# Resource Data and Analysis

# MINFILE

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## INTRODUCTION

In the fall of 1984 a decision was made to redesign MINFILE; the project was given a high priority by the Chief Geologist. A management committee consisting of the Chief Geologist, the Managers of Resource Data and Analysis and Geoscience Projects, and the Director of Data Services was established to oversee the project. Trygve Höy, Cindy Borsholm, and Allan Wilcox (project leader) were selected for the working project team. Their responsibilities included supervision of contractors and the daily progress of the redesign.

## MINFILE REDESIGN OBJECTIVES

MINFILE has undergone a redesign to serve five main functions:

(1) In conjunction with the Ministry's five-year plan to provide a better inquiry base for mineral inventory data for Ministry and industry use.

(2) To eliminate long-term problems caused by the previous conversion of the database from Honeywell to IBM.

(3) To enable downloading of sections of the database onto personal computers for use by individual geologists. Project and district geologists will be able to update and add new information directly.

(4) To provide graphic output capabilities.

(5) To provide a lead in to "expert" systems.

## MINFILE REDESIGN ADVANTAGES

The redesign of MINFILE brings several advantages with it, both from a computerization standpoint and a geological standpoint.

(1) The new MINFILE is a relational database as compared to a hierarchial one.

(2) The system is table driven.

(3) Improved search capabilities allow retrievals on all data fields. Complicated searches using Boolean logic with nested inquiries will be possible.

(4) A fourth generation software/database management system is used to manipulate the data.

## COMPUTER HARDWARE

MINFILE resides on a VAX 11-750 minicomputer at the British Columbia Systems Corporation (BCSC). The VAX 11-730 computer installed in Mineral Titles Branch is dedicated to graphics at the present time and does not have the capacity to handle both systems efficiently. Access to the data is via one VT 240, one VT 102 and two VT 220 terminals. Hard copy is produced on a DEC LA210 local printer.

## COMPUTER SOFTWARE

When the hardware choice was finalized, the following database management systems were considered:

Focus
Powerhouse
DBase II/III
R:Base 4000/6000
ORACLE
ULTRA

The software product had to meet four basic requirements:

(a) be operational on a VAX.

(b) be a relational database.

(c) allow fourth generation access.

(d) support multi-users.

An in-depth test of ORACLE was performed using the IBM PC version of the software. Results of this test were compared against ULTRA (on a VAX 11-750). Certain factors were taken into consideration in choosing the ULTRA software. These factors were (1) referential integrity, (2) data independence, (3) backup/recovery facilities, (4) security, (5) end-user queries, (6) report writing, (7) system support, (8) micro computer compatabilities, (9) file management, (10) ease of screen design, (11) amount of third generation programming required beyond systems fourth generation features, (12) graphics interface, (13) on-line directory, (14) multithreading, (15) database physical design, and (16) lock-out management.

## ULTRA

ULTRA is a directory driven database and information management system designed for the VAX environment that uses the VMS operating system.

ULTRA provides data management for database administrators, application programmers, and end-users. Figure 33-1 illustrates the way data flows within the system and how each component fits into ULTRA.

The ULTRA Directory is the central point of control for the system. Its integration with the Logical User View (LUV) insulates all users from the physical structure of the database which is maintained by the ULTRA DBMS (database management system). The Database Administrator (DBA), with access to the directory, controls how data is used as well as the users. For example, LUV allows the DBA to define logical views of the database for particular users.

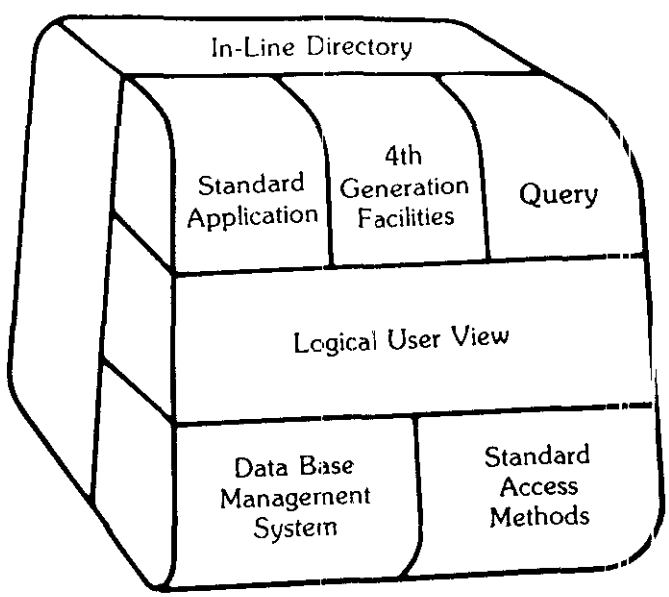


Figure 33.1. ULTRA's integrated architecture.

British Columbia Ministry of Energy, Mines and Petroleum Resources, Geological Fieldwork, 1985, Paper 1986-1.

## TABLE 33-2. MINFILE — NEW DATA FIELDS

### IDENTIFICATION

MINFILE No.
National Mineral Inventory Number
Mindep No.
Name
Status: Open Pit
Underground
NTS
Mining Division
Latitude/Longitude/UTM
Location Accuracy

### HOST ROCK

Dominant Rock Type
Stratigraphic Units: Group
Formation
Member
Igneous/Metamorphic
Informal/Other

Stratigraphic Age/Isotopic Age

### GEOLOGICAL SETTING

Tectonic Belt
Terrane
Physiographic Region
Metamorphism: Type
Grade
Relationship

### MINERAL OCCURRENCE

Commodity
Minerals: Economic
Gangue
Alteration
Alteration Type
Deposit Type
Genetic Type
Age of Mineralization/Isotopic Age
Structural Attributes: Shape
Shape Modifier
Dimension
Attitude: Strike/Dip
Trend/Plunge

### ECONOMIC ATTRIBUTES

Reserves: Ore Zones and
Total Deposit
Grade/Cut-off
Quantity
Date
References
Best Assay-Sampling Method

Production: Year
Commodity
Quantity mined/milled/recovered

### BIBLIOGRAPHY

Bibliography
Work History: Link to Assessment Report System

These logical views may then be used by an applications programmer in a number of programs. A subsequent change to a logical view usually does not require programs to be changed or recompiled. The Directory stores the updated logical view so that wherever it is used, data are accessed in the current format.

ULTRA allows standard application programs written in COBOL, FORTRAN, or BASIC to access the ULTRA DBMS without including logic to physically navigate the DBMS. The programmer simply accesses a logical view of the data needed. LUV performs the database navigation to retrieve the data.

A fourth generation language called MANTIS is able to interact directly with LUV and the DBMS. The programs for the redesign of MINFILE have been written in MANTIS, with the exception of several FORTRAN sub-routines.

Intelligent Query (IQ) allows non-data processing professionals to use the computer for day-to-day information needs. The IQ language consists of simple commands used to retrieve data, calculate from the data, and derive statistical summaries. Queries can be written, named, and stored, so that they can be used repeatedly without retyping the entire query.

CINCOM Systems of Canada Ltd. chose the Ministry as a Beta Test site for a new product called Advanced Query (AQ) which they hope will replace IQ. The main advantage of AQ is that it works directly against the DBMS, whereas, in IQ all your views have to be redefined to IQ. An important advantage of AQ is that you can create your own personal files for downloading to a micro computer.

## MANTIS

MANTIS is a fourth generation programming language allowing users with diverse backgrounds to solve application development problems simply and quickly using a display terminal. It accomplishes this by removing the necessity of coding sheets, job control statements, source decks, and, most importantly, the waiting usually associated with the development and implementation of a new program or system.

MANTIS is an interpreter. Among other things, it enables you to:

(1) Create and test programs interactively using structured programming concepts.

(2) Design and create permanent files for data storage and manipulation.

(3) Design and create formatted screens to enable full use of all the facilities available on today's terminals to display data attractively.

## TABLE 33-1. MINFILE — EXISTING DATA FIELDS

| DEPOSIT IDENTIFICATION | GEOLOGICAL |
|---|---|
| *NTS | *Commodity |
| Latitude/Longitude/UTM | *Minerals |
| Elevation | *Deposit Type |
| *Mining Division | Capsule Geology |
| *MINFILE No. | |
| Name | |
| Status | |
| **ECONOMIC** | **BIBLIOGRAPHY/ MISCELLANEOUS** |
| *Reserves | References |
| *Production | Comments |
| | NMI No. |
| | MINDEP No. |
| | Revision Date |

* Retrievable

## INFORMATION RESIDING IN MINFILE

Old MINFILE data were divided into four main categories: Deposit Identification, Geology, Economic Attributes, and Bibliography/Miscellaneous. The data elements contained in these are illustrated in Table 33-1. The data fields for the new MINFILE are illustrated in Table 33-2. The new database contains more geological information. To capture this new data all staff geologists have been asked to code and rewrite properties that they visit during the course of their field studies. Coding forms and a coding manual were developed before the start of the 1985 field season. The coding forms will be modified based on the experience of staff using them during this season as well as the addition of a few new data fields.

## INFORMATION AVAILABLE

Complete MINFILE is available in the following formats:

(1) Paper.

(2) Microfiche.

(3) Computer tape (ASCII or EBCDIC).

(4) MS-DOS diskette — whole province or by individual map sheet (when the redesign is completed).

A number of reports and indexes are also available. These include:

(1) Alphabetical listing of deposit names.

(2) Commodity index.

(3) Numeric list of MINFILE numbers.

Other selective searches are performed using a user pay cost recovery formula.

Further information is available by telephone or mail from either of the authors at the address below:

Geological Branch
Mineral Resources Division
Ministry of Energy, Mines and Petroleum Resources
Parliament Buildings
Victoria, B.C.
V8V 1X4
*(604) 387-1301 or 387-5975*

## FUTURE PLANS FOR MINFILE

Graphic capabilities will be developed for MINFILE. Direct links with the following Ministry databases are planned; Mineral Titles, Inspection and Engineering, and Mineral Policy. These additional features will provide further output capabilities.

## REFERENCES

CINCOM Systems (1984): ULTRA — Interactive Data Base System — Technical Overview, *CINCOM Systems*, Cincinnati, Ohio, October 1984.

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Piesse, D.F.A. (1985): Evaluation of ULTRA/MANTIS as a Prototype for a Mineral Inventory System, *B.C. Ministry of Energy, Mines & Pet. Res.*, Internal Paper, May 1985.

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