

**Pennsylvania State University
Soil Characterization Laboratory Database System**

by

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INTRODUCTION

The Penn State University Soil Characterization Laboratory Database System is PC-based, uses Clipper-compiled dBase language, and runs from DOS. The system requires 2 megabytes of disk space and runs on 640K RAM memory. With the 800 pedons of Pennsylvania data, the system plus data takes up 13 megabytes of disk space. The dBase data management program is not necessary to run the system; but if available, it can also be used to manage the files. Figure 1 gives a schematic of the system. The system is menu-driven and very user-friendly.

The characterization database system uses the USDA Soil Conservation Service (SCS) field data forms and pedon coding system in the site and horizon data files. Field data codes and raw laboratory data are interactively entered (see Appendix A for codes and forms). The system includes a calculation program that converts the raw laboratory data to the final data and automatically enters it into the database (Figure 1).

A service database with a structure identical to the soil characterization database is included in the system to handle any data that is not to be included in the soil characterization database. Except where noted, the commands for the characterization and the service databases are identical.

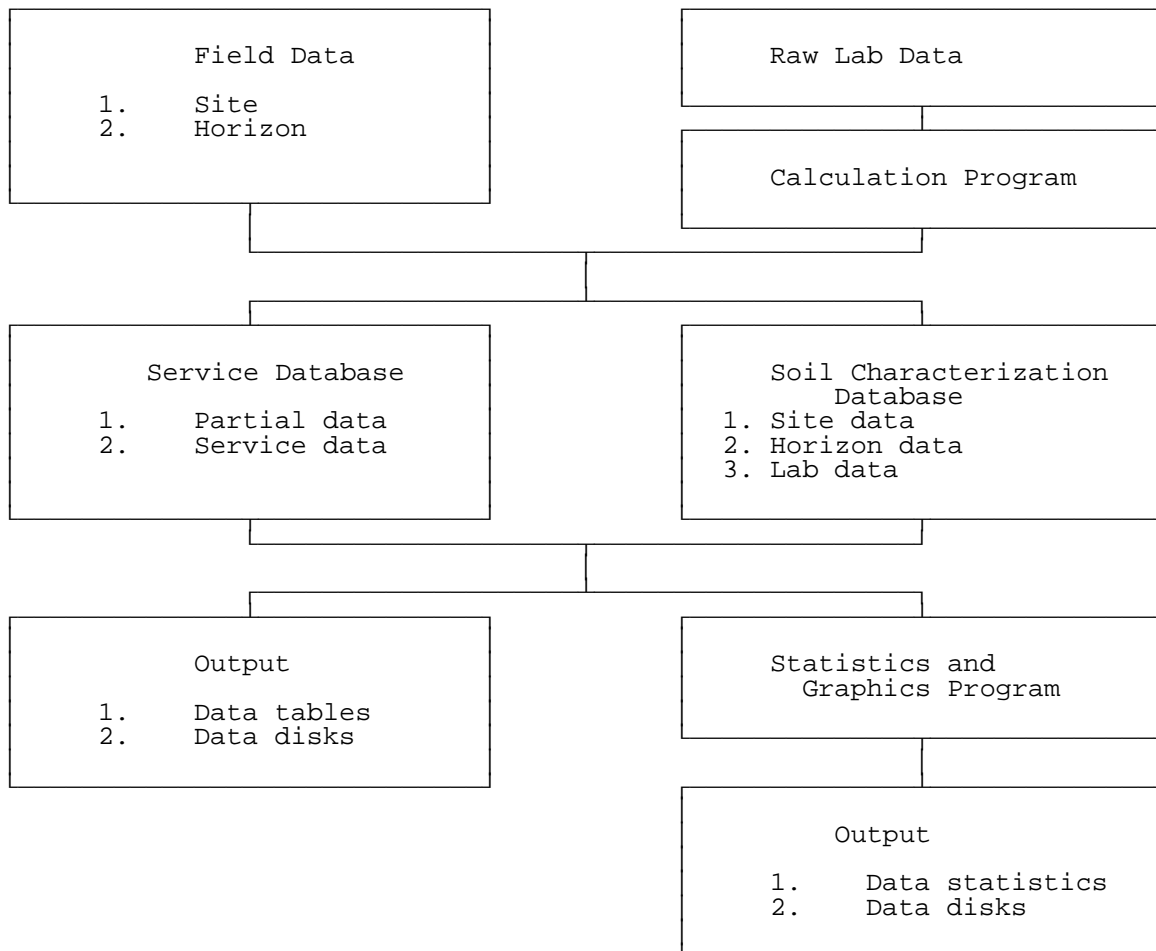


Figure 1. Schematic diagram of the Penn State Soil Characterization Laboratory database system.

STARTING THE PROGRAM

If you have not installed the program on your computer, refer to the installation instructions that accompany the program disks. To start the program, enter the drive that contains the program. The following start-up commands assume that the program is located in the PEDON directory on the C drive:

```
C:\> cd \Pedon <enter>
C:\pedon> menu <enter>
```

The system comes up on the screen with a password window (Figure 2). Type the password and press <enter>. You may also access the system by pressing <enter> without a password, but you will not be able to edit or enter data.

The main system menu (Figure 3) that follows the password window lists the following selections:

- (1) Soil Characterization Data and Service Data
 - (a) add, edit, delete or view data;
 - (b) export data to another file;
 - (c) send a narrative report to a printer or another file.
- (2) Code Files -- edit data codes.
- (3) System Defaults -- change the printer defaults.
- (4) Quit -- exit the system and return to DOS.

Use the up and down cursor arrows to move the highlight bar to the desired menu item and press <enter> to select the option.

DATA ENTRY

Use the cursor keys to highlight the "Soil Characterization Data" option on the main system menu and press <enter>. The soil characterization data menu will appear on the screen (Figure 4). Highlight "Site, Horizon & Laboratory Data" and press <enter>.

The data entry (site, horizon, lab, and lab input) submenu (Figure 5) provides access to four entry screen files (Site, Horizon, Lab, and Inputlab), each with a series of screens or pages (note that labinput and inputlab are used as identical terms in the system). The data screen and corresponding internal data files within the system are as follows: Site - Sitedata; Horizon - Horidata; Lab - Labdata; and Inputlab - Labinput. Any file can also be accessed from the screen top menu of the entry screens (Figure 6).

Use the cursor keys to highlight the desired screen selection and press <enter> to open the screen and data files. The "Narrative Report" selection on the submenu (Figure 5) will be discussed later. "Quit" returns to the main (or previous) menu. The Quit selection can be made in one of the following three ways from any menu:

- (1) Use the cursor keys to highlight "Quit" on the menu and press <enter>;
- (2) Type the letter "Q";
- (3) Press the <esc> key.

These commands will back you out of most screens and situations.

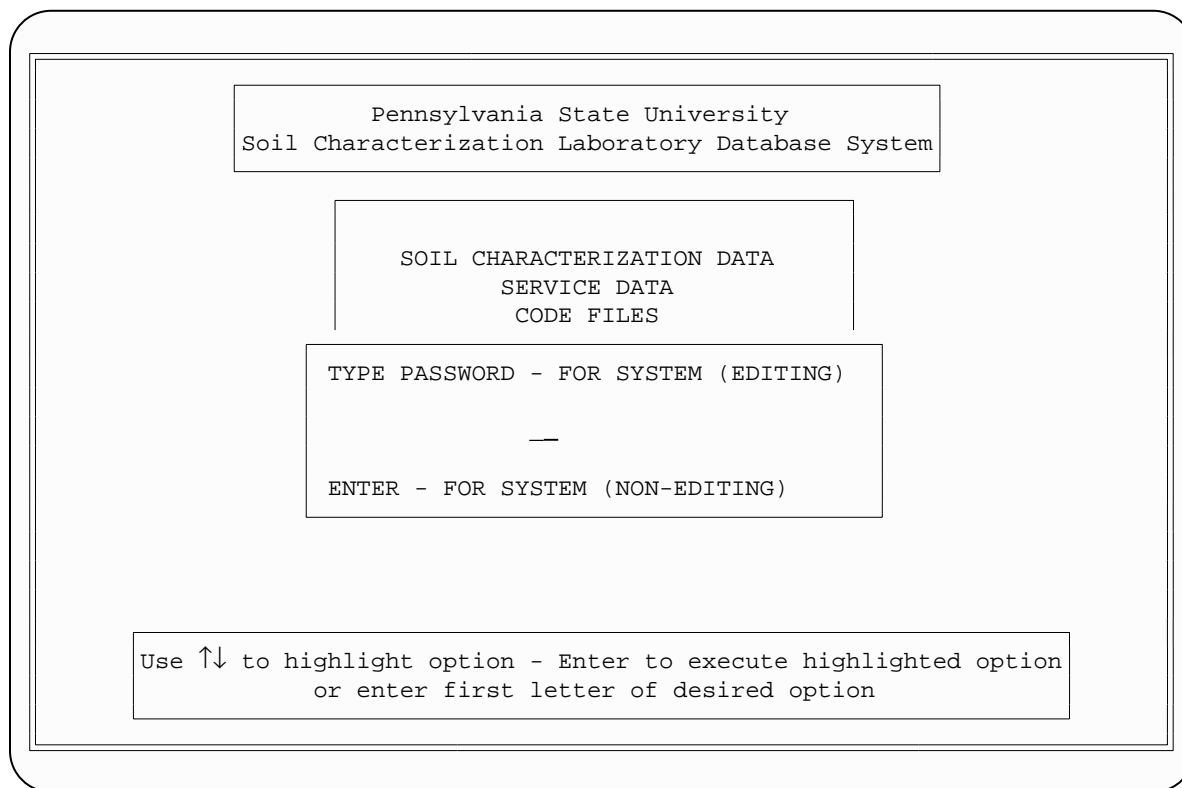


Figure 2. Password window screen for the database system

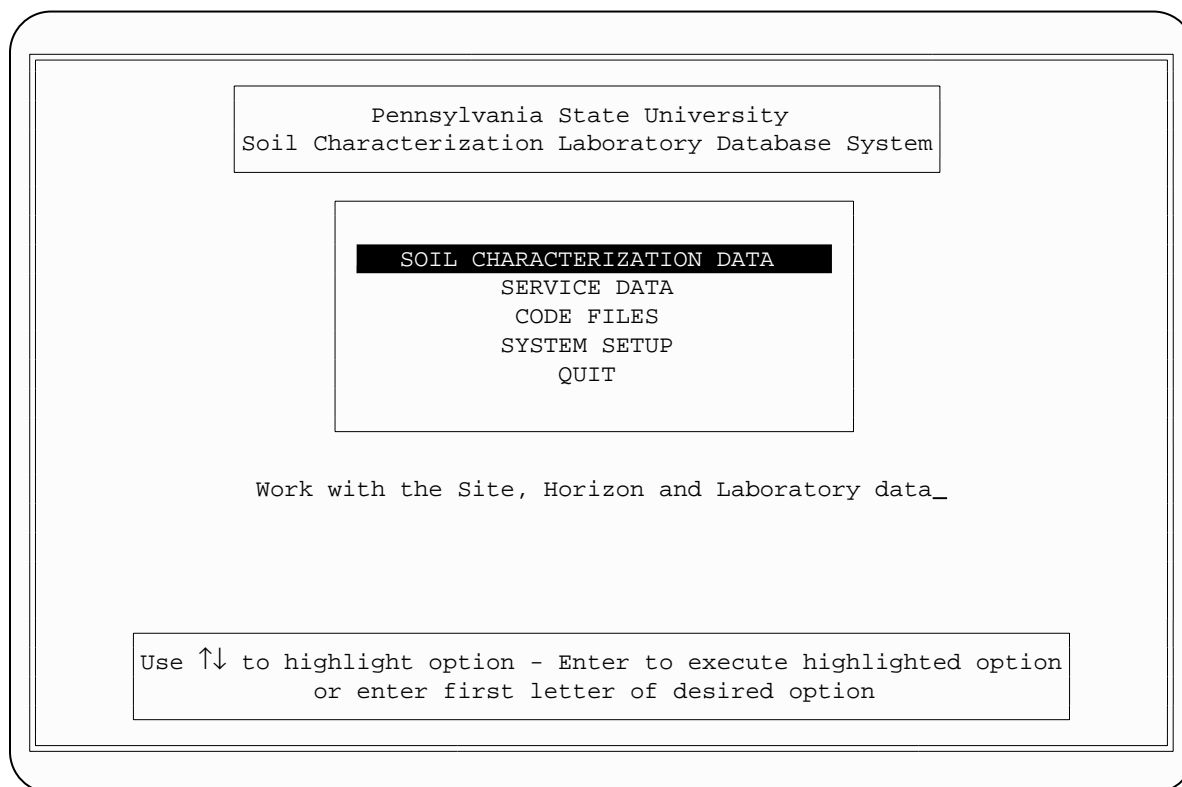


Figure 3. Main system menu screen for the database system

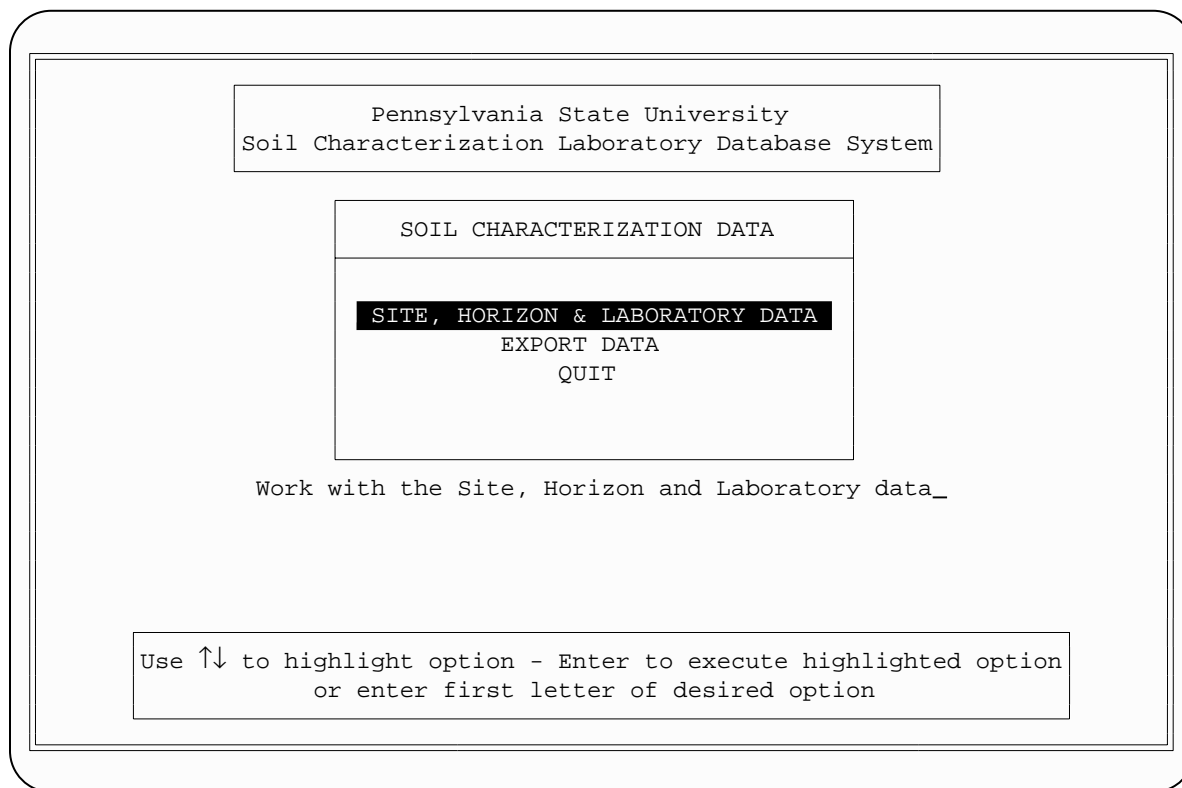


Figure 4. Soil characterization data menu screen for the database system

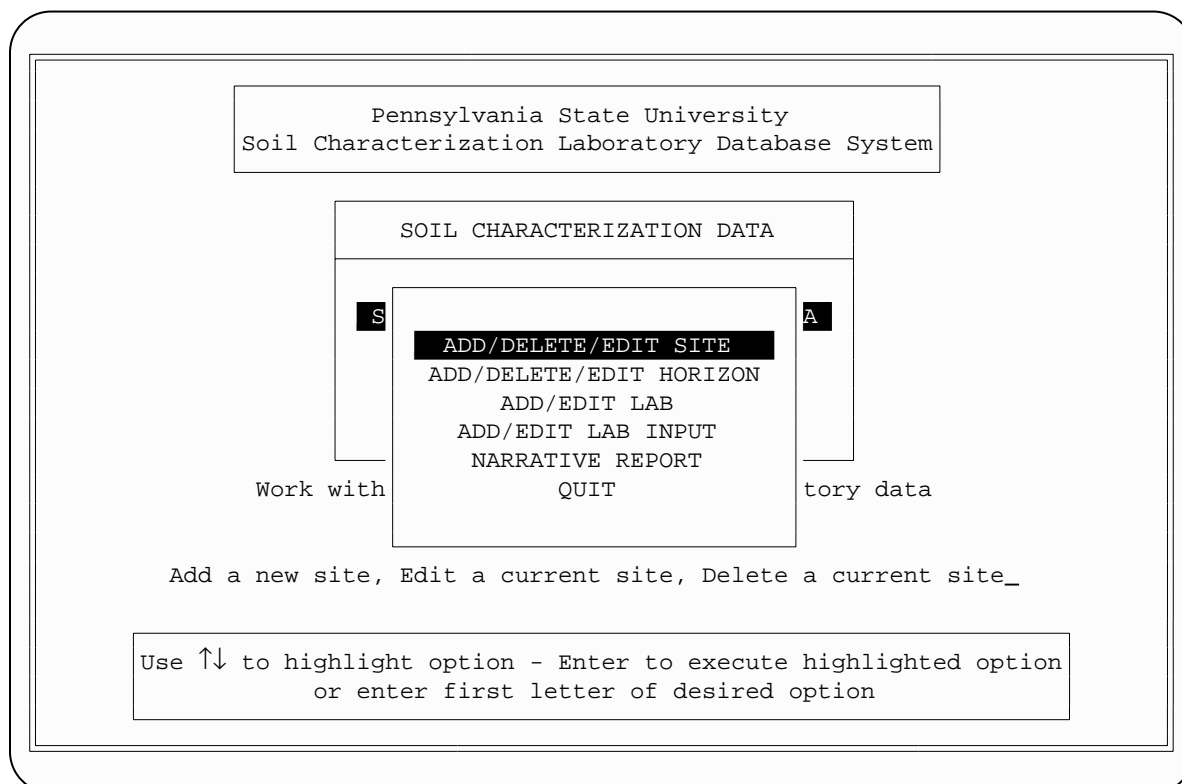


Figure 5. Data entry (site, horizon, lab, and lab input) and narrative report submenu screen for the database system

A Data Entry Screen Features

To enter, edit, or view data in the characterization database, highlight one of the "Add/Delete/Edit" selections (site, horizon, lab, lab input) on the menu and press <enter>. The data entry screens for site (shown in Figure 6), horizon, lab, and lab input have certain common features. Menu features and conventions for selecting pedons, switching entry screens, moving through screen pages, data lines and fields, and exiting the systems are described below.

1. Top entry screen menu

The entry screen menu is displayed across the top of the entry screen, beginning in the upper left corner. A brief description of the menu option appears underneath the menu on the left side of the screen. Two methods to select menu options are available:

- a. Use the cursor arrow keys to highlight the desired menu selection and press <enter>.
- b. Press the key for the first letter of the menu item. For example, press the "A" key to select "Add."

2. Selecting pedons

Pedon information (series name, pedon unit identification, number of horizons) is displayed on the right side of the screen, immediately below the menu line. The menu offers three ways to select a pedon:

- a. **Goto** displays a pedon selection screen (Figure 7). Move the highlight bar to the desired pedon and press <enter>. The up and down cursor arrows move one pedon at a time; <page up> and <page down> keys move one screen page at a time; <home> moves to the top of the list; and <end> moves to the bottom of the list. Press <Alt> and "O" keys at the same time to change the sort order from pedon identification number to alphabetical soil series name.
- b. **Next** moves forward to the next pedon, or site, in the database listing (pedons are sorted by the State-County-Pedon Identification number).
- c. **Prev** (Previous) moves backward to the preceding pedon, or site, in the database listing.

3. Switching entry screens

Any data entry screen/ file can be accessed from the screen top menu of any other entry screen. Move the highlight to the desired entry screen name and press <enter> or simply type the first letter of the name (S for site, H for horizon, L for lab, I for input lab).

4. Paging through the entry screens

Site consists of 2 screen pages; Horizon has 4 pages; Lab has 5 pages; and Inputlab has 7 pages. Each screen page corresponds to a data form page (see Appendix A). The screen page number appears in the upper right corner of the screen. Use <Ctrl> plus <Page Up> and <Ctrl> plus <Page Down> to move forward or back one entry page.

Add Del Edit Next Prev **Goto** Rept Horizon Lab InputLab Quit PAGE 1 OF 2
 Select site from menu bar_ Linden S76-PA-014-099 (1-11)

SOIL SERIES		DATE		SITE ID			LATITUDE				LONGITUDE									
Linden		MO/DA/YR	ST	CNT	UNI	S	MLRA	DEG	MIN	SEC	DIR	DEG	MIN	SEC	DIR					
		04/17/76	PA	014	099		147	40	57	38	N	078	09	43	W					
ID	SYMB	NOTE ID	TRAN ID	YLD ID	PHOTO#	SAMPLE #		DT	PT	PREVIOUS NAME										
						9810 - 9817		PC		Linden										
SLP %	SHP U	G A	H M	ASP S	SLP DEG	LENGTH ABOVE	MICRO TOTAL	SLP K	PHYS PRI	SEC FP	PEDON CLASSIFICATION									
1				180							O I	SO OC	GG DY	SG FL	PSC 06	MIN 08	RX 00	TMP 34	OTH 0	
PRECIP	WATERTABLE		L	S	H	D	ELEV	1 PARENT		2		3 MATERIAL		4		BEDROCK				
110	DEPH DAYS KD		U	T	C	R	420	W	M	OR	W	M	OR	W	M	OR	W	M	OR	BRD BRS BRF
	240		A	A		5		0	A	H4	0	A	A5							
AVG AIR TEMP				AVG SOIL TEMP				MOS	WEATHER		CONTROL		ER	RN						
ANN SUM WIN				ANN SUM WIN				REG	STN #		SEC DEP		WA	OF						
				9.1				UD			-		1	3						
DIAGNOSTIC FEATURES										FLOODING		PONDING								
DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	FRQ	MO	DAYS	FRQ	MO	DAYS					
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

Figure 6. First page (screen) of the site entry form.

Add Del Edit Next Prev **Goto** Rept Horizon Lab InputLab Quit PAGE 1 OF 2
 Select site from menu bar_ Linden S76-PA-014-099 (1-11)

SOIL SERIES		DATE		SITE ID			LATITUDE				LONGITUDE									
Linden		MO/DA/YR	ST	CNT	UNI	S	MLRA	DEG	MIN	SEC	DIR	DEG	MIN	SEC	DIR					
		04/17/76	PA	014	099		147	40	57	38	N	078	09	43	W					
ID	SYMB	NOTE ID	TRAN ID	YLD ID	PHOTO#	SAMPLE #		DT	PT	PREVIOUS NAME										
						9810 - 9817		PC		Linden										
SLP %	SHP U	G A	H M	ASP S	SLP DEG	LENGTH ABOVE	MICRO TOTAL	SLP K	PHYS PRI	SEC FP	PEDON CLASSIFICATION									
1				180							O I	SO OC	GG DY	SG FL	PSC 06	MIN 08	RX 00	TMP 34	OTH 0	
PRECIP	WATERTABLE		L	S	H	D	ELEV	1 PARENT		2		3 MATERIAL		4		BEDROCK				
110	DEPH DAYS KD		U	T	C	R	420	W	M	OR	W	M	OR	W	M	OR	W	M	OR	BRD BRS BRF
	240		A	A		5		0	A	H4	0	A	A5							
AVG AIR TEMP				AVG SOIL TEMP				MOS	WEATHER		CONTROL		ER	RN						
ANN SUM WIN				ANN SUM WIN				REG	STN #		SEC DEP		WA	OF						
				9.1				UD			-		1	3						
DIAGNOSTIC FEATURES										FLOODING		PONDING								
DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	FRQ	MO	DAYS	FRQ	MO	DAYS					
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					

Figure 7. Pedon selection menu screen using the Goto option.

5. Moving through screen lines and data fields

- a. Use the <Page Up> and <Page Down> keys to move from one line to another on the entry screen.
- b. Use the <Home> key to move to the upper left field on a page and the <End> key to move to the lower right field on a page.
- c. Use the <Ctrl> plus left or right arrow keys to move laterally between the main data entry fields.
- d. Use the up arrow key to move right and the down arrow key to move left in a field such as LATITUDE that has more than one selection bar.
- e. Use the left and right arrow keys to move the cursor within a selection bar field.

6. Entering data

- a. Left justify all data entry.
- b. Put leading zero's (0's) in the following fields:
 - (1) Date (01/01/91)
 - (2) Site (PA 001 001)
 - (3) Latitude and longitude (39 56 02) (077 16 39)
- c. Enter data around decimals (.) and dashes (-). Also enter the . and -.
- d. Use <Ctrl> plus <End> keys to record data. At the "Save these changes?" prompt, choose "Yes" or "No" and press <enter>. This will return you to the screen top menu.

7. Exiting the system

The <Esc> key allows you to exit or back out of most situations. From the top screen menu, select "Quit" to return to the previous menu screen.

B. Site Data

Select "Add/Delete/Edit Site" from the data entry and narrative report submenu (Figure 5) to add a new site, delete an existing site, or enter and edit site characteristics data. The site codes and a site data form are provided in Appendix A (A.1 - Site Codes; A.2 - Site Form).

1. Entering new site data

Select "Add" from the screen top menu (Figure 6). A cursor will appear in the SITE ID field. SITE ID, SOIL SERIES, and DATE (mo/da/yr) must be entered before the site record will be saved to a file. The remaining site data can be entered at the same time or at a later time.

- a. **SITE ID:** Type the state abbreviation under ST (PA comes up automatically; type another state code over this or move to CNT with the down arrow key). Enter a county number (001, 027, etc.) under CNT, and the site number (001, 137, etc.) under UNI. The S can be used to make a subdivision of the site, e.g., two or more pedons out of the same soil pit or site. For most sites, S will be left blank. If a mistake is made in the SITE ID, press <Esc> and start over. Once entered, the SITE ID cannot be edited. Press <enter> to move to the next field.
- b. **SOIL SERIES:** For the soil characterization database a pick-list of soil series names will appear on the screen. Select a name from the list or add a new name in the space provided. To select a name on the pick-list, use the cursor arrow keys to highlight the name and press <enter>. To add a new name, press <enter> with the selection bar on the "add new series name" field. Type the new name in the blank field and press <enter>. Capitalize only the first letter of the SOIL SERIES name. The series pick-list does not appear for the service database. Instead, the cursor highlights the SOIL SERIES field. Enter the series or service name and press <enter>.
- c. Once the soil series name is entered, the cursor bar moves to DATE. Enter in which the pedon was described and sampled. After the date is entered, the remaining site data can be entered. Use capital letters for codes. Use the Sitecode file (Appendix A.1) for the correct codes and the S & D (Structure & Description) Sitedata file (Appendix B.1) for an additional explanation of the codes.
- d. Once the data is entered, press <Ctrl> plus <End> to save the site data and return to the top screen menu.

2. Editing existing site data

- a. Use the "Goto" option on the top menu screen to select the site/pedon to be edited (see section A.2 - Selecting Pedons).
- b. The data on file for the selected site will appear on the screen. Select "Edit" from the top screen menu (section A.1). A cursor will appear in the SOIL SERIES field. Move the cursor to the desired data fields (see sections A.4 and A.5) and enter data (section A.6) by typing over the existing data.

3. Deleting a site record

The entire site/pedon record (including site, horizon, lab, and lab input data) can be deleted from the site entry screen.

- a. Use the "Goto" option on the top menu screen to select the site/pedon to be deleted (see section A.2 - Selecting Pedons).
- b. The site data for the pedon to be deleted will appear on the screen. Select "Delete" from the top screen menu (section A.1). At the prompt "Do you really want to delete this site?" select "Yes." The site and associated horizon, lab, and lab input records will be deleted from the database and the cursor will return to the top screen menu.

C. Horizon Data

Select "Add/Delete/Edit Horizon" from the data entry and narrative report submenu (Figure 5) to add horizons to an existing site, enter and edit horizon characteristics data, or delete

a horizon record. The horizon codes and horizon data forms are provided in Appendix A.3. The S & D (Structure & Description) Horidata file (Appendix B.2) provides an additional explanation of the codes.

1. Adding new horizons

Before adding new horizons or entering horizon data for a new pedon, the SITE ID, DATE, and SOIL SERIES name must first be added to the Sitedata file (see section B.1). This will add these data to the Goto listing. Once this has been done, enter the Horizon entry screen from the Site top screen menu (see section A.1) or by selecting "Add/Delete/Edit Horizon" from the main menu (Figure 5).

- a. **Add new horizons** to a site by selecting "Modify" from the screen top menu. A new screen top menu will appear. Move the selection bar to "Append" and press <enter>. Add as many horizons as required by pressing <enter> for each horizon. The number of horizons (e.g., 1-10) entered will be added automatically to the Sitedata file.
- b. **Save the newly added horizons** by selecting "Quit" from the "Modify" screen menu. At the prompt "Save these changes?" select "Yes" and the new horizon records will be saved to file.

2. Entering new horizon data

Enter new horizon data by selecting "Modify" from the top screen menu. When the new screen top menu appears, move the selection bar to "Edit" and press <enter>. A cursor will appear in the first horizon data field. Refer to sections A.4 and A.5 for cursor movement commands and to section A.6 for data entry conventions. In addition, the following data entry conventions will apply:

- a. Use the <Alt> plus H keys to enter data horizontally across the screen and <Alt> plus V to enter data vertically down the screen.
- b. Use all capital letters except for Horizon Sufx (suffix) and free form notes.
- c. For horizons in which a primary structure parts to a secondary structure (e.g., prismatic parting to subangular blocky), enter the primary structure shape (SHP) first, using capitalized letters. Use small case letters for the second structure shape to indicate that the first (primary) structure parts to the second structure.
- d. When two structures are found in a horizon (e.g., subangular blocky and prismatic) use capital letters for both structure shapes.
- e. Use the first rock fragment entry field to enter the kind (KD) and total quantity (percent) of rock fragments in the horizon. In the following rock fragment fields put in the percent and size (SZ) of the various size classes of rock fragments, starting with the largest size found in the soil horizon (see Appendix A.3 for proper codes).
- f. Save the new horizon data by selecting "Quit" from the "Modify" screen menu. At the prompt "Save these changes?" select "Yes."

3. Editing existing horizon data

- a. Use the "Goto" option on the top menu screen to select the site/pedon to be edited (see section A.2 - Selecting Pedons). The data on file will be shown on the screen.

- b. To insert a new horizon between two existing horizons select "Modify" from the top screen menu. When the new screen top menu appears, select "Insert." An indicator arrow will appear on the left side of the screen. Use the up and down cursor arrows to position the indicator where the new horizon is to be inserted and press <enter>. At the prompt "Do you really want to insert a horizon at the arrow?" select "Yes."
- c. To edit existing horizon data, follow the same steps described in section C.2 for entering new horizon data. Type the new data over the existing data.

4. Deleting horizon records

- a. Use the "Goto" option on the top menu screen to select the site/pedon to be edited (see section A.2 - Selecting Pedons). The data on file will be shown on the screen.
- b. Select "Modify" from the screen top menu. When the new screen menu appears, select "Del" (Delete). A pair of asterisks (*) will appear along the left side of the screen. Use the up and down cursor arrows to position the asterisks on the horizon to be deleted and press <enter>. At the prompt "Do you really want to delete the highlighted horizon?", select "Yes."
- c. When a marked horizon is deleted, all of the data associated with that particular horizon in the Horizon (Horidata), Lab (Labdata), and Inputlab (Labinput) files are deleted. This does not affect the Sitedata file.

D. Lab and Lab Input Data

The procedures and keys used to enter or edit laboratory data or raw laboratory data for calculations are the same as those used for horizon data (see sections C.2, C.3-a and C.3-c). Use the Lab data entry screen to enter laboratory data that have already been calculated and are in final form. Use the Lab Input data entry screen to enter raw laboratory data that needs to be calculated. The calculated data will automatically be entered into the Labdata file and will appear on the Lab data entry screen. A description of the Lab and Lab Input variables can be found in the S & D (Structure and Description) files for Labdata (Appendix B.3-a) and Labinput (Appendix B.3-b). Hard copies of the input forms to record raw laboratory data are provided in Appendix C.

DATA OUTPUT

The data can be output in a hard copy, narrative report form (see Appendix D for an example) for individual sites, groups of sites, or for an entire county. Selected data can also be output to disk for use in an outside statistics and/or graphics program.

A Data Tables (Narrative Reports)

The "Narrative Reports" selection can be made from the data entry and report submenu (Figure 5) or from any of the data entry screen top menus (Figure 6). The narrative report for a particular pedon consists of three parts: (1) site description; (2) horizon profile description; and (3) laboratory data tables. The three parts of the narrative report can be printed separately or in combination. Reports can be produced for an individual pedon, all of the pedons for a particular soil series, or all of the characterized pedons in a county. The narrative reports are normally directed to a printer. The reports can be directed to an ASCII file by changing the system printer setup (see the following section "System Setup"). An example narrative report can be found in Appendix D.

The laboratory table program has a feature that vertically squeezes the data printed for pedons with more than 14 horizons so that all of the data fits on two pages - one page for physical and one for chemical and mineralogical data (the system also allows you to override this feature if the number of horizons is such that the lines may overlap).

1. Narrative reports for individual pedons

- a. Choose the "Narrative Reports" option from the data entry and narrative report submenu (Figure 5). When the Selected Sites & Soils/ Selected Counties submenu appears on the screen, move the selection bar to "Selected Sites & Soils" (Figure 8) and press <enter>.
- b. A listing of individual pedons, sorted by pedon number (state-county-unit) will appear on the screen (Figure 9). Move the highlight bar to the desired pedon.
- c. Site, horizon and laboratory reports can be printed individually or in any combination by selecting the appropriate letter (letter options are displayed beside the pedon listing, as illustrated in Figure 9). Select any combination of reports for as many pedons as you desire and then press <enter> to send the reports to the printer.

2. Narrative reports by soil series

- a. Follow step 1-a above to bring up the pedon listing. Press <Alt> plus O to sort the listing alphabetically by soil series name. Move the highlight bar to the desired soil series. Select the reports for all of the pedon listings for that particular series and press <enter> to send the reports to the printer.

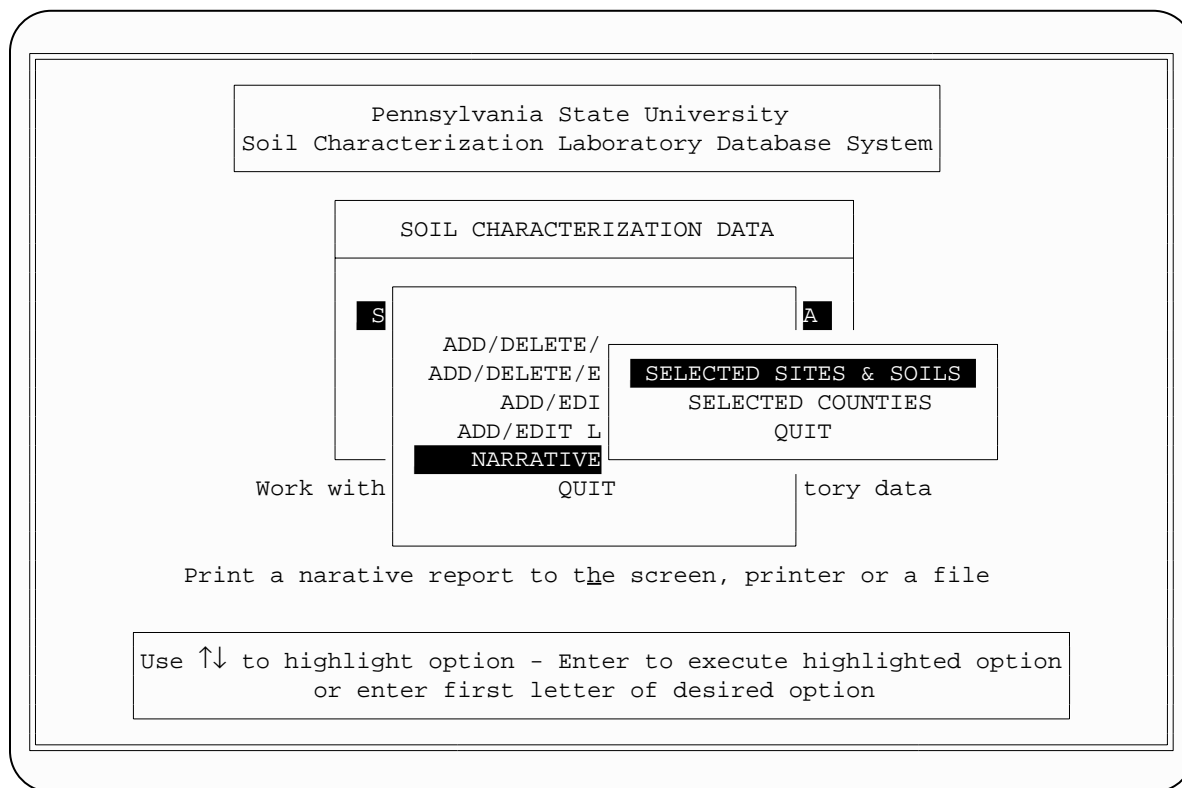


Figure 8. Selected Sites & Soils / Selected Counties narrative report menu.

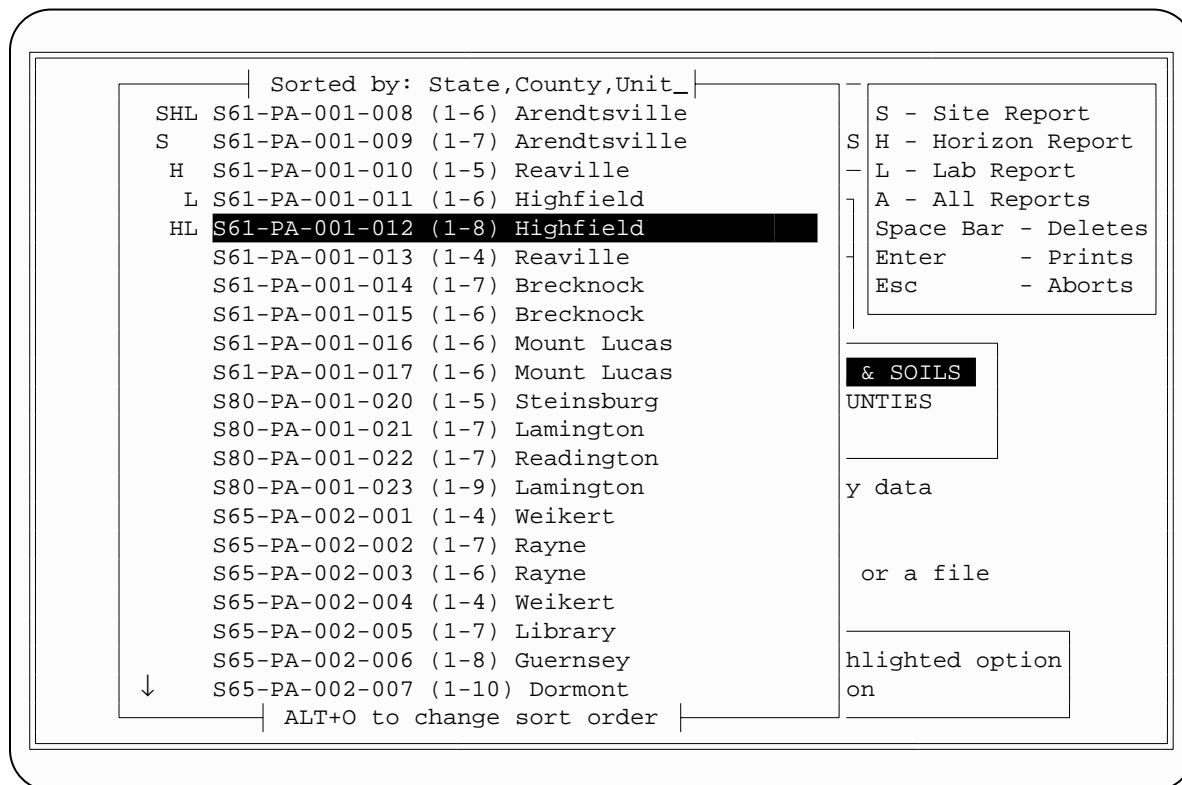


Figure 9. Screen showing part of the selected sites and soils list for narrative reports.

3. Narrative reports by county

- a. Choose the "Narrative Reports" option from the data entry and narrative report submenu (Figure 5). When the Selected Sites & Soils/ Selected Counties submenu appears on the screen (Figure 8), move the selection bar to "Selected Counties" and press <enter>.
- b. A listing of counties, sorted by alphabetical order will appear on the screen (Figure 10). Move the highlight bar to the desired county.
- c. Site, horizon, and laboratory reports can be printed individually or in any combination for all of the characterized soils in a particular county by selecting the appropriate letter (letter options are displayed beside the pedon listing, as illustrated in Figure 10). Select any combination of reports for as many counties as you desire and then press <enter> to send the reports to the printer.

4. Narrative reports from data entry screen top menus

Narrative reports can be generated from any of the data entry screen top menus (Figures 6). The Rept (Report) selection allows you to produce any combination of Site, Horizon, and Lab reports for the pedon on the screen. A report will only be produced for the pedon displayed on the entry screen. This option does allow for direct movement between all data input screens to view the data before it is printed. Follow the directions for entering the data entry screen (see Data Entry) and for selecting pedons (section A.2 under Data Entry). Select Rept from the screen top menu, choose the desired reports to be printed, and press <enter>.

B. Data Output to Disk

Selected data can also be output to disk for use in various statistics and graphics programs. Data format options include dBase, Lotus 1-2-3, Minitab, and ASCII.

1. Move the selection bar to "Export Data" on the soil characterization data menu (Figure 4) and press <enter>.

A listing of the various field code names in the Sitedata, Horidata, and Labdata files (see Appendix B for a description of the field names) will appear on the screen (Figure 11). A "Help" box on the right side of the screen provides a list of cursor movement and data selection commands.

2. Select the data fields first. Move the cursor bar to each desired field and press <enter>. A listing of the selected fields will be displayed on the bottom half of the screen (Figure 12). When all of the fields have been selected, press <Ctrl> plus <End> to complete the field selection step.
3. Once you select the data fields, you will be asked "Do you wish to specify selection criteria?" This step allows you to set parameters for the selected data fields. For instance, you can specify data for certain soil series or for certain ranges of data, such as percent clay between 18 and 35 percent. For numeric fields be sure to select a range of values > 0, since missing data are assigned a 0 value and would not actually be a true 0 value. Move the cursor bar to the desired field and press <enter>. For the SERIESNAME field, a listing of soil series names will appear. For the other fields, a list of options allow you to specify a value or range of values (Figure 13).

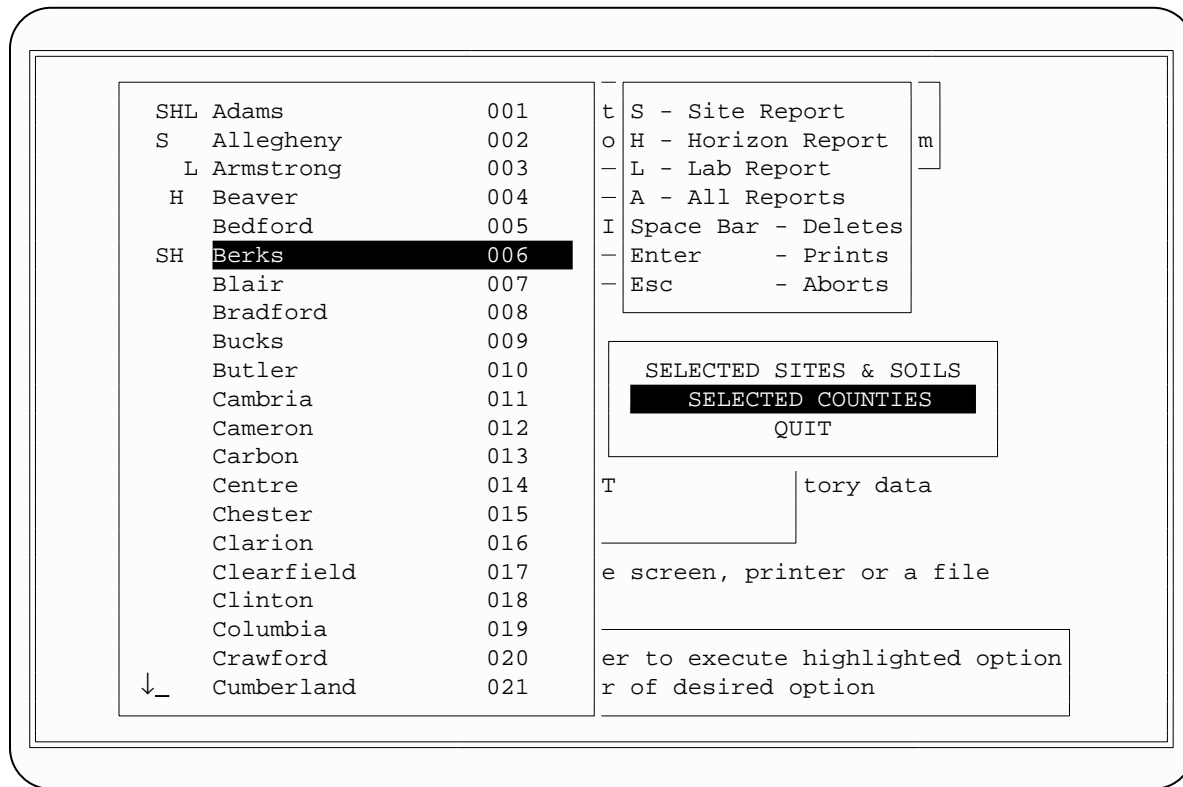


Figure 10. Screen showing part of the selected counties list for narrative reports.

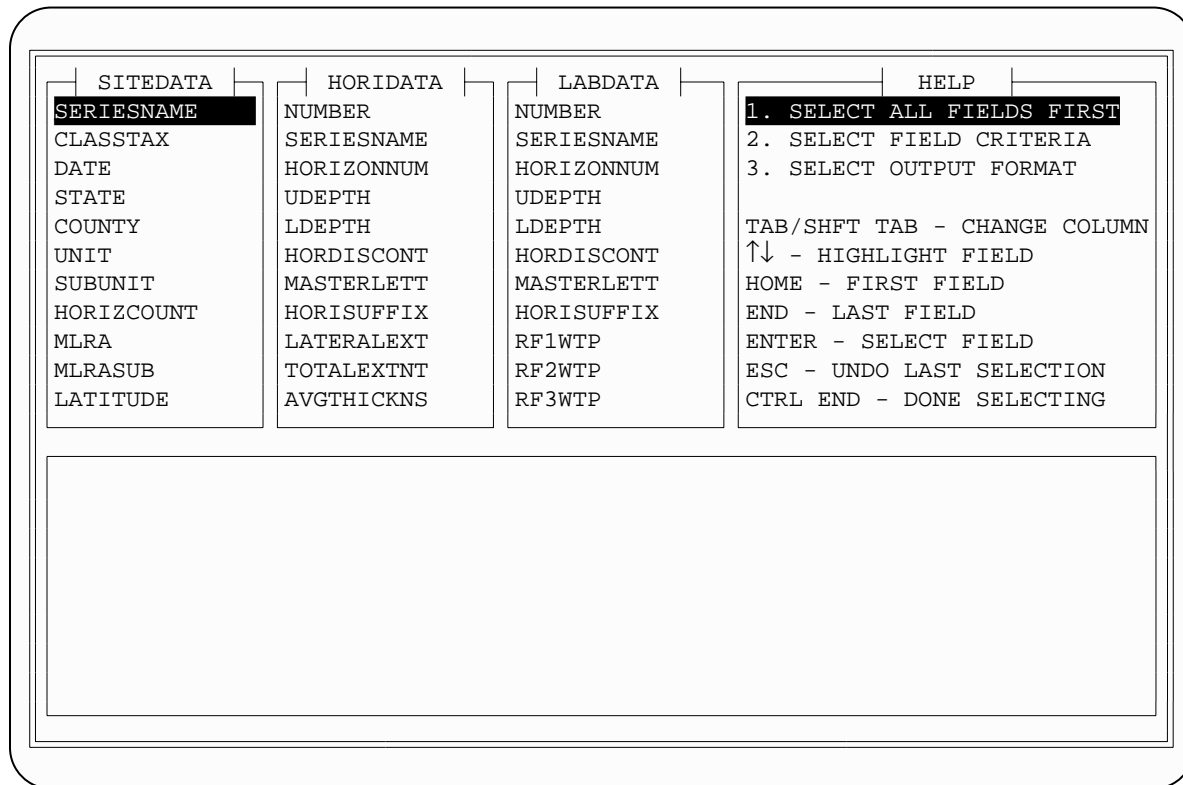


Figure 11. Field selection screen for data export.

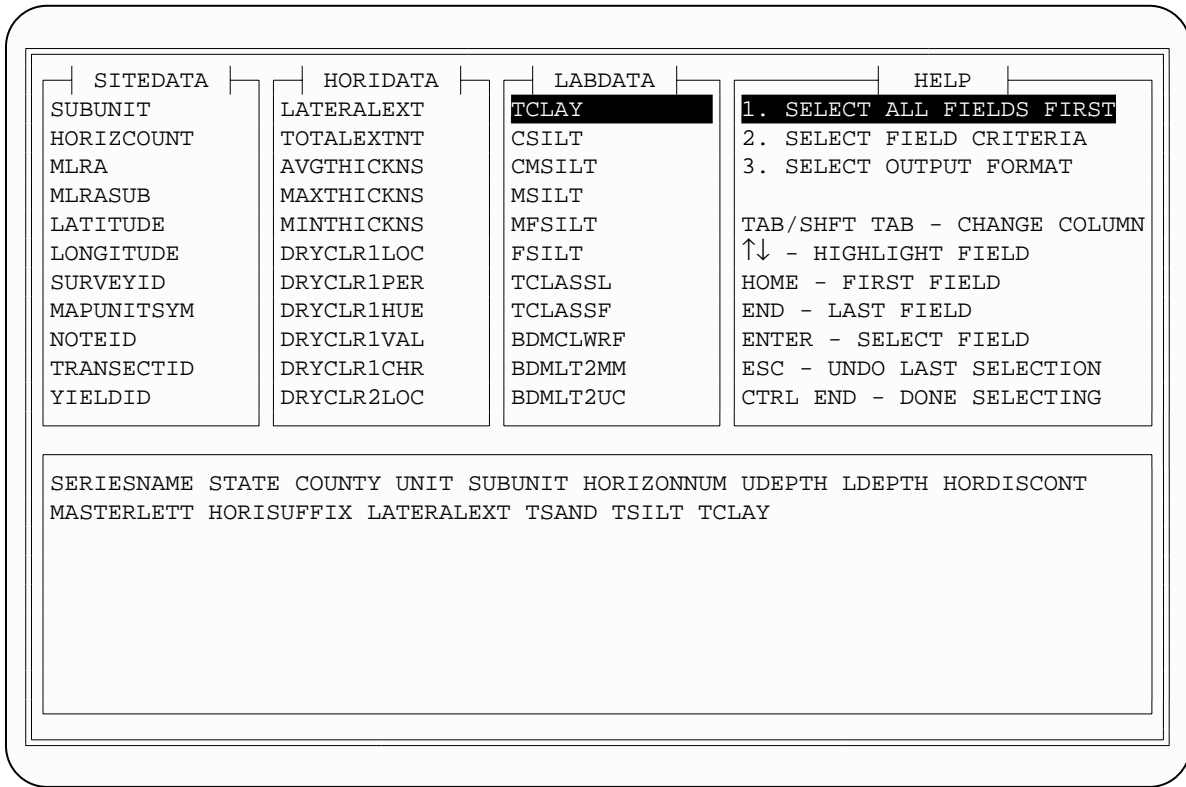


Figure 12. Field selection screen for data export, displaying the list of selected fields.

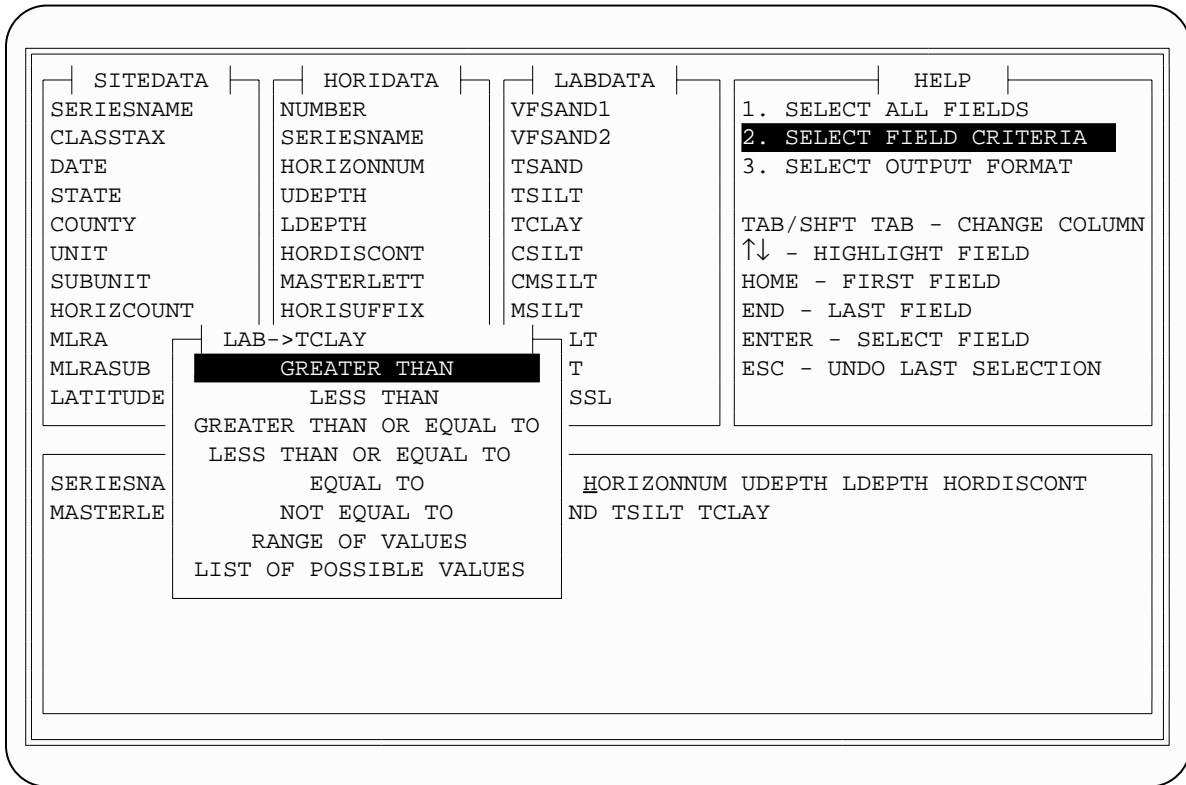


Figure 13. Screen showing option list for specifying data field criteria for data export.

The selection criteria will be displayed on the bottom half of the screen and you will be asked whether you desire to specify additional criteria (Figure 14).

4. Once the field criteria are selected, the system will display a list of available output formats (Figure 15). Select the desired format and specify the file name (include drive, directory, and file name). The data will be copied to that file, along with a second file which provides the field code name, the structure of the field, and a brief description of the field.

SYSTEM SETUP

The "System Setup" option on the main system menu (Figure 3) allows you to select different printer outputs and printer ports (Figure 16). Narrative reports can be directed to any listed printer available to the computer or to an ASCII disk file (Figure 17). The ASCII output file includes all of the printed features of the narrative reports -- site and horizon descriptions and laboratory data with headings in table format. Make the printer or ASCII output selection (be sure to specify the appropriate printer port) before generating the narrative report. To cancel or change the selection at any time during the system operation, you must return to the report or ASCII output selection screen (Figure 17).

CODE FILES

The "Code Files" option from the main menu (Figure 3) allows you to edit or add to the code files for selected fields (Figure 18). Select the desired field from the Code File List menu (Figure 18). The Edit menu (Figure 19) allows you to add to, delete from, or edit the existing list of coded variables for soil series names, classification, vegetation codes, site description codes, Munsell color codes, or horizon description codes. Adding or deleting a soil name only affects the pick list that is available when a new site is added to the Site File.

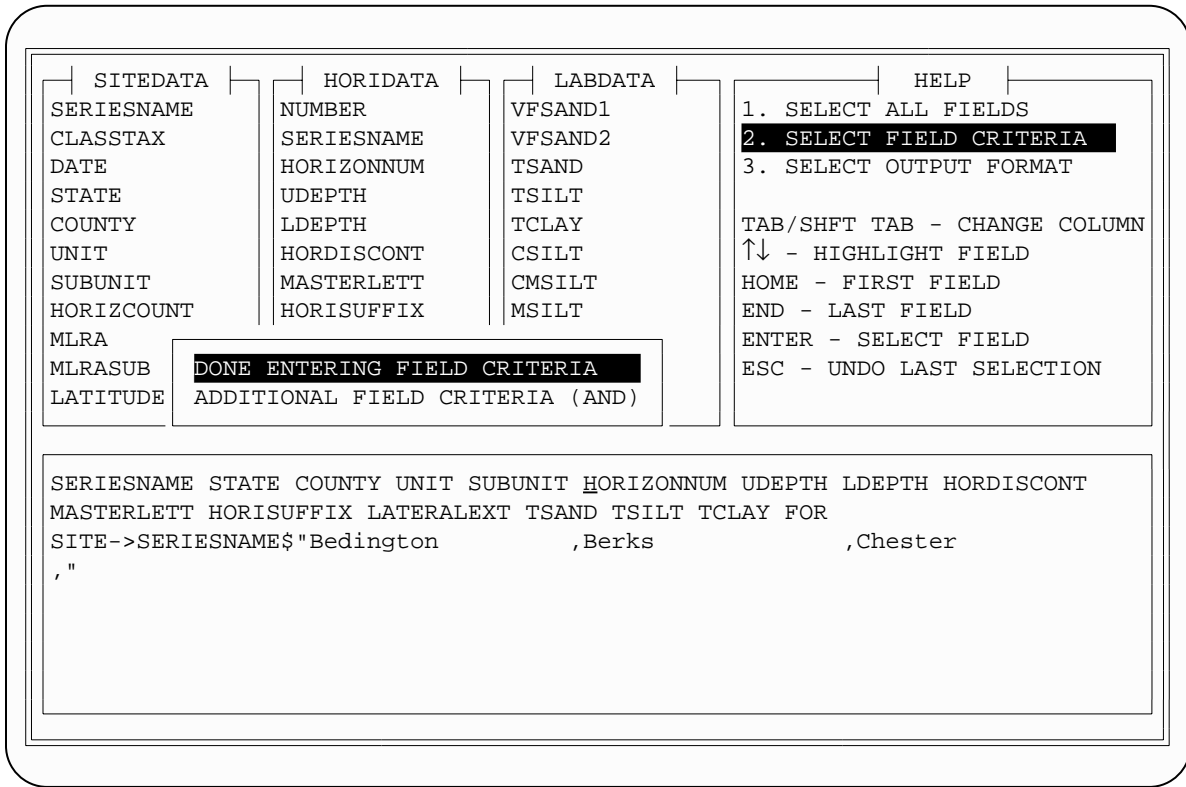


Figure 14. Field criteria selection screen for data export.

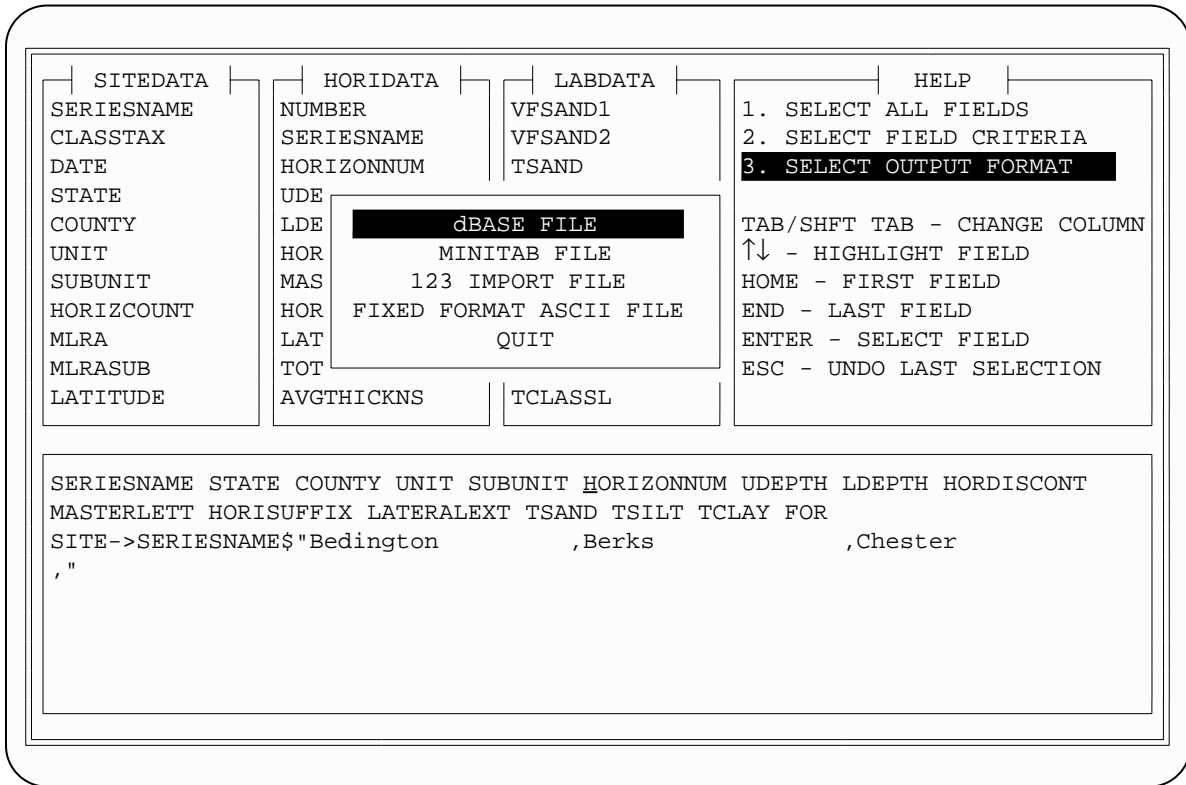


Figure 15. Data format options menu for data export.

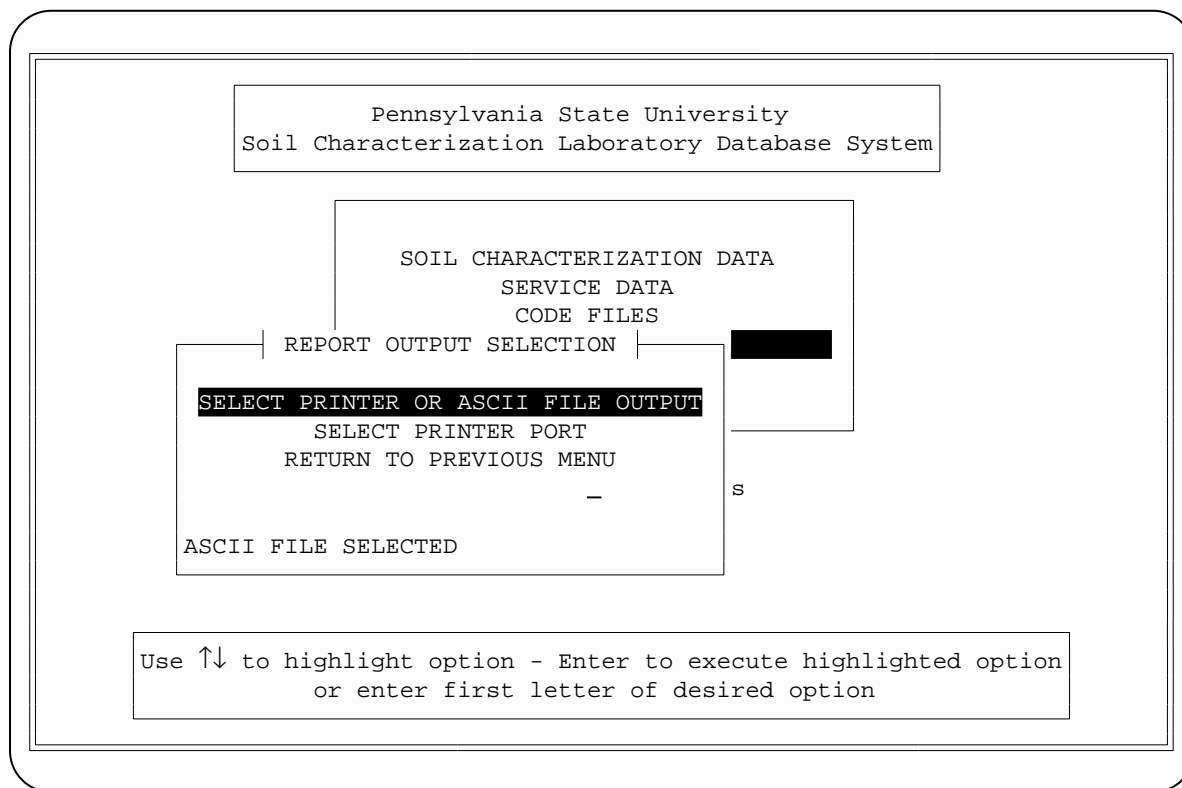


Figure 16. Printer or file report output and port selection menu for system setup.

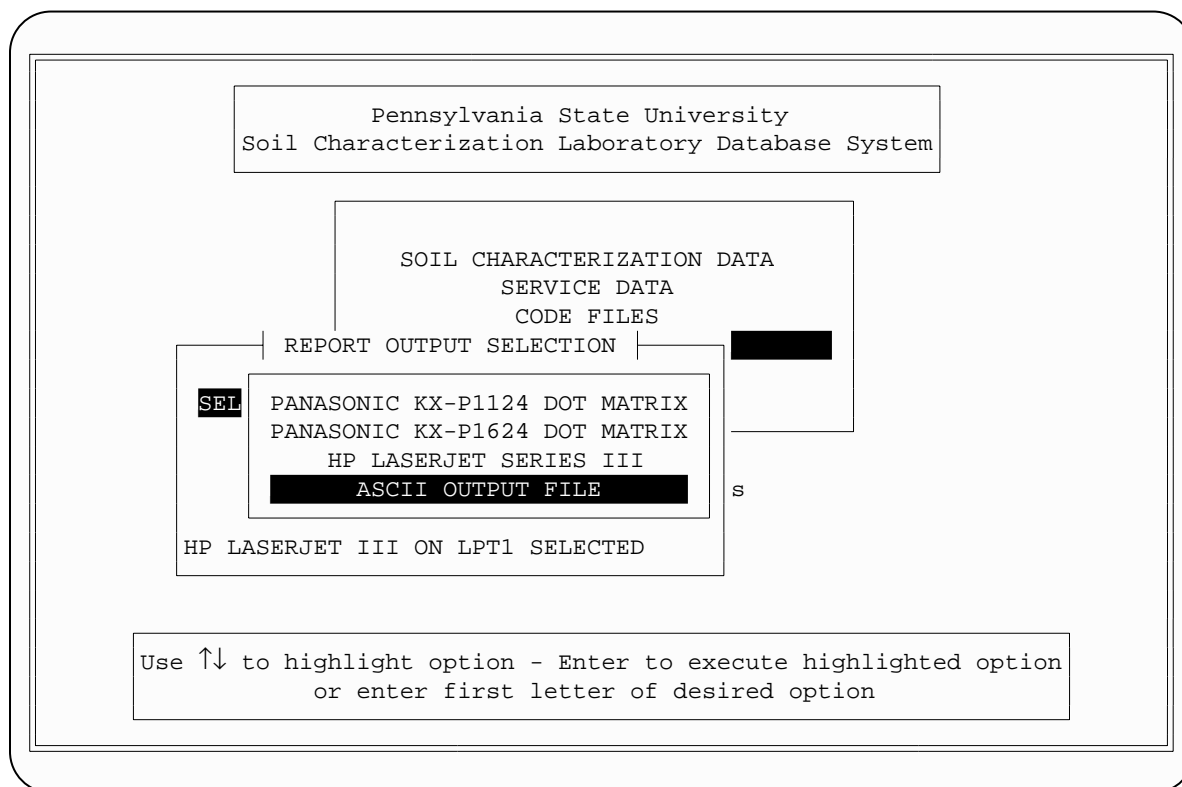


Figure 17. Printer type or ASCII report output selection list for system setup.

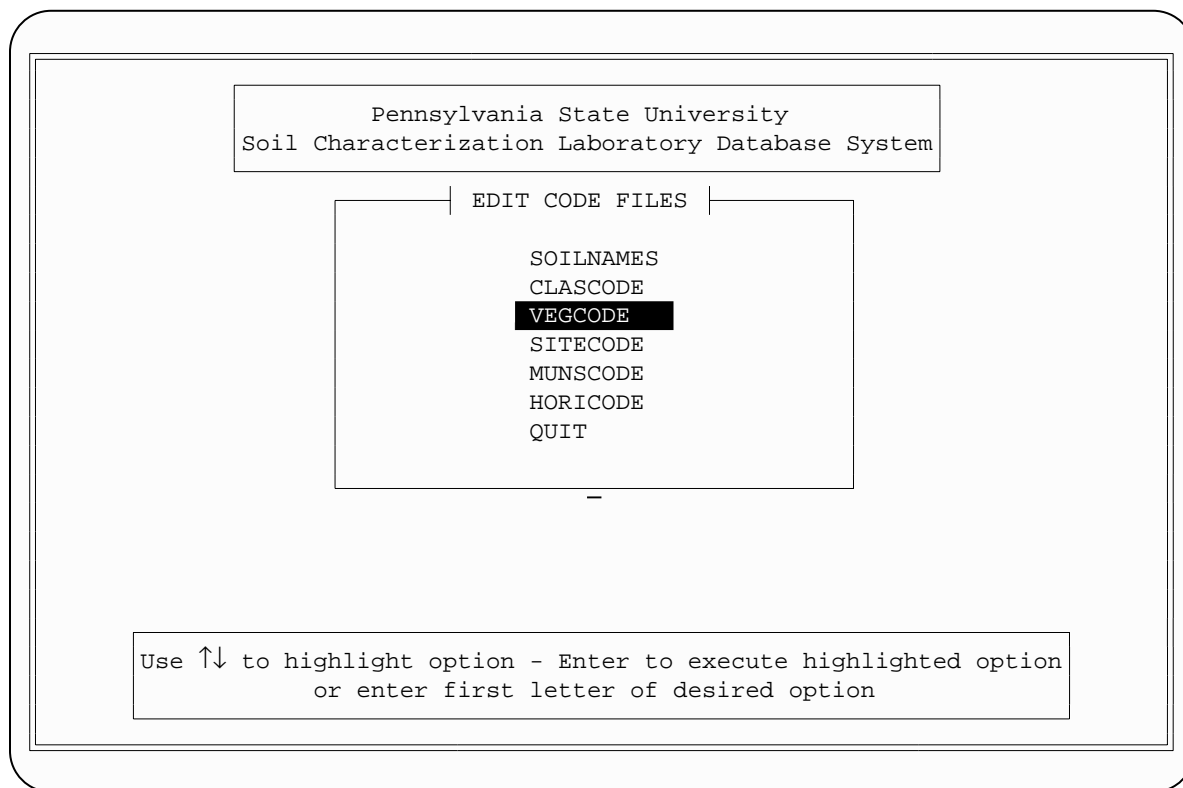


Figure 18. Code file listing menu for code file editing.

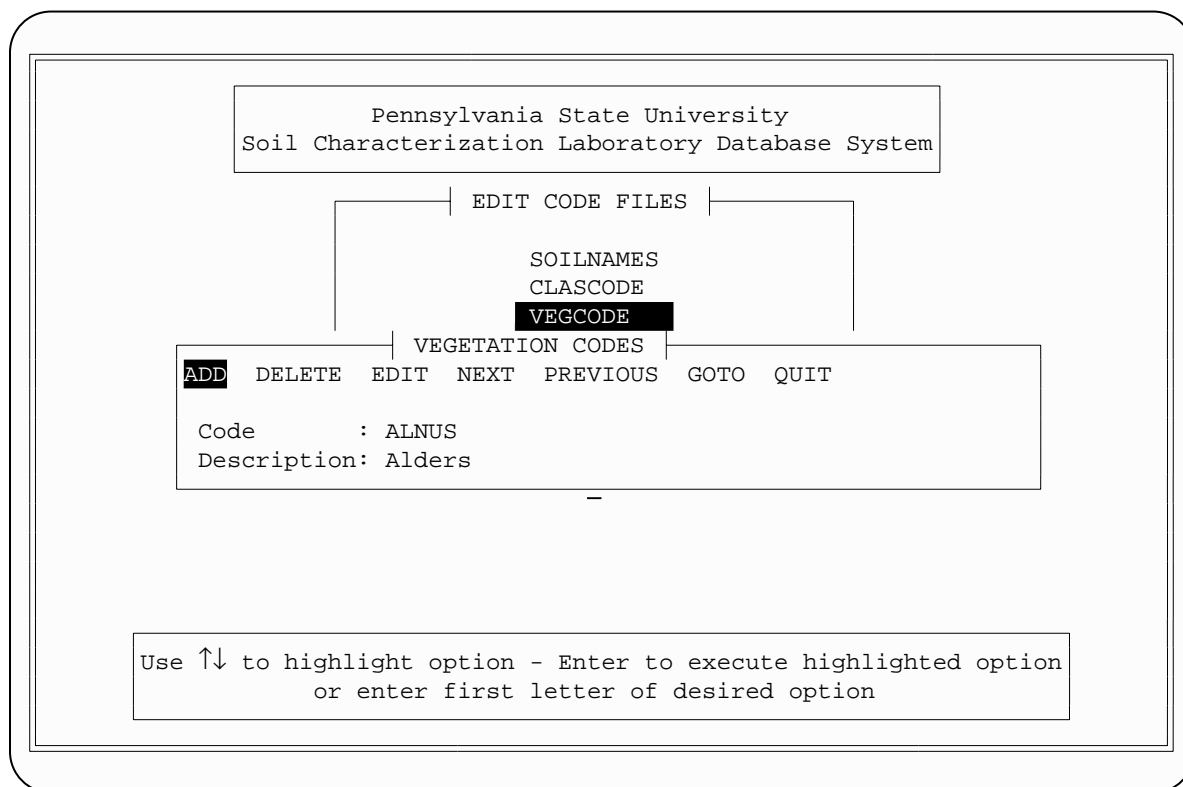


Figure 19. Code file edit menu screen.

APPENDIX A. Site and Horizon Codes and Forms

1. Site codes

**PENNSYLVANIA STATE UNIVERSITY SOIL CHARACTERIZATION LABORATORY
LISTING OF SITE CODES
APRIL 17, 1991**

Page 1 of 9

SITE ID	058	Susquehanna	1	Convex
ST STATE	059	Tioga	2	Plane
PA Pennsylvania	060	Union	3	Concave
NY New York	061	Venango		
	062	Warren	GM	GEOMORPHIC AREA
SITE ID	063	Washington	1	Interfluve
CNT COUNTY	064	Wayne	2	Head slope
001 Adams	065	Westmoreland	3	Side slope
002 Allegheny	066	Wyoming	4	Nose slope
003 Armstrong	067	York		
004 Beaver			HS	HILL SLOPE AREA
005 Bedford	MLRA MAJOR LAND RESOURCE		1	Summit
006 Berks	AREA		2	Shoulder
007 Blair	100	Erie Lake Plain	3	Back slope
008 Bradford	124	Western Allegheny Plateau	4	Foot slope
009 Bucks	126	Central Allegheny Plateau and Mountains	5	Toe slope
010 Butler	127	Eastern Allegheny Plateau and Mountains	MICRO	MICROTOPOGRAPHY
011 Cambria	130	Blue Ridge	K	KIND
012 Cameron	139	Eastern Ohio Till Plain	B	Micro depression
013 Carbon	140	Glaciated Allegheny Plateau	C	Tree throw feature
014 Centre	147	Northern Appalachian Ridges and Valleys	F	Frost polygon
015 Chester	148	Northern Piedmont	G	Gilgai
016 Clarion	149	Northern Coastal Plain	L	Land leveled or smooth
017 Clearfield			M	Mound
018 Clinton			T	Terracettes
019 Columbia			Z	Other (specified in notes)
020 Crawford			MICRO	MICROTOPOGRAPHY
021 Cumberland	ID SOIL SURVEY AREA ID NUMBER		A	AMOUNT
022 Dauphin			0	Minimal variation
023 Delaware	SYMB MAP UNIT SYMBOL		1	<20 cm variation
024 Elk			2	20-50 cm variation
025 Erie	NOTE ID ID NUMBER FOR NOTES		4	50-100 cm variation
026 Fayette			MICRO	MICROTOPOGRAPHY
027 Forest	TRAN ID TRANSECT ID NUMBER		P	PATTERN
028 Franklin			0	No pattern
029 Fulton	YLD ID YIELD ID NUMBER		1	Linear
030 Greene			2	Closed depression
031 Huntingdon	PHOTO # AIRPHOTO NUMBER		3	Reticulate
032 Indiana			SLP	
033 Jefferson	DT DESCRIPTION TYPE		POS	POSITION ON SLOPE
034 Juniata	CY	Crop yield data site	2	On a slope
035 Lackawanna	FN	Field notes	3	On upper third
036 Lancaster	FS	Forestry data site	4	On middle third
037 Lawrence	PC	Full pedon desc for lab characterization	5	On lower third
038 Lebanon	PD	Full pedon description	7	On a slope and in a depression
039 Lehigh	RP	Descrip. for research study	8	In a depression
040 Luzerne	RS	Range data site	9	In a drainageway
041 Lycoming	PT PEDON TYPE			
042 Mckean	MI	Map unit inclusion		
043 Mercer	MO	Modal pedon for series		
044 Mifflin	MR	Within range of map unit		
045 Monroe	MU	Modal pedon for map unit		
046 Montgomery	OS	Outside range of series		
047 Montour	SR	Within range of series		
048 Northampton	TP	Typical pedon for series		
049 Northumberland	SLP	SLOPE PERCENT		
050 Perry		INCLINATION		
051 Philadelphia		Percent		
052 Pike				
053 Potter				
054 Schuylkill				
055 Snyder				
056 Somerset	SHP SLOPE SHAPE			
057 Sullivan	U A UP AND DOWN - U : ACROSS - A			

APPENDIX A-1 (Continued)

PHYS	PHYSIOGRAPHY
PRI	PRIMARY
BA	Badlands
BI	Barrier island
BO	Bolson
CA	Canyon
CF	Coalescent fan piedmont
CP	Coastal plain
DF	Drumlin field
DP	Dissected plateau
FH	Foothills
GF	Glaciofluvial landform
GP	Glaciated plateau
GU	Glaciated uplands
HH	High hill
HI	Hills
KP	Karst plain
LP	Lake plain
LU	Level or undulating upland
LV	Lava plain
MO	Mountains
MV	Mountain valley
PI	Piedmont
PL	Plains
PT	Plateau
RI	Ridge and valley
RV	River valley
SB	Semibolson
SH	Sandhills
TA	Tableland
TL	Triassic lowlands
VM	Volcanic mountains

PHYS	PHYSIOGRAPHY
SEC	SECONDARY
AF	Alluvial fan
AP	Alluvial flat (plain)
BE	Beach
BF	Barrier flat
BO	Bog
BS	Backswamp
BT	Beach terrace
BU	Butte
CB	Carolina bay
CO	Cove
CR	Crater
CU	Cuesta
DE	Delta
DO	Dome
DR	Drumlin
DU	Dune
EK	Esker
EM	End moraine
ES	Escarpment
FE	Felsenmeer
FJ	Fjord
FP	Flood plain
FT	Fluvial terrace
GM	Ground Moraine
HO	Hogback
HS	Hillside
KA	Kame
KE	Kettle
LO	Lowlands
LP	Lake plain
LS	Low sand ridge
LT	Lake terrace
MA	Marsh
ME	Mesa
MO	Mountainside
MT	Marine terrace

OP	Outwash plain
OT	Outwash terrace
OX	Oxbow
PE	Pediment
PL	Playa
RI	Ridge
RP	Primary ridge top
RS	Secondary ridge top
RU	Primary ridge sideslope
RV	Secondary ridge sideslope
SB	Structural bench
SI	Sink
SL	Slough
SM	Salt marsh
SW	Swamp
UL	Level to undulating upland
UP	Upland
VC	Volcanic cone
VF	Valley floor
VS	Valley side

PEDON CLASSIFICATION

See page 6

WATERTABLEKD KIND

2	Perched
3	Apparent
4	Ground

LU LAND USE

A	Abandoned cropland
C	Cropland
E	Forest land grazed
F	Forest land not grazed
G	Pasture land and native pasture
H	Horticultural land
I	Cropland irrigated
J	Hayland
L	Waste disposal land
M	Coal mined land
N	Barren land
O	Orchards and vineyards
P	Rangeland grazed
Q	Wetlands drained
R	Wetlands
S	Rangeland not grazed
T	Tundra
U	Urban and built up land

ST STONINESS

A	Class 0 (or percent cover)
B	Class 1 (or percent cover)
C	Class 2 (or percent cover)
D	Class 3 (or percent cover)
E	Class 4 (or percent cover)
F	Class 5 (or percent cover)

HC HYDRAULIC CONDUCTIVITY

1	Very low
2	Low
3	Moderately low
4	Moderately high
5	High
6	Very high

DR DRAINAGE CLASS

1	Very poorly drained
2	Poorly drained
3	Somewhat poorly drained
4	Moderately well drained
5	Well drained
6	Somewhat excessively drained
7	Excessively drained

ELEV ELEVATION

Meters

PARENT MATERIALW DEGREE OF WEATHERING

0	Unweathered
1	Slight
2	Moderate
3	Strong

PARENT MATERIALM MODE OF DEPOSITION

A	Alluvium
B	Old alluvium
C	Colluvium
D	Glacial drift
E	Eolian
F	Mine spoil
G	Glacial outwash
H	Volcanic ash
I	Lacustrine sands
J	Lacustrine silts
K	Lacustrine clays
L	Lacustrine
M	Marine
N	Marine sands
O	Organic
P	Marine silts
Q	Marine clays
R	Rock
S	Eolian sand
T	Glacial till
U	Unconsolidated sediments
V	Local colluvium
W	Loess
X	Residuum
Y	Solifluctate
Z	Estuarine

PARENT MATERIAL					
OR	ORIGIN				
A0	Sandstone	I0	Igneous	M8	Slate
A1	Noncalcareous sandstone	I1	Coarse igneous	M9	Quartzite
A2	Arkosic sandstone	I2	Basic igneous	O0	Metarhyolite
A4	Calcareous sandstone	I3	Intermediate igneous	O1	Quartz
A5	Red acid sandstone	I4	Granite	O2	Graphitic schist
A6	Gray & brown acid sandstone	I5	Fine igneous	O3	Mica schist
		I6	Diabase or basalt	O4	Gray hornfels
B0	Interbedded sedimentary	I7	Andesite	P0	Pyroclastic
B1	Limestone-sandstone-shale	I8	Acid igneous rock	P1	Tuff
B2	Limestone-sandstone	I9	Ultrabasic igneous	P2	Acidic tuff
B3	Limestone-shale	K0	Organic	P3	Basic tuff
B4	Limestone-siltstone	K1	Mossy material	P4	Volcanic breccia
B5	Sandstone-shale	K2	Herbaceous material	P5	Acidic breccia
B6	Sandstone-siltstone	K3	Woody material	P6	Basic breccia
B7	Shale-siltstone	K4	Wood fragments	P7	Tuff breccia
B8	Shale & sandstone	K5	Logs and stumps	P8	AA
C0	Conglomerate	K6	Charcoal	P9	Pahoehoe
C1	Noncalcar. conglomerate	K7	Coal	S0	Sedimentary
C2	Calcareous conglomerate	L0	Limestone	S1	Marl
E0	Ejecta ash	L1	Chalk	S2	Glauconite
E1	Acidic ash	L2	Marble	T0	Siltstone
E2	Basic ash	L3	Dolomite	T1	Noncalcareous siltstone
E3	Basaltic ash	L4	Phosphatic limestone	T2	Calcareous siltstone
E4	Andesitic ash	L5	Very sandy limestone	T3	Red acid siltstone
E5	Cinders	L6	Argillaceous limestone	T4	Gray & brown acid siltstone
E6	Pumice	L7	Cherty limestone		
E7	Scoria	L8	Very cherty limestone	Y0	Mixed
E8	Volcanic bombs	L9	Chert	Y1	Noncalcareous mixed
H0	Shale	M0	Metamorphic	Y2	Calcareous mixed
H1	Noncalcareous shale	M1	Gneiss	Y4	Mixed igneous-metamorphic-sedimentary
H2	Calcareous shale	M2	Acidic gneiss		
H3	Clay shale	M3	Basic gneiss	Y5	Mixed igneous-metamorphic
H4	Red acid shale	M4	Serpentine		
H5	Gray & brown acid shale	M5	Phyllite	Y6	Mixed igneous-sedimentary
H6	Red calcareous shale	M6	Acid schist		
		M7	Basic schist	Y7	Mixed metamorphic-sedimentary
BEDROCK		ER			
BRD BEDROCK DIP		WA WATER EROSION CLASS			
Degrees		0	None		
		1	Slight		
BEDROCK		2	Moderate		
BRS BEDROCK STRIKE		3	Severe		
Degrees					
		RN		H	Histic
BEDROCK		OF	RUNOFF CLASS	I	Sombric
BRF BEDROCK FRACTURE		1	None	J	Petrogypsic
1	< 10 cm betw. fractures	2	Ponded	K	Placic
2	10-45 cm betw. fractures	3	Very slow	L	Lithic contact
3	45 cm - 1 m betw. fractures	4	Slow	M	Mollic
4	1.0-2.0 m betw. fractures	5	Moderate	N	Natric
5	> 2.0 m betw. fractures	6	Rapid	O	Ochric
		7	Very rapid	P	Plaggen
				Q	Albic
MOS		DIAGNOSTIC FEATURES			
REG MOSITURE REGIME		KND KIND			
AQ	Aquic	1	Kandic	S	Spodic
AR	Aridic	A	Anthropic	T	Argillic
PA	Peraquic	B	Cambic	U	Umbric
PU	Perudic	C	Calcic	V	Sulfuric
TO	Torrlic	D	Durinodes	W	Paralithic contact
UD	Udic	E	Petrocalcic	X	Oxic
US	Ustic	F	Fragipan	Y	Salic
XE	Xeric	G	Gypsic	Z	Duripan

FLOODING		PONDING		PERM PERMEABILITY CLASS	
FRQ	FREQUENCY CLASS	FRQ	FREQUENCY CLASS		
CO	Common (every 1 - 20 yr)	CO	Common	1	Very slow
FR	Frequent (every 1 - 2 yr)	FR	Frequent	2	Slow
NO	None	NO	None	3	Moderately slow
OC	Occasional (every 2 - 20 yr)	OC	Occasional	4	Moderate
RA	Rare (> every 20 years)	RA	Rare	5	Moderately rapid
				6	Rapid
				7	Very rapid

PA PARAMAT PENNSYLVANIA PARENT MATERIAL

01	Aeolian	05	Igneous rock	11731	Grayish brown acid med/coa Wisc. glacial till
011	Loess	051	Granite	11732	Red acid med/coarse Wisconsinan glacial till
012	Aeolian sands	052	Diabase	11733	Fine, Wisconsinan, acid, glacial till
02	Coastal plain sediments	06	Lacustrine silts and clays	11734	Med/coarse, Wisconsinan, acid, glacial till
03	Colluvium	07	Limestone	1174	Pre-Wisconsinan, acid, glacial till
031	Sandstone colluvium	071	Cherty limestone	11741	Fine, pre-Wisconsinan, acid glacial till
0311	Grayish brown sandstone colluvium	072	Shaley limestone	11742	Med/coa, pre-Wisc., acid, glacial till
0312	Red sandstone colluvium	073	Very cherty limestone	11743	Grayish brown acid pre-Wisc. glacial till
032	Shale colluvium	074	Schisty limestone	118	Non-acid to calcareous glacial till
0321	Grayish brown shale colluvium	075	Very sandy limestone	1183	Wisc., non-acid to calcareous glacial till
0322	Red shale colluvium	08	Metamorphic rock	11831	Fine, Wisc., non-acid to calcareous glacial till
033	Cherty limestone colluvium	081	Schist	11832	Med/coa, Wisc., non-acid to calcareous glacial till
034	Limestone colluvium	0811	Graphitic schist	1184	Pre-Wisc., non-acid to calcareous glacial till
04	Fluvial	082	Gneiss	11841	Fine, pre-Wisc., non-acid to calcar. glacial till
041	Fluvial terrace	083	Slate	11842	Med/coa, pre-Wisc., non-acid to calcar. glacial till
0411	Fine/medium, fluvial terrace	084	Marble	12	Siltstone
04111	Grayish brown find/medium fluvial terrace	085	Quartzite	121	Calcareous siltstone
04112	Red fine/medium fluvial terrace	086	Fanglomerate	122	Acid siltstone
0412	Coarse, fluvial terrace	087	Gray hornfels	13	Chert
04121	Grayish brown coarse fluvial terrace	088	Serpentinite	14	Glacial outwash
04122	Red coarse fluvial terrace	089	Metarhyolite	141	Grayish brown glacial outwash
042	Floodplain	09	Sandstone	142	Red glacial outwash
0421	Fine and medium textured floodplain	091	Grayish brown sandstone	11744	Red acid pre-Wisc. glacial till
04211	Grayish brown fine and medium textured floodplain	092	Red sandstone		
04212	Red fine and medium textured floodplain	10	Shale		
0422	Coarse textured floodplain	105	Acid shale		
04221	Grayish brown coarse textured floodplain	1051	Grayish brown acid shale		
04222	Red coarse textured floodplain	1052	Red acid shale		
		106	Calcareous shale		
		1061	Grayish brown calcareous shale		
		1062	Red calcareous shale		
		11	Glacial till		
		117	Acid glacial till		
		1173	Wisconsinan, acid, glacial till		

VEGETATION SPECIES

Alders	ALNUS	Black Locust	ROPS		SH
Alfalfa	MESA	Black Oak	QUVE	Buckhorn Plantain	PLLA
American Beech	FAGR	Black Spruce	PIMA	Buttercup	RANUN
American Elm	ULAM	Black Willow	SANI	Butternut	JUCI
Amer. Hornbeam	CACA18	Blackberry	RUHA	Canada Bluegrass	POCO
Annual Forbs	FORBS	Blackgum	NYSY	Canada Thistle	CIAR4
Apple	MALUS	Blackhaw	VIPR	Cattail	TYPHA
Ash	FRAXI	Blueberry	VACCI	Cedar	CEDRU
Asters	ASTER	Bluegrass	POA	Cheatgrass	BRTE
Austrian Pine	PINI	Bluestem	ANDRO2	Cherry	PRUNU
Balsam Fir	ABBA	Boneset	BONE	Chestnut	CHNUT
Barley	HORDE	Bracken Fern		Chestnut Grass	CHGR
Basswood	TILIA				
Beech	FAGUS	Bromegrass			
Birch	BETUL				
Birdsfoot Trefoil	LOCO6				
Bitternut Hickory	CACO15	Broom Sedge			
Black Birch	BELE				
Black Cherry	PRSE2	Brush			

APPENDIX A-1 (Continued)

Chestnut Oak	QUPR2	Oats	AVENA	Understory	UNDER
Chickory	CICHO	Orchardgrass	DAGL	Viburnum	VIBUR
Chickweed	CERAS	Paper Birch	BEPA	Violets	VIOLA
Cinquefoil	POTEN	Partridgeberry	MIRE	Virginia Creeper	PAQU2
Clovers	TRIFO	Peach	PEACH	Virginia Pine	PIVI2
Clubmoss	LYCOP2	Pennycress	THLAS	Walnut	JUGLA
Coltsfoot	COLTF	Pin Oak	QUPA2	Weeds	WEED
Common Mullein	VETH	Pines	PINUS	Wheat	TRAE
Conifers	CONI	Pitch Pine	PIRI	White Ash	FRAM2
Corn	ZEMA	Plantains	PLANT	White Birch	BEPE2
Cottongrass	COGR	Poison Ivy	RHRA	White Clover	TRRE3
Crabapple	CRAB	Poke	POKE	White Oak	QUAL
Cranberry	VAMA	Poplar	POPUL	Wild Carrot	DACA6
Crownvetch	COVA2	Potato	SOTU	Wild Garlic	ALVI
Cucumbertree	MAAC	Poverty Grass	POVG	Wild Grape	VITIS
Curly Dock	RUCR	Princes Pine	CHUM	Wild Mustard	BRKAP
Daisy	ERIGE2	Quackgrass	AGRE2	Wild Onion	ALLIU
Dandelion	TARAX	Quaking Aspen	POTR5	Willow	SALIX
Deertongue	DETO	Ragweed	AMPU4	Wintergreen	GAPR2
Dogwood	CORNU	Raspberry	RUBUS	Witchazel	HAVI4
Dropseed	SPORO	Red Birch	REBE	Yarrow	ACHIL
Eastern Hemlock	TSCA	Red Clover	TRPR2	Yellow Birch	BEAL2
Eastern Redcedar	JUVI	Red Fescue	FERU2		
East. White Pine	PIST	Red Maple	ACRU		
Elderberry	SAMBU	Red Oak	QURU		
Elm	ULMUS	Red Pine	PIRE		
False Spikenard	FASP	Redtop	AGAL3		
Ferns	POLYS	Reed Canarygrass	PHAR3		
Fire Cherry	FICH	Rhododendron	RHODO		
Foxtail	ALOPE	Rose	ROSA		
Golden Thread	GOTH	Rushes	JUNCU		
Goldenrod	SOLID	Ryegrass	LOLIU		
Grass	GRAS	Sassafras	SAAL5		
Gray Birch	BEPO	Scarlet Oak	QUCO2		
Greenbrier	SMILA2	Scotch Pine	PISY		
Hackberry	CELT1	Scrub Oak	SCROK		
Hardwoods	HARD	Sedges	CAREX		
Hawkweeds	HIERA	Serviceberry	AMELA		
Hawthorn	CRATA	Shadbush	AMAR3		
Hay	HAY	Shagbark Hickory	CAOV2		
Hazelnut	COCO6	Sheep Laurel	SHPLR		
Hickory	CARYA	Sheep Sorrel	RUAC3		
Honeysuckle	LONIC	Silky Cornel	SILCO		
Horsenettle	SOCA3	Silver Maple	ACSA2		
Huckleberry	GAYLU	Skunk Cabbage	VECA2		
Ironweed	VERNO	Smartweed	POLA4		
Ironwood	OLTE	Solomonseal	POPU4		
Jack Pine	PIBA2	Soybeans	SOY		
Japanese		Spearmint	MESP3		
Flase Flower	JFFL	Sphagnum Moss	SPHAG		
Japanese Larch	LAKA	Spireas	SPIRA		
Jewelweed	IMNO	Spruce	PICEA		
Juneberry	AMPA2	Stinging Nettle	URDI		
Ky. Bluegrass	POPR	Strawberry	FRAGA		
Lambkill	LAMKL	Striped Maple	ACPE		
Locusts	ROBIN	Sudangrass	SOSV		
Lovegrass	ERAGR	Sugar Maple	ACSA3		
Lycopodium	LYCOP2	Sumac	RHUS		
Maples	ACER	Sundew	DROSE		
May-apple	POPE	Swampgrass	HESC		
Milkweed	ASCLE	Sweet Vernal	ANOD		
Mockernut		Sweet-fern	MYAS		
Hickory	CATO6	Sweetgum	LIST2		
Moonshine Grass	DACOM	Tall Fescue	FEAR3		
Mosses	MOSS	Thornapple	THOAP		
Mountain Laurel	KALA	Timothy		PHL	
Muhly	MUHLE			EU	
Northern Dewberry		Trailing Arbutus	EPRE2		
Norway Spruce	PIAB	Trillium		TRI	
Nutgrass	CYPER			LL	
Oaks	QUERC	Tulip Poplar	LITU		

PEDON CLASSIFICATION
GG GREATGROUP

AAQAL	Albaqualf	EPSXE	Xeropsamment	MUSHA	Haplustoll
AAQDU	Duraqualf	HFIBO	Borofibrist	MUSNA	Natrustoll
AAQFR	Fragiaqualf	HFICR	Cryofibrist	MUSPA	Paleustoll
AAQGL	Glossaqualf	HFILU	Luvifibrist	MUSVE	Vermustoll
AAQKA	Kandiaqualf	HFIME	Medifibrist	MXEAR	Argixeroll
AAQNA	Natraqualf	HFISP	Sphagnofibrist	MXECA	Calcixeroll
AAQOC	Ochraqualf	HFITR	Tropofibrist	MXEDU	Durixeroll
AAQPN	Plinthaqualf	HFOBO	Borofolist	MXEHA	Haploxaeroll
AAQUM	Umbraqualf	HFOCR	Cryofolist	MXENA	Natrixeroll
ABOCR	Cryoboralf	HFOTR	Tropofolist	MXEPA	Palexeroll
ABOEU	Eutrobotalf	HHEBO	Borochemist	OAQAC	Acraquox
ABOFR	Fragiboralf	HHECR	Cryochemist	OAEU	Eutraquox
ABOGL	Glossoboralf	HHELU	Luvihemist	OAQHA	Haplaquox
ABONA	Natriboralf	HHEME	Medihemist	OAQPN	Plinthaquox
ABOPA	Palebotalf	HHESI	Sulfihemist	OPRAC	Acroperox
AUDAG	Agrudalf	HHESO	Sulfohemist	OPREU	Eutroperox
AUDFE	Ferrudalf	HHETR	Tropohemist	OPRHA	Haploperox
AUDFR	Fragiudalf	HSABO	Borosaprist	OPRKA	Kandiperox
AUDFS	Fraglossudalf	HSACR	Cryosaprist	OPRSO	Sombriperox
AUDGL	Glossudalf	HSAME	Medisaprist	OTOAC	Acritorrox
AUDHA	Hapludalf	HSATR	Troposaprist	OTOEU	Eutrotorrox
AUDKA	Kandiudalf	IANCR	Cryandep	OTOHA	Haplotorrox
AUDKH	Kandhalpludalf	IANDU	Durandep	OUDAC	Acrurox
AUDNA	Natrudalf	IANDY	Dystrandep	OUDEU	Eutrudox
AUDPA	Paleudalf	IANEU	Eutrandep	OUDDA	Hapludox
AUDRH	Rhodualf	IANHY	Hydrandep	OUDDA	Kandiudox
AUSDU	Durustalf	IANPK	Placandep	OUDDO	Sombriudox
AUSHA	Haplustalf	IANVI	Vitrandep	OUSAC	Acrustox
AUSKA	Kandiustalf	IAQAN	Andaquept	OUSEU	Eustrustox
AUSKH	Kandhaplustalf	IAQCR	Cryaquept	OUSHA	Haplustox
AUSNA	Natrustalf	IAQFR	Fragiaquept	OUDDA	Kandiustox
AUSPA	Paleustalf	IAQHL	Halaquept	OUSSO	Sombriustox
AUSPN	Plinthustalf	IAQHP	Haplaquept	SAQCR	Cryaquod
AUSRH	Rhodustalf	IAQHU	Humaquept	SAQDU	Duraquod
AXEDU	Durixeralf	IAQPK	Placaquept	SAQFR	Fragiaquod
AXEFR	Fragixeralf	IAQPN	Plinthaquept	SAQHA	Haplaquod
AXEHA	Haploxaeralf	IAQSU	Sulfaquept	SAQPK	Placaquod
AXENA	Natrixeralf	IAQTR	Tropaquept	SAQSI	Sideraquod
AXEPA	Palexeralf	IOCCR	Cryochrept	SAQTR	Tropaquod
AXEPN	Plinthoxeralf	IOCDU	Durochrept		
AXERH	Rhodoxeralf	IOCDY	Dystrochrept		
DARDU	Durargid	IOCEU	Eutrochrept		
DARHA	Haplargid	IOCFR	Fragiochrept		
DARND	Nadurargid	IOCUS	Ustochrept		
DARNT	Natrargid	IOCXE	Xerochrept		
DARPA	Paleargid	IPLPL	Plaggept		
DORCL	Calciorthid	ITRDY	Dystropept		
DORCM	Cambiorthid	ITREU	Eutropept		
DORDU	Durorthid	ITRHU	Humitropept		
DORGY	Gypsiorthid	ITRSO	Sombritropept		
DORPA	Paleorthid	ITRUS	Ustropept		
DORSA	Salorthid	IUMCR	Cryumbrept		
EAQCR	Cryaquept	IUMFR	Fragiumbrept		
EAQFL	Fluvaquept	IUMHA	Haplumbrept		
EAQHA	Haplaquept	IUMXE	Xerumbrept		
EAQHY	Hydraquept	MALAR	Argialboll		
EAQPS	Psammaquept	MALNA	Natralboll		
EAQSU	Sulfaquept	MAQAR	Argiaquoll		
EAQTR	Tropaquept	MAQCA	Calciaquoll		
EARAR	Arent	MAQCR	Cryaquoll		
EFLCR	Cryofluvent	MAQDU	Duraquoll		
EFLTO	Torrifluvent	MAQHA	Haplaquoll		
EFLTR	Tropofluvent	MAQNA	Natraquoll		
EFLUD	Udifluvent	MBOAR	Argiboroll		
EFLUS	Ustifluvent	MBOCA	Calciboroll		
EFLXE	Xerofluvent	MBOCR	Cryoboroll		
EORCR	Cryorthent	MBOHA	Haploboroll		
EORTO	Torrifluvent	MBONA	Natriboroll		
EORTR	Troporthent	MBOPA	Paleboll		
EORUD	Udorthent	MBOVE	Vermiboroll		
EORUS	Ustorthent	MRERE	Rendoll		
EORXE	Xerorthent	MUDAR	Argiudoll		
EPSCR	Cryopsamment	MUDHA	Hapludoll		
EPSQU	Quartzipsamment	MUDPA	Paleudoll		
EPSTO	Torrripsamment	MUDVE	Vermudoll		
EPSTR	Tropopsamment	MUSAR	Argiudoll		
EPSUD	Udipsamment	MUSCA	Calciustoll		
EPSUS	Ustipsamment	MUSDU	Durustoll		

APPENDIX A-1 (Continued)

SFEFE	Ferrod	UAQKH	Kandhaplaquult	UUDPA	Paleudult
SHUCR	Cryohumod	UAQOC	Ochraquult	UUDPN	Plinthudult
SHUFR	Fragihumod	UAQPA	Paleaquult	UUDRH	Rhodudult
SHUHA	Haplohumod	UAQPN	Plinthaquult	UUSHA	Haplustult
SHUPK	Placohumod	UAQUM	Umbraquult	UUSKA	Kandiustult
SHUTR	Tropohumod	UHUHA	Haplohumult	UUSKH	Kandhaplustult
SORCR	Cryorthod	UHUKA	Kandihumult	UUSPA	Paleustult
SORFR	Fragiorthod	UHUKH	Kandhaplohumult	UUSPN	Plinthustult
SORHA	Haploorthod	UHUPN	Plinthohumult	UUSRH	Rhodustult
SORPK	Placorthod	UHUSO	Sombrihumult	UXEHA	Haploxerult
SORTR	Troporthod	UUDFR	Fragiudult	UXEPA	Palexerult
UAQAL	Albaquult	UUDHA	Hapludult	VTOTO	Torrert
UAQFR	Fragiaquult	UUDKA	Kandiudult	VUDCH	Chromudert
UAQKA	Kandiaquult	UUDKH	Kandhapludult	VUDPE	Pelludert

PEDON CLASSIFICATION
SG SUBGROUP

AB	Abruptic	B006	Borollic	HA09	Hapludic
AB04	Abruptic aridic	B010	Borollic lithic	HA12	Hapludollic
AB08	Abruptic cryic	BO	Boralfic	HA16	Haplustollic
AB10	Abruptic haplic	BO04	Boralfic udic	HE	Hemic
AB14	Abruptic ultic	BO08	Borollic glossic	HE02	Hemic terric
AB16	Abruptic xerollic	BO12	Borollic vertic	HI	Histic
AE	Aeric	CA	Calcic	LI05	Lithic pergelic
AE03	Aeric arenic	CA04	Calcic pachic	HI02	Histic lithic
AE05	Aeric grossarenic	CA06	Calciorthidic	HI06	Histic pergelic
AE06	Aeric humic	CA10	Calcixerollic	HU	Humic
AE08	Aeric mollic	CA20	Cambic	HU02	Humic lithic
AE09	Aeric tropic	CH	Chromic	HU05	Humic pergelic
AE10	Aeric umbric	AQ07	Aquic anionic	IN	Inceptic
AA	Typic	CR	Cryic	HU10	Humaqueptic
AL	Albaquic	CR10	Cryic lithic	HY	Hydric
AL02	Albaquultic	CR14	Cyric pachic	HY02	Hydric lithic
AL04	Albic	CU	Cumulic	LE	Leptic
AL08	Albic glossic	CU02	Cumulic udic	LI	Limnic
AL10	Alfic	CU04	Cumulic ultic	LI02	Lithic
AL12	Alfic arenic	DU	Durargidic	LI04	Lithic mollic
AL13	Alfic andeptic	DU02	Duric	LI06	Lithic ruptic-alphic
AL16	Alfic lithic	DU08	Durixerollic	LI07	Lithic ruptic-argic
AN	Andic	AN25	Anionic	LI08	Lithic ruptic-entic -xerollic
AN01	Andeptic	DU10	Durixerollic lithic	LI09	Lithic ruptic-entic
AN03	Andaquic	AQ11	Aqueptic	KA	Kandic
AN06	Andic dystic	DU12	Durothidic		
AN11	Andeptic glossoboric	DU14	Durorthidic xeric		
AN22	Andic ustic	DY02	Dystric		
AN24	Andaqueptic	DY03	Dystric entic		
AN30	Anthropic	DY04	Dystric fluventic		
AQ	Aqualfic	DY06	Dystric lithic		
AQ02	Aquentic	AN20	Andic udic		
AQ06	Aquic	EN	Entic		
AQ14	Aquic duric	EN02	Entic lithic		
AQ16	Aquic duriorthidic	EN06	Entic ultic		
AQ18	Aquic dystic	EP	Epiaquic		
AQ24	Aquic haplic	AN08	Andic epiaquic		
AQ26	Aquic lithic	EU02	Eutrochreptic		
AQ28	Aquic petroferric	EU04	Eutropeptic		
AQ34	Aquollic	FE	Ferrudalfic		
AQ36	Aquultic	FI	Fibric		
AR	Arenic	FI02	Fibric terric		
AR04	Arenic plinthaquic	FL02	FLuvaquentic		
AR02	Arenic aridic	FL06	Fluventic		
AR06	Arenic plinthic	FL12	Fluventic umbric		
AR08	Arenic rhodic	FR10	Fragiaquic		
AR10	Arenic ultic	FR18	Fragic		
AR14	Arenic umbric	GL02	Glossaquic		
AR16	Arenuc ustalfic	GL04	Glossic		
AR18	Arenic ustollic	GL10	Glossic udic		
AR22	Argiaquic	GL12	Glossic ustollic		
AR24	Argiaquic xeric	GY	Gypsic		
AR26	Argic	GL16	Glossoboric		
AR28	Argic lithic	GR	Grossarenic		
AR30	Argic pachic	GR01	Grossarenic entic		
AR32	Argic vertic	GR04	Grossarenic plinthic		
AR34	Aridic	HA	Haplaquodic		
AR36	Aridic calcic	HU15	Humic rhodic		
AR42	Aridic duric	HA02	Haplic		
AQ08	Aquic arenic	HU20	Humic Xanthic		
AR52	Aridic petrocalcic	LI03	Lithic petrocalcic		
B002	Boralfic lithic	HA07	Haploxerollic		

APPENDIX A-1 (Continued)

LI11	Lithic ruptic-xerothentic	PK12	Plaggic	TR04	Tropic
LI12	Lithic ultic	PL	Plinthudic	TO	Torrertic
LI13	Lithic ruptic-ultic	PL04	Plinthic	UD	Udertic
LI14	Lithic umbric	PS	Psammaquentic	UD01	Udalfic
LI15	Lithic ruptic-xerochreptic	PS02	Psammentic	UD02	Udic
LI16	Lithic ustic	QU	Quartzipsammentic	UD03	Udollic
LI18	Lithic ustollic	RE	Rendollic	UD05	Udorthentic
LI22	Lithic xeric	RH	Rhodic	KH	Kandhaplic
LI24	Lithic xerollic	RU02	Ruptic-alfic	UL	Ultic
MO	Mollic	RU09	Ruptic-lithic	UM	Umbreptic
NA06	Natric	RU11	Ruptic-lithic-entic	UM02	Umbric
OC	Ochreptic	RU15	Ruptic-lithic-xerochreptic	US	Ustalfic
OR	Orthidic	RU17	Ruptic-ultic	US02	Ustertic
OR01	Orthic	RU19	Ruptic-vertic	US04	Ustic
OR02	Orthoxic	SA	Salorthidic	US06	Ustochreptic
OX	Oxic	SA02	Sapric	US08	UStollic
PA	Pachic	SA04	Sapric terric	US12	Ustoxic
PA02	Pachic udic	SI	Sideric	VE02	Vertic
PA04	Pachic ultic	SO	Sombric	VE	Vermic
KA02	Kandiudalfic	SP	Sphagnic	XE	Xeralfic
PA08	Paleustollic	SP02	Sphagnic terric	XE02	Xerertic
PA10	Palexerollic	SP04	Spodic	XE04	Xeric
PE	Pergelic	SU	Suflic	XE08	Xerollic
PE01	Pergelic ruptic-histic	TE	Terric	AQ04	Aqueptic
PE02	Pergelic sideric	TH04	Thapto-histic	XA	Xanthic
PE04	Petrocalcic	TH06	Thapto-histic tropic	PL06	Plinthudic
PE06	Petrocalcic ustalfic	TO02	Torrifluventic	LE	Leptic
PE08	Petrocalcic ustollic	TO04	Torriorthentic	AC	Acric
PE14	Petrocalcic xerollic	TO06	Torripsammentic	AC05	Acric Plinthic
PE16	Petroferric	TO10	Torroxic		
PE20	Petrogypsic	TR	Tropaquodic		
PK	Placic	KA04	Kandiustalfic		
PK10	Plaggeptic				

PEDON CLASSIFICATION

PSC	PARTICLE SIZE CLASS		
010	Medial	044	Sandy-skeletal
102	Fine-loamy over clayey	046	Sandy-skeletal over loamy
108	Fine-silty over fragmental	047	Sandy-skeletal over clayey
011	Medial-skeletal	005	Ashy
110	Fine-silty over sandy or sandy-skeletal	050	Loamy-skeletal
112	Fine-silty over clayey	051	Loamy-skeletal over fragmental
114	Clayey	052	Loamy-skeletal over sandy
116	Clayey over fragmental	054	Loamy-skeletal over clayey
118	Clayey over sandy or sandy-skeletal	056	Clayey-skeletal
012	Medial over cindery	058	Clayey-skeletal over sandy
120	Clayey over loamy-skeleta	006	Cindery over loamy
122	Clayey over fine-silty	062	Sandy
124	Clayey over loamy	063	Sandy over sandy-skeletal
126	Fine	064	Sandy over loamy
013	Ashy over loamy-skeletal	066	Sandy over clayey
134	Very fine	068	Loamy
014	Medial over clayey	007	Ashy over cindery
015	Cindery over medial-skeletal	072	Loamy over sandy or sandy-skeletal
016	Medial over fragmental	008	Ashy over loamy
017	Cindery over medial	080	Coarse-loamy
018	Medial over loamy	084	Coarse-loamy over sandy or sandy-skeletal
019	Ashy over medial	086	Coarse-loamy over clayey
020	Medial over loamy-skeletal	088	Coarse-silty
022	Medial over sandy or sandy-skeletal	009	Ashy-skeletal
024	Medial over thixotropic	003	Cindery
026	Thixotropic	090	Coarse-silty over fragmental
027	Thixotropic-skeletal	092	Coarse-silty over sandy or sandy-skeletal
028	Thixotropic over fragmental	094	Coarse-silty over clayey
030	Thixotropic over sandy or sandy-skeletal	096	Fine-loamy
032	Thixotropic over loamy-skeletal	098	Fine-loamy over fragmental
034	Thixotropic over loamy	082	Coarse-loamy over fragmental
036	Fragmental	097	Fine-loamy over cindery
004	Cindery over sandy or sandy-skeletal	100	Fine-loamy over sandy or sandy-skeletal
		106	Fine-silty

PEDON CLASSIFICATION

MIN	MINEROLOGY CLASS
03	illitic
05	carbonatic
16	ferruginous
08	coprogenous
10	diatomoaceous
12	ferrihumic
14	ferritic
18	gibbsitic
47	siliceous (calcareous)
20	glauconitic
22	gypsic
24	halloysitic
26	illitic
27	illitic (calcareous)
28	kaolinitic
30	marly
32	micaceous
34	mixed
35	mixed (calcareous)
37	montmorillonitic
38	montmorillonitic (calcareous)
40	oxidic
44	serpentinitic
46	siliceous
50	vermiculitic
09	chloritic

PEDON CLASSIFICATION

10	isohyperthermic
12	isomesic
14	isothermic
16	mesic
18	thermic
04	frigid
06	hyperthermic
08	isofrigid
PEDON CLASSIFICATION	
RX SOIL REACTION	
10	euic
12	nonacid
14	noncalcareous
06	allic
04	acid
08	dysic

PEDON CLASSIFICATION

OTH	OTHER
12	ortstein
14	shallow
15	shallow & coated
16	sloping
17	shallow & uncoated
20	uncoated
04	coated
05	cracked
06	level
08	micro

PEDON CLASSIFICATION

TMP SOIL TEMPERATURE

APPENDIX A. Site and Horizon Codes and Forms

2. Site form

Pennsylvania State University
Soil Characterization Laboratory

SOIL NUMBER _____

SITE _____

PAGE 1 OF 1

SOIL SERIES			DATE MO/DA/YR		SITE ID ST CNT UNI S PA			LATITUDE DEG MIN SEC DIR N			LONGITUDE DEG MIN SEC DIR W								
ID	SYMB	NOTE ID	TRAN ID	YLD ID	PHOTO#	SAMPLE #		DT	PT	PREVIOUS NAME									
SLP %	SHP U	G A	H M	ASP S	SLP DEG	LENGTH ABOVE	MICRO K	SLP A	PHYS POS	PEDON CLASSIFICATION O SO GG SG PSC MIN RX TMP OTH									
PRECIP	WATERTABLE DEPH DAYS		L U	S T	H C	D R	ELEV	1 PARENT W M OR		2 W M OR		3 MATERIAL W M OR		4 W M OR		BEDROCK BRD BRS BRF			
AVG ANN			AIR SUM		TEMP WIN		AVG ANN		SOIL SUM		TEMP WIN		MOS REG	WEATHER STN #		CONTROL SEC DEP		ER WA	RN OF
DEPTH KND		DIAGNOSTIC FEATURES			DEPTH KND		DEPTH KND		DEPTH KND		DEPTH KND		FLOODING FRQ MO DAYS		PONDING FRQ MO DAYS				

PERM
-
PA PARMAT

VEGETATION SPECIES				
1	2	3	4	5
-----	-----	-----	-----	-----
6	7	8	9	10
-----	-----	-----	-----	-----

PLOWED
-

GEOGRAPHICALLY ASSOCIATED SOILS	
1	2
-----	-----
3	4
-----	-----

TOWNSHIP _____ USGS 7.5' QUAD _____

DESCRIBERS NAMES _____

DESCRIPTION LOCATION _____

NOTES _____

PENNSYLVANIA STATE UNIVERSITY
 SOIL CHARACTERIZATION LABORATORY
 LISTING OF HORIZON CODES
 APRIL 11, 1991

COLOR		TEXTURE CLASS		TEXTURE	
LO	LOCATION	C		MOD	MODIFIER
0	not given	CE	coprogenous earth	BY	bouldery
1	matrix	CIND	cinders	BYV	very bouldery
2	ped faces	CL	clay loam	BYX	extremely bouldery
3	crushed	COS	coarse sand	CB	cobbly
4	dithionite-citrate pretreated	COSL	coarse sandy loam	CBV	very cobbly
5	after exposure to air	COSL	coarse sandy clay loam	CBX	extremely cobbly
6	after ignition	DE	diatomaceous earth	CN	channery
7	pyrophosphate extract	DOM	decomposed organic matter (sapric)	CNV	very channery
8	prism faces	FB	fibric material	CNX	extremely channery
9	zone just inside prism face	FM	fragmental material	CR	cherty
		FS	fine sand	CRC	coarse cherty
		FSL	fine sandy loam	CRV	very cherty
		G	gravel	CRX	extremely cherty
		GYP	gypsiferous earth	CVA	angular cobbly
		HM	hemic material	FL	flaggy
		ICE	ice or frozen soil	FLV	very flaggy
		L	loam	FLX	extremely flaggy
		LCOS	loamy coarse sand	GR	gravelly
		LFS	loamy fine sand	GRC	coarse gravelly
		LS	loamy sand	GRF	fine gravelly
		LVFS	loamy very fine sand	GRV	very gravelly
		MARL	marl	GRX	extremely gravelly
		MPT	mucky peat	GY	gritty
		MUCK	muck	GYV	very gritty
		OPWD	oxide protected weathered rock	GYX	extremely gritty
		PDOM	partially decomposed organic material (hemic)	HV	heavy
		PEAT	peat	LT	light
		S	sand	MK	mucky
		SC	sandy clay	PT	peaty
		SCL	sandy clay loam	SH	shaly
		SG	sand and gravel	SHV	very shaly
		SI	silt	SHX	extremely shaly
		SIC	silty clay	SR	stratified
		SICL	silty clay loam	ST	stony
		SIL	silt loam	STV	very stony
		SL	sandy loam	STX	extremely stony
		SP	sapric material	SY	slaty
		U	unkown texture	SYV	very slaty
		UDOM	undecomposed organic material (fibric)	SYX	extremely slaty
		UWB	unweathered bedrock	<u>ROCK FRAGMENT MOD</u>	
		VAR	variable	<15%	none
		VFS	very fine sand	15-35%	class name
		VFSL	very fine sandy loam	35-60%	very + name
		WB	weathered bedrock	>60%	extremely + name

APPENDIX A-3 (Continued)

Pennsylvania State University
Soil Characterization Laboratory

SOIL NUMBER HORIZON PAGE 1 OF 4

	SOIL NUMBER				VOL% LAT TOT	THICK NESS	DRY COLOR					MOIST COLOR					TEXTURE	
	DEPH UP LOW	D I S	HORIZON MAST LETT	SUFIX			L	O	%	HUE	V	C	L	O	%	HUE	V	C
1	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
2	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
3	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
4	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
5	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
6	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
7	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
8	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
9	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
10	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
11	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---
12	---	-	---	---	---	a b c	---	---	---	-	-	---	---	-	-	---	---	---

APPENDIX A-3 (Continued)

STRUCTURE	
GR	GRADE
0	structureless
1	weak
2	moderate
3	strong
4	very strong
5	weak & moderate
6	moderate & strong
7	structureless to weak
8	weak to moderate
9	moderate to strong

STRUCTURE	
SZ	SIZE
CO	coarse
CV	coarse & very coarse
F	fine
FF	very fine and fine
FM	fine and medium
M	medium
MC	medium & coarse
TK	thick
TN	thin
VC	very coarse
VF	very fine
VK	very thick
VN	very thin

STRUCTURE	
SHP	SHAPE
ABK	angular blocky structure
BK	blocky structure
COL	columnar struc.
CR	crumb structure
GR	granular structure
MA	massive
PL	platy structure
PR	prismatic struc.
SBK	subangular blocky structure
SGR	single grain

use lower case letters with 2nd structure shape to indicate parts to

CONSISTENCE	
M	MOIST
EFI	extremely firm
FI	firm
FR	friable
L	loose
VFI	very firm
VFR	very friable

CONSISTENCE	
D	DRY
EH	extremely hard dry
H	hard dry
L	loose dry
S	soft dry
SH	slightly hard dry
VH	very hard dry

CONSISTENCE	
O	OTHER
B	brittle
CO	uncemented
D	deformable
I	indurated
MS	moderately smeary
R	rigid
SC	strongly cemented
SD	semi deformable
SM	smeary
VR	very rigid
VWC	very weakly cemented
WC	weakly cemented
WSM	weakly smeary

CONSISTENCE	
ST	STICKINESS
S	moderately sticky
SO	non sticky
SS	slightly sticky
VS	very sticky

CONSISTENCE	
PL	PLASTICITY
P	moderately plastic
PO	non plastic
SP	slightly plastic
VP	very plastic

CONSISTENCE	
CEM	CEMENTATION
H	humus cemented
I	iron cemented
L	lime cemented
S	silica cemented
X	lime and silica cemented

RUPTURE RESISTENCE	
RUP	
ES	extremely strong
EW	extremely weak
M	moderate
S	strong
VS	very strong
VW	very weak
W	weak

PENETRATION RESISTENCE	
PENT	
H	high micro-penetrometer resistance
L	low micro-penetrometer resistance
M	moderate micro-penetrometer resistance
VH	very high micro-penetrometer resistance
VL	very low micro-penetrometer resistance

MOTTLES	
AB	ABUNDANCE
C	common (or percent cover)
F	few (or percent cover)
M	many (or percent cover)

MOTTLES	
SZ	SIZE
1	fine
12	fine & medium
2	medium
23	medium & coarse
3	coarse

MOTTLES	
CT	CONTRAST
D	distinct
F	faint
P	prominent

SURFACE FEATURES	
KD	KIND
A	skeletans over cutans
B	black stains
C	chalcedony or opal
D	clay bridging
G	gibbsite coats
I	iron stains
K	intersecting slickensides
L	lime or carbonate coats
M	iron-manganese coatings
O	organic coatings
P	pressure faces
Q	nonintersecting slickensides
S	skeletans (sand or silt)
T	clay films
U	coatings
V	thin clay films
W	moderately thick clay films
X	oxide coats
Z	thick clay films

SURFACE FEATURES	
AB	ABUNDANCE
C	common (or percent cover)
F	few (or percent cover)
M	many (or percent cover)
V	very few (or percent cover)

SURFACE FEATURES	
CN	CONTINUITY
C	continuous
D	discontinuous
P	patchy

SURFACE FEATURES	
DI	DISTINCTNESS
D	distinct
F	faint
P	prominent

SURFACE FEATURES	
LO	LOCATION
B	between sand grains
C	on tops of columns
F	on faces of peds and in pores
H	on horizontal faces of peds
I	in root channels and/or pores
J	in pores
L	on lower surfaces of peds or stones
M	on bottoms of plates
N	on nodules
P	on faces of peds
R	on rock fragments
S	on sand and gravel
T	throughout
U	on upper surfaces of peds or stones
V	on vertical faces of peds
Z	on vertical and horizontal faces of peds

BOUNDARY	
D	DISTINCTNESS
A	abrupt
C	clear
D	diffuse
G	gradual

BOUNDARY	
T	TOPOGRAPHY
B	broken boundary
I	irregular boundary
S	smooth boundary
W	wavy boundary

APPENDIX A-3 (Continued)

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SOIL NUMBER

HORIZON

PAGE 2 OF 4

	STRUCTURE			CONSISTENCE				RUP	MOTTLES					SURFACE FEATURES				BOU					
	R	SZ	SHP	MOIST DRY	STICKY OTH	PLASTIC	CEM		AB	SZ	T	HUE	V	C	D	AB	N	I	O	HUE	V	C	D
1	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	M	-	ST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	D	-	PL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	O	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX A-3 (Continued)

<u>EFFER EFFERVESCENT CLASS</u>		<u>ROOTS QUANTITY</u>		<u>CONCENTRATIONS KD KIND</u>		<u>ROCK FRAGMENTS SZ SIZE</u>	
0	v. slightly efferv.	C	common (1 to 5 / 1 or 10 sq cm)	A2	clay bodies	10	gravel 2-76 mm
1	slightly efferv.			B1	barite crystals	11	flat grav 2-76 mm
2	strongly efferv.	CM	common to many	B2	soft masses- barite	12	gravel 2-19 mm
3	violently efferv.	F	few (< 1 / 1 or 10 sq cm)	C1	calcite crystals	13	flat grav 2-19 mm
		FC	few to common	C2	soft masses-lime	14	gravel 19-76 mm
<u>EFFER EFFERVESCENT AGENT</u>	<u>AGENT</u>	FF	very few to few	C3	line concretions	15	flat grav 19-76 mm
A	in HCL	M	many (> 5 / 1 or 10 sq cm)	C4	lime nodules	20	cobbles 7.6-25 cm
I	in 1 normal HCL	VF	very few	D1	mica flakes	21	flat cobbles 7.6-25 cm
O	in 3-4% H2O2			D2	soft dark masses	30	stones 25-60 cm
P	in H2O2			D3	dark concretions	31	flat stones 25-60 cm
				D4	dark nodules	40	boulders >60 cm
		<u>SZ</u>	<u>ROOTS - SIZE</u>	E3	gibbsite concr.	41	flat boulders >60 cm
<u>EFFER EFFERVESCENT EXTENT</u>	<u>EXTENT</u>	1	fine 1-2 mm	E4	gibbsite nodules	50	channers 2-150 mm
C	continuous	11	v. fine & fine	F1	plinthite segreg.	60	flagstones 15-38 cm
D	discontinuous	12	fine & med.	F2	soft masses-iron	70	stones 38-60 cm
		13	fine to coarse	F3	iron concretions	80	> 7.6 cm
<u>FLD MSR PROP FIELD MEASURED PROPERTY</u>	<u>FIELD MEASURED PROPERTY</u>	2	medium 2-5 mm	F4	ironstone nodules	81	> 25 cm
KD	KIND	23	medium & coarse	G1	gypsum crystals	RF	rock fragments
GF	clay wt. pct. <20 mm base 5-2 mm fragments	3	coarse 5-10 mm	G2	masses-gypsum		
		4	v. coa. > 10 mm	G3	nests of gypsum		
GM	wt. pct. <20 mm base 20-5 mm fragments	<u>LO</u>	<u>ROOT LOCATION</u>	G4	gypsum threads		
		C	in cracks	H1	halite crystals		
GW	wt. pct. <20 mm base 20-2 mm fragments	M	mat - top of horiz. between peds	H2	salt masses		
		P	between peds	K2	masses- carbonate		
OB	fiber unrubbed	S	mat around stones throughout	K3	carbonate concr.		
OR	rubbed fiber	T		K4	carbonate nodules		
PB	bromthymol blue pH			K5	carbonate threads		
PC	resol red pH	<u>PORES</u>		M1	nonmagnetic shot		
PG	bromocresol green pH	<u>SH</u>	<u>SHAPE</u>	M2	soft masses Fe-Mn		
PH	pH	IE	pores filled with coarse material	M3	Fe-Nn concret.		
PL	LaMotte-Morgan pH	IF	void betw. rock frag.	M4	magnetic shot		
PM	1:1 water meter pH	IR	interstitial pores	S1	opal crystals		
PN	1:2 CaCl2 meter pH	IT	interstit. & tubul.	S2	soft masses silica		
PP	phenol red pH	TC	contin. tubular	S3	silica concretions		
PR	chlorophenol red pH	TD	discont. tubular	S4	durinodes		
PS	soiltest pH	TE	dendritic tubular	T2	worm casts		
PT	thymol-blue pH	TS	constricted tubular pores	T3	insects casts		
PY	pH Ydrion	TU	tubular pores	T4	worm nodules		
PZ	unspecified meth. pH	VS	vesicular pores				
S2	pct. passing # 200 sieve	VT	vesicul. & tubular	<u>CONCENTRAT QT QUANTITY</u>			
S4	pct. passing # 40 sieve			C	common		
SA	sand	<u>QT</u>	<u>PORE QUANTITY</u>	F	few		
SC	coa. & v. coa. sand	C	common	M	many		
SF	fine sand	CM	common to many				
SI	silt	F	few	<u>CONCENTRAT SH SHAPE</u>			
SM	medium sand	FC	few to common	C	cylindrical		
SV	very fine sand	FF	very few to few	O	rounded		
		M	many	P	plate like		
<u>WET WETNESS CLASS</u>	<u>WETNESS CLASS</u>	VF	very few	Z	irregular		
D	dry wetness class	<u>SZ</u>	<u>PORE SIZE</u>				
M	moist wet. class	1	fine 0.05-2mm	<u>CONCENTRAT SZ SIZE</u>			
W	wet wet. class	11	very fine and fine	1	fine < 2mm		
		12	fine and medium	12	fine and medium		
<u>HYDRAULIC CONDUCTIVITY (HC) HYC CLASS</u>	<u>HYC CLASS</u>	13	fine to coarse	2	medium 2-5mm		
1	very low HC	2	medium 2-5mm	23	medium & coarse		
2	low HC	23	medium & coarse	3	coarse 5-20mm		
3	moder. low HC	3	coarse 5-10mm	34	coa. & v. coa.		
4	moder. high HC	4	v. coa. > 10mm	4	v coa. 20-76mm		
5	high HC	V1	very fine	45	v coa & extr coa		
6	very high HC			5	extr coa >76mm		
		<u>CN</u>	<u>PORE CONTIN.</u>				
		H	high continuity	<u>ROCK FRAGMENTS RO ROUNDNESS</u>			
		L	low continuity	1	angular		
		M	moderate contin.	2	subangular		
				3	subrounded		
				4	rounded		
				5	well rounded		

for total rock fragment content use KD, % and RF (under SZ) in first blank

<u>ROCK FRAGMENTS KD KIND</u>	
A0	sandstone
A1	noncalc. sandstone
A2	arkosic sandstone
A4	calcar. sandstone
A5	red acid sandstone
A6	gray & brown acid sandstone
B0	interbedded sedimentary limestone,
B1	sandstone & shale
B2	limestone & sandstone
B3	limestone & shale
B4	limestone & siltstone
B5	sandstone & shale
B6	sandstone & siltstone
B7	shale & siltstone
B8	shale & sandstone
C0	conglomerate
C1	noncalc. conglom.
C2	calcar. conglom.
E0	ejecta ash
E1	acidic ash
E2	basic ash
E3	basaltic ash
E4	andesitic ash
E5	cinders
E6	pumice
E7	scoria
E8	volcanic bombs
H0	shale
H1	noncalcar. shale
H2	calcareous shale
H3	clay shale
H4	red acid shale
H5	gray-brown acid shale
H6	red calc. shale
I0	igneous
I1	coarse igneous
I2	basic igneous
I3	intermed. igneous
I4	granite
I5	fine igneous
I6	diabase or basalt
I7	andesite
I8	acid igneous rock
I9	ultrabasic igneous

APPENDIX A-3 (Continued)

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	EFFER			FLD MSR		PROP		W	H	ROOTS			PORES				CONCENTRAT				ROCK			FRAGMENTS				
	C	A	E	KD	AMT	KD	AMT			T	C	QT	SZ	O	SH	QT	SZ	CN	KD	QT	H	SZ	KD	%	O	SZ	KD	%
1	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

APPENDIX A-3 (Continued)

K0	organic	L8	very cherty	O4	gray hornfels	T2	calcareous
K1	mossy material		limestone	P0	pyroclastic		siltstone
K2	herbaceous mat.	L9	chert	P1	tuff	T3	red acid siltstone
K3	woody material	M0	metamorphic	P2	acidic tuff	T4	gray & brown acid
K4	wood fragments	M1	gneiss	P3	basic tuff		siltstone
K5	logs and stumps	M2	acidic gneiss	P4	volcanic breccia	Y0	mixed lithology
K6	charcoal	M3	basic gneiss	P5	acidic breccia	Y1	noncalcareous
K7	coal	M4	serpentine	P6	basic breccia		mixed
L0	limestone	M5	phyllite	P7	tuff breccia	Y2	calcareous mixed
L1	chalk	M6	acid schist	P8	aa	Y4	mixed igneous
L2	marble	M7	basic schist	P9	pahoehoe		metamorphic &
L3	dolomite	M8	slate	S0	sedimentary		sedimentary
L4	phosphatic	M9	quartzite	S1	marl	Y5	mixed igneous &
	limestone	O0	metarhyolite	S2	glauconite		metamorphic
L5	v. sandy limestone	O1	quartz	T0	siltstone	Y6	mixed igneous &
L6	argillaceous	O2	graphitic schist	T1	noncalcareous		sedimentary
	limestone	O3	mica schist		siltstone	Y7	mixed
L7	cherty limestone						metamorphic &
							sedimentary

COLOR CODES

10B 2/1	10YR 8/4	5GY 7/1	5YR 7/8
10B 5/1	10YR 8/6	5Y 2/1	5YR 8/1
10BG 6/1	10YR 8/8	5Y 2/2	5YR 8/2
10R 2/1	2.5Y 2/2	5Y 3/1	5YR 8/3
10R 2/2	2.5Y 3/1	5Y 3/2	5YR 8/4
10R 2/3	2.5Y 3/2	5Y 4/1	7.5YR 2/1
10R 3/1	2.5Y 3/4	5Y 4/2	7.5YR 2/2
10R 3/2	2.5Y 4/1	5Y 4/3	7.5YR 2/4
10R 3/3	2.5Y 4/2	5Y 4/4	7.5YR 3/1
10R 3/4	2.5Y 4/3	5Y 4/5	7.5YR 3/2
10R 3/6	2.5Y 4/4	5Y 4/6	7.5YR 3/3
10R 4/1	2.5Y 4/6	5Y 5/1	7.5YR 3/4
10R 4/2	2.5Y 5/1	5Y 5/2	7.5YR 4/1
10R 4/3	2.5Y 5/2	5Y 5/3	7.5YR 4/2
10R 4/4	2.5Y 5/3	5Y 5/4	7.5YR 4/3
10R 4/6	2.5Y 5/4	5Y 5/6	7.5YR 4/4
10R 4/8	2.5Y 5/6	5Y 6/1	7.5YR 4/5
10R 5/1	2.5Y 6/1	5Y 6/2	7.5YR 4/6
10R 5/2	2.5Y 6/2	5Y 6/3	7.5YR 4/8
10R 5/3	2.5Y 6/4	5Y 6/4	7.5YR 4/9
10R 5/4	2.5Y 6/6	5Y 6/6	7.5YR 5/1
10R 5/6	2.5Y 6/8	5Y 6/8	7.5YR 5/2
10R 5/8	2.5Y 7/1	5Y 7/1	7.5YR 5/3
10R 6/1	2.5Y 7/2	5Y 7/2	7.5YR 5/4
10R 6/2	2.5Y 7/4	5Y 7/3	7.5YR 5/6
10R 6/3	2.5Y 7/6	5Y 7/4	7.5YR 5/8
10R 6/4	2.5Y 7/8	5Y 7/6	7.5YR 6/2
10R 6/6	2.5Y 8/2	5Y 7/8	7.5YR 6/3
10R 6/8	2.5Y 8/4	5Y 8/1	7.5YR 6/4
10YR 2/1	2.5Y 8/6	5Y 8/2	7.5YR 6/5
10YR 2/2	2.5Y 8/8	5Y 8/3	7.5YR 6/6
10YR 2/3	2.5YR 2/2	5Y 8/4	7.5YR 6/8
10YR 3/1	2.5YR 2/4	5Y 8/6	7.5YR 7/1
10YR 3/2	2.5YR 2/6	5Y 8/8	7.5YR 7/2
10YR 3/3	2.5YR 2/8	5YR 2/1	7.5YR 7/3
10YR 3/4	2.5YR 3/2	5YR 2/2	7.5YR 7/4
10YR 3/6	2.5YR 3/4	5YR 3/1	7.5YR 7/6
10YR 4/1	2.5YR 3/6	5YR 3/2	7.5YR 7/8
10YR 4/2	2.5YR 4/2	5YR 3/3	7.5YR 8/2
10YR 4/3	2.5YR 4/3	5YR 3/4	7.5YR 8/4
10YR 4/4	2.5YR 4/4	5YR 3/5	7.5YR 8/6
10YR 4/5	2.5YR 4/6	5YR 4/1	N 1/0
10YR 4/6	2.5YR 4/8	5YR 4/2	N 2/0
10YR 5/1	2.5YR 5/2	5YR 4/3	N 3/0
10YR 5/2	2.5YR 5/4	5YR 4/4	N 4/0
10YR 5/3	2.5YR 5/6	5YR 4/5	N 5/0
10YR 5/4	2.5YR 5/8	5YR 4/6	N 6/0
10YR 5/5	2.5YR 6/2	5YR 4/7	N 7/0
10YR 5/6	2.5YR 6/4	5YR 4/8	N 8/0
10YR 5/7	2.5YR 6/5	5YR 5/1	
10YR 5/8	2.5YR 6/6	5YR 5/2	
10YR 5/9	2.5YR 6/8	5YR 5/3	
10YR 6/1	2.5YR 7/1	5YR 5/4	
10YR 6/2	2.5YR 7/2	5YR 5/5	
10YR 6/3	2.5YR 7/6	5YR 5/6	
10YR 6/4	5B 4/1	5YR 5/7	
10YR 6/5	5B 5/1	5YR 5/8	
10YR 6/6	5BG 4/1	5YR 6/1	
10YR 6/8	5BG 4/2	5YR 6/2	
10YR 7/1	5BG 5/1	5YR 6/3	
10YR 7/2	5G 4/1	5YR 6/4	
10YR 7/3	5G 4/2	5YR 6/6	
10YR 7/4	5G 5/2	5YR 6/8	
10YR 7/6	5G 6/1	5YR 7/1	
10YR 7/8	5G 6/2	5YR 7/2	
10YR 8/1	5GY 4/1	5YR 7/3	
10YR 8/2	5GY 5/1	5YR 7/4	
10YR 8/3	5GY 6/1	5YR 7/6	

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SOIL NUMBER	HORIZON	PAGE 4 OF 4
		FREE FORM HORIZON NOTES:
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

APPENDIX B. Structure and Description Files for the Pedon Program

B-1. Site Data Structure and Description (SITEDATA.S&D)

Variable	----- Variable -----			Description	SITEDATA.S&D
	Type	Length	Dec.		
SERIESNAME	C	18	0	Current soil series name	
CLASSTAX	C	1	0	Taxadjunct or variant(T or V code)	
DATE	C	8	0	Date described	
STATE	C	2	0	State abbreviation(PA,NY,NE etc.)	
COUNTY	C	3	0	County code number(001 to 067 for PA)	
UNIT	C	3	0	Pedon number within the county(001 to 999)	
SUBUNIT	C	1	0	Unique subdivision	
HORIZCOUNT	N	2	0	Number of horizons in the pedon	
MLRA	C	3	0	Major land resource area number	
MLRASUB	C	1	0	Major land resource area number subscript	
LATITUDE	C	7	0	Latitude in degrees, minutes, seconds; direction	
LONGITUDE	C	8	0	Longitude in degrees, minutes, seconds; direction	
SURVEYID	C	3	0	Soil survey area identification number	
MAPUNITSYM	C	5	0	Map unit symbol for map unit where pedon was collected	
NOTEID	C	5	0	Identification number for notes	
TRANSECTID	C	5	0	Identification number for transect data stop; number of transect; actual interval between transects	
YIELDID	C	5	0	Identification number for yield data	
PHOTONUM	C	5	0	Aerial photograph number	
LABSAMPLE	C	13	0	Soil Characterization laboratory sample storage number	
DESCTYPE	C	2	0	Code for the reason for the description	
PEDONTYPE	C	2	0	Code for what the pedon represents	
PREVSNAME	C	16	0	Series name when sampled	
PRCNTSLOPE	C	3	0	Percent slope at this site	
SLOPESHape	C	2	0	Code for shape of the slope up and down and across slope	
GEOMORPCO	C	1	0	Code for geomorphic slope component	
HILLSLOPEC	C	1	0	Code for hillslope component	
SLOPEASPCT	C	3	0	Slope aspect(0 to 360 degrees)	
SLOPLNGABV	C	4	0	Slope length from crest to site (meters)	
SLOPLNGTOT	C	4	0	Total slope length (meters)	
MICROREKND	C	1	0	Code for kind of microrelief	
MICROREAMT	C	1	0	Code for vertical change in microrelief	
MICROREPAT	C	1	0	Code for pattern of microrelief	
PDNPOSITON	C	1	0	Code for relative position of the site on slope	
REGNLPHYS	C	2	0	Code for major landform	
LOCALPHYS	C	2	0	Code for local landform	
ORDER	C	1	0	Code for soil taxonomy order	
SUBORDER	C	2	0	Code for soil taxonomy suborder	
GREATGROUP	C	2	0	Code for soil taxonomy great group	
SUBGROUP	C	4	0	Code for soil taxonomy subgroup	
PARTSIZECL	C	3	0	Code for soil taxonomy particle size class	
MINERALOGY	C	2	0	Code for soil taxonomy mineralogy class	
REACTION	C	2	0	Code for soil taxonomy reaction class	
TEMPERATUR	C	2	0	Code for soil taxonomy temperature regime	
OTHER	C	2	0	Code for soil taxonomy other family type	

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description	SITEDATA.S&D
PRECIPCM	C	3	0	Annual precipitation at site in centimeters	
WATERDEPTH	C	3	0	Depth of water table when described in centimeters	
WATERDAYS	C	3	0	Duration of water table in days	
WATERKIND	C	1	0	Code for kind of water table	
LANDUSE	C	1	0	Code for kind of landuse	
STONINESS	C	2	0	Percent surface cover of rocks or stoniness class code	
HYDRALCOND	C	1	0	Code for hydraulic conductivity class	
PERMEABLT	C	1	0	Code for permeability class	
DRAINAGE	C	1	0	Code for drainage class	
ELEVATION	C	5	0	Elevation above mean sea level in meters	
PM1WEATHER	C	1	0	Code for parent material weathering intensity	
PM1MODEDEP	C	1	0	Code for parent material mode of deposition	
PM1ORIGIN	C	2	0	Code for bedrock source of parent material	
PM2WEATHER	C	1	0	Code for parent material weathering intensity	
PM2MODEDEP	C	1	0	Code for parent material mode of deposition	
PM2ORIGIN	C	2	0	Code for bedrock source of parent material	
PM3WEATHER	C	1	0	Code for parent material weathering intensity	
PM3MODEDEP	C	1	0	Code for parent material mode of deposition	
PM3ORIGIN	C	2	0	Code for bedrock source of parent material	
PM4WEATHER	C	1	0	Code for parent material weathering intensity	
PM4MODEDEP	C	1	0	Code for parent material mode of deposition	
PM4ORIGIN	C	2	0	Code for bedrock source of parent material	
BEDRCKDIP	C	2	0	Bedrock dip in degrees(from horizontal; 0 to 90) (
BEDRCKSTRK	C	3	0	Bedrock strike in degrees(0 to 360)	
BEDRCKFRAC	C	1	0	Code for bedrock fracture	
AIRTMPANN	C	4	1	Average annual air temperature degrees C	
AIRTMPSUMR	C	4	1	Average summer air temperature degrees C	
AIRTMPWNTR	C	4	1	Average winter air temperature degrees C	
TEMPANNUAL	C	4	1	Average annual soil temperature degrees C	
TEMPSUMMER	C	4	1	Average summer soil temperature degrees C	
TEMPWINTER	C	4	1	Average winter soil temperature degrees C	
MOISTUREGI	C	2	0	Code for soil taxonomy moisture regime	
WTHRSTATN	C	6	0	U.S. weather station number for representative weather station	
CONTRLSECT	C	6	0	Particle size control section upper and lower depth in centimeters	
WATEROSION	C	1	0	Code for water erosion	
RUNNOFF	C	1	0	Code for runoff	
DH1DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm	
DH1KIND	C	1	0	Soil taxonomy diagnostic horizon - kind	
DH2DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm	
DH2KIND	C	1	0	Soil taxonomy diagnostic horizon - kind	
DH3DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm	
DH3KIND	C	1	0	Soil taxonomy diagnostic horizon - kind	
DH4DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm	
DH4KIND	C	1	0	Soil taxonomy diagnostic horizon - kind	
DH5DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm	
DH5KIND	C	1	0	Soil taxonomy diagnostic horizon - kind	
FLOODFRQ	C	2	0	Code for frequency of flooding	
FLOODMONTH	C	2	0	Beginning month of flooding	
FLOODDAYS	C	2	0	Duration of flooding in days	

APPENDIX B (Continued)

----- Variable -----					SITEDATA.S&D
Variable	Type	Length	Dec.	Description	
PONDFRQ	C	2	0	Code for frequency of ponding	
PONDMONTH	C	2	0	Beginning month of ponding	
PONDDAYS	C	2	0	Duration of ponding in days	
VEG1SPECIE	C	6	0	Code for vegetation species	
VEG2SPECIE	C	6	0	Code for vegetation species	
VEG3SPECIE	C	6	0	Code for vegetation species	
VEG4SPECIE	C	6	0	Code for vegetation species	
VEG5SPECIE	C	6	0	Code for vegetation species	
VEG6SPECIE	C	6	0	Code for vegetation species	
VEG7SPECIE	C	6	0	Code for vegetation species	
VEG8SPECIE	C	6	0	Code for vegetation species	
VEG9SPECIE	C	6	0	Code for vegetation species	
VEG10SPEC	C	6	0	Code for vegetation species	
ASSOCSOIL1	C	16	0	Name of associated soil on landscape	
ASSOCSOIL2	C	16	0	Name of associated soil on landscape	
ASSOCSOIL3	C	16	0	Name of associated soil on landscape	
ASSOCSOIL4	C	16	0	Name of associated soil on landscape	
DSCRBRSNMS	C	150	0	Names of describers	
LOCATION	C	254	0	Location of pedon, free form description	
NOTES1	C	254	0	Free form site notes	
NOTES2	C	254	0	Free form site notes	
QUADSHEET	C	20	0	USGS 7 1/2 minute topographic map name	
TOWNSHIP	C	20	0	Township name	
PAPARMAT	C	5	0	Code for Penn State soil char lab parent material	
PLOWED	L	1	0	Code for was the soil plowed(Y yes : N no)	
SOILTYPE	C	36	0	Soil type (surface texture)	

APPENDIX B (Continued)

B-2. Horizon Data Structure and Description (HORIDATA.S&D)

Variable	----- Variable -----			Description	HORIDATA.S&D
	Type	Length	Dec.		
NUMBER	C	9	0	State, County (001 to 067), pedon no. (sequential within a county)	
SERIESNAME	C	18	0	Current soil series name	
HORIZONNUM	N	2	0	Horizon number (sequential from surface down)	
UDEPTH	C	3	0	Upper depth of horizon (centimeters)	
LDEPTH	C	3	0	Lower depth of horizon (centimeters)	
HORDISCONT	C	1	0	Horizon lithologic discontinuity	
MASTERLETT	C	3	0	Horizon master letter	
HORISUFFIX	C	4	0	Horizon suffix	
LATERALEXT	C	2	0	Volume percent laterally that the horizon features occupies	
TOTALEXTNT	C	2	0	Total volume percent of feature in horizon	
AVGTHICKNS	C	3	0	Average thickness of horizon in cm	
MAXTHICKNS	C	3	0	Maximum thickness of horizon	
MINTHICKNS	C	3	0	Minimum thickness of horizon in inches	
DRYCLR1LOC	C	1	0	Location of dry color	
DRYCLR1PER	C	2	0	Percent of the matrix occupied by color	
DRYCLR1HUE	C	5	0	Munsell dry color hue	
DRYCLR1VAL	C	1	0	Munsell dry color value	
DRYCLR1CHR	C	1	0	Munsell dry color chroma	
DRYCLR2LOC	C	1	0	Location of dry color	
DRYCLR2PER	C	2	0	Percent of the matrix occupied by color	
DRYCLR2HUE	C	5	0	Munsell dry color hue	
DRYCLR2VAL	C	1	0	Munsell dry color value	
DRYCLR2CHR	C	1	0	Munsell dry color chroma	
DRYCLR3LOC	C	1	0	Location of dry color	
DRYCLR3PER	C	2	0	Percent of the matrix occupied by color	
DRYCLR3HUE	C	5	0	Munsell dry color hue	
DRYCLR3VAL	C	1	0	Munsell dry color value	
DRYCLR3CHR	C	1	0	Munsell dry color chroma	
WETCLR1LOC	C	1	0	Location of moist color	
WETCLR1PER	C	2	0	Percent of the matrix occupied by color	
WETCLR1HUE	C	5	0	Munsell moist color hue	
WETCLR1VAL	C	1	0	Munsell moist color value	
WETCLR1CHR	C	1	0	Munsell moist color chroma	
WETCLR2LOC	C	1	0	Location of moist color	
WETCLR2PER	C	2	0	Percent of the matrix occupied by color	
WETCLR2HUE	C	5	0	Munsell moist color hue	
WETCLR2VAL	C	1	0	Munsell moist color value	
WETCLR2CHR	C	1	0	Munsell moist color chroma	
WETCLR3LOC	C	1	0	Location of moist color	
WETCLR3PER	C	2	0	Percent of the matrix occupied by color	
WETCLR3HUE	C	5	0	Munsell moist color hue	
WETCLR3VAL	C	1	0	Munsell moist color value	
WETCLR3CHR	C	1	0	Munsell moist color chroma	
TXTR1CLASS	C	4	0	Textural class USDA	
TXTR2CLASS	C	4	0	Textural class USDA	
TXTR1MODIF	C	3	0	Texture modifier	
TXTR2MODIF	C	3	0	Texture modifier	

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description	HORIDATA.S&D
STRUC1GRAD	C	1	0	Grade of structure unit	
STRUC1SIZE	C	2	0	Size of structure unit	
STRUC1SHAP	C	3	0	Shape of structure unit	
STRUC2GRAD	C	1	0	Grade of structure unit	
STRUC2SIZE	C	2	0	Size of structure unit	
STRUC2SHAP	C	3	0	Shape of structure unit	
STRUC3GRAD	C	1	0	Grade of structure unit	
STRUC3SIZE	C	2	0	Size of structure unit	
STRUC3SHAP	C	3	0	Shape of structure unit	
CONSISTDRY	C	3	0	Dry consistence	
CONSISTMOS	C	3	0	Moist consistence	
CONSISTOTH	C	3	0	Other consistence	
STICKINESS	C	2	0	Stickiness, wet consistence	
PLASTICITY	C	2	0	Plasticity, wet consistence	
CEMENTATIN	C	1	0	Cementation agent	
RUPTURERES	C	2	0	Rupture resistance	
MICROPENT	C	2	0	Penetrometer resistance	
MOTT1ABUND	C	2	0	Percent of matrix mottle occupies or abundance class	
MOTT1SIZE	C	2	0	Size of mottle	
MOTT1CONTR	C	1	0	Contrast of mottle	
MT1HUE	C	5	0	Munsell color hue of mottle	
MT1VAL	C	1	0	Munsell color value of mottle	
MT1CHR	C	1	0	Munsell color chroma of mottle	
MOTT2ABUND	C	2	0	Percent of matrix mottle occupies or abundance class	
MOTT2SIZE	C	2	0	Size of mottle	
MOTT2CONTR	C	1	0	Contrast of mottle	
MT2HUE	C	5	0	Munsell color hue of mottle	
MT2VAL	C	1	0	Munsell color value of mottle	
MT2CHR	C	1	0	Munsell color chroma of mottle	
MOTT3ABUND	C	2	0	Percent of matrix mottle occupies or abundance class	
MOTT3SIZE	C	2	0	Size of mottle	
MOTT3CONTR	C	1	0	Contrast of mottle	
MT3HUE	C	5	0	Munsell color hue of mottle	
MT3VAL	C	1	0	Munsell color value of mottle	
MT3CHR	C	1	0	Munsell color chroma of mottle	
SURFEA1KND	C	1	0	Kind of coat or surface feature code	
SURFEA1AMT	C	2	0	Percent of the surface covered by coat or abundance class	
SURFEA1CN	C	1	0	Continuity of coat	
SURFEA1DIS	C	1	0	Distinctness of coat	
SURFEA1LOC	C	1	0	Location of coat	
SURFEA1HUE	C	5	0	Munsell color hue of coat	
SURFEA1VAL	C	1	0	Munsell color value of coat	
SURFEA1CHR	C	1	0	Munsell color chroma of coat	
SURFEA2KND	C	1	0	Kind of coat or surface feature code	
SURFEA2AMT	C	2	0	Percent of the surface covered by coat or abundance class	
SURFEA2CN	C	1	0	Continuity of coat	
SURFEA2DIS	C	1	0	Distinctness of coat	
SURFEA2LOC	C	1	0	Location of coat	
SURFEA2HUE	C	5	0	Munsell color hue of coat	
SURFEA2VAL	C	1	0	Munsell color value of coat	
SURFEA2CHR	C	1	0	Munsell color chroma of coat	

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description	HORIDATA.S&D
SURFEA3KND	C	1	0	Kind of coat or surface feature code	
SURFEA3AMT	C	2	0	Percent of the surface covered by coat or abundance class	
SURFEA3CN	C	1	0	Continuity of coat	
SURFEA3DIS	C	1	0	Distinctness of coat	
SURFEA3LOC	C	1	0	Location of coat	
SURFEA3HUE	C	5	0	Munsell color hue of coat	
SURFEA3VAL	C	1	0	Munsell color value of coat	
SURFEA3CHR	C	1	0	Munsell color chroma of coat	
BOUNDRYTOP	C	1	0	Boundary topography	
BOUNDIST	C	1	0	Boundary distinctness	
EFFERVCLAS	C	1	0	Effervescence class	
EFFERVAGNT	C	1	0	Effervescence agent	
EFFERVEXTN	C	1	0	Effervescence extension	
FLDPRP1KND	C	2	0	Kind of field measured property	
FLDPRP1AMT	C	3	0	Value or amount of field measured property	
FLDPRP2KND	C	2	0	Kind of field measured property	
FLDPRP2AMT	C	3	0	Value or amount of field measured property	
FLDPRP3KND	C	2	0	Kind of field measured property	
FLDPRP3AMT	C	3	0	Value or amount of field measured property	
FLDPRP4KND	C	2	0	Kind of field measured property	
FLDPRP4AMT	C	3	0	Value or amount of field measured property	
FLDPRP5KND	C	2	0	Kind of field measured property	
FLDPRP5AMT	C	3	0	Value or amount of field measured property	
FLDPRP6KND	C	2	0	Kind of field measured property	
FLDPRP6AMT	C	3	0	Value or amount of field measured property	
SOILWATER	C	1	0	Wetness class	
HYDRALCOND	C	1	0	Hydraulic conductivity class for horizon	
ROOTS1QUAN	C	2	0	Number of roots per unit area (see pores for unit area) or class	
ROOTS1SIZE	C	2	0	Size of roots	
ROOTS1LOC	C	1	0	Location of roots	
ROOTS2QUAN	C	2	0	Number of roots per unit area (see pores for unit area) or class	
ROOTS2SIZE	C	2	0	Size of roots	
ROOTS2LOC	C	1	0	Location of roots	
ROOTS3QUAN	C	2	0	Number of roots per unit area (see pores for unit area) or class	
ROOTS3SIZE	C	2	0	Size of roots	
ROOTS3LOC	C	1	0	Location of roots	
PORES1SHAP	C	2	0	Shape of soil pores	
PORES1QUAN	C	2	0	Number of pores in a unit area (1 sq. cm for fine or very fine and 10 sq. cm for coarser pores) or class	
PORES1SIZE	C	2	0	Size of pores	
PORES1CONT	C	2	0	Continuity of pores	
PORES2SHAP	C	2	0	Shape of soil pores	
PORES2QUAN	C	2	0	Number of pores in a unit area (1 sq. cm for fine or very fine and 10 sq. cm for coarser pores) or class	
PORES2SIZE	C	2	0	Size of pores	
PORES2CONT	C	2	0	Continuity of pores	
PORES3SHAP	C	2	0	Shape of soil pores	
PORES3QUAN	C	2	0	Number of pores in a unit area (1 sq. cm for fine or very fine and 10 sq. cm for coarser pores) or class	
PORES3SIZE	C	2	0	Size of pores	
PORES3CONT	C	2	0	Continuity of pores	

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description	HORIDATA.S&D
CONCEN1KND	C	2	0	Kind of soil body code	
CONCEN1QUA	C	2	0	Quantity of soil body in volume percent of matrix occupied or class	
CONCEN1SHP	C	1	0	Shape of soil body	
CONCEN1SIZ	C	2	0	Size of soil body	
CONCEN2KND	C	2	0	Kind of soil body code	
CONCEN2QUA	C	2	0	Quantity of soil body in volume percent of matrix occupied or class	
CONCEN2SHP	C	1	0	Shape of soil body	
CONCEN2SIZ	C	2	0	Size of soil body	
CONCEN3KND	C	2	0	Kind of soil body code	
CONCEN3QUA	C	2	0	Quantity of soil body in volume percent of matrix occupied or class	
CONCEN3SHP	C	1	0	Shape of soil body	
CONCEN3SIZ	C	2	0	Size of soil body	
ROCK1KIND	C	2	0	Bedrock source code for rock fragment	
ROCK1PERCN	C	2	0	Volume percent of rock fragments	
ROCK1RND	C	1	0	Roundness code of rock fragment	
ROCK1SIZE	C	1	0	Size code of rock fragment	
ROCK2KIND	C	2	0	Bedrock source code for rock fragment	
ROCK2PERCN	C	2	0	Volume percent of rock fragments	
ROCK2RND	C	1	0	Roundness code of rock fragment	
ROCK2SIZE	C	1	0	Size code of rock fragment	
ROCK3KIND	C	2	0	Bedrock source code for rock fragment	
ROCK3PERCN	C	2	0	Volume percent of rock fragments	
ROCK3RND	C	1	0	Roundness code of rock fragment	
ROCK3SIZE	C	1	0	Size code of rock fragment	
ROCK4KIND	C	2	0	Bedrock source code for rock fragment	
ROCK4PERCN	C	2	0	Volume percent of rock fragments	
ROCK4RND	C	1	0	Roundness code of rock fragment	
ROCK4SIZE	C	1	0	Size code of rock fragment	
ROCK5KIND	C	2	0	Bedrock source code for rock fragment	
ROCK5PERCN	C	2	0	Volume percent of rock fragments	
ROCK5RND	C	1	0	Roundness code of rock fragment	
ROCK5SIZE	C	1	0	Size code of rock fragment	
ROCK6KIND	C	2	0	Bedrock source code for rock fragment	
ROCK6PERCN	C	2	0	Volume percent of rock fragments	
ROCK6RND	C	1	0	Roundness code of rock fragment	
ROCK6SIZE	C	1	0	Size code of rock fragment	
RFRAGTV	C	2	0	Rock fragments total (>2mm pct. by vol., est. in the field)	
RFRAG1V	C	2	0	Rock fragments (>250mm [10 in.] pct. by vol., est. in the field)	
RFRAG2V	C	2	0	Rock fragments (250 to 76mm [10 to 3 in.] pct. by vol., est. in the field)	
RFRAG3V	C	2	0	Rock fragments (76 to 19mm [3 to 0.75 in] pct. by vol., est. in the field)	
RFRAG45V	C	2	0	Rock fragments (19 to 2mm [0.75 in. to 2mm] pct. by vol., est. in the field)	
NOTES	C	254	0	Horizon note, free form grammatically correct	

APPENDIX B (Continued)

B-3. Laboratory Structure and Description Files (LAB.S&D)

(a) Laboratory Data Structure and Description (LABDATA.S&D)

Variable	Type	Length	Dec.	Description
NUMBER	C	9	0	State, County (001 to 067), pedon no. (sequential within a county)
SERIESNAME	C	18	0	Current soil series name
HORIZONNUM	N	2	0	Horizon number (sequential from surface down)
UDEPTH	N	3	0	Upper depth of horizon (centimeters)
LDEPTH	N	3	0	Lower depth of horizon (centimeters)
HORDISCONT	C	1	0	Horizon lithologic discontinuity
MASTERLETT	C	3	0	Horizon master letter
HORISUFFIX	C	4	0	Horizon suffix
RF1WTP	N	4	1	Rock fragments (>250mm [10 in.] wt. pct.)
RF2WTP	N	4	1	Rock fragments (250 to 76mm [10 to 3 in.] wt. pct.)
RF3WTP	N	4	1	Rock fragments (76 to 19mm [3.0 to 0.75 in.] wt. pct.)
RF4WTP	N	4	1	Rock fragments (19mm to 4.7mm [0.75 in. to 4.7mm] wt. pct.)
RF5WTP	N	4	1	Rock fragments (4.7 mm to 2.0 mm, wt. pct.)
RFTWTP	N	5	1	Rock fragments total wt. pct. of <2mm + >2mm material
LT2MMWTP	N	5	1	Less than 2mm wt. pct. of total soil material (<2mm + >2mm)
VCSAND	N	4	1	Very coarse sand (2.0 to 1.0 mm frac., wt. pct. of < 2.0 mm mat.)
CSAND	N	4	1	Coarse sand (1.0 to 0.5 mm frac., wt. pct. of < 2.0 mm mat.)
MSAND	N	4	1	Medium sand (0.5 to 0.25 mm frac., wt. pct. of < 2.0 mm mat.)
FSAND	N	4	1	Fine sand (0.25 to 0.10 mm frac., wt. pct. of < 2.0 mm mat.)
VFSAND	N	4	1	Very fine sand (0.1 to 0.05 mm frac., wt. pct. of < 2.0 mm mat.)
VFSAND1	N	4	1	Very fine sand (0.10 to 0.07 mm frac., wt. pct. of < 2 mm mat.)
VFSAND2	N	4	1	Very fine sand (0.07 to 0.05 mm frac., wt. pct. of < 2.0 mm mat.)
TSAND	N	5	1	Total sand (2.0 to 0.5 mm frac., wt. pct. of < 2.0 mm mat.)
TSILT	N	5	1	Total silt (0.05 to 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
TCLAY	N	5	1	Total clay (< 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
CSILT	N	4	1	Coarse silt (0.05 to 0.02 mm frac., wt. pct. of < 2.0 mm mat.)
CMSILT	N	4	1	Coarse+Medium silt (0.05 to 0.005 mm frac., wt. pct. of < 2.0 mm mat.)
MSILT	N	4	1	Medium silt (0.02 to 0.005 mm frac., wt. pct. of < 2.0 mm mat.)
MFSILT	N	4	1	Medium+Fine silt (0.02 to 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
FSILT	N	4	1	Fine silt (0.005 to 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
TCLASSL	C	4	0	Textural class (determined in the laboratory)
TCLASSF	C	4	0	Textural class (estimated in the field)
BDMCLWRF	N	4	2	Bulk density moist clod with rock fragments (g/cc, 1/3 atm. mois.)
BDMLT2MM	N	4	2	Bulk density moist < 2mm material (g/cc, 1/3 atm. moisture)
BDMLT2UC	N	4	2	Bulk density moist < 2mm material (core uncorrected for rock fragments; g/cc 1/3 atmos)
BDDLT2MM	N	4	2	Bulk density dry < 2mm material(g/cc, oven dry)
BDGT2MM	N	4	2	Bulk density > 2mm material (rock fragments, g/cc, oven dry)
BDTSOIL	N	4	2	Bulk density total soil (g/cc ,<2mm + >2mm mat., 1/3 atm. mois.)
BDMETH	C	1	0	Bulk density method (C = clod method, R = core method)
RFTVP	N	5	1	Rock fragments total vol. pct. (calculated from weight & BD data)
PORETSOIL	N	2	0	Porosity total soil (rock fragments + fine earth) volume percent
PORELT2MM	N	2	0	Porosity less < 2mm basis (fine earth only, rock fragments not incl.) vol. pct.
COELT2MM	N	5	3	Coefficient of linear extensibility of less than 2mm material

APPENDIX B (Continued)

Variable	Variable			Description	LABDATA (LAB.S&D)
	Type	Length	Dec.		
M03ACLWTP	N	5	1	Moisture content 1/3 atm. clod with rock fragments, wt. pct.	
M03ALT2WTP	N	4	1	Moisture content 1/3 atm. < 2mm wt. pct.	
M03ALT2UC	N	5	1	Moisture content 1/3 atm. < 2mm wt. pct. (core uncorrected for rock fragments)	
M15ALT2WTP	N	4	1	Moisture content 15 atm. < 2mm wt. pct.	
M3LT2BUWTP	N	4	1	Moisture content 1/3 atm. < 2mm bulk sample (not from clod or core) wt. pct.	
AWLT2MMWTP	N	5	1	Available water < 2mm wt. pct.	
AWLT2MMVP	N	5	3	Available water < 2mm volume basis (cm/cm)	
AWTSOILWTP	N	5	1	Available water total soil (rock fragments+< 2mm, wt. pct.)	
AWTSOILVP	N	5	3	Avail. water total soil (rock fragments+< 2mm, vol. basis cm/cm)	
PHWL	N	3	1	pH (1:1 water, lab)	
PHWF	N	3	1	pH (1:1 water, field)	
PHKCLL	N	3	1	pH (1:1 KCl, lab)	
PHKCLF	N	3	1	pH (1:1 KCl, field)	
PHACL2L	N	3	1	pH (1:1 CaCl2, lab)	
PHACL2F	N	3	1	pH (1:1 CaCl2, field)	
OCWTP	N	5	2	Organic carbon weigh percent(< 2 mm material)	
OCMETH	C	1	0	Organic carbon method (W = Walkly-Black; C = combustion)	
TN	N	5	2	Total nitrogen (Kjeldal method)	
CN	N	6	2	Carbon/nitrogen ratio	
CACO3EQ	N	5	1	Calcium carbonate equivalent (percent < 2 mm material)	
TSULFWTP	N	5	3	Total sulfur weight percent (< 2 mm material)	
CA	N	4	1	Calcium exchangeable (meq/100g)	
MG	N	4	1	Magnesium exchangeable (meq/100g)	
NA	N	5	2	Sodium exchangeable (meq/100g)	
K	N	5	2	Potassium exchangeable (meq/100g)	
TB	N	5	1	Total bases exchangeable (meq/100g)	
CAMG	N	5	1	Calcium/Magnesium Ratio	
ALKCL	N	4	1	Aluminum exchangeable with 1N KCL (meq/100g)	
EXACID	N	5	1	Extractable acidity (meq/100g)	
CECSUM	N	5	1	Cation exchange capacity sum of cation method(meq/100g)	
CECNH4	N	5	1	Cation exchange capacity ammonium acetate method(meq/100g)	
BSSUM	N	5	1	Base saturation sum of cations method(percent)	
BSNH4	N	5	1	Base saturation ammonium acetate method(percent)	
ACIDSOLK	N	6	1	Acid soluble potassium (pounds/acre K; 1.0 N HNO3 method)	
FE2O3	N	4	1	Iron oxides (percent < 2 mm material)	
ALCBD	N	5	2	Aluminum extractable with CBD (percent)	
MNCBD	N	5	2	Manganese extractable with CBD (percent)	
KAOL	C	2	0	Kaolinite (percent < 2 um clay)	
ILL	C	2	0	Illite (percent < 2 um clay)	
VERM	C	2	0	Vermiculite (percent < 2 um clay)	
MONT	C	2	0	Montmorillonite (percent < 2 um clay)	
CHLOR	C	2	0	Chlorite (percent < 2 um clay)	
INTER	C	2	0	Intergrade (percent < 2 um clay)	
QUARTZ	C	2	0	Quartz (percent < 2 um clay)	

APPENDIX B (Cont.)

(b) Laboratory Input Data Structure and Description (LABINPUT.S&D)

Variable	----- Variable -----			Description	LABINPUT (LAB.S&D)
	Type	Length	Dec.		
RF1VP	N	2	0	Rock fragments (>250mm [10 in.] vol. pct. est. in the field)	
RF2VP	N	2	0	Rock fragments (250mm to 76mm [10 to 3 in.] vol. pct. est. in the field)	
RF3VP	N	2	0	Rock fragments (76 to 19mm [3.0 to 0.75 in.] vol. pct. est. in the field)	
RF3WT	N	4	0	Rock fragments (76 to 19mm [3.0 to 0.75 in.] wt. in g, air dried)	
RF4WT	N	4	0	Rock fragments (19 to 4.7mm [0.75 in. to 4.7mm] wt. in g, air dry)	
RF5WT	N	4	0	Rock fragments (4.7mm to 2.0mm wt. in g, air dry)	
LT2MMWT	N	4	0	Less than 2mm material (< 2.0mm wt. in g, air dry)	
PSLABNUM	C	3	0	PS (Particle size) lab no. for analysis container (fleaker and bottle)	
PSFLKWT	N	6	2	PS fleaker weight (oven dry)	
PSFLKPSOWT	N	6	2	PS fleaker plus soil wt. (oven dry after H2O2 treatment and candling)	
PSBWT20UM	N	6	3	PS bottle weight for 20 um pipette fraction (oven dry)	
PSBWT5UM	N	6	3	PS bottle weight for 5 um pipette fraction (oven dry)	
PSBWT2UM	N	6	3	PS bottle weight for 2 um pipette fraction (oven dry)	
PSBP20UMWT	N	6	3	PS bottle plus 20 um pipette fraction wt. (oven dry), incl. all <20 um mater.	
PSBP5UMWT	N	6	3	PS bottle plus 5 um pipette fraction wt. (oven dry), incl. all < 5 um material	
PSBP2UMWT	N	6	3	PS bottle plus 2 um pipette fraction wt. (oven dry), incl. all < 2 um material	
PSBLANKWT	N	5	3	PS Na hexametaphosphate blank wt. (25ml pipette fraction of 1000 ml which had 10 ml of conc. Na hex. added)	
PSLABNUM2	C	3	0	PS (Particle size) lab number for analysis container (beaker)	
VCSANDWT	N	5	2	Very coarse sand weight (2.0 to 1.0mm fraction) (oven dry)	
CSANDWT	N	5	2	Coarse sand weight (1.0 to 0.5mm fraction) (oven dry)	
MSANDWT	N	5	2	Medium sand weight (0.5 to 0.25mm fraction) (oven dry)	
FSANDWT	N	5	2	Fine sand weight (0.25 to 0.10mm fraction) (oven dry)	
VFSAND1WT	N	5	2	Very fine sand 1 weight (0.10 to 0.074mm) (oven dry)	
VFSAND2WT	N	5	2	Very fine sand 2 weight (0.074 to 0.050mm) (oven dry)	
TCLASSF	C	4	0	Textural classification estimated in the field	
CLETTERa	L	1	0	Clod identification letter (a,b,c etc.)	
CLWTMAIRa	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in air	
CLWTMWATa	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in water	
CLWTODAIRa	N	6	2	Clod wt. oven dry moisture content weighed in air	
CLWTODWATa	N	6	2	Clod wt. oven dry moisture content weighed in water	
CLRFWTAIRa	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in air	
CLRFWTWATa	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in water	
CLETTERb	L	1	0	Clod identification letter (a,b,c etc.)	
CLWTMAIRb	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in air	
CLWTMWATb	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in water	
CLWTODAIRb	N	6	2	Clod wt. oven dry moisture content weighed in air	
CLWTODWATb	N	6	2	Clod wt. oven dry moisture content weighed in water	
CLRFWTAIRb	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in air	
CLRFWTWATb	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in water	
CLETTERc	L	1	0	Clod identification letter (a,b,c etc.)	
CLWTMAIRc	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in air	
CLWTMWATc	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in water	
CLWTODAIRc	N	6	2	Clod wt. oven dry moisture content weighed in air	
CLWTODWATc	N	6	2	Clod wt. oven dry moisture content weighed in water	
CLRFWTAIRc	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in air	
CLRFWTWATc	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in water	
BDMETH	C	1	0	Bulk density method (C = clod method, R = core method)	

APPENDIX B (Continued)

Variable	----- Variable -----			Description	LABINPUT (LAB.S&D)
	Type	Length	Dec.		
CAN15NUM	C	2	0	Can number for 15 atm. moisture content deter. of < 2mm material	
CAN15WT	N	6	3	Can wt. for 15 atm. moisture content deter. of < 2mm material	
CAN15AMWT	N	6	3	Can plus soil wt. of 15 atm. moisture content < 2mm material	
CAN15AODWT	N	6	3	Can plus soil wt. of 15 atm. oven dry moisture content < 2mm mat.	
PHWL	N	3	1	pH (water, lab)	
PHWF	N	3	1	pH (water, field)	
PHKCLL	N	3	1	pH (KCl, lab)	
PHKCLF	N	3	1	pH (KCl, field)	
PHCaCl2L	N	3	1	pH (CaCl2, lab)	
PHCaCl2F	N	3	1	pH (CaCl2, field)	
OCMETH	C	1	0	Organic carbon method (W = Walkly-Black; C = combustion)	
OCBLANKWT	N	5	3	Organic carbon blank weight (procedure without soil;grams)	
OCBWT	N	8	4	Organic carbon bottle weight	
OCBPCO2WT	N	8	4	Organic carbon bottle plus CO2 weight	
OCSOILWT	N	5	3	Organic carbon soil sample weight	
MCCNUM	C	2	0	Moisture correction can number	
MCCWT	N	6	3	Moisture correction can weight	
MCCPADSOWT	N	6	3	Moisture correction can plus air dry soil weight	
MCCPODSOWT	N	6	3	Moisture correction can plus oven dry soil weight	
MC	N	5	3	Moisture correction factor (factor to convert from air dry to oven dry weight basis)	
CACECPPM	N	4	1	Exchangeable calcium (parts per million; 0,2,5,8,10 ppm standards)	
CACECDF	N	3	0	Exchangeable calcium Dilution Factor (e.g. 2,5,10 etc.)	
MGCECPPM	N	4	2	Exchangeable magnesium (ppm; 0.0,0.4,1.0,1.6,2.0 ppm standards)	
MGCECDF	N	3	0	Exchangeable magnesium Dilution Factor (e.g. 2,5,10 etc.)	
NACECPPM	N	4	2	Exchangeable sodium (ppm; 0,0.4,1.0,1.6,2.0 ppm standards)	
NACECDF	N	3	0	Exchangeable sodium Dilution Factor (e.g. 2,5,10 etc.)	
KCECPPM	N	5	2	Exchangeable potassium (ppm; 0,2,5,8,10 ppm standards)	
KCECDF	N	3	0	Exchangeable potassium Dilution Factor (e.g. 2,5,10 etc.)	
CECSOILWT	N	4	2	Cation exchange capacity soil weight (air dry, grams)	
EXACIDBLML	N	5	2	Extractable acidity (ml of acid used in titration of blank)	
EXACIDSOML	N	5	2	Extractable acidity (ml of acid used in titration of soil sample)	
EXACIDNORM	N	5	3	Extractable acidity (normality of acid used in the titration)	
EXACIDSOWT	N	4	2	Extractable acidity soil weight (air dry, grams)	
ALKCLSOWT	N	4	2	Aluminum exchangeable with KCL soil weight (air dry, grams)	
ALKCLPPM	N	4	1	Aluminum exchangeable with KCL (ppm; 0,2,4,6,10 ppm standards)	
ALKCLDF	N	3	0	Aluminum exchangeable with KCL Dilution Factor (e.g. 2,5,10 etc.)	
ALCBDPMP	N	4	1	Aluminum extractable with CBD (ppm; 0,2,4,6,10,20 standards)	
ALCBDDF	N	3	0	Aluminum extractable with CBD Dilution Factor (e.g. 2,5,10 etc.)	
MNCBDPPM	N	4	2	Manganese extractable with CBD (ppm; 0,0.5,1.5,3.0 standards)	
MNCBDDF	N	3	0	Manganese extractable with CBD Dilution Factor (e.g. 2,5,10 etc.)	
FECBDPPM	N	3	1	Iron oxides extractable with CBD (ppm; 0,1,3,6 ppm standards)	
FECBDDF	N	3	0	Iron oxides extractable with CBD Dilution Factor (e.g. 2,5,10 etc.)	
FECBDSOWT	N	4	2	Iron oxides extractable with CBD soil weight (air dry, grams)	

SAMPLE NUMBER	DEPTH (cm)	D I S	HORIZON	ROCK FRAGMENTS mm			(VOLUME PERCENT; WEIGHT, GRAMS)				
				1VP >250	2VP 250-76	3VP 76-19	3WT 76-19	4WT 19-4.7	5WT 4.7-2	WT <2mm	
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SAMPLE NUMBER CNT UNI_NUM	L E T	BULK DENSITY			ROCK FRAGMENTS		B D M	N U M	15 CAN WT	ATMOSPHERE CAN+ 15AMWT	WATER CAN+ 15AODWT
		WTMAIR	WTMWT	WTODAIR	WTODWAT	RFWTAIR					
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Appendix C Penn State Soil Characterization Lab

LAB INPUT FORMS

PAGE 7 OF 7

SAMPLE NUMBER	CEC SOILWT	CA CEC		MG CEC		PPM		CATION EXCHANGE CAPACITY		K CEC		EXCHANGEABLE ACIDITY			
		DF	PPM	DF	PPM	DF	PPM	DF	PPM	DF	PPM	EXACID SOWT	EXACID BLML	EXACID SOML	EXACID NORM
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00
4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	2.00	2.00	2.00	2.00

APPENDIX D. Site, Horizon, Physical and Chemical Data Tables for Pedon 014-099

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam PAGE 1 OF 4

CLASSIFICATION: Fluventic Dystrchrept; Coarse-loamy, mixed, mesic DATE PRINTED: 09/30/92

SOIL SERIES NAME: Linden SAMPLED SERIES NAME: Linden
 SOIL SURVEY NO.: S76-PA-014-099 (1-11) SOIL TYPE : Very Fine Sandy Loam
 DESCRIPTION TYPE: Full pedon desc for lab characterization LAB SAMPLE NO.: 9810 - 9817
 PEDON TYPE: CONTROL SECTION (cm):
 DIAGNOSTIC FEATURES (depth cm):
 ASSOCIATED SOILS:
 COUNTY: Centre MLRA: 147, Northern Appalachian Ridges and Valleys
 TOWNSHIP: Rush USGS 7.5' QUAD SHEET: Phillipsburg
 LATITUDE (D-M-S): 40-57-38-N LONGITUDE (D-M-S): 078-09-43-W
 LOCATION: 1 km E of Casanova Vill. 200 m N of Twp Rt 323 along Moshannon Creek; Centre County PA
 REGIONAL LANDFORM: Ridge and valley LOCAL LANDFORM: Flood plain
 GEOMORPHIC COMPONENT: HILLSLOPE COMPONENT:
 SLOPE LENGTH (above,meters): SLOPE LENGTH (total,meters):
 SLOPE SHAPE (up-down,across): , , POSITION ON SLOPE:
 SLOPE (%): 1 ELEVATION (meters): 420
 SLOPE ASPECT (degrees): 180
 MICRORELIEF (amount,pattern kind): , ,
 PARENT MATERIAL WEATHERING:
 1. Unweathered
 2. Unweathered
 PARENT MATERIAL MODE OF DEPOSITION: PARENT MATERIAL ORIGIN:
 1. Alluvium 1. Red acid shale
 2. Alluvium 2. Red acid sandstone
 BEDROCK DIP (degrees): BEDROCK STRIKE (degrees):
 BEDROCK FRACTURE:
 PARENT MATERIAL (PA system): Red fine and medium textured floodplain
 FLOOD PATTERN (freq.,beg. mon.,days): , ,
 PONDING PATTERN (freq.,beg. mon.,days): , ,
 WATER TABLE (depth cm,days,kind): 240, ,
 DRAINAGE: Well drained MOISTURE REGIME: Udic
 EROSION: Slight PERMEABILITY: Moderate
 STONINESS: Class 0 HYDRAULIC CONDUCTIVITY:
 WEATHER STATION: PLOWED: Yes PERCOLATION RATE (in/hr):
 RUNOFF: Very slow
 SOIL TEMPERATURE(C): ANNUAL WINTER SUMMER
 9.1 0.0 0.0
 AIR TEMPERATURE(C): 0.0 0.0 0.0
 PRECIPITATION(cm): 110
 LAND USE: Abandoned cropland
 VEGETATION: Oaks; Pines; Grass
 DESCRIBERS NAMES: E. J. Ciolkosz, R. C. Cronce, E. R. Stein
 DATE DESCRIBED: 04/17/76 PHOTO #:
 YIELD ID#: TRANSECT ID#:
 MAP UNIT SYMBOL: NOTE ID#:
 NOTES: MS thesis site of Dick Cronce(1978) and Ed Stein(1977). The dark colors (N 2/0) in C4, C5 and C6 horizons appear to be Fe-Mn coatings on the sand grains and coarse fragments. Oaks, pines and several types of native grasses.
 PA CLASSIFICATION: FLUVENTIC, , DYSTR, OCHR, EPT, COARSE-LOAMY, MIXED, MESIC,

APPENDIX D (Continued)

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam

PAGE 2 OF 4

CLASSIFICATION: Fluventic Dystrochrept; Coarse-loamy, mixed, mesic

DATE PRINTED: 09/30/92

- 1 Ap1-- 0 to 10 cm; dark brown (7.5YR 3/2) matrix; very fine sandy loam; weak fine granular structure and weak fine subangular blocky structure; very friable, non sticky, slightly plastic; many roots; pH 4.5; abrupt wavy boundary
- 2 Ap2-- 10 to 20 cm; dark reddish brown (5YR 3/3) matrix; very fine sandy loam; weak very fine subangular blocky structure; friable, non sticky, slightly plastic; many roots; pH 4.5; abrupt smooth boundary
- 3 Bw1-- 20 to 41 cm; reddish brown (5YR 4/4) matrix; loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many roots; few faint clay films in root channels and/or pores; pH 4.4; clear wavy boundary; Dark reddish brown (5YR 3/4) ped faces.
- 4 Bw2-- 41 to 56 cm; reddish brown (5YR 4/4) matrix; loam; weak coarse prismatic structure parting to weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common roots; faint clay films on faces of peds; pH 4.5; clear wavy boundary; Films are on prism faces; dark reddish brown (5YR 3/3) ped faces.
- 5 BC-- 56 to 74 cm; dark brown (7.5YR 4/4) matrix; loam; weak coarse prismatic structure parting to weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; common roots; common faint clay films on faces of peds; pH 4.5; gradual wavy boundary; Films are on prism faces.
- 6 C1-- 74 to 114 cm; dark brown (7.5YR 3/2) matrix; very fine sandy loam; structureless massive; very friable, slightly sticky, slightly plastic; common roots; pH 4.4; clear wavy boundary
- 7 C2--114 to 140 cm; dark yellowish brown (10YR 3/4) matrix; loamy sand; structureless massive; very friable, non sticky, non plastic; few roots; pH 4.4; abrupt wavy boundary
- 8 C3--140 to 150 cm; dark yellowish brown (10YR 3/4) matrix, black (N 2/0) matrix; gravelly loamy sand; with many medium and coarse prominent yellowish brown (10YR 5/6) mottles; structureless single grain; loose, non sticky, non plastic; few roots; pH 4.4; 50% gray & brown acid sandstone rock fragments, 40% gravel 2 mm-1.9 cm, 10% gravel 1.9-7.6 cm; abrupt wavy boundary; black (N 2/0) coatings on gravel.
- 9 C4--150 to 160 cm; black (N 2/0) matrix; very gravelly sand; structureless single grain; firm, weakly cemented, non sticky, non plastic; pH 4.4; 50% gray & brown acid sandstone rock fragments, 40% gravel 2 mm-1.9 cm, 10% gravel 1.9-7.6 cm; abrupt wavy boundary
- 10 C5--160 to 190 cm; dark yellowish brown (10YR 4/4) matrix, black (N 2/0) matrix, strong brown (7.5YR 5/8) matrix; very gravelly sand; structureless single grain; loose, non sticky, non plastic; pH 4.4; 65% gray & brown acid sandstone rock fragments, 45% gravel 2 mm-1.9 cm, 15% gravel 1.9-7.6 cm, 5% flat cobbles 7.6-25 cm; abrupt wavy boundary; Also black (N 2/0) coatings on coarse gravel, strong brown (7.5YR 5/8) and dark reddish brown (5YR 3/4) coating on medium gravel
- 11 C6--190 to 282 cm; strong brown (7.5YR 5/6) matrix, black (N 2/0) matrix, red (2.5YR 5/6) matrix; very gravelly coarse sand; structureless single grain; loose, non sticky, non plastic; pH 4.4; 75% gray & brown acid sandstone rock fragments, 30% gravel 2 mm-1.9 cm, 15% gravel 1.9-7.6 cm, 25% flat cobbles 7.6-25 cm, 5% flat stones 25-60 cm

APPENDIX D (Continued)

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam

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CLASSIFICATION: Fluventic Dystrachrept; Coarse-loamy, mixed, mesic

DATE PRINTED: 09/30/92

ROCK FRAGMENT DISTRIBUTION (MM) (PCT)										TEXTURAL CLASS	
NO	DEPTH (cm)	HORI-ZON	ROCK FRAGMENT DISTRIBUTION (MM) (PCT)					TOTAL WT	TOTAL VOL	LAB	FIELD
			> 250	250-76	76-19	19-4.7	4.7-2.0				
1	0-10	Ap1	0.0	0.0	0.0	0.0	0.0	0.0	VFSL	VFSL	
2	10-20	Ap2	0.0	0.0	0.0	0.0	0.0	0.0	VFSL	VFSL	
3	20-41	Bw1	0.0	0.0	0.0	0.0	0.0	0.0	SIL	L	
4	41-56	Bw2	0.0	0.0	1.4	0.0	0.0	1.4	L	L	
5	56-74	BC	0.0	0.0	1.1	0.0	0.0	1.1	L	L	
6	74-114	C1	0.0	0.0	0.0	0.0	0.0	0.0	FSL	VFSL	
7	114-140	C2	0.0	0.0	0.0	2.6	4.8	7.4	LS	LS	
8	140-150	C3	0.0	19.1	4.6	22.7	9.9	56.3	COS	LS	
9	150-160	C4	0.0	0.0	25.8	39.0	8.8	73.6	COS	S	
10	160-190	C5	0.0	3.7	29.8	33.3	12.5	79.3	COS	S	
11	190-282	C6	0.0	5.5	32.1	22.6	18.9	79.1	COS	COS	

PARTICLE SIZE DISTRIBUTION (MM) (PCT OF < 2 MM MATERIAL)													TOTAL SAND	TOTAL SILT	TOTAL CLAY
V	SAND				V FINE			SILT			C+M	M+F	2.0-0.05	0.05-<	
	COARSE 2.0-1.0	COARSE 1.0-0.5	MEDIUM 0.5-0.25	FINE 0.25-0.10	0.10-0.05	0.10-0.07	0.07-0.05	CO 0.05-0.02	MED 0.02-0.005	FINE 0.005-0.002					0.002-0.001
1	0.3	0.7	5.6	29.8	21.2	12.7	8.5	22.8	4.9	2.9	27.7	7.8	57.6	30.6	11.8
2	0.6	0.8	6.4	24.7	23.1	11.2	11.9	24.9	6.0	4.2	30.9	10.2	55.6	35.1	9.3
3	0.2	0.9	4.8	9.2	19.4	11.6	7.8	32.5	17.6	1.1	50.1	18.7	34.5	51.2	14.3
4	0.8	1.0	7.1	18.9	20.9	9.9	11.0	12.3	13.0	10.2	25.3	23.2	48.7	35.5	15.8
5	0.9	0.7	7.5	22.5	17.2	9.2	8.0	16.5	12.1	3.3	28.6	15.4	48.8	31.9	19.3
6	0.9	2.2	25.8	28.7	15.4	10.0	5.4	9.0	7.0	1.5	16.0	8.5	73.0	17.5	9.5
7	5.3	10.0	40.1	21.3	6.6	4.3	2.3	7.8	2.4	0.4	10.2	2.8	83.3	10.6	6.1
8	16.4	19.8	45.0	7.7	1.6	0.9	0.7	4.4	1.8	0.1	6.2	1.9	90.5	6.3	3.2
9	20.7	24.4	38.3	4.3	1.9	1.3	0.6	3.3	1.7	2.1	5.0	3.8	89.6	7.1	3.3
10	33.3	24.6	26.3	2.1	4.4	3.7	0.7	4.5	1.3	1.7	5.8	3.0	90.7	7.5	1.8
11	36.7	24.6	27.9	1.9	1.6	1.4	0.2	2.9	1.3	1.6	4.2	2.9	92.7	5.8	1.5

NO	BULK DENSITY (G/CC)					MOISTURE (PCT)			AVAILABLE WATER			PORE SPACE		
	1/3 ATM MOISTURE		OVEN DRY			RETAINED AT 1/3 ATM		15 ATM	< 2 MM MATERIAL		TOTAL SOIL < 2 MM + FRAGMENTS		FINE EARTH	TOTAL SOIL
	ENTIRE CLOD	TOTAL SOIL <2MM+FRAGS	<2 MM IN CLOD	<2 MM IN CLOD	COLE < 2 MM	ENTIRE CLOD	<2 MM IN CLOD	<2 MM SIEVED	WEIGHT (PCT)	CM/CM OF SOIL	WEIGHT (PCT)	CM/CM OF SOIL	<2MM (PCT)	FE+RF (PCT)
1								9.9						
2	1.21	1.21	1.21	1.24	0.046	11.4	11.5	10.8	0.7	0.008	0.7	0.008	53	53
3	1.27	1.27	1.27	1.33	0.015	22.8	23.0	12.2	10.8	0.137	10.8	0.137	51	51
4	1.36	1.36	1.35	1.40	0.013	21.3	22.0	12.2	9.8	0.132	9.7	0.131	48	48
5	1.48	1.36	1.36	1.41	0.010	19.1	16.1	10.7	5.4	0.073	5.3	0.073	48	47
6	1.54	1.53	1.53	1.51	0.005	12.6	13.0	6.4	6.6	0.101	6.6	0.101	41	41
7	1.75	1.78	1.75	1.77	0.027	12.3	12.5	3.4	9.1	0.159	8.4	0.150	33	31
8								6.0						
9								4.1						
10								4.1						
11								4.5						

APPENDIX D (Continued)

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam

PAGE 4 OF 4

CLASSIFICATION: Fluventic Dystrochrept; Coarse-loamy, mixed, mesic

DATE PRINTED: 09/30/92

NO	DEPTH (cm)	HORI-ZON	CLAY MINERALS (PCT OF < 0.002 MM MATERIAL)						
			KAOL	ILL	VERM	MONT	CHL	INT	QUARTZ
1	0- 10	Ap1	30	25	25	0	5	15	0
2	10- 20	Ap2	30	25	25	0	5	15	0
3	20- 41	Bw1	30	25	30	0	0	15	0
4	41- 56	Bw2	35	30	25	0	0	10	0
5	56- 74	BC	40	30	15	0	0	15	0
6	74-114	C1	40	40	15	0	0	5	0
7	114-140	C2	35	50	10	0	0	5	0
8	140-150	C3	35	50	10	0	0	5	0
9	150-160	C4	35	45	5	0	0	10	5
10	160-190	C5	35	50	5	0	0	5	5
11	190-282	C6	40	50	0	0	0	5	5

NO	EXTRACTABLE CATIONS (MILLIEQUIVALENTS PER 100 GRAMS OF < 2.0 MM MATERIAL)										BASE SAT		HNO3 EXTRACT- ABLE K (LB/ACRE)
	CA	MG	NA	K	TOTAL BASES	ACIDITY	CEC (SUM)	CEC (NH4)	AL	SUM (PCT)	NH4 (PCT)	CA/MG	
1	0.0	0.3	0.07	0.12	0.5	28.3	28.8		4.2	1.7			
2	0.0	0.2	0.08	0.08	0.4	26.0	26.4		4.2	1.5			
3	0.5	1.3	0.06	0.08	1.9	23.1	25.0		3.8	7.6		0.4	
4	0.0	0.3	0.06	0.06	0.4	24.7	25.1		4.2	1.6			
5	0.0	0.2	0.06	0.05	0.3	20.8	21.1		3.1	1.4			
6	0.0	0.4	0.08	0.06	0.5	11.8	12.3		1.8	4.1			
7	0.0	0.6	0.06	0.04	0.7	11.0	11.7		1.4	6.0			
8	0.1	0.8	0.06	0.03	1.0	7.2	8.2		0.5	12.2		0.1	
9	0.0	0.4	0.06	0.06	0.5	13.3	13.8		0.5	3.6			
10	0.1	0.6	0.06	0.04	0.8	7.5	8.3		0.5	9.6		0.2	
11	0.3	0.8	0.06	0.05	1.2	6.9	8.1		0.1	14.8		0.4	

NO	pH (1:1 SOIL:SOLUTION)						CACO3 EQUIV- ALENT (PCT)	ORGANIC MATTER			IRON OXIDES FE2O3 (PCT)	CBD EXTRACTABLE		TOTAL SULFUR S (PCT)
	WATER		1 N KCL		0.01 M CACL2			C	N	C/N		AL	MN	
	LAB	FIELD	LAB	FIELD	LAB	FIELD	(PCT)	(PCT)	(PCT)	(PCT)	(PCT)	(PCT)	(PCT)	
1	4.4		3.7		4.0			3.60			6.2			
2	4.5		3.8		4.2			3.00			5.2			
3	4.7		3.8		4.3			0.90			6.5			
4	4.7		3.7		4.2			0.67			7.5			
5	4.8		3.7		4.3			0.53			6.7			
6	5.0		3.9		4.4			0.65			5.6			
7	5.0		4.0		4.5			0.70			4.2			
8	5.1		4.2		4.6			0.21			3.5			
9	5.1		4.2		4.7			0.23			4.4			
10	5.3		4.4		4.9			0.16			4.6			
11	5.2		4.6		5.1			0.18			4.4			