

APPENDIX A

NATIONAL DATA BASES

National data bases are a source of ground water, surface water and geologic information that may be used to supplement or satisfy some of the data requirements.

A. U.S. Geological Survey National Water Information System

Information discussed below for the U.S. Geological Survey (USGS) National Water Information System (NWIS) was taken from a description of the NWIS found at the following web site:

<http://water.usgs.gov/public/pubs/FS/FS-027-98>

The USGS investigates the occurrence, quantity, quality, distribution, and movement of the surface and underground waters that constitute the Nation's water resources. The USGS is the principal Federal water-data agency that collects and disseminates the data being used by State and local governments, public and private utilities, and other Federal agencies to develop and manage our water resources. Data are collected by USGS personnel in all 50 States, plus Puerto Rico and Guam. These hydrologic data are used not only for determining the adequacy of water supplies, but also for implementing flood-warning systems; designing dams, bridges, and flood control projects; allocating irrigation water; locating sources of pollution; planning for energy development; and predicting the potential effects of radioactive waste disposal on water supplies.

1. Description Of The NWIS

As part of the Survey's program of disseminating water data to the public, the Water Resources Division (WRD) maintains a distributed network of computers and file servers for the storage and retrieval of water data collected through its activities at approximately 1.4 million sites. This system is called the NWIS.

The NWIS is a distributed water database in which data can be processed over a network of computer workstations and file servers at Survey offices throughout the U.S. The system is composed of four subsystems: the Ground-Water Site-Inventory System, the Water-Quality System, the Automated Data-Processing System, and the Water-Use Data System.

Many types of data are stored in the NWIS distributed, local data bases, including:

- Site information
- Time-series (flow, stage, precipitation, chemical)
- Peak flow
- Ground water
- Water quality
- Water use

2. Ground-Water Site Inventory System

The Ground-Water Site Inventory (GWSI) System contains and provides access to inventory information about sites at stream reaches, wells, test holes, springs, tunnels, drains, lakes, reservoirs, ponds, excavations, and water-use facilities. The system also provides for entering new sites within the local database.

Approximately 300 components make up the descriptive elements of the GWSI. These components are stored in one general data file called the Site File, which contains site information common to all subsystems of the NWIS, and eight GWSI data files that contain ground-water-related information. The eight GWSI data files contain well-construction, ground-water level, ground-water well or spring discharge, geohydrologic characteristics, observation-well report header, aquifer hydraulics, ground-water use by state, and miscellaneous data.

The GWSI retrieval program can be used for retrieving information from the Site File and the associated GWSI files to generate two types of general data tables, four types of water-level tables, or a file suitable for input to other programs.

Through the system menu, the GWSI System maintains the local databases and performs other administrative tasks, including data dictionary modifications and site identification changes, and provides programs for entering field data into files used to update the local database.

3. Water Quality System

The Water Quality System contains results of more than 3.5 million analyses of water samples that describe the chemical, physical, biological, and radiochemical characteristics of both surface and ground waters. Types of chemical data include filtered and/or unfiltered concentrations of major ions,

trace elements, nutrients, pesticides, base-neutral organics, acid organics, and volatile organic compounds. Physical characteristics data include pH, specific conductance, water and air temperature, dissolved oxygen, barometric pressure, and percent dissolved oxygen saturation.

Water samples data are analyzed at laboratories equipped to perform chemical analyses ranging from determinations of simple inorganic compounds, such as chlorides, to complex organic compounds, such as pesticides. As each analysis is completed, the results are verified by laboratory personnel and transmitted to the originator of the data by use of a computer, and then stored in their water-quality database.

Sediment data in the Water Quality System include suspended-sediment concentrations in water, sediment-size distributions, and chemical concentrations of suspended sediments and bottom sediments. Biological data in the system include population densities and diversity indexes of periphyton, phytoplankton, and benthic invertebrates.

The system can produce three types of tables of water-quality data and one table of biological population data. Types of summary tables include frequency percentiles; analytical detection limits; sample summary; and alert limits. Several standard output formats, such as flat-file and the 1- and *-format, are available for input to applications. The system's graphic outputs include: X-Y plots, regression plots, box plots, time-series plots, Stiff diagrams, and Piper diagrams.

4. Automated Data-Processing System

The Automated Data Processing System (ADPS) contains more than 850,000 station years of time-series data that describe stream-water levels, streamflow (discharge), reservoir water levels, surface-water quality, ground-water levels, and rainfall. ADPS consists of a collection of computer programs and databases.

The water data stored in ADPS results from the processing of data collected by automated recorders and by observations and manual measurements at field installations around the nation. The data from these sites are transported by field personnel or are relayed through telephones or satellites to offices where USGS personnel, using ADPS procedures, process the data.

The data relayed through the Geostationary Operational Environmental Satellite (GOES) system are processed automatically in near-real time, and in many cases are available within minutes at the local USGS web pages.

5. Water-Use Data System

The Water-Use Data System (WUDS) stores summary data on water use throughout the nation and includes two database systems: the Site-Specific Water-Use Data System (SWUDS), and the Aggregate Water-Use Data System (AWUDS). SWUDS stores measurements and estimates of water use by individual users. AWUDS stores aggregated estimates of water use by county, hydrologic unit, and aquifer. The WUDS is used to enter and update existing water-use data, and to provide retrievals and displays of data that are stored in a local database.

6. NWIS Assistance

General assistance in the operation and application of NWIS is available from the NWIS office in Reston, Virginia. Write to or call:

National Water Information System
U.S. Geological Survey
MS 437, National Center
Reston, VA 20192
Telephone: 703 648-5306.

Water data are available at local Web sites that can be accessed at <http://water.usgs.gov/index.html>.

Contact information for the USGS State Representatives is available at <http://water.usgs.gov/public/staterep.html>.

B. USGS National Coal Resources Data System

During the energy crisis of the mid-1970's, the U.S. Geological Survey (USGS), in cooperation with state geological organizations, initiated an ambitious project to create a comprehensive national coal information database. This database, known as the National Coal Resources Data System (NCRDS), was to locate, measure, and characterize all of the Nation's coal resources, regardless of bed thickness, depth, location, or quality. An initial goal of the project was to obtain and characterize at least one sample per coal bed from every geographic quadrangle (approximately 50 to 60 square miles) underlain by coal.

During the 20 years since its inception, the NCRDS Coal Quality database has developed into the largest publicly available database of its kind. As part of this effort the USGS has maintained a coal quality database of national scope, which contains data on more than 13,000 samples). The data in the coal quality database represent analyses of the coal as it exists in the ground. For each sample, 136 parameters are recorded, including location and descriptive data, ASTM analyses (on an as-received moisture basis), and major-, minor-, and trace-element analyses (on a remnant moisture basis). The

analyses are presented on a whole-coal basis, except for the oxides, which are presented on an ash basis. Many of these data have been published in various USGS Open-File Reports or other publications.

Public data analyses for 7,430 coal samples representing complete-bed thicknesses at various localities, are available on the USGS Open-File Report (OF97-134) CDROM or by searching the COALQUAL database and NCRDS database found at the following USGS web site:
<http://energy.er.usgs.gov/products/databases/coalqual/docs/pdflist.pdf>

Data for individual analyses, not representing the complete-bed thickness, may be requested from the USGS Eastern Energy Resources Team. Requests for the CDROM, which is available to the public at no charge, or requests for data searches should be made to:

Linda Jean Bragg
USGS
956 National Center
Reston, VA 20192
Email: lbragg@usgs.gov
Phone: 703-648-6451
Fax: 703-648-6419

Requests for information should reference the Freedom of Information Act. When more than one hour is required to complete a data search, costs to cover materials and the hourly wages of the employee performing the search will be charged. Vertical and Lateral Distribution of Coal Quality Components

Further information regarding the availability of USGS data sources can be obtained by accessing the USGS.world wide web on the Internet. See links below.

Home page: <http://www.usgs.gov>

Water Resources Division: <http://h2o.usgs.gov/>

C. U.S. Bureau of Land Management (BLM)

While the U.S. Geological Survey is probably the premier data collection agency, the U.S. Bureau of Land Management has a great source of information and data at their “Meta Data and WWW Mapping Home Page.” There is much geospatial data and this site has a large, useful array of literally hundreds of links with directions. Link to:

<http://www.blm.gov/gis/narsc/metadata/nsdi.html>

D. U.S. Department of Agriculture

The Natural Resources Conservation Service has technical resources on maps, soils data, water, climate and other related subjects. Link to: <http://www.nrcs.usda.gov/TechRes.html>

E. U.S. Environmental Protection Agency

1. STORET

STORET is a computerized data base utility maintained by the U.S. Environmental Protection Agency (EPA) for the STORage and RETrieval of parametric data pertaining to the quality of the waterways within and contiguous to the U.S. Since its inception in the early 1960s, the original data base has evolved into a comprehensive system, capable of performing a broad range of reporting, statistical analysis and graphics functions, while continuing to serve in its original role as a repository of parametric water quality data. STORET is accessed by hundreds of users, utilizing computer terminals located throughout the country.

The system is comprised of several individual but related files, which contain various types of information, including:

- Geographic and other descriptive data about the sites where water quality data have been collected, referred to in STORET as "station" data.
- Data related to the physical characteristics and chemical constituents of the water, fish tissue, or sediment sampled, referred to in STORET as "parametric" data.
- Information on pollution-caused fish kills.
- Daily stream flow data.

The data contained in STORET are collected, stored, and used by a variety of Federal, State, and local government agencies and their contractors.

EPA Headquarters provides extensive operational support for the STORET user community, through the STORET User Assistance Section, Assessment and Watershed Protection Division in the Office of Water. User Assistance personnel are available by telephone from 8:00 a.m. to 5:00 p.m. eastern time, Monday through Friday, to answer questions. During those hours, users may call toll free (800) 424-9067. The STORET User Handbook contains complete documentation on how to use the system. Copies of the Handbook are distributed to all new users. A current list of Handbook owners is used as a mailing list for updates, periodicals, memoranda, and other items that may be made available to STORET users.

User assistance personnel also periodically conduct basic and advanced STORET training seminars. (Prerequisites for the advanced seminar are completion of the basic seminar and at least 6 months experience as an active STORET user.) In addition, an annual 3-day users' meeting provides a forum for users from across the country to exchange ideas and share experiences with the use of the system.

Representatives of Federal, State, interstate, and local government agencies and private individuals all are eligible to become STORET users. Depending on the affiliation of the user, there are several methods of monetary compensation of EPA for the use of the system. Charges assessed will not exceed the direct costs in responding to a data request.

For further information on funding or on how STORET can help you fulfill your water quality data analysis needs, contact your Regional STORET representative.

STORET User Assistance ((800) 424-9067) can furnish you with the name and telephone number of your representative. See also the EPA web site at: <http://www.epa.gov/storet>

F. Pennsylvania State University Coal Data Base

The Pennsylvania State Coal Database contains information on nearly 1,500 coal samples collected from all seven U.S. coal provinces over the past 30 years for inclusion in the Pennsylvania State Coal Sample Bank. These are the PSOC series samples used worldwide and frequently cited in research papers, as well as the recent DECS series. For general purposes, the most useful samples are those representing the entire thickness of the seam at the sample site, of which there are about 675. The others are subsamples which illustrate the heterogeneity of coal properties through the vertical extent of a seam. The database is now operated with Microsoft Access 97.

The data can be divided into several broad categories:

- Sample location, type, description, and geology
- Standard chemical data (proximate, ultimate, sulfur forms, calorific value)
- Petrographic data (maceral analysis and vitrinite reflectance)
- Inorganic constituents (major and trace inorganic elements)
- Technological & utilization testing (Gieseler plastometry, ash fusion data, Hardgrove grindability index, etc.)

Many of the individual analyses are recalculated to several different bases of expression, increasing the number of data fields required. In total over 400 fields are used, although not all are completed for

every sample. For the majority of recent samples, the standard printed report format requires four pages to fully describe each sample.

Users may obtain data through Pennsylvania State personnel in several ways, and many transactions can be completed with a telephone call. A standard printed report on an individual sample usually fills four pages. Database searches can be performed and the results used to select individual reports, create a composite table of data, or transmit an electronic data set in one of several file formats. Current fees for these services can be obtained through the contact listed below.

A searchable subset is available on the web site so that users may obtain data directly at no cost. Thirty-one of the most commonly requested data fields and 587 whole-seam, working-section or run-of-mine samples are included. Simple searches based on location, seam name or analytical data are possible. These result in a table listing samples meeting the search criteria, and a one-screen-per-sample data summary is accessible. The web site is expected to provide additional capabilities in the future.

Contact:

Gareth D. Mitchell, Research Associate
Coal and Organic Petrology Laboratories
The Pennsylvania State University
105 Academic Projects Bldg.
University Park, PA 16802-2300
<http://www.ems.psu.edu/COPL>

Phone	(814) 865-6543
Fax	(814) 865-3573
email	n8h@psu.edu