DIGITAL DATABASE DESCRIPTION FOR THEGEOLOGIC MAP OF THE SILVER LAKE QUADRANGLE, COWLITZ COUNTY, WASHINGTON

Database by Christopher B. DuRoss

Introduction

This pamphlet serves to introduce and describe the digital files that are included in this publication, available for downloading *at http://geopubs.wr.usgs.gov*. These files include a set of ARC/INFO geospatial databases containing the geologic information as well as Adobe Acrobat Portable Document Format (PDF) and PostScript plot files containing images of the geologic map sheet and the text of an accompanying pamphlet that describes the geology of the area. For those interested only in a paper plot of the map and pamphlet, please see the section entitled "For Those Who Don't Use Digital Geologic Map Databases" below.

This digital map publication, generated from new mapping by the author, shows the general distribution of bedrock and surficial deposits in the Silver Lake 7.5-minute quadrangle. Together with the accompanying geologic description pamphlet, it presents current knowledge on the geologic structure and stratigraphy of the area covered. The database identifies map units that are classified by general age and lithology following the stratigraphic nomenclature of the U.S. Geological Survey. The scale of the source map limits the spatial resolution (scale) of the database to 1:24,000 or smaller. The content and character of the digital publication, as well as methods of obtaining the digital files, are described below.

For those who don't use digital geologic map databases

For those interested in the geology of the Silver Lake quadrangle who do not use an ARC/INFO compatible Geographic Information System (GIS), we have provided two sets of plot files containing images of the map sheet and a geologic description pamphlet. There is a set of images in PostScript format and another in Adobe Acrobat PDF format (see the sections “PostScript plot files” and “PDF plot files” below).

Those who have computer capability can access the plot file packages in any of the three ways described below (see the section "Obtaining the digital database and plot file packages"). However, it should be noted the plot file packages do require gzip and tar utilities to access the plot files. Therefore additional software, available free on the Internet, may be required to use the plot files (see section "Tar files"). In addition, the map sheet is large, and requires large-format color plotters to produce a plot of the entire image, although smaller plotters can be used to plot portions of the images using the PDF plot files (see the sections "PostScript plot files" and "PDF plot files" below).

Those without computer capability can obtain plots of the map files through U.S. Geological Survey print on demand service for digital geologic maps (see section "Obtaining plots from the U.S. Geological Survey) or from an outside vendor (see section "Obtaining plots from an outside vendor").

The U.S. Geological Survey has adopted version numbers for its publications, similar to the system used in the computer software industry. Therefore, this publication may be revised and upgraded from time to time. See the section "Revisions and version numbers" for details on this new policy.

MF-2371 digital contents

The digital data for the Miscellaneous Field Studies Map consist of three packages. The first is the **Encapsulated PostScript plot file package**, which consists of Encapsulated PostScript plot files of the geologic map with explanation, and a geologic description pamphlet with figures and tables. The second is the **PDF plot file package**, which contains the same plot files as the first package, but as PDF files. The third is the **Digital database - metadata package**, which contains the geologic map database itself and supporting data, including base maps, map explanation, geologic description, and references.

Encapsulated PostScript plot file package

This package contains the images described here in PostScript format (see below for more information on PostScript plot files):

sl. ps	An ARC/INFO Postscript plottable file containing an image of the geologic map, base map, cross sections, correlation of map units, description of map units, and index map of the Silver Lake 7.5-minute quadrangle

PDF plot file package

This package contains the images described here in PDF format (see below for more information on PDF plot files):

sl.pdf	A PDF file containing an image of the geologic map, base map, cross sections, correlation of map units, description of map units, and index map of the Silver Lake 7.5-minute quadrangle
readme.pdf	A PDF file of this document
geol.pdf	A PDF file of the geologic description pamphlet with black and white figures
geol_clr.pdf	A PDF file of the geologic description pamphlet with color figures

Digital database - metadata package

The database package includes geologic map database files for the Silver Lake 7.5-minute quadrangle. The digital maps, or coverages, and associated INFO directory have been converted to uncompressed ARC/INFO export files. ARC export files promote ease of data handling, and are usable by some Geographic Information Systems in addition to ARC/INFO (see below for a discussion of working with export files). Raster data are stored in ARC grid format rather than export format to reduce file size. The ARC export files and associated ARC/INFO coverages, grids, and directories, as well as the additional digital material included in the database, are described below:

ARC/INFO export file	**Resultant Coverage**	**Description of Coverage**
sl_geo.e00	sl_geo	Faults, depositional contacts, and rock units in the quadrangle
sl_stx.e00	sl_stx	Geologic attitudes as points; include pttype, strike, and dip fields, dip values as annotation, fold axis as arcs, and cross section lines
sl_ann.e00	sl_ann	Unit labels and leaders
sl_rad.e00	sl_rad	Radiometric age localities as points; include age, sample number, and map plot number
sl_fos.e00	sl_fos	Megafossil and plant fossil localities as points; include sample number and map plot number
sl_chm.e00	sl_chm	Geochemistry localities as points; include sample number and map plot number
sl_clay.e00	sl_clay	Clay pit in Toutle formation as points
sl_coal.e00	sl_coal	Coal mine or prospect in Cowlitz Formation as points
fnt034.e00	fnt034	ARC/INFO font used with markerset
fnt035.e00	fnt035	ARC/INFO font used with markerset
nt339.e00	fnt339	ARC/INFO font used with markerset
geologyk.mrk.e00	geologyk.mrk	ARC/INFO markerset (custom)
droid.lut.e00	droid.lut	ARC/INFO marker look up table (internal)
slpoly.lut.e00	slpoly.lut	ARC/INFO line look up table for polygons (internal)
slln.lut.e00	slln.lut	ARC/INFO line look up table for lines and fold arcs (internal)
sllm.lut.e00	sllm.lut	ARC/INFO line look up table for fold and fault markers (internal)

ARC/INFO grids	**Description of Grid**
sl_grd	Silver Lake color geology grid merged with grid of topographic base

The digital publication package also includes the following files:

ASCII text files, including explanatory text, PostScript plot files, Encapsulated PostScript files from Adobe Illustrator 8 used as map collar and figures for the geologic report, ARC Macro Language files for plotting maps, custom ARC lineset, and a ARC Macro Language file for conversion of ARC export files into ARC coverages:

metadata.txt	The metadata as a text file
readme.doc	The readme as a MSWord document
readme.txt	The readme as a text file
readme.pdf	The readme as a PDF file
geol.pdf	Geology pamphlet as a PDF file
geol_clr.pdf	Geology pamphlet as a PDF file with color figures
geol.doc	Geology pamphlet as an MSWord document
import.aml	ASCII text file in ARC Macro Language (AML) to convert ARC export files to ARC coverages in ARC/INFO
sl.eps	Encapsulated PostScript Adobe Illustrator 8 file (map collar) for the Silver Lake 7.5 minute quadrangle
sl.gra	ARC Graphics Metafile for Silver Lake 7.5-minute quadrangle
sl_plot.aml	Plot AML generates uncompressed PostScript of Silver Lake 7.5-minute quadrangle at 600 dpi
geol61c.lin	Custom ARC lineset
johanna.txt	Custom ARC textset
uncom	Parameter file in sl_plot.aml to uncompress PostScript file
sl.tab	ARC/INFO grid remap table for colors
info	ARC/INFO directory
log	ARC/INFO log file
alc1.shd	ARC/INFO shadeset (custom)

The following supporting directory is not included in the database package, but is produced in the process of reconverting the export files into ARC coverages:

info/	INFO directory containing files supporting the databases

Tar files

The two data packages described above are stored in tar (UNIX tape archive) files. A tar utility is required to extract the database from the tar file. This utility is included in most UNIX systems and can be obtained free of charge over the Internet from Internet Literacy's Common Internet File Formats Webpage (*http://www.matisse.net/files/formats.html*). The tar files have been compressed, and may be uncompressed with **gzip**, which is available free of charge over the Internet via links from the U.S. Geological Survey Public Domain Software page (*http://edcwww.cr.usgs.gov/doc/edchome/ndcdb/public.html*). When the tar file is uncompressed and the data is extracted from the tar file, a directory is produced that contains the data in the package as described above. The specifics of the tar files are listed below:

Name of compressed tar file (size)	Size of uncompressed tar file	Directory produced when extracted from tar file	Data package contained
2371ps.tar.gz (18.1 Mb)	105 Mb	2371ps/	PostScript Plot file Package
2371pdf.tar.gz (8.5 Mb)	8.97 Mb	2371pdf/	Portable Document Format Package
2371db.tar.gz (27.7 Mb)	85.1 Mb	2371db/	Digital Database Package

PostScript plot files

For those interested in the geology of the Silver Lake 7.5-minute quadrangle who don't use an ARC/INFO compatible GIS system we have included a PostScript plot file. The file contains a color plot of the geologic map sheet at 1:24,000 scale. The PostScript image of the map sheet is 36 by 41 inches, so it requires a large plotter to produce paper copies at the intended scale.

The final ARC/INFO PostScript plot file for the map (sl.ps) was produced by the ARC/INFO version 8.0.2 for Unix PostScript command using the uncompressed option, after running a plot AML (sl_plot.aml). The file (sl_eps) contains an Adobe Illustrator v. 8 Encapsulated PostScript file of the map template, which has figures of cross-sections, correlation of map units, description of map units, and index map. The plot AML (sl_plot.aml) combines the ARC/INFO files with the placed EPS file (sl.eps) and creates a graphics Metafile and a final PostScript plot file (sl_ps). The import.aml imports all the export (.e00) files into ARC/INFO.

PDF plot files

We have also included a second digital package containing PDF versions of the PostScript map sheets described above. Adobe Acrobat PDF files are similar to PostScript plot files in that they contain all the information needed to produce a paper copy of a map and they are platform-independent. Their principal advantage is that they require less memory to store and are therefore quicker to download from the Internet. In addition, PDF files allow printing of portions of a map image on a printer smaller than that required to print the entire map without the purchase of expensive additional software. All PDF files in this report have been created from PostScript plot files using Adobe Acrobat Distiller. In test plots we have found that paper maps created with PDF files contain almost all the detail of maps created with PostScript plot files. We would, however, recommend that those users with the capability to print the large PostScript plot files use them in preference to the PDF files.

To use PDF files, the user must get and install a copy of Adobe Acrobat Reader. This software is available free from the Adobe website (*http://www.adobe.com*). Please follow the instructions given at the website to download and install this software. Once installed, the Acrobat Reader software contains an on-line manual and tutorial.

There are two ways to use Acrobat Reader in conjunction with the Internet. One is to use the PDF reader plug-in with your Internet browser. This allows interactive viewing of PDF file images within your browser. This is a very handy way to quickly look at PDF files without downloading them to your hard disk. The second way is to download the PDF file to your local hard disk, and then view the file with Acrobat Reader. We strongly recommend that large map images be handled by downloading to your hard disk, because viewing them within an Internet browser tends to be very slow.

To print a smaller portion of a PDF map image using Acrobat Reader, it is necessary to cut out the portion desired using Acrobat Reader and the standard cut and paste tools for your platform, and then to paste the portion of the image into a file generated by another software program that can handle images. Most word processors (such as Microsoft Word) will suffice. The new file can then be printed. Image conversion in the cut and paste process, as well as changes in the scale of the map image, may result in loss of image quality.

Digital database format

The databases in this report were compiled in ARC/INFO, a commercial Geographic Information System by Environmental Systems Research Institute (ESRI) in Redlands, California, with version 3.0 of the menu interface ALACARTE (Fitzgibbon and Wentworth, 1991; Fitzgibbon, 1991; Wentworth and Fitzgibbon, 1991). The files are in either GRID (ARC/INFO raster data) format or COVERAGE (ARC/INFO vector data) format. Coverages are stored in uncompressed ARC export format (ARC/INFO version 8.0.2 for Unix). ARC/INFO export files (files with the .e00 extension) can be converted into ARC/INFO coverages in ARC/INFO (see below) and can be read by some other Geographic Information Systems, such as MapInfo, via ArcLink and ESRI's ArcView (version 1.0 for Windows 3.1 to 3.11 is available for free from ESRI's web site: http://www.esri.com). The digital compilation was done in version 8.0.2 of ARC/INFO for Unix.

Obtaining the digital database and plot file packages

The digital data can be obtained in any of three ways:

a. From the Western Region Geologic Information Web Page
b. Anonymous ftp over the Internet
c. Sending a cd with request

To obtain tar files of database or plot file packages from the U.S. Geological Survey web pages

The U.S. Geological Survey now supports a set of graphical pages on the World Wide Web. Digital publications (including this one) can be accessed via these pages. The location of the main Web page for the entire U.S. Geological Survey is

http://www.usgs.gov

The Web server for digital publications from the Western Region is

http://geopubs.wr.usgs.gov

To access this publication, go to

http://geopubs.wr.usgs.gov/map-mf/mf2371/

Besides providing easy access to the entire digital database, the Western Region Web page also affords easy access to the PostScript plot files for those who do not use digital databases (see below).

To obtain tar files of database or plot file packages by ftp:

The files in this reports are stored on the U.S. Geological Survey Western Region FTP server. The Internet ftp address of this server is:

ftp://geopubs.wr.usgs.gov

The user should log in with the user name anonymous and then input their e-mail address as the password. This will give the user access to all the publications available via ftp from this server.

The files in this report are stored in the subdirectory

pub/map-mf/mf2371/

To obtain tar files of database or plot file packages on tape

Database files, PostScript plot files, and related files can be obtained by sending a compact disk (CD) with request and return address to:

Silver Lake Quadrangle Geologic Map Plot Files
c/o PNWUC Database Coordinator
U.S. Geological Survey
345 Middlefield Road, M/S 975
Menlo Park, CA 94025

Do not omit any part of this address!

NOTE: Be sure to include with your request the exact names, as listed above, of the tar files you require. A Miscellaneous Field Studies number is not sufficient, unless you are requesting both the database package and plot file package for the report.

The compressed tar file will be returned on the compact disk.

Obtaining plots from a commercial vendor

Those interested in the geologic map of the Silver Lake 7.5-minute quadrangle, but who use neither a computer nor the Internet, can still obtain the information. We will provide the PostScript plot files on digital compact disk (details below) for use by commercial vendors who can make large-format plots. Send a blank compact disk (CD) with request and return address to:

Silver Lake Quadrangle Geologic Map Plot Files
c/o PNWUC Database Coordinator
U.S. Geological Survey

345 Middlefield Road, M/S 975
Menlo Park, CA 94025

Do not omit any part of this address!

The compressed tar file will be returned on the compact disk.

Make sure your vendor is capable of reading compact disks and PostScript plot files. Important information regarding compact disk format is included in the sections "Database Release Format", "Tar Files", and "PostScript Plot Files" above, so be certain to provide a copy of this document to your vendor.

Obtaining paper plots from the U.S. Geological Survey

The U.S. Geological Survey provides a print on demand service for digital maps such as this report. To obtain plots, contact the U.S. Geological Survey at:

USGS Information Services

Box 25286
Denver Federal Center
Denver, CO 80225-0046

(303) 202-4200
1-800-USA-MAPS
FAX: (303) 202-4695
e-mail: infoservices@usgs.gov

Be sure to include with your request the Miscellaneous Field Studies Map number.

Converting ARC export files

ARC export files are converted to ARC coverages using the ARC command IMPORT with the option COVER. To ease conversion and maintain naming conventions, we have included an ASCII text file in ARC Macro Language that will convert all of the export files in the database into coverages and create the associated INFO directory. From the ARC command line type:

Arc: &run import.aml

ARC export files can also be read by some other Geographic Information Systems. Please consult your GIS documentation to see if you can use ARC export files and the procedure to import them.

Digital compilation

Several different coverages were generated during the construction of the Silver Lake quadrangle map. The raster geology images were scanned, georeferenced, and converted to vector coverages with ARC/INFO's gridline routine. Alacarte and some custom menus and AMLs were used to project, transform, edit, tag, and build lines, polygons, and points in the map. A digital layout or map collar was made with Adobe Illustrator (sl_eps). The topographic base map was scanned as a 250 dpi TIFF image, georeferenced and converted to an ARC/INFO GRID, The geology polygon coverage was converted to a grid, and merged with the topographic base grid to create a geology/topography grid (sl_grd). The plot AML (sl_plot.aml) runs in ARC/INFO and call the coverages, grids, and Adobe Illustrator EPS files to make an uncompressed PostScript file (sl_ps). The map is in UTM projection, zone 10, meters, 1:24,000 scale. The pamphlet that describes the geology was saved to PDF from Microsoft Word.

Annotation

Within the structural coverage is an annotation showing dip amount associated with each attitude. This annotation layer is called by the plot AML used by ARC/INFO, using a custom ARC textset, johanna.txt. The plot AML converts all coverages into a PostScript file. Map unit labels (not annotation) are used to label geology polygons. Smaller polygons, in which the label would not fit, can be identified on plots by the color of the polygon.

Base maps

The source of the base maps used is the U.S. Geological Survey, 1:24,000-scale topographic map of the Silver lake quadrangle, which has 20-foot contour intervals (1985). The topographic map was scanned on an rasterizing scanner at 250 dpi as 1-bit TIFF image. This scanned TIFF image of the base was registered and rectified in ARC/INFO and then made into a grid. The image was clipped using ARC/INFO grid to conform to the area of the geologic coverages and merged with the geology grid to give an apparent transparent color image of both combined. The base map-geology layers are digital images but no information other than location is attached to the lines. The base-geology maps are provided for reference only.

Spatial resolution

Uses of this digital geologic map should not violate the spatial resolution of the data. Although the digital form of the data removes the constraint imposed by the scale of a paper map, the detail and accuracy inherent in map scale are also present in the digital data. The fact that this database was edited at a scale of 1:24,000 means that higher resolution information is not present in the dataset. Plotting at scales larger than 1:24,000 will not yield greater real detail, although it may reveal fine-scale irregularities below the intended resolution of the database. Similarly, where this database is used in combination with other data of higher resolution, the resolution of the combined output will be limited by the lower resolution of these data.

Database specifics

The map databases consist of ARC coverages and supporting INFO files, which are stored in a UTM (Universal Transverse Mercator) projection (Table 1). Digital tics define a 7.5-minute grid of latitude and longitude in the coverages corresponding with quadrangle corners.

Table 1 - *Map Projection*

The map is stored in UTM projection

PROJECTION:	UTM	
UNITS:	METERS	-on the ground
ZONE:	10	-UTM zone
PARAMETERS		
END		

The content of the geologic database can be described in terms of the lines, points, and the areas that compose the map. Descriptions of the database fields use the terms explained in table 2.

Table 2 - *Field Definition Terms*

ITEM NAME	name of the database field (item)
WIDTH	maximum number of digits or characters stored
OUTPUT	output width
TYPE	B-binary integer, F-binary floating-point number, I-ASCII integer, C-ASCII character string
N. DEC.	number of decimal places maintained for floating point numbers

Lines

The lines (arcs) are recorded as strings of vectors and are described in the arc attribute table (table 3). They define the boundaries of the map units, faults, and the map boundaries. These distinctions, including the geologic identities of the unit boundaries, are recorded in the LTYPE field according to the line types listed in table 4.

Table 3 - *Content of the Arc Attribute Tables*

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.	Description
FNODE#	4	5	B		starting node of arc (from node)
TNODE#	4	5	B		ending node of arc (to node)
LPOLY#	4	5	B		polygon to the left of the arc
RPOLY#	4	5	B		polygon to the right of the arc
LENGTH	4	12	F	3	length of arc in meters
<coverage>#	4	5	B		unique internal control number
<coverage>-ID	4	5	B		unique identification number
LTYPE	35	35	C		line type (see table 4)
SEL	1	1	I		user-defined field used to save a selected set
SYMB	3	3	I		user defined field used to save symbol assignments (such as color)

Table 4 - *Line Types recorded in the LTYPE Field (listed by coverage name, LTYPE ending with "m" or "_" is for cartographic plotting purposes to cause a symbol to plot at a specific location on that line).*

sl_geo
contact, approximately located
contact, certain
contact, concealed
contact, inferred
map boundary
normal fault, approximately located

normal fault, approximately located _m
normal fault, certain
normal fault, certain _m
normal fault, concealed
s.s. fault, r.l., approximately located
s.s. fault, r.l., concealed
ss fault, rl, approximately located, queried
ss fault, rl, concealed, queried
water boundary, certain

sl_stx
cross section

sl_ann
leader

Areas

Map units (polygons) are described in the polygon attribute table (table 5). The identities of the map units from compilation sources are recorded in the PTYPE field by map label (table 6). Note that ARC/INFO coverages cannot contain both point and polygon information, so only coverages with polygon information will have a polygon attribute table, and these coverages will not have a point attribute table. More complete descriptions of the various rock units can be found in the geologic report (geol.txt or geol.pdf) that accompanies the dataset.

Table 5 - Content of the Polygon Attribute Tables

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.	Description
AREA	4	12	F	3	area of polygon in square meters
PERIMETER	4	12	F	3	length of perimeter in meters
<coverage>#	4	5			unique internal control number
<coverage>-ID	4	5	B		unique identification number
PTYPE	35	35	C		unit label
SEL	1	1	I		user defined field used to save a selected set
SYMB	3	3	I		user defined field used to save symbol assignments (such as color)

Table 6 - *Map Units*

(See geol.txt or geol.ps for descriptions of units)

sl_geo
Qa
Qf
Ql
Qlh
Qls
Qoa
Qsa
Qsl
Qsp
Qss
Qss?
Qt
Ta
Tahg
Tba
Tc

Tdi
Tgrs
Tk
Tmt
Tto
Ttob
Ttoc
Tts
Tvs
Tw
Twp
water

Points

Data gathered at a single locality (points) are described in the point attribute table (table 7). The identities of the points from compilation sources are recorded in the PTTYPE field. Map units are described more fully in the text file geol.txt or geol.pdf. Note that ARC/INFO coverages cannot contain both point and polygon information, so only coverages with point information will have a point attribute table, and these coverages will not have a polygon attribute table.

Table 7 – *Content of the Point Attribute Table*

sl_stx
Geologic attitudes

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.
AREA	4	12	F	3
PERIMETER	4	12	F	3
SL_STX#	4	5	B	
SL_STX-ID	4	5	B	
PTTYPE	35	35	C	
PTTYPE	3	3	I	
STRIKE	3	3	I	
SEL	1	1	I	
SYMB	3	3	I	

Unique values of PTTYPE in sl_stx:
bedding
fault, ss, rl
horz bedding
igneous foliation
inclined cleavage

sl_chm
Sample locality for chemical analysis

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.
AREA	4	12	F	3
PERIMETER	4	12	F	3
SL_CHM#	4	5	B	
SL_CHM-ID	4	5	B	
PTTYPE	35	35	C	
SAMPNO	35	35	C	

SEL	1	1	I	
SYMB	3	3	I	
PLOTNO	7	7	I	
FIELDSAMPL	17	17	C	
LATITUDE	19	19	C	
LONGITUDE	17	17	C	
MAPUNIT	9	9	C	
ROCKTYPE	26	26	C	
SIO2	8	9	F	2
TIO2	8	9	F	2
AL2O3	8	9	F	2
FE2O3	8	9	F	2
FEO	9	9	C	
MNO	8	9	F	2
MGO	8	9	F	2
CAO	8	9	F	2
NA2O	8	9	F	2
K2O	8	9	F	2
P2O5	8	9	F	2
H2O+	8	9	F	2
H2O-	9	9	C	
CO2	9	9	C	
TOTAL	8	9	F	2
SIO2_N	8	9	F	2
TIO2_N	8	9	F	2
AL2O3_N	8	9	F	2
FE2O3_N	8	9	F	2
FEO_N	8	9	F	2
MNO_N	8	9	F	2
MGO_N	8	9	F	2
CAO_N	8	9	F	2
NA2O_N	8	9	F	2
K2O_N	8	9	F	2
P2O5_N	8	9	F	2
Plagioclas	9	9	C	
Clinopyrox	9	9	C	
Orthopyrox	9	9	C	
Olivine	9	9	C	
FE-TiOxide	9	9	C	
Hornblende	9	9	C	
Quartz	9	9	C	
K-Feldspar	10	10	C	
Other	19	19	C	
Groundmass	9	9	C	
No.PointsC	9	9	C	
Texture	27	27	C	
MG	9	9	C	
BA	9	9	C	
RB	9	9	C	
SR	9	9	C	
Y	9	9	C	
ZR	9	9	C	
NB	9	9	C	
NI	9	9	C	
CU	9	9	C	

ZN	9	9	C
CR	9	9	C

Unique values of PTTYPE in sl_chm:
chemistry

sl_rad
Sample location for radiometric age determination

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.
AREA	4	12	F	3
PERIMETER	4	12	F	3
SL_RAD#	4	5	B	
SL_RAD-ID	4	5	B	
PTTYPE	35	35	C	
SAMPNO	35	35	C	
SEL	1	1	I	
SYMB	3	3	I	
PLOTNO	7	7	I	
AGE	15	15	C	

Unique values of PTTYPE in sl_rad:
radiometric

sl_fos
Megafauna and plant fossil localities

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.
AREA	4	12	F	3
PERIMETER	4	12	F	3
SL_FOS#	4	5	B	
SL_FOS-ID	4	5	B	
PTTYPE	35	35	C	
SAMPNO	35	35	C	
SEL	1	1	I	
SYMB	3	3	I	
PLOTNO	5	5	C	

Unique values of PTTYPE in sl_fos:
fossil

sl_coal and (sl_clay)

Coal mine or prospect localities and Clay pit localities

ITEM NAME	WIDTH	OUTPUT	TYPE	N.DEC.
AREA	4	12	F	3
PERIMETER	4	12	F	3
<COVER>#	4	5	B	
<COVER>-ID	4	5	B	
PTTYPE	35	35	C	
SAMPNO	35	35	C	
SEL	1	1	I	
SYMB	3	3	I	

Unique values of PTTYPE in sl_coal:
coal
Unique values of PTTYPE in sl_clay:

clay

Acknowledgments

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References Cited

Fitzgibbon, T.T., 1991, ALACARTE installation and system manual (version 1.0): U.S. Geological Survey Open-File Report 91-587B.

Fitzgibbon, T.T., and Wentworth, C.M., 1991, ALACARTE user interface - AML code and demonstration maps (version 1.0): U.S. Geological Survey Open-File Report 91-587A.

Wentworth, C.M., and Fitzgibbon, T.T., 1991, ALACARTE user manual (version 1.0): U.S. Geological Survey Open-File Report 91-587C.