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1981/50. A whole-rock geochemical data-base system

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Abstract

A considerable amount of geochemical data is available for Tasmanian rocks. An electronic data processing facility to store and retrieve this data is available on the Geological Survey Computer. Updating and retrieval is straight-forward, and the system is therefore available to any licensed users of the system.

INTRODUCTION

Geochemical data in the form of whole-rock and trace element analyses are regularly obtained by many geologists in the Survey and a large amount of data is also produced by other people which is relevant to the work of Survey geologists. The data-base system, established initially to facilitate work on the geochemical evolution of the Blue Tier Batholith, is capable of handling several thousand analyses of Tasmanian rocks. The incorporation of published analyses from sources other than the Survey will lead to a comprehensive state-wide geochemical data-base, from which any group of analyses can be extracted rapidly and accurately.

In addition to this the available data can be sorted, stored and processed by the user's own programs, such as CIPW norm, Rittman norm, Pearce and Cann plots, discriminant analysis or any other program. The value of the data-base system is inestimable, as comparison of techniques, comparison of different groups of analyses and the evaluation of the most effective methods of future sampling and analytical programmes can be carried out. This should lead to long term savings of analytical costs.

THE DATA-BASE

Each analysis is recorded as a separate record in the data-file. Each record comprises the following fields:

(1) Stratigraphic unit or major rock body

(2) Stratigraphic sub-unit (may include geological age)

(3) Field number

(4) Catalogue or thin section number

(5) Name of geologist who collected the specimen

(6) 1:50 000 sheet number

(7) Grid reference

(8) Analysis type

(9) Rock type

(10) Chemical analysis: SiO_2, TiO_2, Al_2O_3, Cr_2O_3, Fe_2O_3, FeO, MnO, MgO, CaO, Na_2O, K_2O, P_2O_5, H_2O^+, H_2O^-, LOI, CO_2, total (calculated)

(11) Trace element analysis (ppm). Twenty-six trace elements are provided for, lanthanides are not included.

DETAILS OF PROGRAM OPERATION

ANADAT is a program to manage a file containing analytical data. The operating procedure is as follows:

(1) Load Regional Pack 1 disc, unprotect both discs.

(2) Run the disc and wait for both protect lights to go off.

(3) RUn ANADAT.

(4) In response to program cues, enter the desired options.

OPTION 1. Determine if output is required in printed form or not. If output is required to a data file on which operations are to be performed, use logical unit 6.

Note: Choice of LU 6 automatically results in a print-out of the data included in ROCDAT. ROCDAT is in a form which may be edited by OSEDIT or EDIT.

Note: Choice of LU 6 is only possible if using SEARCH mode (see below).

Note: If you require a permanent file of your search result, it is necessary to copy ROCDAT onto your own file. *e.g.* After the search.

```
AL MYFILE, 1C7,3,80
CP 6,1,80,A.
AT MYFILE,1
```

MYFILE can then be used in such programs as CIPWNM or XLFRAC.

OPTION 2. Mode of operation of the program.

(*a*) *LIST MODE*. Used to obtain a listing of all the file contents. It lists stratigraphic unit, geologist, field number, analysis number, catalogue number, grid reference and sheet number of the specimen.

(*b*) *ADD MODE*. Used to update the source data file (add more analyses). After entering wait for cues. To avoid unnecessary printout use in conjunction with VDU (enter 3 in first option). To exit the ADD mode, enter EX under stratigraphic unit.

(*c*) *SEARCH MODE*. Used to find particular analyses. The operations of searching are discussed below. If the results of the search are to be used for calculations using other programs, use with logical unit 6.

(*i*) *Search by analysis number*. If only one number is required enter the same number in each field. This option is only useful if all analyses fall within one range otherwise it is better to search by the alternative method.

(ii) Search by search keys. This is the more versatile method of extracting data. How many descriptors (set of keys) for the search? Any number between 0 and 8 inclusive. For example if you want all the dolerite AND basalt on the file, only ONE descriptor is used.

If you want all the dolerite AND basalt, on the Blue Tier Map Sheet, TWO descriptors are used.

Which field does the descriptor span?

Descriptor	*Field*	*Example*
Stratigraphic Unit	1 - 20	Blue Tier Batholith/Mt Read Volcanics//
Stratigraphic Sub-Unit	21 - 40	Poimena Pluton/Comstock Tuff//
Field Number	41 - 48	BT 30/PL-95-22/MYROCK 31//
Catalogue Number	49 - 56	77-153/81-2//
Geologists Inititals	57 - 60	PRW/AVB/MMcM//
Sheet Number	61 - 64	33/91/8011//
Grid Reference	65 - 76	33079651-ANG/DN563284//
Analysis Type	77 - 88	MICROPROBE/WHOLE ROCK/AAS//
Rock Type	89 - 104	BASALT/GARNET SCHIST/PHLOGOPITE//

Enter search keys. Search key examples are listed above. The slashes and double slashes are essential as they delimit the search strings. *e.g.* There are probably no rocks classed as 'Poimena Pluton Comstock', and therefore no analyses will be found. However Poimena Pluton/Comstock// will find all analyses of 'Poimena Pluton' AND all analyses of 'Comstock'.

e.g. You want all analyses of dolerite and basalt on the Blue Tier 1:50 000 sheet.

Enter Nos of descriptors = 2
Field of 1st descriptor = 89104
Enter key = DOLERITE/BASALT//
Field of 2nd descriptor = 61 64
Enter key = 33//

(*d*) *EXIT MODE*. An entry of EX at the appropriate point will result in return of control to DOS. The program can be restarted by entering ST.

LOGICAL UNITS

The program uses the following logical units:

Logical Unit	*Physical Unit*
1	CEMDAT
2	ANADAT
3	20
4	22
6	ROCDAT
8	99

CONCLUSIONS

The geochemical system should provide a long term data storage and retrieval system of considerable value to the operations of the Survey.

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