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**Solid Waste Projection Model:
Database User's Guide (Version 1.4)**

C. L. Blackburn

October 1993

**Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830**

**Pacific Northwest Laboratory
Operated for the U.S. Department of Energy
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Richland, Washington 99352

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Executive Summary

The Solid Waste Projection Model (SWPM) system is an analytical tool developed by Pacific Northwest Laboratory (PNL) for Westinghouse Hanford Company (WHC) specifically to address Hanford solid waste management issues. This document is one of a set of documents supporting the SWPM system and providing instructions in the use and maintenance of SWPM components. This manual contains instructions for using Version 1.4 of the SWPM database: system requirements and preparation, entering and maintaining data, and performing routine database functions. This document supports only those operations which are specific to SWPM database menus and functions and does not provide instruction in the use of Paradox, the database management system in which the SWPM database is established.

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1.0 Introduction

Waste management is becoming an ever more important topic. Management of current and future solid wastes will require the development of appropriate treatment, storage, and disposal (TSD)^(a) facilities and operations to match the characteristics of the wastes. Inadequate provision of these TSD facilities and operations will surely incur costs in the form of agency fines or excessive handling fees, and may even result in the need to curtail operations. On the other hand, overdevelopment could needlessly commit productive resources and precious capital.

The Solid Waste Projection Model (SWPM) system is an analysis tool developed by Pacific Northwest Laboratory (PNL)^(b) for Westinghouse Hanford Company (WHC) specifically to address these issues at the Hanford Central Waste Complex (HCWC). SWPM provides the ability to:

- develop detailed projections of the volumes of wastes to be managed and the characteristics of these wastes
- characterize and evaluate the impact of alternative TSD technologies or operating strategies on facilities and operations
- assess the impact upon TSD cost and capacity requirements when waste volumes or waste characteristics vary

This manual describes how to use the SWPM database Version 1.4, which has been specifically designed and structured to support analyses of WHC's developing solid waste management technology. The manual reflects database development completed through Fiscal Year 1992. This version of the database is to be used in conjunction with Version 1.1 of the Solid Waste Projection Model.

This database has been implemented by PNL using the Paradox database management system, a standard commercial software package produced by Borland International. While the database management software is off-the-shelf, the database design and application software are specific to the SWPM application. This includes data table structures, data entry screens, menus, report formats, and the custom software that ties all these components together into a system. The database application also includes technical documentation and written procedures covering its use and administration.

-
- (a) The terms "treatment," "storage," and "disposal," as used here, do not necessarily correspond to the same terms used under the Resource Conservation and Recovery Act (RCRA). For example, storage, as defined by the model, could correspond to normal process holdup under RCRA.
- (b) Pacific Northwest Laboratory is operated for the U.S. Department of Energy by Battelle Memorial Institute under Contract DE-AC06-76RLO 1830.

The database application has been designed to support the following WHC-managed activities:

- **Data entry of forecast information supplied by waste generator organizations:** This information is received on standardized forms, reviewed by a data analyst, and entered into the database using a series of on-screen forms. Data integrity checks are applied before releasing the data into the database.
- **Maintenance of existing forecast information:** Updated or additional information is entered into the database in a process very similar to the original data entry.
- **Notepad maintenance:** During preparation and entry of forecast data, it is often necessary to record assumptions made, shortcomings in the data submissions, and other issues that require consideration or action. The notepad function provides a convenient means to record such information during any data entry or maintenance operation. Additionally, this function accepts notes in a more defined format for specific instances where footnote information was requested on the data collection forms.
- **Reporting of information:** A set of reports addressing the needs of various audiences is provided. Report preparation and production are controlled through the Report Manager feature of the application.

The database application also supports these PNL-managed activities:

- **Entry and maintenance of treatment, storage and disposal (TSD) data:** This section of the database describes what is done to the forecasted waste streams that enter a proposed treatment system.
- **Interface to the model:** A set of files, known as a Reference Data Library (RDL), is extracted from the forecast and TSD portions of the database. These files are used by the model to analyze various waste management system scenarios.

This user's guide first describes the SWPM system and explains the data needed to run the model (Section 2). Instructions for operating the Version 1.4 SWPM Database follow the system description and cover the following activities:

- preparing to use the database, including computer system requirements (Section 3)
- entering and maintaining data (Section 4)
- using standard SWPM database functions, including uploading and downloading (Section 5), maintaining the database (Section 6), and printing reports (Section 7)

This document is part of an integrated set of SWPM system documentation. Five additional documents provide overview information about the SWPM system and detailed instructions in the use, maintenance, and application of the other components of the SWPM system. These documents are listed in Table 1.1.

Table 1.1. SWPM Documents

<u>Title</u>	<u>Description</u>	<u>Primary Audience</u>
System Overview	Overview of the SWPM system and potential applications	Study Managers
Database Technical Reference Manual	Development and maintenance reference manual for database software and utilities	Database Specialist
Model User's Guide	User's instructions for model operation and execution	Analyst
Model Technical Reference Manual	Development and maintenance reference manual for model software and applications	Software Engineer
Configuration Management and Administrative Plan	Instruction for long-term system administration maintenance and configuration management	System Administrator

2.0 System Description

This chapter provides the user with a basic understanding of the solid waste management system being modeled, its representation in the SWPM system, the configuration of the individual SWPM system components, and the data required to support the model.

2.1 The System Being Modeled

A generic representation of the solid waste management system modeled by SWPM is shown in Figure 2.1. Solid wastes of a given type or class are received from a number of waste generators and are distributed to various operations. Operations are defined as either treatments or disposals and are linked to other operations to represent a given waste management scheme. At each treatment operation, wastes are changed in volume or characteristics or both. The waste volumes are then redistributed to subsequent operations until a final disposal operation is reached. Because all operations have fixed capacity constraints, each operation has an associated storage option to track any waste distributed to the operation in excess of that capacity.

A distinct series of waste treatment operations are defined for each type or class of waste being accepted and processed. If wastes are converted from one type or class to another as a result of an operation, they are then transferred to the appropriate series of operations for the new type or class. This transfer occurs when wastes leaving each operation are distributed to the next operation in the series.

The various types of data required to support operation of the projection model are shown schematically in Figure 2.1. These data are supplied by two sources:

- Solid waste forecast data come from information on forms provided annually by the facilities generating solid wastes and from inventory data for stored Hanford wastes. These data are supplied to the model as waste generator forecast volumes and characteristics. In Figure 2.1, this source is depicted as an inflow of information from a typical waste generator.
- The information utilized to represent the treatment, storage, and disposal operations is based on historical information obtained from the Solid Waste Information and Tracking System (SWITS) database,^(a) waste generator forecast information, and current design information for the Hanford Solid Waste Programs system.

(a) Maintained by WHC; not part of the SWPM system developed by PNL.

Figure 2.1. Modeling The Solid Waste Management System

Distribution of incoming waste receipts and of wastes leaving each treatment operation is handled by the flow percentages shown in Figure 2.1. These percentages are used to allocate incoming waste volumes to initial operations and to distribute wastes from one operation to the next operation(s). The percentages are based upon waste properties (physical, chemical, radiological, etc.) that define "treatability" and the operating strategy defined for an analysis case.

2.2 The Solid Waste Projection Model (SWPM) System

The SWPM system, shown in Figure 2.2, uses a data-driven logistics model to provide detailed analyses of the generic system described above. The SWPM is supported by a database that is used to store and maintain forecasts of waste volume and characteristics, as well as the characteristics of the

Figure 2.2. The SWPM System

TSD operations and facilities. This information is passed from the database into a set of specially formatted electronic files. These files, called the RDL, are loaded into SWPM's operating environment.

The SWPM database operates using the Paradox database management system. Forecast information is entered into the database by WHC staff through custom data entry screens. These screens are similar in layout to the paper forms submitted by the waste generator organizations. TSD data are entered from process flow sheets created by PNL according to WHC specifications. The other PNL-operated components of the system are external to the database and covered in other SWPM system documentation.

The key to operating SWPM is the graphical user interface, which accesses the RDL and guides the user through the selection of case-specific data sets, providing a complete and reproducible analysis case. Once this case has been specified, a SWPM run may be initiated from the user interface. Any changes or additions made to the RDL in the process of specifying a case are saved in a uniquely identified file called an Incremental Data Library (IDL).

The graphical user interface also prompts the user to select from among several standard output tables. These tables, generated after a model run has finished, provide standard reports for model results. Reports may also be generated for previous cases. The Model User's Guide contains specific information on user interface and model operation.

3.0 Preparing to Use the SWPM Database

This chapter explains how to access the SWPM database application and prepare to perform routine operations in the database. Section 3.1 provides some general warnings for the user, and Sections 3.2 and 3.3 briefly discuss installation and technical requirements. The last part of this chapter, Section 3.4, includes instructions on the actual execution of the database application. Table 3.1 lists most of the common ways in which function keys are used in database operations.

Table 3.1. Paradox Function Keys Used in Operating the SWPM Database

<u>Function</u>	<u>Key(s)</u>
Copy value from previous record	[Ctrl-D]
Edit mode (from display mode)	[F9]
Erase current field	[Ctrl-Backsp]
Exit form, save modifications	[F2]
Exit form, undo last modification	[Esc]
Delete record	[Del]
Field View	[Alt-F5]
Help, Table Lookup	[F1]
Insert Record	[Ins]
Move to first field of record	[Ctrl-Left Arrow]
Move to first record in table	[Home]
Move to last field of record	[Ctrl-Right Arrow]
Move to last record in table	[End]
Move to next field	[Tab]
Move to next image	[F4]
Move to next record (table view)	[Down Arrow]
Move to next record (form view)	[Pg Down]
Move to previous field	[Shift-Tab]
Move to previous image	[F3]
Move to previous record (table view)	[Up Arrow]
Move to previous record (form view)	[Pg Up]
Find first occurrence of a value	[Ctrl-Z]
Find next occurrence of a value	[Alt-Z]

3.1 Warnings

Because of the complex relationships among the types of data stored in the database, keep in mind the following warnings:

- The SWPM database application does not accept forecast information unless the waste generator facility to which the forecast applies has been defined in the database. A waste generator record is created in the system by entering it in two tables. The first, the waste generator table, is a master list of waste generators. It defines the waste generator organization to the system and provides some descriptive information. The second, the forecast table, associates each waste generator with an annual forecast or a modified version of a forecast, referred to as a scenario. This feature allows the possibility of a single database containing more than one scenario for any or all waste generators. In current practice, annual forecasts are maintained separately, and scenarios are created during the operation of the SWPM model rather than in the database.
- Before attempting to enter data, review and organize all information and tag it with waste generator abbreviated names and forecast scenario ID codes. The initial scenario ID to be used for 1992, for instance, would be "FD92." Once data have been entered, changes to certain key data elements, such as waste generator names, waste categories, and waste classes, can cause inconsistencies and errors in the database. Careful organization and planning and an initial review of the data supplied by the waste generators are very useful in minimizing later problems with the database.
- All data entry and maintenance should be performed using menu selections. Entering data directly into the underlying Paradox tables will bypass many of the data integrity checks that are useful in catching errors and inconsistencies.

3.2 Installation

Installation of Version 1.4 of the SWPM database should be done under guidance of the database administrator. Requirements for directory structure, hard disk space, Paradox installation defaults, and other issues are discussed in the *SWPM Database Version 1.4 Technical Reference*.

3.3 System Requirements

To provide full operation of the SWPM database, the following system hardware requirements must be satisfied:

- IBM PC, XT, AT, PS/2 or compatible computer
- 640 kilobytes of RAM
- Connection to the PNL network, as described in the *SWPM Database Version 1.4 Technical Reference*.

- 10-20 megabytes of free work space on a local or network hard disk.
- Hewlett Packard Laserjet II or later printer.

The following are recommended for performance, but not required:

- 80386 or later processor.
- 2 megabytes or more of expanded memory, or a similar amount of extended memory converted to expanded using memory management software.

Operation of the SWPM database requires the following software:

- DOS Version 3.3 or later.
- Paradox Version 3.5 (stand-alone or accessible from the network) - See the database administrator for information about Paradox setup defaults and network access. No other version of Paradox should be used.
- Network configuration defined to include connections to appropriate servers, as described in the SWPM Database Version 1.4 Technical Reference.

The SWPM database application has been successfully tested as a task running under Windows 3.1. Running Paradox as a Windows task does result in slower performance, however. With some memory configurations, Paradox may not get all the memory from Windows that it needs to support the SWPM application. Paradox software does not execute reliably under OS/2 Version 1.x but appears to perform adequately in OS/2 Version 2.0. A 386 or 486 processor with at least 8 megabytes of memory is mandatory for running Paradox under Windows or OS/2.

3.4 Getting Started

Paradox menu selections are shown in bold in the following steps.

- If necessary, boot DOS or OS/2 2.0 on your computer and then execute Paradox.
- Establish the directory containing SWPM files as your working directory. Select **TOOLS, MORE, DIRECTORY** from successive Paradox menus and then enter "J:\SWPMDB92" when asked for a directory name. This directory may also be set as the default by customizing your Paradox installation or by including it in a Paradox initialization script. See the database administrator for assistance.

- Execute the SWPM startup script. Select **SCRIPTS, PLAY** from the menus and then enter the script name as "SWPM".
- Choose 1) **FY92 (v1.4)** from the SWPM database selection menu. After entering the correct password, the SWPM application main menu appears. See Figure 3.1 for a diagram of the application menu structure. This diagram shows the main menu options on the left and successively lower-level menus to the right. The lowest-level menu options execute the database operations shown next to them in the diagram.

Note: Other versions of the SWPM database operate differently. Specific instructions given in this manual may not be valid for versions other than Version 1.4. See the Appendix for a list of SWPM databases and descriptions of each.

SWPM Main Menu

FORECAST	IDFore	.....	Select WG name and scenario
	ForeVol	.....	Maintain forecast volumes
	PCD	.....	Maintain PCD data
	HCD	.....	Maintain HCD data
	Cont	.....	Maintain Container data
	Rad	.....	Maintain Radionuclide data
TSD	Oper	.....	Maintain Oper table
	Dist F	.....	Maintain Dist. Fraction table
	OperFlow	.....	Maintain Operation Flow table
	OperCap	.....	Maintain Operation Cap. table
RDL		.....	Produce Ref. Data Library files
Codes	WG	.....	Maintain WG table
	WClass	WClass	Maintain Waste Class table
		WCat	Maintain Waste Category table
		TSD_WClass	Maintain TSD Waste Class table
	Types	PCD	Maintain PCD Types table
		HCD	Maintain HCD Types table
		Cont	Maintain Container types table
	Groups	WG_Group	Maintain WG Group table
		WG_Class	Maintain WG Class table
	Scenario	.....	Maintain Scenario table
	Forecast	.....	Maintain Forecast table
	Rad	Radionuclides	Maintain valid rad. names list
		Units	Maintain units of measure list
Report_Mgr	(select rpt)	Prtnew	Process, then print report
		New	Process, then store report text
		Reprint	Reprint stored report text
		Store	Store report text
		Table	Return to report table
		Quit	Quit Report Manager
Notes	Notepad	.....	Maintain general notepad
	PCD_Oth	.....	Maintain "OTHER" PCD notepad
	Cont_Oth	.....	Maintain "OTHER" cont. notepad
	HCD_Oth	.....	Maintain "OTHER" HCD notepad
	Box_Dim	.....	Maintain box dimensions notepad
Admin		.....	Priviledged Admin. Functions

Figure 3.1. SWPM Menu Structure

4.0 Entering and Maintaining Forecast Data

This chapter describes the process of entering the annual waste generator forecasts into the SWPM database. These forecasts are provided by the waste generator organizations on data collection forms sent to them each year by WHC. The procedures below are a guide to entering new data or modifying existing data in the database.

Forecast information is entered into the SWPM database through several screens that generally correspond to the structure of the data collection forms. These screens are defined by Paradox data entry forms or by direct views of one or more of the SWPM database tables. Access to the screens is accomplished by choosing **Forecast** from the SWPM database application Main Menu. This selection leads to another menu from which other options are chosen, as explained in the detailed procedure in the following sections.

4.1 Entering and Editing Forecasts

Waste generator forecasts are entered into five tables, each of which has its own menu selection. Forecast entry or update is accomplished using the following steps:

- Select **Forecast** from the main SWPM menu.
- Choose **IDFore** from the next menu. Select a waste generator/scenario combination by highlighting it with the cursor, then pressing [F8] or [Esc]. Unless current practices change, there will be only one forecast for each waste generator. All data entry activity following this selection applies to the waste generator selected, until another selection is chosen. If a waste generator and scenario combination has been selected, the combination will appear on the Forecast menu screens.
- All of the remaining choices on the Forecast menu involve entering or updating data in one of the five tables that hold forecast data. The data entry selections reflect the names of the database tables in which each type of data is stored:

<u>Table</u>	<u>Type of Data to Enter</u>
ForeVol	Volumes in cubic feet by waste class.
PCD	Physical content descriptor percentages for each waste class.
HCD	Hazardous content descriptor percentages for each mixed or hazardous waste class and PCD type.
Cont	Container percentages for each waste class and PCD type.
Rad	Radionuclide data for each waste class.

- If a new forecast is to be entered, select each of these options in the order shown above and complete the data entry before going to the next on the list. The HCD selection is used only if the current waste generator's forecast includes mixed or hazardous waste.
- A table will appear containing the data for the selected menu option. The order of selections on the Forecast menu should be used as a general guide to the order of data entry, since the validity of data entered may depend on the contents of another table. For instance, PCD information can only be entered for waste classes that have volumes entered in the ForeVol table. After PCD data are entered, container and HCD information can be added. Only data for waste class/PCD combinations that exist in the PCD table are accepted into either the HCD and Cont tables. The Radionuclide table depends only on the contents of the ForeVol table, however, and therefore can be entered before PCD, HCD or Cont data.

Note: When data are incomplete or inconsistent, or issues are raised by the nature of the data, make notes about the situation using the notepad function. See Section 4.2 for instructions.

- Press [F2] to finish and save your work. If the changes to the table are not to be saved, press [Esc].

Interruptions in Data Entry

- Work can be interrupted before completing data entry for a waste generator in every table. However, updates should be finished within any one of the tables.
- In some cases, you will not be allowed to save partial entries, and you must either finish the work or press [Esc] and lose what work you did get done. For example, when entering PCD data, the decimal fractions entered must total to 1 for every waste class with non-zero volumes, or none of the data on that screen can be saved.
- Take note of where work was interrupted, because you are not automatically returned to a previous stopping point in the next session.
- Keep in mind that incomplete data entry for a waste generator may cause inconsistent totals on reports, should any be run before the work is finished.

Data Integrity Checks

- In most instances where names for waste generators, waste classes, container types, PCDs, HCDs or other descriptive labels are needed, a list of valid choices is presented. These choices may appear as predefined items on the screen or in a popup table from which an item may be selected.

Additionally, some data entry screens allow entry to an "Other" category. Use the notepad to record explanations of "Other" usage or to capture information on other issues that arise.

- Some numeric entries are checked. As noted above, distribution factors such as PCD, HCD, and container percentages must be entered as decimal fractions summing to 1. You will not be able to exit from a data entry process until the necessary corrections are made unless you press [Esc] and discard the data you entered on the current screen. Volume data (entered as cubic feet) are not checked, since there is no basis for automatically validating volumes.

4.2 Using the Notepad Function

The notepad provides a means to record notes when some explanation is necessary. Notes can be made at any time during data entry. In special situations, when the forecast specifies an "Other" type of characteristic or when a nonstandard box-type container is specified, the notepad should be used.

General Purpose Notepad

To bring up the notepad during data entry, press [Ctrl-N] and select NotePad if a menu is displayed. On some data entry screens, only the general notepad is usable and no menu appears. Enter up to 160 characters of notes and press [Enter] to return to the data entry screen. See Figure 4.1 for an example of a general purpose notepad screen.

These are examples of circumstances in which a note should be made to the general purpose notepad:

- Some aspect of a waste generator forecast is unclear or inconsistent, but the forecast is generally complete enough to enter. An example of this would be when a waste generator fails to include radionuclide information but has submitted an otherwise complete forecast. In such a case, a note would be made as a reminder that the waste generator's listed contact person must be called with a request for the missing information.
- A significant change to data is made and the reasons for the change need to be recorded. For example, if a forecast was removed from the database because it duplicated a submission from another organization, an explanatory note should be entered.
- An assumption is needed to complete entry of a forecast before reporting deadlines. It might be necessary, for instance, to define the container used by a waste generator as "55G DRUM" because no container type was specified. A notepad entry would be required that draws attention to this assumption and describes intended remedial action. Failure to define any container type at all would have otherwise resulted in inconsistent content among certain SWPM reports.

Volume (CuFt) By Waste Class and Year for: AMES FD92
WClass: CH_LLW_I Yr: 1993 Mode:CoEdit
Row Sum = 1695

WORK\EFORVOL	WClass Abbrev	HELD	1993	1994
1	CH_LLW_I		145	100
2	CH_LLW_III			
3	CH_LLW_GTCIII			
4	RH_LLW_I			
5	RH_LLW_III			
6	RH_LLW_GTCIII			
7	CH_LLMW_I			
8	CH_LLMW_III			
9	CH_LLMW_GTCIII			
10	RH_LLMW_I			
11	RH_LLMW_III			
12	RH_LLMW_GTCIII			
13	HAZ			
14	CH_TRU			
15	RH_TRU			
16	CH_TRUM			
17	RH_TRUM			

NOTE PAD

*** Enter notes in this area ***

Figure 4.1. Typical General Purpose Notepad Screen

- If the data entry operator intentionally enters data differently than it appears on the waste generator forecast form, one or more notes should be entered to explain and justify the differences.
- At any other time when an explanation would be helpful or an issue needs to be raised.

Special Purpose Notepads

To bring up a special purpose notepad during data entry, press [Ctrl-N] and select OthNotes or BoxDim as needed. Only selections that are appropriate to the current context will be available.

These are examples of circumstances in which a note should be made to the one of the special purpose notepads:

- The forecast specifies "Other" as a type and explanatory information is provided as footnotes on the forecast form. This applies to PCD, HCD and container types. In these cases, invoke the notepad by pressing [Ctrl-N] while the cursor is in the "Other" type field for the item being entered. Choose OthNotes from the notepad menu and enter up to 160 characters of notes. Press [Enter] to finish entering a note. See Figure 4.2 for an example showing the PCD data entry screen with the OthNotes notepad menu option selected and the notepad window open at the bottom of the screen.

WORK\PCD	PCD Abbrev	CH_LLW_I	CH_LLW_III	CH_LLW_GTCIII	RH_LLW_
1	HEPA FILTERS	.02			
2	SLUDGE/AB LIQ	.05			
3	LABPACKS				
4	COMPACTBLE SOL	.02			
5	COMP/COMB SOL	.02			
6	WOOD	.04			
7	STAINLSS METAL	.02			
8	OTH METAL <.5	.1			
9	OTH METAL >=.5	.05			
10	GLASS	.01			
11	CONCRETE	.1			
12	PARTICULATE	.05			
13	SOIL	.05			
14	LEAD				
15	MERCURY				
16	BIOLOGICAL				
17	SPENT RESINS				

OTHER PCD NOTE

Description of OTHER Type

*** Enter notes in this area ***

Figure 4.2. Typical "Other" Type Notepad Screen

- The forecast specifies that one of the box container types is used and gives the dimensions of the box as a footnote. Press [Ctrl-N] while the cursor is at the location in the box column where data will be or has been entered. Choose BoxNotes from the notepad menu and then enter the dimensions and any appropriate comments in the spaces provided. See Figure 4.3 for an example of the notepad screen that appears for boxes.

Important Points about Using the Notepads

- Notes are stored in separate tables and are printed using a report selections in the Report Manager. When notes address issues that need to be resolved, they remain on the report until a resolution is recorded by the database administrator and the entry is removed.
- Previously entered notes cannot be recalled for editing during data entry. They can be viewed and edited by selecting Notes from the main SWPM menu.
- Due to memory constraints, only 10 notes of each type may be entered during a single data entry process. A warning appears if you attempt to exceed the limit. If more notes are needed, end the data entry process as usual. This causes temporarily stored notes to be written to notepad tables and makes room for a new batch. Resume data entry by reselecting the same Forecast menu option as before.

WORK\ECNT	WClass Abbrev	PCD Abbrev	55G DRUM	ODD DRUM	4X4X8 BOX
1	CH_LLW-I	HEPA FILTERS			
2	CH_LLW-I	SLUDGE/AB LIQ	1		
3	CH_LLW-I	COMPACTBLE SOL	1		
4	CH_LLW-I	COMP/COMB SOL.	1		
5	CH_LLW-I	WOOD			
6	CH_LLW-I	STAINLSS METAL			
7	CH_LLW-I	OTH METAL <.5	.05		
8	CH_LLW-I	OTH METAL >=.5	.1		
9	CH_LLW-I	GLASS	1		
10	CH_LLW-I	CONCRETE	.25		
11	CH_LLW-I	PARTICULATE	.5		
12	CH_LLW-I	SOIL	.5		
13	CH_LLW-I	SPENT RESINS	1		
14	CH_LLW-I	OTHER			

Box length:	Width:	Height:
BOX DESCRIPTION		
*** Enter dimensions above and notes in this area ***		

Figure 4.3. Box-type Containers Notepad Screen

- Take care to position the cursor at the specific location on the screen to which the note applies.
- When notes are made in the general purpose notepad, the following items are also recorded automatically:
 - current table name
 - current field name
 - current field content
 - today's date
 - user ID

Notes taken in conjunction with "Other" types will capture the following:

- waste generator
- waste class
- PCD type
- container type - if applicable
- HCD type - if applicable

Notes made concerning box-type containers include these items automatically:

- waste generator
- waste class
- PCD type
- container type
- length - if entered in the space provided
- width - if entered in the space provided
- height - if entered in the space provided

4.3 Checking Forecast Data

In order to fully verify information entered into the SWPM database, you will need to inspect the data visually. Internal consistency checking is performed during data entry for some values, but other data cannot be tested automatically. Items needing review include the completeness and accuracy of the waste generator table, the volume amounts and radionuclides of forecasted wastes, and the specific selections of PCDs, containers, and HCDs for each forecast waste class.

For visual inspection, view the data using the data entry/editing processes described in Section 4 or generate reports from the Report Manager as explained in Section 7.

5.0 Uploading/Downloading

The network copy of the database is intended to be the reference version of the database and is subject to a number of quality assurance (QA) requirements. These requirements include password protection and strict change control. You are encouraged to make and use local copies of the database in certain situations where "what-if" changes are made, or when slow network performance becomes a major hindrance. Using a local copy for data entry yields a number of benefits. You can avoid the sometimes sluggish system response caused by the combination of network traffic and processing overhead from Paradox data entry software. Software maintenance, ad hoc queries and operation of the model interface on the network reference database will not interrupt or impede local data entry. For these reasons, productivity is usually greater when accessing a local copy compared with using the network database. Also, it is possible to divide the data entry workload among multiple users, and this activity goes more quickly on local copies of the database.

The database administrator must coordinate transfers of data from one or more local databases to the network database. This process needs special attention and coordination if more than one local database is involved. Be sure to discuss any intended use of upload and download procedures with the administrator prior to their use. The user or users responsible for entering and maintaining forecast data should upload data to the network regularly to keep the reference database current and to guard against loss of data. The steps required to upload data are detailed in Section 5.1, immediately following. The download process, explained in Section 5.2 below, provides the means to create local copies of the current versions of software and data. Data and software can be downloaded in separate processes, or the entire application can be done at once.

5.1 Uploading Data to the Network

- When a significant amount of new data is entered, it is your responsibility to notify the database administrator that an upload is needed. The administrator may also request an upload to ensure that the latest data are available for reporting or modeling purposes.
- In contrast to the previous version of the database, uploading is performed in DOS for this version, rather than as a Paradox operation. If the SWPM application is running, end it and then terminate Paradox.
- Verify that the default drive is the local disk containing SWPM data and that the current directory is `\SWPMD92`.

- Execute the DOS batch file that performs the upload by entering the command **SWPMUPLD**. You must confirm your intention to upload by pressing [Enter]. Otherwise, terminate the process by pressing [Ctrl-C].

A check is made to insure that the network upload area is ready to receive the data. If the area has not been prepared, the upload process will terminate with an appropriate error message. Advise the database administrator of the problem immediately.

The messages that may be generated during uploading are listed in Table 5.1.

Table 5.1 Messages During Uploading

Normal Messages
<p>Logging start of upload... An entry is made to the upload log file recording the date and time at which the upload began.</p> <p>Uploading data... The DOS XCOPY command is being used to copy the contents of the \SWPMDB92\D directory to the network drive. File names appear as they are copied.</p> <p>Logging completion of process... A log entry is being made about the successfully completed upload.</p> <p>Upload finished. All data were uploaded successfully, logging is complete and the process has ended.</p>

Table 5.1 Messages During Uploading (contd)

Error Messages
<p>Network not available - upload not performed. Cannot locate files on network, implying that network connection does not exist. Verify connection to the J drive and retry.</p>
<p>Upload area not ready, upload not performed. The upload area still contains data from the last upload. It must be prepared by the database administrator before attempting another upload.</p>
<p>Logging attempted upload... A note in the log file is made about the unsuccessful upload attempt.</p>
<p>No files found to copy - upload not performed. The upload process may have been executed from the wrong disk drive or directory. Verify that the default drive and directory are as directed in the upload instructions. Notify the database administrator if this problem persists.</p>
<p>Out of memory or disk space - upload not completed. The memory or disk space requirements exceed what was available. These problems may be cured by removal of memory-resident programs and unneeded files. Notify the database administrator if this condition persists after a second attempt.</p>
<p>Logging failed upload... The abnormal event that just occurred is recorded in the log file. This message appears after either of the two previous error messages.</p>
<p>Process aborted by user - upload not completed. Under some circumstances, the use of [Ctrl-C] after a data upload has started will terminate the process. This message indicates such an event was detected.</p>
<p>Logging aborted upload The abnormal termination of the upload by the user is recorded in the log file.</p>
<p>Sharing violation Files in the network upload area were in use. Enter F if the "Abort, Retry, Fail" appears. Even if the process resumes and appears to finish, do not assume that the upload was successful. Notify the database administrator that the upload may be incomplete.</p>

5.2 Downloading Data And Software From the Network

Approval from the database administrator is not needed for downloading. The user should be aware, however, that downloads will write over existing files. If a data download is executed in a situation where the local copy is more current than the network, information will be lost. A policy of maintaining current backups of local SWPM data is extra insurance against such an occurrence.

There are two download processes available: one for data and another for software. A software download will include the database application software with its related screens, menus, and system tables but not Paradox itself. A third download choice transfers both data and software to the local drive. The instructions below apply to each of the three options.

- Downloading is performed in DOS, not from within the database application. If the SWPM application is running, end it and then terminate Paradox.
- Establish J drive as the default drive and set \SWPMDB92 as the current directory.
- Execute the download command by entering **SWPMDNLD <target drive> <type option>**. When executed with neither of the optional parameters specified, the download process assumes that the target drive is C and only data will be included. The parameters must be specified in the order shown. Use a single space between the command and each parameter.

Parameter definitions and valid values are:

<target drive> Destination drive for the download. Valid values are **C** or **D** (the default is **C**)

<type option> Type of download process. Valid values are **DATA**, **SW**, or **ALL** (the default is **DATA**).

Note: Parameters are case-sensitive.

Examples:

SWPMDNLD Using defaults, the data download process is executed with C drive as the target.

SWPMDNLD D ALL Downloads a copy of the entire application including data and software to D drive.

SWPMDNLD C SW Downloads to C drive, copying only the software. Note that the drive was named explicitly even though drive C is the default. If a type option other than the default is to be used, it must be the second parameter. In such a case, the drive parameter must be provided as a place holder, even if the default is to be used.

Notes: A directory named \SWPMDB92 must exist on the target drive. Subdirectories will be created as needed, however.

It is possible that some of the above drive choices could be configured as network drives on some workstations, such as on a computer with no hard disks. In such cases, the download process will be successful, but the performance benefit of using a local drive will not be realized.

- After starting the download, a message will appear that shows the selection options for the target disk and process to be executed.
- If the options are acceptable, press [Enter] when prompted. Otherwise, the download process can be terminated by pressing [Ctrl-C].

The messages generated during processing are listed in Table 5.2.

Table 5.2. Messages During Downloading

Normal Messages	
Logging start of download...	An entry to the log file is being made that notes the date and time when the download process was invoked.
Downloading data...	The DOS XCOPY command is being used to copy the contents of \SWPMDB92\D directory to the target drive. File names appear as they are copied.
Data download complete, logging...	The data download completed successfully, and the event is being logged.
Downloading software...	The DOS XCOPY command is being used to copy the contents of several subdirectories of J:\SWPMDB92 to the target drive. File names appear as they are copied.
SW download complete, logging...	The software download completed successfully, and the event is being logged.
Logging completion of process...	The final completion of the entire process is being recorded in the log file.
Download finished.	All processing and logging is complete.

Table 5.2. Messages During Downloading (contd)

Error Messages
<p>Invalid target disk drive specified. A drive other than C or D was specified as the first parameter when SWPMDNLD was executed. Rerun with a valid parameter.</p>
<p>Invalid download process type specified. Something other than "DATA", "SW" or "ALL" was specified as the second parameter when SWPMDNLD was executed. Rerun with a valid parameter.</p>
<p>Warning: No files found to copy The DATA download process failed. Notify the database administrator.</p>
<p>Out of memory or disk space The memory or disk space requirements exceeded what was available. These problems may be cured by removal of memory-resident programs and unneeded files. Notify the database administrator if this condition persists after a second attempt is made.</p>
<p>Out of environment space The computer configuration does not provide enough memory in the DOS environment for temporary variables created by this process. These temporary variables are created to hold information about the destination drive and type of download. A line in the CONFIG.SYS file must be modified or added that sets the environment space to 1024 bytes. Call the database administrator for assistance.</p>
<p>Logging failed download... The abnormal event that just occurred is recorded in the log file.</p>
<p>Process aborted by user Under some circumstances, the use of [Ctrl-C] after a data download has started will stop the process. This message indicates such an event was detected.</p>
<p>Logging aborted download The abnormal termination of the download by the user is recorded in the log file.</p>
<p>Sharing violation Someone else was using the network database. Enter F if the "Abort, Retry, Fail" appears. Even if the process resumes and appears to finish, do not assume that the download was successful. Try again later, or ask the other user to back out of the database until the download is accomplished.</p>

6.0 Maintaining Codes (Lookup) Information

The SWPM database contains a number of lookup tables used for the following purposes:

- to validate data, restricting the content of some fields to members of a list
- to support grouping and subtotaling of information on reports
- to control the order in which items are printed or displayed
- to permit the substitution of expanded names on reports in cases where the database contains only abbreviations. Maintenance requirements for most codes-type tables are very modest. Access to these tables is controlled via passwords. Except for defining new waste generators, most codes table maintenance will be performed by the database administrator.

6.1 Selecting A Codes Table for Maintenance

- Select Codes from the Main Menu.
- Choose one of the following options:

WG	Table of valid waste generator names.
WClass	Submenu of waste class-related tables: WClass Table of valid waste classes. WCat Table of valid waste categories. TSD_WClass Table of valid TSD waste classes.
Types	Submenu of type descriptors: PCD Table of valid physical content descriptors. HCD Table of valid hazardous content descriptors. Cont Table of valid container types.
Groups	Submenu of group definitions: WG_Group Table of valid waste generator groups. WG_Class Table of valid waste generator classes.
Scenario	Table of available scenarios.
Forecast	Table of waste generator/scenario combinations.

Rad	Submenu of radionuclide tables:
Radionuclides	Table of valid radionuclide names.
Units	Table of valid radionuclide concentration units.

6.2 Performing Codes Table Maintenance - General Instructions

Except for the waste generator table (option WG) the editing procedures are generally the same for all the tables listed in Section 6.1. Specific instructions for the waste generator table appear in Section 6.3 below. General codes table maintenance instructions are as follows:

- Select Codes from the Main Menu.
- Select the appropriate codes table as directed in Section 6.1. The table containing the selected data appears.
- Use the [Ins] key to add a new item. Enter the new item name in response to the prompt that appears above the table. An error message will appear if the name is already in use. Otherwise, the insert is performed in the appropriate place in the table. Be sure to complete the process by entering data in any other fields that the new item may have. Press [F2] to save the new item.
- If an existing code name is to be changed, place the cursor on the row containing the old name and press [Ctrl-F9]. Alternately, select Update from the menu that appears after pressing [F10].

Note: Do not change the name field directly as you would any other field. [Ctrl-F9] must be used so that the entire database will be updated with the new name.

- Fields other than the name of the code can be updated by pressing [F9], making the changes and then pressing [F2] to save them.
- Delete by pressing [Del]. If the code to be deleted is not in use in the database, the delete will be accepted and performed. Codes that are in use elsewhere in the data will not be removed from a codes table.
- The general purpose notepad may be used while editing codes tables. Press [Ctrl-N] to invoke it.
- To finish codes maintenance, press [F2] to make sure updates are saved. Then, press [F8] to clear the screen and return to the menu.

6.3 Performing Codes Table Maintenance - Waste Generator Table Instructions

- **Select Codes** from the Main Menu
- **Select WG** from the next menu. The table of existing waste generators appears.
- To insert a new waste generator, press the [Ins] key. A prompt will appear to get the waste generator abbreviation. After verifying that it does not already exist, a row for the new waste generator will be created in the appropriate place in the table. Be sure to complete the other fields for the new entry as well. Waste generator group and class fields are automatically validated and can be selected from lists by pressing [F1]. Finish entering the new item by pressing [F2].
- After defining a new waste generator, a forecast record must be created for it using the **Forecast** selection on the Codes menu.
- If an existing waste generator abbreviation is to be changed, place the cursor on the line to be changed and press [Ctrl-F9]. Alternately, select **Update** from the menu that appears after pressing [F10].

Note: Do not change the waste generator field directly as you would any other field. [Ctrl-F9] must be used so that all occurrences of the old waste generator abbreviation are changed to the new value in the entire database.

- Fields other than the waste generator abbreviation can be updated by pressing [F9], making the changes, and then pressing [F2] to save them.
- Delete by pressing [Del]. If the waste generator to be deleted is not in use in the database, the delete will be accepted and performed.
- After waste generator table maintenance is complete, press [F2] to make sure updates are saved. Then, press [F8] to clear the screen and return to the menu.
- At any time during the editing process, the general purpose notepad may be invoked by pressing [Ctrl-N]. For more information about the notepad, see Section 4.2.

6.4 Maintaining the Model Variable Dictionary

The model variable dictionary (MVD) contains names, descriptions, and other information about variables used in the SWPM. No special procedures were developed to perform maintenance on the

tables involved, since changes are very rare. In view of the lack of any provision within the SWPM database application for performing maintenance on the MVD, all required updates to this area of the database should be left to the database administrator.

7.0 Printing Reports From the Database

Reporting in SWPM is accomplished using the Report Manager selection that appears on the main SWPM menu. The Report Manager is a set of Paradox tables, programs, and text files that work together to present a list of available reports or other processes. An item is selected from this list as if it were a menu. The report process is then executed and status messages are displayed. In some report processes, you may be asked for further input. Output takes the form of printed reports, text files containing images of the reports, and, in some cases, spreadsheet files. A Hewlett Packard Laserjet II or later model printer is assumed for all print output.

Reports can be generated from the Report Manager in two different ways. For most purposes, the preferred method is one which performs the complete process of retrieving, manipulating, and summarizing current data into a result table. The desired output, generally a report or spreadsheet, is then generated from the result table. This method has the advantage of always producing output based on the current database contents. Report output can also be generated by a faster method in which output comes directly from the existing result table without refreshing it from the database. This method is acceptable only when the user is certain that no changes to data have occurred since the result table was created. When additional copies of a report are needed or another related report process has already been run that updates the same result table, this method can avoid some unnecessary processing.

In each of the two methods, you can select whether output goes directly to the printer or is held in a text file that can be viewed, distributed electronically to other users, imported into a word processor, or printed. When the print option is used, the corresponding text file will automatically be updated so that it contains the same information that was sent to the printer. A few report processes are designed to produce spreadsheets only and do not create printed reports or text files.

7.1 Operating the Report Manager

- From the Main Menu, select **Report_Mgr**. A table of report selections appears. See Figure 7.1 for an example of this screen.
- Move the cursor to the report you want and press **[F2]** to select it. Otherwise, press **[F8]** or **[Esc]** to terminate the Report Manager.

Note: To assist in making the right selection, the report identified as **C100** lists all available reports and includes additional information that does not appear on the Report Manager screen. It may be helpful to print this report first.

- After a report is selected, a screen is displayed with more information about the report (see Figure 7.2 for an example):

Place cursor on report to be selected, then press F2.
Press F8 to exit

FY-1992 SWPM DATABASE REPORTS REPORT MANAGER			
Rpt#	Report Name	Last Run	Running Time(mins)
C100	FY-1992 SWPM DATABASE REPORTS	10/02/92	1.4
C101	WASTE GENERATOR LIST BY WG GROUP		- new -
C102	WASTE GENERATOR LIST BY WG ABBREV		- new -
C105	BILLING REPORT - FY93 SHIPMENT FORECAST	8/06/92	1.4
C106	BILLING REPORT - REF/92 COMPARATIVE	9/18/92	3.1
C107	CONTAINER VOLUMES BY WASTE CLASS - rpt	9/18/92	1.1
C108	CONTAINER VOLUMES BY WG GROUP - rpt	9/18/92	1.8
C109	PCD VOLUMES BY WASTE CLASS - rpt	9/18/92	2.1
C110	PCD VOLUMES BY WG GROUP - rpt	9/18/92	1.5
C111	HCD VOLUMES BY WASTE CLASS - rpt	9/18/92	2.4
C112	HCD VOLUMES BY WG GROUP - rpt		- new -
C113	PCD BY HCD WITHIN WASTE CLASS - rpt	9/18/92	.9
C114	PCD BY CONTAINER WITHIN WASTE CLASS - rpt		- new -
F2: Select Report F8: Quit			

Figure 7.1. Report Manager - Report Selection Screen

PrtNew New Reprint Store Table Quit
Run complete process including new data - store and print

SELECTED REPORT INFORMATION

Report Name: FY-1992 SWPM DATABASE REPORTS
Report ID: C100
Processing Time: 1.4
Last processed: 10/02/92
Print File Size: 16384 bytes

Figure 7.2. Report Manager - Report Information and Menu Screen

- **Report name:** Similar to the title printed on the report.
 - **Report ID:** A unique code assigned to a report or other process. Report IDs begin with "C." Processes that produce spreadsheets or other forms of data files begin with "X." Many "X"-type reports produce printed reports as well. Descriptions included in report C100 identify the nature of the output from each process.
 - **Processing time:** This represents how long this selection took to finish when it was last executed. This time is only a general guideline, since it is highly dependent on the type of computer used, amount of data in the database, optional processing steps that you have selected or rejected, whether the database is a local copy or on the network, or the amount of competing network traffic.
 - **Last processed date:** The last date on which the complete report process was executed.
 - **Report file size:** This value, expressed in bytes of disk space, serves as a rough indication of the volume of report output that will be generated. The amount shown varies a little from the file size that would be reported by the DOS directory command, due to differences in the way Paradox and DOS measure space allocation. For non-printing processes, "Unknown" will be displayed.
- The menu shown at the top of the report information screen contains the following selections:
 - PrtNew** Uses the preferred report generation method explained above. All necessary processing is done to extract the current data from the database into a result table. Then, the report is printed or the spreadsheet is generated from that result. The processing time shown on the "Selected Report Information" screen applies to this option.
 - New** Similar to "PrtNew," except that the report goes only to a text file, not to the printer.
 - Reprint** Prints the contents of the result table that was created the last time "PrtNew" or "New" was selected. This is useful for printing more copies of a report but will not include database changes made since the last time PrtNew or New was used. The processing time shown on the information screen does not apply here, since no processing is performed by this option.
 - Store** Stores the report in a text file using existing result data. As with "Reprint," updates will not be included and time to process is less than shown on the screen.
 - Table** Returns the user to the report selection screen. Use this to go back and select some other report.

Quit Ends Report Manager and returns to the SWPM Main Menu.

After a process begins, additional operator input may be required. For example, the user may be asked to choose whether to bypass conversion of volume data from cubic feet to cubic meters. Some report selections also allow the user to accept or bypass the recalculation of PCD volumes. The best choice depends on the circumstances at the time the report is to be run. In all cases, rerunning the optional processes includes current information in the output, but will take extra processing time.

7.2 Report Manager Output

By default all reports are sent to printer port LPT1. This default can be changed in the Paradox software setup. See the Paradox User's Guide or ask the database administrator for assistance in changing the report destination.

Spreadsheets are produced in Lotus 1-2-3 Version 2.x format. Each spreadsheet uses the report ID for its name and has ".WK1" as its file name extension. Other spreadsheet types are available on request. Spreadsheet files can be found in the \SWPMDB92\SS directory.

Report text files are plain ASCII text files, although most will have a cryptic Hewlett Packard Laserjet printer setup code as the first line in the file. Each file uses the report ID as its name and ".RPT" as the extension. These files are located in the \SWPMDB92\R directory. They may be retrieved with WordPerfect or other text and word processor software capable of loading DOS text files. These files may also be printed, as explained in Section 7.3, below.

7.3 Other Ways to Print Existing Reports

If you know that the desired report has already been generated, it is not necessary to use Paradox to get a copy of it. The report file can be sent directly to the printer from the DOS prompt. The form of the DOS command is as follows:

```
COPY J:\SWPMDB92\R\"report ID\".RPT LPT1
```

The "report ID" used as the file name in this command is the same as the identifier for that report displayed on the Report Manager or on report C100. Section 7.2 provides more information about report files. See the database administrator for assistance when needed. The above command assumes that a printer is connected to the LPT1 port. LPT2 or another port could also substituted if necessary. Here is an example of the command to be used to print a report identified as "C105":

```
COPY J:\SWPMDB92\R\C105.RPT LPT1
```


There are other DOS commands besides COPY that will work, such as PRINT and TYPE.

Note: Use the PRINT command with caution, since it will abort a Paradox session where [Alt-O] or [Ctrl-O] was used to get to the DOS prompt. The TYPE command requires the redirection of output to the printer, but allows a suspended Paradox session to resume, as does COPY.

Here are examples of these commands to print the same file used in the COPY example above:

```
PRINT J:\SWPMDB92\R\C105.RPT
```

```
TYPE J:\SWPMDB92\R\C105.RPT > PRN
```

Appendix A

Versions of Solid Waste Projection Model Database

Appendix A

Versions of Solid Waste Projections Model Databases

FY-1989 v1.1	Forecast data requested during 1989, covering a forecast period of 1990 through 2020. This database is substantially different in structure than later versions and does not have a fully developed software application for user access. For these reasons, Version 1.1 has been archived on tape and is used only in response to special requests.
FY-1990 v1.2	Forecast data requested during Fiscal Year 1990, covering a forecast period of 1991 through 2021. This database is in a structure that generally conforms to later versions, but special attention is needed to insure data extracted from it are comparable to the more recent versions. The application software for this version includes provisions for validated data entry and the generation of reference data library files for the model. The database and its application have been archived to tape due to the availability of more current information.
FY-1991 v1.3	Forecast data requested during Fiscal Year 1991 covering a forecast period of 1992 through 2021. This database does not contain a complete set of forecasts because of nonresponse by a number of waste generators. Its structure supports reasonable comparability with later versions. The application software does not include the ability to produce data for the model, although it has validated data entry capability. This version was archived after the creation of the reference database described below.
Reference	This database contains all data available for all waste generators that submitted a Fiscal Year 1991 forecast supplemented by data from Version 1.2 for the non-reporting waste generators. It covers years 1992 through 2021. Its structure is similar enough to other recent versions to support comparative analysis. The application software for this database does not include a data entry feature. A fully functional reference data library generator is available to produce data files for model input.
FY-1992 v1.4	This is the database version addressed by this User's Guide. It contains forecast data requested during Fiscal Year 1992, covering forecast years 1993 through 2022. Its application software includes complete data entry functionality and an updated reference data library generator to produce model input files.

FY-1993 v.1.5

At the time of writing of this document, software for this database was under development and data entry was not complete. This database version will contain forecast data requested during Fiscal Year 1993, covering forecast years 1994 through 2023.

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