COALFILE

By Candace E. Kenyon

BACKGROUND

COALFILE is a computer-based data storage and retrieval system for coal exploration information. It provides an index to data contained in coal assessment reports and the updating and maintenance of this file is an ongoing project; the history of the project is outlined by Kenyon (1985). In the spring of 1985, an internal committee was appointed to undertake an in-depth project review of COALFILE.

PROJECT REVIEW

Following are the terms of reference for the project review of COALFILE:

(1) To determine and document the usage of COALFILE by industry and government.
(2) To assess the relevance of the information in the files to the various users.
(3) To assess the timeliness, relevance, and quality of output.
(4) To assess the technical aspects of the data management system as well as the application capabilities and identify problem areas.
(5) To determine the costs of maintaining COALFILE as well as the income received from sales of output.
(6) To recommend changes to make the database most effective.

Four techniques were utilized in the project evaluation: file research, questionnaires (a random sampling of industry), interviews, and observation.

It was determined that COALFILE provided a valuable catalogue of accurate, up-to-date, exploration summary data but to a limited user market. Industry most commonly used the file as an index to further information searches. In some cases there were false expectations of the data due to a lack of understanding and exposure of the information contained in the file. Those who utilized COALFILE were not interested in the analytical data which comprised a major portion of the database because most individuals wished to review the actual assessment report when interpreting analytical information. Output from the existing file was satisfactory, but the cost structure was not yet developed.

An assessment of the technical aspects of the project revealed some problems. The British Columbia Systems Corporation (BCSC) provided all of the technical assistance for the computer file. COALFILE had undergone three major conversions on mainframe systems in a five-year period. This involved changes in operating systems, programming languages, database systems, and a lack of continuity in computer personnel. Because of this control of technical aspects by BCSC, the database manager had no read or write access to the operating software and the system was costly to maintain and inflexible concerning editing and retrieval capabilities. Complicated programs were necessary to produce customized reports as well as statistical and graphic output. A disproportionate amount of time and resources were being spent on machines and consultants.

The in-depth evaluation of COALFILE resulted in the following recommendations:

(1) COALFILE should be restricted to information dealing with exploration work as compared to results from exploration work. This would mean elimination of analytical data capture.

(2) A property summary file for the coal deposits in the province should be created, independent of COALFILE.
(3) Other unique projects, independent of COALFILE should deal with the data falling into the 'Results of Exploration Work' category.
(4) COALFILE should not be stored on the mainframe at BCSC but should reside on a dedicated disk in the microcomputer environment. Basic utility programs on the mainframe would continue to be utilized.
(5) The database manager should take a PL/1 programming course to provide the Geological Branch with more autonomy in regards to COALFILE.
(6) COALFILE should have a higher profile. It should be included in government publication lists and other forms of distribution should be devised. A price structure for data output should be established.

REVISIONS TO COALFILE

Upon completion of the project review, a COALFILE Management Committee was formed in order to decide the future direction of the database. The database manager was appointed project leader and considered the following options in a detailed cost-benefit analysis study:

(1) To carry out the revisions as recommended by the Evaluation Committee (downloading COALFILE to the IBM PC XT Microcomputer).
(2) To adapt new coding forms to the old files, retaining the record structures, but dropping the analytical information (the data would be downloaded for this option also).
(3) To leave COALFILE as is and keep collecting data on the old coding forms.

The operating costs for each option were detailed for 1985/86 and then projected over a five-year period. The first option proved to be more economical and the project leader then presented an implementation plan to carry out the necessary revisions to COALFILE.

The object of this plan was to have the project completed by the end of January 1986. Industry could then have a hands on demonstration at the Cordilleran Round-up in Vancouver.

The implementation plan called for major programming changes and testing, including a complete conversion of the old files to new record structures and a rewrite of all the load/edit programs. Software that was to be retained on the mainframe had to be modified. Complete instruction and maintenance manuals had to be written. All the data in the new format was downloaded to the micro computer (IBM PC XT) and the files were then defined to a fourth generation language (FOCUS). Further testing was done at this level to determine the type of output available.

The following benefits resulted from revisions to the old database:

(1) Data storage now resides on the microcomputer. This eliminates disk storage costs on the mainframe system. Routine maintenance can be done at the micro level.
(2) Basic utility programs on the mainframe can still be accessed.
(3) Shorter record structures allow for interactive editing capabilities and these newly designed files incorporated data field changes suggested by the internal committee. The entire database can reside on a 5 megabyte disk.

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(4) FOCUS generates reports using multiple retrieval parameters as well as statistical charts and graphics on the microcomputer. The language is user friendly and will encourage hands on experience.

(5) The use of both the mainframe and the microcomputer will allow for a variety of output products.

(6) Reliance on BCSC for database management no longer exists.

PRESENT STATUS OF COALFILE

COMPUTER ASPECTS

COALFILE presently resides on floppy diskettes and is accessed on an IBM PC XT. Six sequential files, each record 230 characters in length, comprise the database. WYLBUR software is used for editing purposes. FOCUS (a fourth generation language) is used for generating reports, statistics, and graphs. An Epsom printer and an HP7475A plotter produce hardcopy. The IBM PC XT contains an IRMA board which allows data transfer to and from the IBM 3081 Model K mainframe at BCSC.

Calcomp software for producing x, y coordinate plots resides on the mainframe and operates in TSO foreground. Hardcopy is produced on a flat bed plotter at the Ministry of Transportation and Highways. Basic utilities written in PL/1 reside on the mainframe and are run using menu driven Wylbur exec programs. These utilities are used to load new data, create subset files, restore tapes, back up data, sort files, manipulate tapes and disks, and provide a help facility. The mainframe is more efficient than the micro for running and printing batch jobs. To assure data security, COALFILE is backed up onto tape at BCSC on a regular basis. The old database and all associated utilities are archived on tape (see Geological Fieldwork, 1984, Fig. 130, which illustrates computer hook ups for the Geological Branch).

TYPE OF DATA (Table 34-1)

COALFILE is updated with information extracted from assessment reports on a yearly basis. Each report can have as many as six files of associated data. The following record types comprise the database:

(1) **Explore record:** Contains general information such as property ownership, operators, location, work summary, licence area, and types of analyses done. Each coal property in the province has a unique identifier. Detailed information for each report is found in the following record types.

(2) **Comment record:** This is reserved for text concerning the assessment report (for example, title of report, comments, completeness of information).

(3) **Map record:** Indicates the type of maps, including scale and area mapped, that were submitted with the assessment report.

(4) **Trench record:** Provides location data for each trench. It contains the seam name(s) that the trench intersects and the types of sampling done.

(5) **Bulk record:** Contains location information concerning bulk samples (whether from pits or adits). It indicates the seam name, the position of the sample in the seam, type of testing, and sample size.

(6) **Borehole record:** Provides location data, type of borehole, depth drilled, inclination, number of coal intersections, number of analyses, contractor, geophysical log types, and core storage information.

TABLE 34-1. SUMMARY OF RECORDS STORED IN COALFILE

Record Type	Total No. Records
Explore	621
Comment	627
Map	540
Trench	3 076
Bulk	631
Borehole	6 442

INFORMATION AVAILABLE

Output from COALFILE is available as hardcopy or on diskettes or tape. Information is available as raw data or as customized requests. All output in raw data format is accompanied by a description of the structure of the record(s) and the associated code tables. Costs for output have not yet been determined, but they will be reasonable and will vary according to the type of request.

RAW DATA

Obtaining data in raw format allows the user to utilize whatever software is available to access the information.

(1) **Hardcopy printouts:** This can be either an entire file(s) or specific information, such as all the boreholes on Vancouver Island.

(2) **Diskettes** (5 1/4 inch): This could involve one or more file types on a diskette, depending on the request. One diskette can hold 1 500 records.

(3) **Tapes:** A complete file or the entire database could be copied onto a tape at BCSC. The archived borehole analysis data are best purchased as a tape.

CUSTOMIZED RETRIEVALS

Customized data retrievals are available in a variety of formats:

(1) **FOCUS-generated reports:** These customized reports are easy to read with headings, selected information, specific retrieval parameters, summary data if required, and many other features. Codes are replaced by words.

(2) **Statistical and graphic output:** Data can be summarized and presented in one of these formats. An example would be a graph illustrating borehole drilling over a 10-year period. This is an alternative to a report format.

(3) **Plots, x y coordinates:** These are hardcopy location maps on a UTM grid system at any desired scale. The plot can illustrate borehole, trench, or bulk sample locations. Up to eight pieces of information can be printed beside the location point. A printout of the raw data accompanies the plot.

OTHER INFORMATION

(1) **Open file listing:** This is a customized report providing an index summary of exploration data for all non-confidential assessment reports on file with the Ministry. The charge for this listing is $5.00.

(2) **Information pamphlet:** Detailed data descriptions for each record type are listed here as well as examples of output available from COALFILE. There is no charge for this pamphlet.

PLANS FOR COALFILE

COALFILE will be updated on a regular basis. The data are presently residing on floppy diskettes, but an alternative storage method should be available soon, either a fixed dedicated hard disk or a removable cartridge (that is, a Bernoulli box with two removable 10-megabyte cartridges).

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REFERENCES

Kenyon, C. (1985): COALFILE, B.C. Ministry of Energy, Mines & Pet. Res., Geological Fieldwork, 1984, Paper 1985-1, pp. 399-402.