.284E-06									
GENETIC RISKS: (EFFECTS/YR)										
	2.024E-12	2.061E-08	7.667E-20	1.804E-18	2.561E-16	4.060E-19	5.604E-19	4.328E-14	6.660E-09	1.268E-19
	1.237E-17	7.014E-09	3.583E-17	2.503E-17	7.213E-17	9.319E-16	4.101E-16	2.007E-13	2.791E-16	3.088E-16
	1.039E-14	2.346E-14	4.297E-15	3.064E-16	1.832E-16	1.705E-14	1.876E-16	5.117E-17	1.811E-17	6.535E-15
	4.644E-07	1.405E-17	4.979E-16	4.133E-16	4.004E-18	2.340E-15	4.008E-16	5.239E-15	1.241E-15	6.923E-16
	4.987E-07									

TABLE C-4
(Continued)

FATAL CANCER RATE (DEATHS/YR) - COMBINED LET

***SUMMED OVER ALL CANCERS

NUCLIDES	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
PATHWAYS										
- INGESTION	5.349E-12	1.108E-07	2.256E-19	8.228E-19	5.685E-18	1.176E-18	2.680E-17	1.672E-16	1.406E-07	5.980E-19
	.000	3.157E-06	3.013E-17	6.037E-17	1.862E-16	.000	.000	.000	5.499E-16	2.610E-15
	3.995E-16	4.023E-19	5.190E-19	4.035E-16	5.164E-17	.000	2.883E-16	9.735E-17	6.985E-18	8.044E-18
	2.875E-06	6.969E-18	8.006E-16	9.457E-17	8.439E-18	9.932E-16	8.990E-17	1.076E-15	5.301E-16	3.695E-16
	6.284E-06									
% OF INTERNAL	100.	100.	90.7	85.7	39.4	77.5	71.4	79.0	100.	12.9
	.000	100.	98.8	99.4	99.0	.000	.000	.000	49.2	91.1
	97.3	45.3	44.7	37.1	.255	.000	67.4	1.16	.111	.137
	100.	.123	7.79	.943	18.7	10.2	.944	10.6	9.42	9.21
	100.									
% OF ALL PATHWAYS	100.	100.	85.8	7.09	.948	77.5	71.4	.168	100.	12.9
	.000	100.	34.3	99.4	99.0	.000	.000	.000	49.2	88.2
	1.61	7.366E-04	5.125E-03	29.5	.250	.000	67.4	1.15	.110	3.704E-02
	100.	.122	7.78	.939	18.7	8.46	.936	5.74	8.33	9.21
	100.									
- INHALATION	8.212E-24	1.233E-24	2.321E-20	1.373E-19	8.728E-18	3.421E-19	1.074E-17	4.438E-17	1.155E-19	4.049E-18
	3.161E-19	1.370E-18	3.806E-19	3.558E-19	1.860E-18	8.744E-23	1.120E-17	.000	5.667E-16	2.562E-16
	1.100E-17	4.862E-19	6.413E-19	6.840E-16	2.021E-14	1.628E-18	1.397E-16	8.281E-15	6.302E-15	5.858E-15
	2.934E-15	5.653E-15	9.482E-15	9.930E-15	3.662E-17	8.774E-15	9.437E-15	9.111E-15	5.098E-15	3.641E-15
	1.065E-13									

TABLE C-4
(Continued)

% OF INTERNAL	1.535E-10	1.114E-15	9.33	14.3	60.6	22.5	28.6	21.0	8.216E-11	87.1
	100.	4.340E-11	1.25	.586	.989	100.	100.	.000	50.8	8.94
	2.68	54.7	55.3	62.9	99.7	100.	32.6	98.8	99.9	99.9
	1.020E-07	99.9	92.2	99.1	81.3	89.8	99.1	89.4	90.6	90.8
	1.695E-06									
% OF ALL PATHWAYS	1.535E-10	1.114E-15	8.82	1.18	1.45	22.5	28.6	4.468E-02	8.216E-11	87.1
	1.10	4.340E-11	.433	.586	.989	4.101E-06	1.17	.000	50.7	8.65
	4.422E-02	8.902E-04	6.333E-03	50.0	97.9	4.136E-03	32.6	97.8	98.9	27.0
	1.020E-07	99.0	92.1	98.6	81.3	74.7	98.3	48.6	80.1	90.8
	1.695E-06									
- AIR IMMERSION	.000	.000	1.376E-25	1.474E-24	3.297E-20	.000	.000	7.577E-20	1.404E-27	.000
	2.654E-21	8.044E-23	7.544E-21	.000	.000	2.070E-20	2.742E-20	2.079E-19	4.032E-25	4.870E-23
	7.354E-21	7.423E-20	1.108E-20	2.991E-22	9.520E-23	4.397E-20	2.491E-30	8.426E-24	6.196E-24	6.969E-21
	3.827E-22	4.120E-24	3.310E-24	3.616E-24	.000	7.920E-22	2.940E-24	2.326E-21	4.519E-21	2.041E-24
	5.271E-19									
% OF EXTERNAL	.000	.000	9.658E-04	1.384E-05	5.632E-03	.000	.000	7.644E-05	4.189E-02	.000
	9.314E-03	2.904E-03	1.317E-02	.000	.000	9.708E-04	2.904E-03	4.377E-05	1.214E-04	5.174E-05
	3.007E-05	1.359E-04	1.094E-04	1.065E-04	2.448E-05	1.117E-04	1.004E-05	9.783E-06	9.761E-06	4.397E-05
	3.285E-03	8.160E-06	2.705E-05	8.601E-06	.000	4.002E-05	3.943E-06	2.721E-05	6.168E-04	1.310E-04
	7.175E-05									
% OF ALL PATHWAYS	.000	.000	5.231E-05	1.270E-05	5.497E-03	.000	.000	7.627E-05	9.983E-19	.000
	9.212E-03	2.548E-15	8.593E-03	.000	.000	9.708E-04	2.870E-03	4.377E-05	3.610E-08	1.645E-06
	2.957E-05	1.359E-04	1.094E-04	2.185E-05	4.610E-07	1.117E-04	5.820E-13	9.954E-08	9.723E-08	3.209E-05
	1.331E-14	7.214E-08	3.215E-08	3.593E-08	.000	6.743E-06	3.062E-08	1.241E-05	7.105E-05	5.085E-08
	8.388E-12									
- GROUND SURFACE	.000	.000	1.425E-20	1.065E-17	5.854E-16	.000	.000	9.912E-14	3.350E-24	.000
	2.849E-17	2.770E-18	5.727E-17	.000	.000	2.132E-15	9.443E-16	4.749E-13	3.322E-19	9.412E-17
	2.446E-14	5.462E-14	1.013E-14	2.809E-16	3.889E-16	3.935E-14	2.480E-23	8.613E-17	6.348E-17	1.585E-14
	1.165E-17	5.049E-17	1.224E-17	4.205E-17	.000	1.979E-15	7.455E-17	8.548E-15	7.327E-16	1.558E-18
	7.346E-13									

TABLE C-4
(Continued)

% OF EXTERNAL	.000	.000	100.	100.	100.	.000	.000	100.	100.	.000
	100.	100.	100.	.000	.000	100.	100.	100.	100.	100.
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	100.	100.	100.	100.	.000	100.	100.	100.	100.	100.
	100.									
% OF ALL PATHWAYS	.000	.000	5.42	91.7	97.6	.000	.000	99.8	2.382E-15	.000
	98.9	8.774E-11	65.2	.000	.000	100.	98.8	100.	2.974E-02	3.18
	98.3	100.	100.	20.5	1.88	100.	5.795E-06	1.02	.996	73.0
	4.051E-10	.884	.119	.418	.000	16.8	.776	45.6	11.5	3.882E-02
	1.169E-05									
- INTERNAL	5.349E-12	1.108E-07	2.488E-19	9.601E-19	1.441E-17	1.518E-18	3.754E-17	2.116E-16	1.406E-07	4.647E-18
	3.161E-19	3.157E-06	3.051E-17	6.073E-17	1.881E-16	8.744E-23	1.120E-17	.000	1.117E-15	2.867E-15
	4.105E-16	8.885E-19	1.160E-18	1.088E-15	2.026E-14	1.628E-18	4.280E-16	8.379E-15	6.309E-15	5.866E-15
	2.875E-06	5.660E-15	1.028E-14	1.002E-14	4.506E-17	9.767E-15	9.527E-15	1.019E-14	5.628E-15	4.011E-15
	6.284E-06									
% OF ALL PATHWAYS	100.	100.	94.6	8.27	2.40	100.	100.	.213	100.	100.
	1.10	100.	34.8	100.	100.	4.101E-06	1.17	.000	100.	96.8
	1.65	1.627E-03	1.146E-02	79.5	98.1	4.136E-03	100.	99.0	99.0	27.0
	100.	99.1	99.9	99.6	100.	83.2	99.2	54.4	88.5	100.
	100.									
- EXTERNAL	.000	.000	1.425E-20	1.065E-17	5.854E-16	.000	.000	9.912E-14	3.351E-24	.000
	2.849E-17	2.770E-18	5.728E-17	.000	.000	2.132E-15	9.444E-16	4.749E-13	3.322E-19	9.412E-17
	2.446E-14	5.462E-14	1.013E-14	2.809E-16	3.889E-16	3.935E-14	2.480E-23	8.613E-17	6.348E-17	1.585E-14
	1.165E-17	5.049E-17	1.224E-17	4.205E-17	.000	1.979E-15	7.455E-17	8.548E-15	7.327E-16	1.558E-18
	7.346E-13									
% OF ALL PATHWAYS	.000	.000	5.42	91.7	97.6	.000	.000	99.8	2.383E-15	.000
	98.9	8.774E-11	65.2	.000	.000	100.	98.8	100.	2.975E-02	3.18
	98.3	100.	100.	20.5	1.88	100.	5.795E-06	1.02	.996	73.0
	4.051E-10	.884	.119	.418	.000	16.8	.776	45.6	11.5	3.882E-02
	1.169E-05									

TABLE C-4
(Continued)

TOTAL OVER ALL PATHWAYS	5.349E-12	1.108E-07	2.630E-19	1.161E-17	5.999E-16	1.518E-18	3.754E-17	9.934E-14	1.406E-07	4.647E-18
	2.881E-17	3.157E-06	8.779E-17	6.073E-17	1.881E-16	2.132E-15	9.556E-16	4.749E-13	1.117E-15	2.961E-15
	2.487E-14	5.462E-14	1.013E-14	1.368E-15	2.065E-14	3.935E-14	4.280E-16	8.465E-15	6.372E-15	2.172E-14
	2.875E-06	5.711E-15	1.030E-14	1.007E-14	4.506E-17	1.175E-14	9.602E-15	1.874E-14	6.360E-15	4.013E-15
	6.284E-06									
% OF TOTAL	8.512E-05	1.76	4.186E-12	1.848E-10	9.546E-09	2.416E-11	5.974E-10	1.581E-06	2.24	7.395E-11
	4.585E-10	50.2	1.397E-09	9.664E-10	2.993E-09	3.393E-08	1.521E-08	7.558E-06	1.777E-08	4.712E-08
	3.958E-07	8.692E-07	1.612E-07	2.178E-08	3.286E-07	6.263E-07	6.811E-09	1.347E-07	1.014E-07	3.456E-07
	45.8	9.088E-08	1.638E-07	1.602E-07	7.171E-10	1.869E-07	1.528E-07	2.982E-07	1.012E-07	6.385E-08

COLLECTIVE GENETIC EFFECT (EFFECTS/YR) - COMBINED LET

***SUMMED OVER ALL GONADS

NUCLIDES	H-3	C-14	FE-55	NI-59	CO-60	NI-63	SR-90	NB-94	TC-99	RU-106
	SB-125	I-129	CS-134	CS-135	CS-137	BA-137M	EU-154	TL-208	PO-210	PB-210
	PB-212	BI-214	PB-214	RA-226	TH-228	AC-228	RA-228	TH-232	U-234	U-235
	NP-237	U-238	PU-238	PU-239	PU-241	AM-241	PU-242	AM-243	CM-243	CM-244
	TOTAL									
PATHWAYS										
- INGESTION	2.024E-12	2.061E-08	7.165E-20	2.780E-19	2.936E-18	3.807E-19	3.418E-19	1.032E-16	6.660E-09	1.209E-19
	.000	7.014E-09	1.069E-17	2.489E-17	7.144E-17	.000	.000	.000	2.634E-16	2.483E-16
	9.244E-17	9.960E-21	6.314E-20	1.719E-16	4.358E-18	.000	1.745E-16	1.121E-18	2.933E-19	6.648E-19
	4.644E-07	2.905E-19	1.374E-16	1.495E-17	9.912E-19	1.626E-16	1.419E-17	1.732E-16	9.960E-17	7.341E-17
	4.987E-07									
% OF INTERNAL	100.	100.	96.0	96.3	96.8	93.8	61.0	99.7	100.	95.3
	.000	100.	98.8	99.4	99.0	.000	.000	.000	94.4	91.1
	99.4	83.0	73.3	90.3	13.5	.000	93.0	4.24	53.4	70.3
	100.	54.4	27.8	3.73	24.8	11.1	3.73	11.5	10.6	10.6
	100.									

TABLE C-4
(Continued)

% OF ALL PATHWAYS	100.	100.	93.5	15.4	1.15	93.8	61.0	.238	100.	95.3
	.000	100.	29.8	99.4	99.0	.000	.000	.000	94.4	80.4
	.890	4.246E-05	1.469E-03	56.1	2.38	.000	93.0	2.19	1.62	1.017E-02
	100.	2.07	27.6	3.62	24.8	6.95	3.54	3.31	8.03	10.6
	100.									
- INHALATION	3.230E-24	2.385E-25	2.994E-21	1.055E-20	9.574E-20	2.531E-20	2.186E-19	3.439E-19	3.213E-22	5.943E-21
	3.766E-21	2.999E-21	1.325E-19	1.400E-19	6.926E-19	9.051E-25	3.894E-19	.000	1.555E-17	2.437E-17
	5.509E-19	2.043E-21	2.304E-20	1.845E-17	2.802E-17	3.520E-20	1.315E-17	2.532E-17	2.555E-19	2.803E-19
	4.309E-16	2.431E-19	3.572E-16	3.860E-16	3.013E-18	1.303E-15	3.663E-16	1.333E-15	8.372E-16	6.184E-16
	5.763E-15									
% OF INTERNAL	1.596E-10	1.157E-15	4.01	3.66	3.16	6.23	39.0	.332	4.824E-12	4.69
	100.	4.275E-11	1.22	.559	.960	100.	100.	.000	5.57	8.94
	.592	17.0	26.7	9.69	86.5	100.	7.01	95.8	46.6	29.7
	9.278E-08	45.6	72.2	96.3	75.2	88.9	96.3	88.5	89.4	89.4
	1.156E-06									
% OF ALL PATHWAYS	1.596E-10	1.157E-15	3.90	.585	3.739E-02	6.23	39.0	7.945E-04	4.824E-12	4.69
	3.045E-02	4.275E-11	.370	.559	.960	9.712E-08	9.496E-02	.000	5.57	7.89
	5.302E-03	8.711E-06	5.363E-04	6.02	15.3	2.065E-04	7.01	49.5	1.41	4.289E-03
	9.278E-08	1.73	71.7	93.4	75.2	55.7	91.4	25.4	67.5	89.3
	1.156E-06									
- AIR IMMERSION	.000	.000	1.953E-26	2.101E-25	1.427E-20	.000	.000	3.312E-20	6.034E-28	.000
	1.153E-21	4.292E-23	3.288E-21	.000	.000	9.044E-21	1.190E-20	8.745E-20	1.761E-25	2.292E-23
	3.089E-21	3.189E-20	4.709E-21	1.234E-22	3.992E-23	1.902E-20	3.545E-31	3.397E-24	2.340E-24	2.881E-21
	1.644E-22	1.497E-24	1.036E-24	1.353E-24	.000	3.627E-22	9.480E-25	1.026E-21	1.890E-21	6.486E-25
	2.255E-19									
% OF EXTERNAL	.000	.000	9.640E-04	1.387E-05	5.639E-03	.000	.000	7.671E-05	4.189E-02	.000
	9.328E-03	2.887E-03	1.315E-02	.000	.000	9.705E-04	2.906E-03	4.358E-05	1.213E-04	6.352E-05
	3.000E-05	1.359E-04	1.096E-04	1.063E-04	2.646E-05	1.115E-04	1.008E-05	1.373E-05	1.332E-05	4.409E-05
	3.395E-03	1.108E-05	3.129E-05	1.099E-05	.000	4.147E-05	4.669E-06	2.748E-05	6.222E-04	1.428E-04
	7.218E-05									

TABLE C-4
(Continued)

% OF ALL PATHWAYS	.000	.000	2.548E-05	1.165E-05	5.573E-03	.000	.000	7.653E-05	9.060E-18	.000
	9.325E-03	6.119E-13	9.176E-03	.000	.000	9.705E-04	2.903E-03	4.358E-05	6.309E-08	7.425E-06
	2.973E-05	1.359E-04	1.096E-04	4.027E-05	2.179E-05	1.115E-04	1.889E-13	6.638E-06	1.292E-05	4.409E-05
	3.540E-14	1.066E-05	2.080E-07	3.275E-07	.000	1.550E-05	2.365E-07	1.958E-05	1.524E-04	9.370E-08
	4.522E-11									
- GROUND SURFACE	.000	.000	2.026E-21	1.515E-18	2.530E-16	.000	.000	4.318E-14	1.440E-24	.000
	1.236E-17	1.487E-18	2.500E-17	.000	.000	9.319E-16	4.097E-16	2.007E-13	1.452E-19	3.609E-17
	1.030E-14	2.346E-14	4.297E-15	1.161E-16	1.509E-16	1.705E-14	3.515E-24	2.473E-17	1.757E-17	6.534E-15
	4.842E-18	1.352E-17	3.310E-18	1.232E-17	.000	8.745E-16	2.031E-17	3.733E-15	3.038E-16	4.544E-19
	3.124E-13									
% OF EXTERNAL	.000	.000	100.	100.	100.	.000	.000	100.	100.	.000
	100.	100.	100.	.000	.000	100.	100.	100.	100.	100.
	100.	100.	100.	100.	100.	100.	100.	100.	100.	100.
	100.	100.	100.	100.	.000	100.	100.	100.	100.	100.
	100.									
% OF ALL PATHWAYS	.000	.000	2.64	84.0	98.8	.000	.000	99.8	2.162E-14	.000
	100.	2.119E-08	69.8	.000	.000	100.	99.9	100.	5.203E-02	11.7
	99.1	100.	100.	37.9	82.3	100.	1.873E-06	48.3	97.0	100.
	1.043E-09	96.2	.665	2.98	.000	37.4	5.07	71.3	24.5	6.564E-02
	6.265E-05									
- INTERNAL	2.024E-12	2.061E-08	7.464E-20	2.886E-19	3.032E-18	4.060E-19	5.604E-19	1.035E-16	6.660E-09	1.268E-19
	3.766E-21	7.014E-09	1.083E-17	2.503E-17	7.213E-17	9.051E-25	3.894E-19	.000	2.789E-16	2.727E-16
	9.299E-17	1.200E-20	8.618E-20	1.903E-16	3.238E-17	3.520E-20	1.876E-16	2.644E-17	5.489E-19	9.451E-19
	4.644E-07	5.336E-19	4.946E-16	4.010E-16	4.004E-18	1.465E-15	3.805E-16	1.506E-15	9.368E-16	6.918E-16
	4.987E-07									
% OF ALL PATHWAYS	100.	100.	97.4	16.0	1.18	100.	100.	.239	100.	100.
	3.045E-02	100.	30.2	100.	100.	9.712E-08	9.496E-02	.000	99.9	88.3
	.895	5.117E-05	2.006E-03	62.1	17.7	2.065E-04	100.	51.7	3.03	1.446E-02
	100.	3.80	99.3	97.0	100.	62.6	94.9	28.7	75.5	99.9
	100.									

TABLE C-4
(Continued)

- EXTERNAL	.000	.000	2.026E-21	1.515E-18	2.530E-16	.000	.000	4.318E-14	1.440E-24	.000
	1.236E-17	1.487E-18	2.500E-17	.000	.000	9.319E-16	4.097E-16	2.007E-13	1.452E-19	3.609E-17
	1.030E-14	2.346E-14	4.297E-15	1.161E-16	1.509E-16	1.705E-14	3.515E-24	2.473E-17	1.757E-17	6.534E-15
	4.842E-18	1.352E-17	3.310E-18	1.232E-17	.000	8.745E-16	2.031E-17	3.733E-15	3.038E-16	4.544E-19
	3.124E-13									
% OF ALL PATHWAYS	.000	.000	2.64	84.0	98.8	.000	.000	99.8	2.163E-14	.000
	100.	2.119E-08	69.8	.000	.000	100.	99.9	100.	5.203E-02	11.7
	99.1	100.	100.	37.9	82.3	100.	1.873E-06	48.3	97.0	100.
	1.043E-09	96.2	.665	2.98	.000	37.4	5.07	71.3	24.5	6.564E-02
	6.265E-05									
TOTAL OVER ALL PATHWAYS	2.024E-12	2.061E-08	7.667E-20	1.804E-18	2.561E-16	4.060E-19	5.604E-19	4.328E-14	6.660E-09	1.268E-19
	1.237E-17	7.014E-09	3.583E-17	2.503E-17	7.213E-17	9.319E-16	4.101E-16	2.007E-13	2.791E-16	3.088E-16
	1.039E-14	2.346E-14	4.297E-15	3.064E-16	1.832E-16	1.705E-14	1.876E-16	5.117E-17	1.811E-17	6.535E-15
	4.644E-07	1.405E-17	4.979E-16	4.133E-16	4.004E-18	2.340E-15	4.008E-16	5.239E-15	1.241E-15	6.923E-16
	4.987E-07									
% OF TOTAL	4.058E-04	4.13	1.537E-11	3.617E-10	5.135E-08	8.143E-11	1.124E-10	8.680E-06	1.34	2.543E-11
	2.480E-09	1.41	7.185E-09	5.020E-09	1.446E-08	1.869E-07	8.223E-08	4.024E-05	5.596E-08	6.191E-08
	2.084E-06	4.704E-06	8.618E-07	6.145E-08	3.675E-08	3.419E-06	3.763E-08	1.026E-08	3.632E-09	1.310E-06
	93.1	2.818E-09	9.984E-08	8.288E-08	8.030E-10	4.692E-07	8.038E-08	1.051E-06	2.488E-07	1.388E-07

RESIDUAL RADIOACTIVITY RELEASED OUTSIDE THE BASIN
WITH THE STREAM WATER

NUCLIDE	FIRST MILLENNIUM	SECOND MILLENNIUM	THIRD MILLENNIUM	FOURTH MILLENNIUM	FIFTH MILLENNIUM	SIXTH MILLENNIUM	SEVENTH MILLENNIUM	EIGHTH MILLENNIUM	NINTH MILLENNIUM	TENTH MILLENNIUM
H-3	3.2193E-04	5.5502E-32	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
C-14	9.7061E-01	1.4410E-07	4.7530E-17	3.1403E-26	2.0748E-35	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00	0.0000E+00
FE-55	2.4581E-11	1.3032E-40	1.3032E-40	1.3032E-40	1.3032E-40	1.3032E-40	1.3032E-40	1.3032E-40	1.3032E-40	1.3032E-40
NI-59	4.1579E-08	1.8159E-21	7.9473E-35	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38
CO-60	5.6176E-09	8.7245E-39	8.7245E-39	8.7245E-39	8.7245E-39	8.7245E-39	8.7245E-39	8.7245E-39	8.7245E-39	8.7245E-39
NI-63	3.3295E-08	7.8700E-25	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38
SR-90	1.8469E-08	2.5122E-32	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38	1.4324E-38
NB-94	4.1443E-08	6.6362E-14	1.0633E-19	1.7038E-25	2.7299E-31	4.4796E-37	1.7319E-38	1.7319E-38	1.7319E-38	1.7319E-38

TABLE C-4
(Continued)

TC-99	9.8592E-01	8.6826E-03	7.1409E-07	1.4762E-10	3.0516E-14	6.3082E-18	1.3040E-21	2.6957E-25	5.5725E-29	1.1519E-32
RU-106	9.0947E-11	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40
SB-125	2.3570E-09	5.2086E-39	5.2086E-39	5.2086E-39	5.2086E-39	5.2086E-39	5.2086E-39	5.2086E-39	5.2086E-39	5.2086E-39
I-129	4.2384E-08	9.0075E-01	8.5112E-02	1.0447E-02	1.2823E-03	1.5739E-04	1.9319E-05	2.3712E-06	2.9105E-07	3.5725E-08
CS-134	7.4778E-10	1.3018E-39	1.3018E-39	1.3018E-39	1.3018E-39	1.3018E-39	1.3018E-39	1.3018E-39	1.3018E-39	1.3018E-39
CS-135	4.1620E-08	5.6560E-28	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38
CS-137	2.2166E-08	4.1756E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38
BA-137M	2.2166E-08	4.1756E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38	1.4974E-38
EU-154	2.9152E-10	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40	5.2128E-40
TL-208	3.1192E-09	2.8755E-09	2.6510E-09	2.4440E-09	2.2532E-09	2.0773E-09	1.9151E-09	1.7655E-09	1.6277E-09	1.5006E-09
PO-210	4.0726E-08	1.8448E-17	8.3649E-27	3.8072E-36	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
PB-210	4.0726E-08	1.8448E-17	8.3649E-27	3.8072E-36	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
PB-212	3.1192E-09	2.8755E-09	2.6510E-09	2.4440E-09	2.2532E-09	2.0773E-09	1.9151E-09	1.7655E-09	1.6277E-09	1.5006E-09
BI-214	4.0726E-08	1.8448E-17	8.3649E-27	3.8072E-36	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
PB-214	4.0726E-08	1.8448E-17	8.3649E-27	3.8072E-36	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
RA-226	4.0726E-08	1.8448E-17	8.3649E-27	3.8072E-36	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
TH-228	3.1192E-09	2.8755E-09	2.6510E-09	2.4440E-09	2.2532E-09	2.0773E-09	1.9151E-09	1.7655E-09	1.6277E-09	1.5006E-09
AC-228	4.1570E-08	2.9035E-17	2.0300E-26	1.4215E-35	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
RA-228	4.1570E-08	2.9035E-17	2.0300E-26	1.4215E-35	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38	1.6277E-38
TH-232	3.1192E-09	2.8755E-09	2.6510E-09	2.4440E-09	2.2532E-09	2.0773E-09	1.9151E-09	1.7655E-09	1.6277E-09	1.5006E-09
U-234	4.1445E-08	8.1027E-11	1.5846E-13	3.0989E-16	6.0602E-19	1.1851E-21	2.3177E-24	4.5326E-27	8.8640E-30	1.7337E-32
U-235	4.1445E-08	8.1027E-11	1.5846E-13	3.0989E-16	6.0602E-19	1.1851E-21	2.3177E-24	4.5326E-27	8.8640E-30	1.7337E-32
NP-237	4.2252E-08	5.2324E-01	3.6325E-01	8.2331E-02	2.2223E-02	5.9988E-03	1.6192E-03	4.3708E-04	1.1798E-04	3.1847E-05
U-238	4.1445E-08	8.1027E-11	1.5846E-13	3.0989E-16	6.0602E-19	1.1851E-21	2.3177E-24	4.5326E-27	8.8640E-30	1.7337E-32
PU-238	5.9976E-09	5.8048E-13	5.6206E-17	5.4423E-21	5.2697E-25	5.1025E-29	4.9408E-33	4.8174E-37	7.0317E-39	7.0317E-39
PU-239	3.0277E-08	7.6835E-09	1.9500E-09	4.9490E-10	1.2560E-10	3.1877E-11	8.0901E-12	2.0532E-12	5.2109E-13	1.3225E-13
PU-241	6.4125E-10	2.6451E-33	1.6928E-39	1.6928E-39	1.6928E-39	1.6928E-39	1.6928E-39	1.6928E-39	1.6928E-39	1.6928E-39
AM-241	1.2270E-09	2.5482E-10	5.2922E-11	1.0991E-11	2.2828E-12	4.7410E-13	9.8465E-14	2.0450E-14	4.2472E-15	8.8209E-16
PU-242	3.0596E-08	7.9755E-09	2.0791E-09	5.4202E-10	1.4130E-10	3.6836E-11	9.6027E-12	2.5034E-12	6.5260E-13	1.7013E-13
AM-243	2.2555E-09	1.9301E-09	1.6517E-09	1.4135E-09	1.2096E-09	1.0352E-09	8.8588E-10	7.5811E-10	6.4877E-10	5.5520E-10
CM-243	2.0723E-09	1.8771E-19	1.7021E-29	4.3356E-39	3.2552E-39	3.2552E-39	3.2552E-39	3.2552E-39	3.2552E-39	3.2552E-39
CM-244	1.0019E-09	1.8643E-27	1.9534E-39	1.9534E-39	1.9534E-39	1.9534E-39	1.9534E-39	1.9534E-39	1.9534E-39	1.9534E-39

1	RESIDUAL RADIOACTIVITY IN TRANSIT IN YEAR 10000	REMAINING IN TRENCH	RELEASED TO THE ATMOSPHERE
H-3	0.0000E+00	1.2612E-44	2.1492E-12
C-14	0.0000E+00	3.3631E-44	3.6893E-12

TABLE C-4
(Continued)

FE-55	7.7352E-43	2.8026E-45	4.1228E-10
NI-59	6.8186E-01	2.3527E-01	2.6349E-09
CO-60	9.4609E-41	5.6052E-45	7.4523E-10
NI-63	1.4754E-33	5.0901E-34	2.6008E-09
SR-90	8.0337E-40	2.8026E-44	2.0296E-09
NB-94	4.3986E-01	2.6699E-01	2.7272E-09
TC-99	1.7641E-36	6.1844E-37	1.7243E-10
RU-106	1.4027E-42	1.4013E-45	1.0919E-10
SB-125	3.1577E-41	2.8026E-45	3.7054E-10
I-129	3.8831E-09	1.1156E-09	7.7922E-10
CS-134	6.1181E-42	1.4013E-45	2.7834E-10
CS-135	4.9348E-01	5.0417E-01	2.5661E-09
CS-137	8.7941E-40	2.9427E-44	2.0017E-09
BA-137M	8.7941E-40	2.9427E-44	2.0017E-09
EU-154	8.9081E-42	8.4078E-45	1.2451E-09
TL-208	1.1404E-03	9.9883E-01	4.8662E-09
PO-210	3.5171E-03	9.6502E-03	2.6809E-09
PB-210	3.5171E-03	9.6502E-03	2.6809E-09
PB-212	1.1404E-03	9.9883E-01	4.8662E-09
BI-214	3.5171E-03	9.6502E-03	2.6809E-09
PB-214	3.5171E-03	9.6502E-03	2.6809E-09
RA-226	3.5171E-03	9.6502E-03	2.6809E-09
TH-228	1.1404E-03	9.9883E-01	4.8662E-09
AC-228	2.6711E-01	7.3289E-01	2.6831E-09
RA-228	2.6711E-01	7.3289E-01	2.6831E-09
TH-232	1.1404E-03	9.9883E-01	4.8662E-09
U-234	8.7211E-02	9.1279E-01	2.7869E-09
U-235	8.7210E-02	9.1279E-01	2.7869E-09
NP-237	9.2019E-06	2.5752E-06	1.0874E-09
U-238	8.7211E-02	9.1279E-01	2.7869E-09
PU-238	4.5704E-36	4.4487E-35	2.7578E-09
PU-239	6.9912E-02	6.8081E-01	2.9846E-09
PU-241	4.4374E-41	1.2612E-44	1.6132E-09
AM-241	1.5879E-07	1.1805E-07	2.9554E-09
PU-242	9.1441E-02	8.9025E-01	2.9892E-09
AM-243	2.2407E-01	1.6656E-01	4.3210E-09

TABLE C-4
(Continued)

CM-243	2.0333E-40	3.2230E-44	2.1943E-09
CM-244	6.7786E-41	1.6816E-44	1.8304E-09

HEALTH EFFECTS RESULTING FROM RESIDUAL
RADIOACTIVITY RELEASED IN 100 YEARS

NUCLIDE	RESIDUAL ACTIVITY	CONVERSION FACTOR	HEALTH EFFECTS
H-3	2.6253E-04	7.3500E-06	1.9296E-09
C-14	1.0090E-01	4.6100E-03	4.6514E-04
FE-55	2.4581E-11	3.1900E-04	7.8415E-15
NI-59	3.9663E-08	2.0000E-05	7.9327E-13
CO-60	5.6176E-09	5.4400E-04	3.0560E-12
NI-63	3.2572E-08	4.9800E-05	1.6221E-12
SR-90	1.8393E-08	4.7500E-04	8.7369E-12
NB-94	3.0537E-08	5.2100E-02	1.5910E-09
TC-99	4.2643E-08	2.1500E-04	9.1682E-12
RU-106	9.0947E-11	1.0100E-03	9.1856E-14
SB-125	2.3570E-09	2.8600E-07	6.7411E-16
I-129	4.2384E-08	9.0800E-03	3.8484E-10
CS-134	7.4778E-10	6.0300E-02	4.5091E-11
CS-135	4.1192E-08	5.9300E-03	2.4427E-10
CS-137	2.2143E-08	4.0400E-02	8.9458E-10
BA-137M	2.2143E-08	0.0000E+00	0.0000E+00
EU-154	2.9145E-10	9.3300E-05	2.7192E-14
TL-208	3.2360E-10	7.6700E-04	2.4820E-13
PO-210	3.5993E-08	1.0300E-01	3.7073E-09
PB-210	3.5993E-08	1.8000E-01	6.4788E-09
PB-212	3.2360E-10	1.7300E-03	5.5982E-13
BI-214	3.5993E-08	1.8900E-05	6.8028E-13
PB-214	3.5993E-08	3.5900E-05	1.2922E-12
RA-226	3.5993E-08	3.2400E-02	1.1662E-09

TABLE C-4
(Continued)

TH-228	3.2360E-10	3.9000E-03	1.2620E-12
AC-228	3.6526E-08	2.2800E-04	8.3279E-12
RA-228	3.6526E-08	2.2800E-02	8.3279E-10
TH-232	3.2360E-10	7.3500E-03	2.3784E-12
U-234	1.9277E-08	3.0500E-04	5.8794E-12
U-235	1.9277E-08	3.5100E-04	6.7661E-12
NP-237	4.2252E-08	2.6800E-01	1.1324E-08
U-238	1.9277E-08	3.0400E-04	5.8601E-12
PU-238	3.6190E-09	5.9400E-02	2.1497E-10
PU-239	5.2014E-09	6.5400E-03	3.4017E-11
PU-241	6.3831E-10	1.0800E-03	6.8938E-13
AM-241	2.2534E-10	1.0100E-01	2.2759E-11
PU-242	5.2083E-09	6.2100E-03	3.2343E-11
AM-243	2.4179E-10	1.0000E-01	2.4179E-11
CM-243	1.8673E-09	5.5400E-02	1.0345E-10
CM-244	9.8506E-10	4.6300E-02	4.5608E-11

HEALTH EFFECTS RESULTING FROM RESIDUAL
RADIOACTIVITY RELEASED IN 500 YEARS

NUCLIDE	RESIDUAL ACTIVITY	CONVERSION FACTOR	HEALTH EFFECTS
H-3	3.2193E-04	7.3500E-06	2.3662E-09
C-14	9.6866E-01	4.6100E-03	4.4655E-03
FE-55	2.4581E-11	3.1900E-04	7.8415E-15
NI-59	4.1579E-08	2.0000E-05	8.3158E-13
CO-60	5.6176E-09	5.4400E-04	3.0560E-12
NI-63	3.3295E-08	4.9800E-05	1.6581E-12
SR-90	1.8469E-08	4.7500E-04	8.7728E-12
NB-94	4.1391E-08	5.2100E-02	2.1564E-09
TC-99	8.3805E-01	2.1500E-04	1.8018E-04
RU-106	9.0947E-11	1.0100E-03	9.1856E-14

TABLE C-4
(Continued)

SB-125	2.3570E-09	2.8600E-07	6.7411E-16
I-129	4.2384E-08	9.0800E-03	3.8484E-10
CS-134	7.4778E-10	6.0300E-02	4.5091E-11
CS-135	4.1620E-08	5.9300E-03	2.4681E-10
CS-137	2.2166E-08	4.0400E-02	8.9549E-10
BA-137M	2.2166E-08	0.0000E+00	0.0000E+00
EU-154	2.9152E-10	9.3300E-05	2.7199E-14
TL-208	1.5914E-09	7.6700E-04	1.2206E-12
PO-210	4.0725E-08	1.0300E-01	4.1947E-09
PB-210	4.0725E-08	1.8000E-01	7.3305E-09
PB-212	1.5914E-09	1.7300E-03	2.7531E-12
BI-214	4.0725E-08	1.8900E-05	7.6970E-13
PB-214	4.0725E-08	3.5900E-05	1.4620E-12
RA-226	4.0725E-08	3.2400E-02	1.3195E-09
TH-228	1.5914E-09	3.9000E-03	6.2064E-12
AC-228	4.1569E-08	2.2800E-04	9.4778E-12
RA-228	4.1569E-08	2.2800E-02	9.4778E-10
TH-232	1.5914E-09	7.3500E-03	1.1697E-11
U-234	3.9691E-08	3.0500E-04	1.2106E-11
U-235	3.9691E-08	3.5100E-04	1.3931E-11
NP-237	4.2252E-08	2.6800E-01	1.1324E-08
U-238	3.9691E-08	3.0400E-04	1.2066E-11
PU-238	5.9392E-09	5.9400E-02	3.5279E-10
PU-239	2.0135E-08	6.5400E-03	1.3168E-10
PU-241	6.4125E-10	1.0800E-03	6.9255E-13
AM-241	8.4294E-10	1.0100E-01	8.5137E-11
PU-242	2.0256E-08	6.2100E-03	1.2579E-10
AM-243	1.1717E-09	1.0000E-01	1.1717E-10
CM-243	2.0722E-09	5.5400E-02	1.1480E-10
CM-244	1.0019E-09	4.6300E-02	4.6389E-11

HEALTH EFFECTS RESULTING FROM RESIDUAL
RADIOACTIVITY RELEASED IN 1000 YEARS

TABLE C-4
(Continued)

NUCLIDE	RESIDUAL ACTIVITY	CONVERSION FACTOR	HEALTH EFFECTS
H-3	3.2193E-04	7.3500E-06	2.3662E-09
C-14	9.7061E-01	4.6100E-03	4.4745E-03
FE-55	2.4581E-11	3.1900E-04	7.8415E-15
NI-59	4.1579E-08	2.0000E-05	8.3158E-13
CO-60	5.6176E-09	5.4400E-04	3.0560E-12
NI-63	3.3295E-08	4.9800E-05	1.6581E-12
SR-90	1.8469E-08	4.7500E-04	8.7728E-12
NB-94	4.1443E-08	5.2100E-02	2.1592E-09
TC-99	9.8592E-01	2.1500E-04	2.1197E-04
RU-106	9.0947E-11	1.0100E-03	9.1856E-14
SB-125	2.3570E-09	2.8600E-07	6.7411E-16
I-129	4.2384E-08	9.0800E-03	3.8484E-10
CS-134	7.4778E-10	6.0300E-02	4.5091E-11
CS-135	4.1620E-08	5.9300E-03	2.4681E-10
CS-137	2.2166E-08	4.0400E-02	8.9549E-10
BA-137M	2.2166E-08	0.0000E+00	0.0000E+00
EU-154	2.9152E-10	9.3300E-05	2.7199E-14
TL-208	3.1192E-09	7.6700E-04	2.3924E-12
PO-210	4.0726E-08	1.0300E-01	4.1948E-09
PB-210	4.0726E-08	1.8000E-01	7.3306E-09
PB-212	3.1192E-09	1.7300E-03	5.3962E-12
BI-214	4.0726E-08	1.8900E-05	7.6972E-13
PB-214	4.0726E-08	3.5900E-05	1.4621E-12
RA-226	4.0726E-08	3.2400E-02	1.3195E-09
TH-228	3.1192E-09	3.9000E-03	1.2165E-11
AC-228	4.1570E-08	2.2800E-04	9.4781E-12
RA-228	4.1570E-08	2.2800E-02	9.4781E-10
TH-232	3.1192E-09	7.3500E-03	2.2926E-11
U-234	4.1445E-08	3.0500E-04	1.2641E-11
U-235	4.1445E-08	3.5100E-04	1.4547E-11
NP-237	4.2252E-08	2.6800E-01	1.1324E-08
U-238	4.1445E-08	3.0400E-04	1.2599E-11
PU-238	5.9976E-09	5.9400E-02	3.5626E-10

TABLE C-4
(Continued)

PU-239	3.0277E-08	6.5400E-03	1.9801E-10
PU-241	6.4125E-10	1.0800E-03	6.9255E-13
AM-241	1.2270E-09	1.0100E-01	1.2393E-10
PU-242	3.0596E-08	6.2100E-03	1.9000E-10
AM-243	2.2555E-09	1.0000E-01	2.2555E-10
CM-243	2.0723E-09	5.5400E-02	1.1480E-10
CM-244	1.0019E-09	4.6300E-02	4.6389E-11

HEALTH EFFECTS RESULTING FROM RESIDUAL
RADIOACTIVITY RELEASED IN 10000 YEARS

NUCLIDE	RESIDUAL ACTIVITY	CONVERSION FACTOR	HEALTH EFFECTS
H-3	3.2193E-04	7.3500E-06	2.3662E-09
C-14	9.7061E-01	4.6100E-03	4.4745E-03
FE-55	2.4581E-11	3.1900E-04	7.8415E-15
NI-59	4.1579E-08	2.0000E-05	8.3158E-13
CO-60	5.6176E-09	5.4400E-04	3.0560E-12
NI-63	3.3295E-08	4.9800E-05	1.6581E-12
SR-90	1.8469E-08	4.7500E-04	8.7728E-12
NB-94	4.1443E-08	5.2100E-02	2.1592E-09
TC-99	9.9460E-01	2.1500E-04	2.1384E-04
RU-106	9.0947E-11	1.0100E-03	9.1856E-14
SB-125	2.3570E-09	2.8600E-07	6.7411E-16
I-129	9.9777E-01	9.0800E-03	9.0597E-03
CS-134	7.4778E-10	6.0300E-02	4.5091E-11
CS-135	4.1620E-08	5.9300E-03	2.4681E-10
CS-137	2.2166E-08	4.0400E-02	8.9549E-10
BA-137M	2.2166E-08	0.0000E+00	0.0000E+00
EU-154	2.9152E-10	9.3300E-05	2.7199E-14
TL-208	2.2229E-08	7.6700E-04	1.7050E-11
PO-210	4.0726E-08	1.0300E-01	4.1948E-09

TABLE C-4
(Continued)

PB-210	4.0726E-08	1.8000E-01	7.3306E-09
PB-212	2.2229E-08	1.7300E-03	3.8456E-11
BI-214	4.0726E-08	1.8900E-05	7.6972E-13
PB-214	4.0726E-08	3.5900E-05	1.4621E-12
RA-226	4.0726E-08	3.2400E-02	1.3195E-09
TH-228	2.2229E-08	3.9000E-03	8.6693E-11
AC-228	4.1570E-08	2.2800E-04	9.4781E-12
RA-228	4.1570E-08	2.2800E-02	9.4781E-10
TH-232	2.2229E-08	7.3500E-03	1.6338E-10
U-234	4.1526E-08	3.0500E-04	1.2666E-11
U-235	4.1526E-08	3.5100E-04	1.4576E-11
NP-237	9.9925E-01	2.6800E-01	2.6780E-01
U-238	4.1526E-08	3.0400E-04	1.2624E-11
PU-238	5.9982E-09	5.9400E-02	3.5629E-10
PU-239	4.0574E-08	6.5400E-03	2.6535E-10
PU-241	6.4125E-10	1.0800E-03	6.9255E-13
AM-241	1.5486E-09	1.0100E-01	1.5641E-10
PU-242	4.1384E-08	6.2100E-03	2.5699E-10
AM-243	1.2344E-08	1.0000E-01	1.2344E-09
CM-243	2.0723E-09	5.5400E-02	1.1480E-10
CM-244	1.0019E-09	4.6300E-02	4.6389E-11

TABLE FOR ACCOUNTING MODEL -- YEAR 100

COLUMN 1: INDIVIDUAL CANCER RISK (UNITLESS)
COLUMN 2: COLLECTIVE CANCER RISK (DEATHS/YEAR)
COLUMN 3: GENETIC RISK (EFFECTS/YEAR)
COLUMN 4: R-ACTIVITY PUMPED OUT THE WELL 1ST 100 YEARS (CI)
COLUMN 5: R-ACTIVITY PUMPED OUT THE STREAM 1ST 100 YEARS (CI)
COLUMN 6: R-ACTIVITY RELEASED TO ATMOSPHERE 1ST 100 YEARS (CI)
COLUMN 7: R-ACTIVITY RELEASED DOWNSTREAM 1ST 100 YEARS (CI)
COLUMN 8: R-ACTIVITY RELEASED DOWNSTREAM LAST 9900 YEARS (CI)
COLUMN 9: R-ACTIVITY IN TRENCH AFTER 10000 YEARS ASSUMING PERFECT CONTAINMENT (CI)

H-3	1.2345E-10	4.3618E-11	1.6501E-11	2.9890E-06	0.0000E+00	2.1492E-12	2.6253E-04	5.9396E-05	0.0000E+00
C-14	3.2585E-07	1.1513E-07	2.1426E-08	4.4131E-04	0.0000E+00	3.6893E-12	1.0090E-01	8.6971E-01	2.9820E-01

TABLE C-4
(Continued)

FE-55	7.4446E-18	2.6304E-18	7.6669E-19	0.0000E+00	0.0000E+00	4.1228E-10	2.4581E-11	1.1729E-39	0.0000E+00
NI-59	1.2988E-16	4.5889E-17	7.3599E-18	0.0000E+00	0.0000E+00	2.6344E-09	3.9663E-08	1.9157E-09	9.1704E-01
CO-60	1.6977E-14	5.9986E-15	2.5607E-15	0.0000E+00	0.0000E+00	7.4523E-10	5.6176E-09	7.8520E-38	0.0000E+00
NI-63	3.8474E-17	1.3594E-17	3.5458E-18	0.0000E+00	0.0000E+00	2.6006E-09	3.2572E-08	7.2282E-10	1.9844E-33
SR-90	1.0284E-15	3.6335E-16	5.4502E-18	0.0000E+00	0.0000E+00	2.0295E-09	1.8393E-08	7.5646E-11	0.0000E+00
NB-94	5.9150E-13	2.0899E-13	9.1036E-14	0.0000E+00	0.0000E+00	2.7212E-09	3.0537E-08	1.0906E-08	7.0681E-01
TC-99	2.2733E-17	8.0322E-18	3.2894E-19	0.0000E+00	0.0000E+00	1.7243E-10	4.2643E-08	9.9460E-01	9.6802E-01
RU-106	1.3152E-16	4.6470E-17	1.2680E-18	0.0000E+00	0.0000E+00	1.0919E-10	9.0947E-11	4.6915E-39	0.0000E+00
SB-125	8.1540E-16	2.8810E-16	1.2368E-16	0.0000E+00	0.0000E+00	3.7054E-10	2.3570E-09	4.6878E-38	0.0000E+00
I-129	2.7286E-15	9.6409E-16	1.6946E-17	0.0000E+00	0.0000E+00	7.7922E-10	4.2384E-08	9.9777E-01	9.9959E-01
CS-134	2.4847E-15	8.7790E-16	3.5829E-16	0.0000E+00	0.0000E+00	2.7834E-10	7.4778E-10	1.1716E-38	0.0000E+00
CS-135	1.2537E-15	4.4296E-16	1.8259E-16	0.0000E+00	0.0000E+00	2.5661E-09	4.1192E-08	4.2834E-10	9.9770E-01
CS-137	5.2660E-15	1.8606E-15	7.1358E-16	0.0000E+00	0.0000E+00	2.0017E-09	2.2143E-08	2.2615E-11	0.0000E+00
BA-137M	5.7303E-14	2.0246E-14	8.8497E-15	0.0000E+00	0.0000E+00	2.0017E-09	2.2143E-08	2.2615E-11	0.0000E+00
EU-154	2.7037E-14	9.5527E-15	4.0993E-15	0.0000E+00	0.0000E+00	1.2451E-09	2.9145E-10	7.4440E-14	0.0000E+00
TL-208	1.2809E-12	4.5258E-13	1.9124E-13	0.0000E+00	0.0000E+00	2.7980E-09	3.2360E-10	2.1905E-08	1.0000E+00
PO-210	2.7323E-14	9.6540E-15	2.0668E-15	0.0000E+00	0.0000E+00	2.6792E-09	3.5993E-08	4.7324E-09	1.3168E-02
PB-210	6.1673E-14	2.1790E-14	2.1565E-15	0.0000E+00	0.0000E+00	2.6792E-09	3.5993E-08	4.7324E-09	1.3168E-02
PB-212	6.9128E-14	2.4425E-14	1.0054E-14	0.0000E+00	0.0000E+00	2.7980E-09	3.2360E-10	2.1905E-08	1.0000E+00
BI-214	4.7749E-13	1.6871E-13	7.2460E-14	0.0000E+00	0.0000E+00	2.6792E-09	3.5993E-08	4.7324E-09	1.3168E-02
PB-214	8.8550E-14	3.1287E-14	1.3274E-14	0.0000E+00	0.0000E+00	2.6792E-09	3.5993E-08	4.7324E-09	1.3168E-02
RA-226	3.2228E-14	1.1387E-14	2.1118E-15	0.0000E+00	0.0000E+00	2.6792E-09	3.5993E-08	4.7324E-09	1.3168E-02
TH-228	5.2508E-13	1.8552E-13	4.3883E-16	0.0000E+00	0.0000E+00	2.7980E-09	3.2360E-10	2.1905E-08	1.0000E+00
AC-228	3.1368E-13	1.1083E-13	4.8007E-14	0.0000E+00	0.0000E+00	2.6813E-09	3.6526E-08	5.0444E-09	1.0000E+00
RA-228	1.1295E-14	3.9910E-15	1.7018E-15	0.0000E+00	0.0000E+00	2.6813E-09	3.6526E-08	5.0444E-09	1.0000E+00
TH-232	2.1687E-13	7.6627E-14	2.6497E-16	0.0000E+00	0.0000E+00	2.7980E-09	3.2360E-10	2.1905E-08	1.0000E+00
U-234	1.7708E-13	6.2568E-14	2.9887E-17	0.0000E+00	0.0000E+00	2.7607E-09	1.9277E-08	2.2250E-08	1.0000E+00
U-235	2.2912E-13	8.0952E-14	9.4330E-15	0.0000E+00	0.0000E+00	2.7607E-09	1.9277E-08	2.2250E-08	9.9999E-01
NP-237	9.2562E-14	3.2705E-14	4.8811E-15	0.0000E+00	0.0000E+00	1.0874E-09	4.2252E-08	9.9925E-01	9.9671E-01
U-238	1.5885E-13	5.6124E-14	2.3906E-17	0.0000E+00	0.0000E+00	2.7607E-09	1.9277E-08	2.2250E-08	1.0000E+00
PU-238	2.8983E-13	1.0240E-13	4.9395E-15	0.0000E+00	0.0000E+00	2.7447E-09	3.6190E-09	2.3792E-09	4.9061E-35
PU-239	2.7043E-13	9.5550E-14	3.8323E-15	0.0000E+00	0.0000E+00	2.7899E-09	5.2014E-09	3.5373E-08	7.5051E-01
PU-241	1.2754E-15	4.5063E-16	4.0043E-17	0.0000E+00	0.0000E+00	1.6132E-09	6.3831E-10	2.9349E-12	0.0000E+00
AM-241	2.7304E-13	9.6473E-14	1.5469E-14	0.0000E+00	0.0000E+00	2.7888E-09	2.2534E-10	1.3233E-09	2.7679E-07
PU-242	2.5698E-13	9.0796E-14	3.6436E-15	0.0000E+00	0.0000E+00	2.7900E-09	5.2083E-09	3.6176E-08	9.8187E-01
AM-243	2.8621E-13	1.0112E-13	1.7391E-14	0.0000E+00	0.0000E+00	2.7975E-09	2.4179E-10	1.2102E-08	3.9063E-01

TABLE C-4
(Continued)

CM-243	1.7756E-13	6.2736E-14	1.2054E-14	0.0000E+00	0.0000E+00	2.1932E-09	1.8673E-09	2.0498E-10	0.0000E+00
CM-244	1.1356E-13	4.0123E-14	6.9222E-15	0.0000E+00	0.0000E+00	1.8303E-09	9.8506E-10	1.6867E-11	0.0000E+00
TOTALS:	3.2598E-07	1.1518E-07	2.1443E-08						

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TABLE FOR ACCOUNTING MODEL -- YEAR 500

COLUMN 1: INDIVIDUAL CANCER RISK (UNITLESS)
COLUMN 2: COLLECTIVE CANCER RISK (DEATHS/YEAR)
COLUMN 3: GENETIC RISK (EFFECTS/YEAR)
COLUMN 4: R-ACTIVITY PUMPED OUT THE WELL 1ST 500 YEARS (CI)
COLUMN 5: R-ACTIVITY PUMPED OUT THE STREAM 1ST 500 YEARS (CI)
COLUMN 6: R-ACTIVITY RELEASED TO ATMOSPHERE 1ST 500 YEARS (CI)
COLUMN 7: R-ACTIVITY RELEASED DOWNSTREAM 1ST 500 YEARS (CI)
COLUMN 8: R-ACTIVITY RELEASED DOWNSTREAM LAST 9500 YEARS (CI)
COLUMN 9: R-ACTIVITY IN TRENCH AFTER 10000 YEARS ASSUMING PERFECT CONTAINMENT (CI)

H-3	3.0276E-11	1.0697E-11	4.0470E-12	3.6654E-06	0.0000E+00	2.1492E-12	3.2193E-04	5.5502E-32	0.0000E+00
C-14	6.2566E-07	2.2106E-07	4.1139E-08	4.2367E-03	0.0000E+00	3.6893E-12	9.6866E-01	1.9451E-03	2.9820E-01
FE-55	1.4889E-18	5.2607E-19	1.5334E-19	0.0000E+00	0.0000E+00	4.1228E-10	2.4581E-11	1.1729E-39	0.0000E+00
NI-59	6.0072E-17	2.1225E-17	3.3038E-18	0.0000E+00	0.0000E+00	2.6349E-09	4.1579E-08	1.8159E-21	9.1704E-01
CO-60	3.3955E-15	1.1997E-15	5.1214E-16	0.0000E+00	0.0000E+00	7.4523E-10	5.6176E-09	7.8520E-38	0.0000E+00
NI-63	8.5881E-18	3.0344E-18	8.1131E-19	0.0000E+00	0.0000E+00	2.6008E-09	3.3295E-08	7.8700E-25	1.9844E-33
SR-90	2.1250E-16	7.5083E-17	1.1208E-18	0.0000E+00	0.0000E+00	2.0296E-09	1.8469E-08	2.5122E-32	0.0000E+00
NB-94	4.1242E-13	1.4572E-13	6.3490E-14	0.0000E+00	0.0000E+00	2.7272E-09	4.1391E-08	5.2398E-11	7.0681E-01
TC-99	6.7222E-07	2.3751E-07	1.1249E-08	3.6602E-03	0.0000E+00	1.7243E-10	8.3805E-01	1.5656E-01	9.6802E-01
RU-106	2.6305E-17	9.2941E-18	2.5360E-19	0.0000E+00	0.0000E+00	1.0919E-10	9.0947E-11	4.6915E-39	0.0000E+00
SB-125	1.6308E-16	5.7620E-17	2.4735E-17	0.0000E+00	0.0000E+00	3.7054E-10	2.3570E-09	4.6878E-38	0.0000E+00
I-129	1.6989E-12	6.0027E-13	1.3367E-15	2.0647E-10	0.0000E+00	7.7922E-10	4.2384E-08	9.9777E-01	9.9959E-01
CS-134	4.9694E-16	1.7558E-16	7.1659E-17	0.0000E+00	0.0000E+00	2.7834E-10	7.4778E-10	1.1716E-38	0.0000E+00
CS-135	3.3818E-16	1.1949E-16	4.9256E-17	0.0000E+00	0.0000E+00	2.5661E-09	4.1620E-08	5.6560E-28	9.9770E-01
CS-137	1.0646E-15	3.7616E-16	1.4426E-16	0.0000E+00	0.0000E+00	2.0017E-09	2.2166E-08	1.6155E-37	0.0000E+00
BA-137M	1.2069E-14	4.2643E-15	1.8639E-15	0.0000E+00	0.0000E+00	2.0017E-09	2.2166E-08	1.6155E-37	0.0000E+00
EU-154	5.4089E-15	1.9111E-15	8.2010E-16	0.0000E+00	0.0000E+00	1.2451E-09	2.9152E-10	4.6915E-39	0.0000E+00
TL-208	1.3130E-12	4.6391E-13	1.9603E-13	0.0000E+00	0.0000E+00	2.9177E-09	1.5914E-09	2.0638E-08	1.0000E+00
PO-210	6.1467E-15	2.1718E-15	5.2843E-16	0.0000E+00	0.0000E+00	2.6809E-09	4.0725E-08	8.0648E-13	1.3168E-02

TABLE C-4
(Continued)

PB-210	1.5851E-14	5.6006E-15	5.7929E-16	0.0000E+00	0.0000E+00	2.6809E-09	4.0725E-08	8.0648E-13	1.3168E-02
PB-212	6.8990E-14	2.4376E-14	1.0168E-14	0.0000E+00	0.0000E+00	2.9177E-09	1.5914E-09	2.0638E-08	1.0000E+00
BI-214	2.6527E-13	9.3726E-14	4.0256E-14	0.0000E+00	0.0000E+00	2.6809E-09	4.0725E-08	8.0648E-13	1.3168E-02
PB-214	4.9186E-14	1.7378E-14	7.3741E-15	0.0000E+00	0.0000E+00	2.6809E-09	4.0725E-08	8.0648E-13	1.3168E-02
RA-226	7.4799E-15	2.6428E-15	5.7378E-16	0.0000E+00	0.0000E+00	2.6809E-09	4.0725E-08	8.0648E-13	1.3168E-02
TH-228	1.1037E-13	3.8996E-14	2.0898E-16	0.0000E+00	0.0000E+00	2.9177E-09	1.5914E-09	2.0638E-08	1.0000E+00
AC-228	1.8480E-13	6.5293E-14	2.8284E-14	0.0000E+00	0.0000E+00	2.6831E-09	4.1569E-08	1.0374E-12	1.0000E+00
RA-228	2.3843E-15	8.4244E-16	3.6705E-16	0.0000E+00	0.0000E+00	2.6831E-09	4.1569E-08	1.0374E-12	1.0000E+00
TH-232	4.5425E-14	1.6050E-14	7.4526E-17	0.0000E+00	0.0000E+00	2.9177E-09	1.5914E-09	2.0638E-08	1.0000E+00
U-234	3.5900E-14	1.2684E-14	2.2523E-17	0.0000E+00	0.0000E+00	2.7847E-09	3.9691E-08	1.8359E-09	1.0000E+00
U-235	8.8104E-14	3.1129E-14	8.0023E-15	0.0000E+00	0.0000E+00	2.7847E-09	3.9691E-08	1.8359E-09	9.9999E-01
NP-237	1.8512E-14	6.5409E-15	9.7623E-16	0.0000E+00	0.0000E+00	1.0874E-09	4.2252E-08	9.9925E-01	9.9671E-01
U-238	3.2186E-14	1.1372E-14	1.7538E-17	0.0000E+00	0.0000E+00	2.7847E-09	3.9691E-08	1.8359E-09	1.0000E+00
PU-238	5.8269E-14	2.0588E-14	9.9554E-16	0.0000E+00	0.0000E+00	2.7575E-09	5.9392E-09	5.8995E-11	4.9061E-35
PU-239	5.5781E-14	1.9709E-14	7.9931E-16	0.0000E+00	0.0000E+00	2.8721E-09	2.0135E-08	2.0439E-08	7.5051E-01
PU-241	2.5508E-16	9.0126E-17	8.0086E-18	0.0000E+00	0.0000E+00	1.6132E-09	6.4125E-10	2.6452E-33	0.0000E+00
AM-241	6.1778E-14	2.1828E-14	4.0480E-15	0.0000E+00	0.0000E+00	2.8666E-09	8.4294E-10	7.0571E-10	2.7679E-07
PU-242	5.3097E-14	1.8760E-14	7.6710E-16	0.0000E+00	0.0000E+00	2.8729E-09	2.0256E-08	2.1128E-08	9.8187E-01
AM-243	7.9022E-14	2.7920E-14	6.5943E-15	0.0000E+00	0.0000E+00	2.9146E-09	1.1717E-09	1.1172E-08	3.9063E-01
CM-243	3.6003E-14	1.2721E-14	2.4813E-15	0.0000E+00	0.0000E+00	2.1943E-09	2.0722E-09	1.6654E-14	0.0000E+00
CM-244	2.2713E-14	8.0250E-15	1.3845E-15	0.0000E+00	0.0000E+00	1.8304E-09	1.0019E-09	1.8643E-27	0.0000E+00
TOTALS:	1.2979E-06	4.5858E-07	5.2393E-08						

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TABLE FOR ACCOUNTING MODEL -- YEAR 1000

COLUMN 1: INDIVIDUAL CANCER RISK (UNITLESS)
COLUMN 2: COLLECTIVE CANCER RISK (DEATHS/YEAR)
COLUMN 3: GENETIC RISK (EFFECTS/YEAR)
COLUMN 4: R-ACTIVITY PUMPED OUT THE WELL 1ST 1000 YEARS (CI)
COLUMN 5: R-ACTIVITY PUMPED OUT THE STREAM 1ST 1000 YEARS (CI)
COLUMN 6: R-ACTIVITY RELEASED TO ATMOSPHERE 1ST 1000 YEARS (CI)
COLUMN 7: R-ACTIVITY RELEASED DOWNSTREAM 1ST 1000 YEARS (CI)
COLUMN 8: R-ACTIVITY RELEASED DOWNSTREAM LAST 9000 YEARS (CI)
COLUMN 9: R-ACTIVITY IN TRENCH AFTER 10000 YEARS ASSUMING PERFECT CONTAINMENT (CI)

TABLE C-4
(Continued)

H-3	1.5138E-11	5.3487E-12	2.0235E-12	3.6654E-06	0.0000E+00	2.1492E-12	3.2193E-04	5.5502E-32	0.0000E+00
C-14	3.1346E-07	1.1075E-07	2.0611E-08	4.2452E-03	0.0000E+00	3.6893E-12	9.7061E-01	1.4410E-07	2.9820E-01
FE-55	7.4446E-19	2.6304E-19	7.6669E-20	0.0000E+00	0.0000E+00	4.1228E-10	2.4581E-11	1.1729E-39	0.0000E+00
NI-59	3.2861E-17	1.1611E-17	1.8037E-18	0.0000E+00	0.0000E+00	2.6349E-09	4.1579E-08	1.8159E-21	9.1704E-01
CO-60	1.6977E-15	5.9986E-16	2.5607E-16	0.0000E+00	0.0000E+00	7.4523E-10	5.6176E-09	7.8520E-38	0.0000E+00
NI-63	4.2975E-18	1.5184E-18	4.0605E-19	0.0000E+00	0.0000E+00	2.6008E-09	3.3295E-08	7.8700E-25	1.9844E-33
SR-90	1.0625E-16	3.7541E-17	5.6040E-19	0.0000E+00	0.0000E+00	2.0296E-09	1.8469E-08	2.5122E-32	0.0000E+00
NB-94	2.8115E-13	9.9336E-14	4.3283E-14	0.0000E+00	0.0000E+00	2.7272E-09	4.1443E-08	6.6362E-14	7.0681E-01
TC-99	3.9799E-07	1.4062E-07	6.6603E-09	4.3341E-03	0.0000E+00	1.7243E-10	9.8592E-01	8.6833E-03	9.6802E-01
RU-106	1.3152E-17	4.6470E-18	1.2680E-19	0.0000E+00	0.0000E+00	1.0919E-10	9.0947E-11	4.6915E-39	0.0000E+00
SB-125	8.1540E-17	2.8810E-17	1.2368E-17	0.0000E+00	0.0000E+00	3.7054E-10	2.3570E-09	4.6878E-38	0.0000E+00
I-129	8.9353E-06	3.1571E-06	7.0145E-09	2.1725E-03	0.0000E+00	7.7922E-10	4.2384E-08	9.9777E-01	9.9959E-01
CS-134	2.4847E-16	8.7790E-17	3.5829E-17	0.0000E+00	0.0000E+00	2.7834E-10	7.4778E-10	1.1716E-38	0.0000E+00
CS-135	1.7187E-16	6.0725E-17	2.5033E-17	0.0000E+00	0.0000E+00	2.5661E-09	4.1620E-08	5.6560E-28	9.9770E-01
CS-137	5.3231E-16	1.8808E-16	7.2132E-17	0.0000E+00	0.0000E+00	2.0017E-09	2.2166E-08	1.6155E-37	0.0000E+00
BA-137M	6.0345E-15	2.1321E-15	9.3195E-16	0.0000E+00	0.0000E+00	2.0017E-09	2.2166E-08	1.6155E-37	0.0000E+00
EU-154	2.7045E-15	9.5555E-16	4.1005E-16	0.0000E+00	0.0000E+00	1.2451E-09	2.9152E-10	4.6915E-39	0.0000E+00
TL-208	1.3441E-12	4.7491E-13	2.0068E-13	0.0000E+00	0.0000E+00	3.0619E-09	3.1192E-09	1.9110E-08	1.0000E+00
PO-210	3.1611E-15	1.1169E-15	2.7907E-16	0.0000E+00	0.0000E+00	2.6809E-09	4.0726E-08	1.8448E-17	1.3168E-02
PB-210	8.3795E-15	2.9607E-15	3.0875E-16	0.0000E+00	0.0000E+00	2.6809E-09	4.0726E-08	1.8448E-17	1.3168E-02
PB-212	7.0386E-14	2.4869E-14	1.0391E-14	0.0000E+00	0.0000E+00	3.0619E-09	3.1192E-09	1.9110E-08	1.0000E+00
BI-214	1.5459E-13	5.4619E-14	2.3459E-14	0.0000E+00	0.0000E+00	2.6809E-09	4.0726E-08	1.8448E-17	1.3168E-02
PB-214	2.8663E-14	1.0127E-14	4.2973E-15	0.0000E+00	0.0000E+00	2.6809E-09	4.0726E-08	1.8448E-17	1.3168E-02
RA-226	3.8732E-15	1.3685E-15	3.0644E-16	0.0000E+00	0.0000E+00	2.6809E-09	4.0726E-08	1.8448E-17	1.3168E-02
TH-228	5.8451E-14	2.0652E-14	1.8324E-16	0.0000E+00	0.0000E+00	3.0619E-09	3.1192E-09	1.9110E-08	1.0000E+00
AC-228	1.1138E-13	3.9354E-14	1.7048E-14	0.0000E+00	0.0000E+00	2.6831E-09	4.1570E-08	2.9035E-17	1.0000E+00
RA-228	1.2114E-15	4.2802E-16	1.8764E-16	0.0000E+00	0.0000E+00	2.6831E-09	4.1570E-08	2.9035E-17	1.0000E+00
TH-232	2.3957E-14	8.4647E-15	5.1173E-17	0.0000E+00	0.0000E+00	3.0619E-09	3.1192E-09	1.9110E-08	1.0000E+00
U-234	1.8036E-14	6.3725E-15	1.8114E-17	0.0000E+00	0.0000E+00	2.7868E-09	4.1445E-08	8.1186E-11	1.0000E+00
U-235	6.1464E-14	2.1717E-14	6.5351E-15	0.0000E+00	0.0000E+00	2.7868E-09	4.1445E-08	8.1186E-11	9.9999E-01
NP-237	8.1383E-06	2.8755E-06	4.6438E-07	2.5611E-04	0.0000E+00	1.0874E-09	4.2252E-08	9.9925E-01	9.9671E-01
U-238	1.6163E-14	5.7108E-15	1.4052E-17	0.0000E+00	0.0000E+00	2.7868E-09	4.1445E-08	8.1186E-11	1.0000E+00
PU-238	2.9138E-14	1.0295E-14	4.9789E-16	0.0000E+00	0.0000E+00	2.7578E-09	5.9976E-09	5.8053E-13	4.9061E-35
PU-239	2.8490E-14	1.0066E-14	4.1329E-16	0.0000E+00	0.0000E+00	2.9280E-09	3.0277E-08	1.0297E-08	7.5051E-01
PU-241	1.2754E-16	4.5063E-17	4.0043E-18	0.0000E+00	0.0000E+00	1.6132E-09	6.4125E-10	2.6452E-33	0.0000E+00
AM-241	3.3243E-14	1.1746E-14	2.3399E-15	0.0000E+00	0.0000E+00	2.9149E-09	1.2270E-09	3.2161E-10	2.7679E-07

TABLE C-4
(Continued)

PU-242	2.7176E-14	9.6018E-15	4.0083E-16	0.0000E+00	0.0000E+00	2.9298E-09	3.0596E-08	1.0788E-08	9.8187E-01
AM-243	5.3026E-14	1.8736E-14	5.2391E-15	0.0000E+00	0.0000E+00	3.0510E-09	2.2555E-09	1.0088E-08	3.9063E-01
CM-243	1.8001E-14	6.3603E-15	1.2406E-15	0.0000E+00	0.0000E+00	2.1943E-09	2.0723E-09	1.8771E-19	0.0000E+00
CM-244	1.1356E-14	4.0125E-15	6.9226E-16	0.0000E+00	0.0000E+00	1.8304E-09	1.0019E-09	1.8643E-27	0.0000E+00
TOTALS:	1.7785E-05	6.2839E-06	4.9867E-07						